☐ Executed Contract File
☐ Contractor
☐ Finance
☐ City Clerk
☐ Surety
☐ Granting Agency
☐ Project Manager
☐ CM/Inspector
☐ Design Professional
☐ _____

City of Kansas City, Missouri
Water Services Department
Kenneth C. Morgan P.E., Director

Project Manual

PROJECT/CONTRACT NO. 81000999/1751

PART 1

BLUE RIVER WWTP GRIT REMOVAL AND FINE SCREENS PROJECT

BIDDER/ADDRESS

Company	Goodwin Brothers Construction Co.
Contact	Doug Wachsnicht
Address	6455 Universal Avenue
	Kansas City, MO 64120
Phone	636-931-6084
Fax	636-931-6085
Email	dougw@goodwinbros.com

Project Manager: Kevin White
Telephone: 816-513-0213
Email: kevin.wite@kcmo.org

KC WATER
OFFICE OF THE DIRECTOR

4800 E. 63rd Street
Kansas City, Missouri 64130
www.kcwater.us

816-513-0504
Fax: 816-513-0185

April 10, 2025

Doug Wachsnicht
Goodwin Brothers construction Co.
6455 Universal Avenue
Kansas City, MO 64120

Re: Notice to Proceed for Contract No. 81000999/1751 Blue River WWTP Grit Removal and Fine Screens Project

Dear Mr. Wachsnicht:

The Contract Times for the subject Project shall begin **April 11, 2025**. This letter is your official Notice to Proceed to begin the Work at the Site at that time. In accordance with the Contract the Work shall be substantially complete within 12 Months for GMP-1 and within 30 Months for GMP-2. Work shall be complete and ready for final Payment within 90 calendar days after the date of substantial completion. The Missouri Tax Exemption Certificate for this Project is enclosed.

This Notice to Proceed is issued with the understanding that the City will not make any payment under this Contract until you furnish to OWNER sufficient proof from the City's Commissioner of Revenue that shows your compliance with the City's earnings and profits tax and occupational license tax ordinances. If any of your Subcontractors cannot obtain a taxpayer clearance letter, you must inform the City when the substitution of these Subcontractors is made.

KC Water is now requiring management of all construction contracts within Trimble Unity Construct Project Management Software. These include, but are not limited to, electronic invoice submission, document management, and submission of change orders.

Please direct all project-related questions to kevin.white@kcmo.org, City's Representative, at 816-513-0213 and all e-Builder-related questions to Alvina Kweh, Planning Engineer, at 816-513-0444.

Sincerely,

Jeff Martin, P.E., Deputy Director, Chief Engineering Officer

Form **5060**

Missouri Department of Revenue
Project Exemption Certificate

This form is to be completed and given to your contractor.

Exempt Entity and Project Information

Name of Exempt Entity Issuing the Certificate			Missouri Tax Exemption Number
City of Kansas City, Missouri			1 2 4 9 0 4 6 6
Address	**City**	**State**	**ZIP Code**
414 East 12th Street, 3rd Floor	Kansas City	MO	64106
E-mail Address			
Kevin.White@kcmo.org			
Project Number	**Project Begin Date (MM/DD/YYYY)**		**Estimated Project End Date (MM/DD/YYYY)**
81000999	04/11/2025		12/31/2027

Description of Project
Blue River WWTP Grit Removal and Fine Screens Project

Project Location	Certificate Expiration Date (MM/DD/YYYY)
Blue River WWTP, Kansas City, Missouri	04/11/2026

Provide a signed copy of this certificate, along with a copy of the exempt entity's Missouri Sales and Use Tax Exemption Letter to each contractor or subcontractor who will be purchasing tangible personal property for use in this project. It is the responsibility of the exempt entity to ensure the validity of the information on the certificate. The exempt entity must issue a new certificate if any of the information changes.

Signature of Authorized Exempt Entity	Printed Name of Authorized Exempt Entity	Date (MM/DD/YYYY)
Kevin White	Kevin White	04/10/2025

Contractor

The Missouri exempt entity named above hereby authorizes the purchase, without sales tax, of tangible personal property to be incorporated or consumed in the construction project identified herein and no other, pursuant to **Section 144.062, RSMo.** Under penalties of perjury, I declare that the above information and any attached supplement is true, complete, and correct.

Name of Purchasing Contractor	Signature of Contractor	Date (MM/DD/YYYY)
		/ /
Address	**City**	**State** / **ZIP Code**

Subcontractor

Contractors - Present this to your supplier in order to purchase the necessary materials tax exempt. Complete the Subcontractor portion if extending the certificate to your subcontractor. The contractor must sign the form in the space provided below.

Name of Purchasing Subcontractor			
Address	**City**	**State**	**ZIP Code**
Signature of Contractor	**Contractor's Printed Name**	**Date (MM/DD/YYYY)**	
		/ /	

Form 5060 (Revised 08-2015)

Taxation Division
P.O Box 358
Jefferson City, MO 65105-0358

Phone: (573) 751-2836
Fax: (573) 522-1271
E-mail: salestaxexemptions@dor.mo.gov

Visit http://dor.mo.gov/business/sales/sales-use-exemptions.php for additional information.

Enclosure

cc: Kevin White, PM
Blake Anderson, PE
Raed Asfan, Project Engineer
Contract File
e-Builder File

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

TABLE OF CONTENTS

Project Number: 81000999

Project Title: Blue River WWTP Grit Removal and Fine Screens Project

PART 1 – PROJECT MANUAL

INTRODUCTORY INFORMATION

00010 Table of Contents

BIDDING REQUIREMENTS

00440 CREO 5: Construction Contract CREO Instructions
00450 CREO 8: Contractor Utilization Plan/Request for
00450.01 Waiver Letter of Intent to Subcontract
00460 CREO 10: Timetable for MBE/WBE Utilization
00470 CREO 11: Request for Modification or Substitution
00485 CREO Monthly Reporting Instructions
00490 Pre-Contract Bidder's Certification Form

CONTRACTING REQUIREMENTS

00500 Contract for Progressive Design-Build Services
00515.01 Employee Eligibility Verification Affidavit
00560 Missouri Project Exemption Certificate
00560.01 Kansas City Missouri Tax Exempt Certificate
00610 Performance and Maintenance Bond Form
00615 Payment Bond Form
00616 Performance Bond Form
00617 Maintenance Bond Form
00620 Insurance Certificate Forms
00630 Revenue Clearance Release Authorization
00830 Wage Rate Requirements – Jefferson County
00930 Request for Interpretation Form
00931 Supplemental Design Instructions
00932 Request for Proposal
00933 Request for Proposal Log
00940 Change Order Form
00945 Work Change Directive

PART 2 – PROJECT MANUAL

DIVISION 1 - GENERAL REQUIREMENTS

01019 Closeout Procedures
01020 Record Documents
01021 Operation and Maintenance Data
01110 Summary of Work
01140 Work Restrictions
01140.02 OCCP

01210.01	Allowance Authorization
01290	Payment Procedures and Change Management
01290.01	Application for Payment
01290.02	Schedule of Values
01290.03	Certified Payroll Report Instructions
01290.05	Certified Payroll Report Form
01290.07	Payroll Certification
01290.09	Subcontractors and Major Material Suppliers List
01290.11	Daily Labor Force Report
01290.12	Certificate of Substantial Completion
01290.13	Punch List
01290.14	Contractor Affidavit for Final Payment
01290.15	Subcontractor Affidavit for Final Payment
01300	Submittals
01320	Construction Progress Documentation
01320.01	Daily Field Observation Report
01320.02	Periodic Field Observation Report
01320.03	Weekly Report of Working Days
01322	Photographic and Video Documentation
01330.01	Letter of Transmittal
01335	Document Management
01340	Project BIM Coordination
01340.A	Attribute Standard
01352	Selective Alterations and Demolition
01354	Hazardous Materials Procedures
01400	Quality Control
01410	Regulatory Requirements
01433	Manufacturers Field Services
01480	Water Tightness
01500	Temporary Facilities
01566	Cleanup Operations
01570	Temporary Erosion Sediment Control
01580	Project Signs
01581	Public Communications
01600	Product Delivery Storage and Handling
01615	Equipment Identification and Tagging
01630	Substitution Request
01664	Training
01735	Pipe Services Colors
01757	Commissioning

414 E. 12th Street
Kansas City, MO
64106

File #: 250041

ORDINANCE NO. 250041

Authorizing a $12,722,536.00 progressive design-build contract with Goodwin Bros. Construction Co., for the Blue River Wastewater Treatment Plant Grit Removal and Fine Screens Project.

BE IT ORDAINED BY THE COUNCIL OF KANSAS CITY:

Section 1. That the Director of the Water Services Department is authorized to execute Contract No. 1751 in the amount of $12,722,536.00 with Goodwin Bros. Construction Co., for the Blue River Wastewater Treatment Plant Grit Removal and Fine Screens Project, Project No. 81000999. A copy of the contract is on file in the office of Water Services.

Section 2. That the Director of Water Services is authorized to expend up to the sum of $12,722,536.00 from Account No. AL-8194-807778-611060-81000999, Sewer Treatment Facilities, to satisfy the cost of this contract.

I hereby certify that there is a balance, otherwise unencumbered, to the credit of the appropriation to which the foregoing expenditure is to be charged, and a cash balance, otherwise unencumbered, in the treasury, to the credit of the fund from which payment is to be made, each sufficient to meet the obligation hereby incurred.

Tammy L. Queen
Director of Finance

Approved as to form:

Mark P. Jones
Senior Associate City Attorney

Authenticated as Passed

Quinton Lucas, Mayor

Marilyn Sanders, City Clerk

JAN 30 2025

Date Passed

Docusign Envelope ID: 25772504-B945-47DE-9BD6-0F68FB2D0B8D

CREO - Division of Economic Equity & Inclusion

Contractor Utilization Plan Approval Form

Prepared by: Delois Moore

Date: 12/27/20

e-Builder users: Approval Form must be completed and attached in PDF format where indicated. CUP/LOIs must be attached where indicated, or as supporting documents.

Contract/Project Number: 81000999	Project Name: Blue River WWTP Grit Removal and Fine Screen
Developer/Prime: Goodwin Bros Construction Co	Contact Name: Doug Wachsnicht
Address: 6455 Universal Drive, KCMO 64120	Email: dwachsnicht@goodwinbros.com

Full Contract Value: $ 12,722,536.00

Funding: ☑ City ☐ State ☐ Federal ☐ CO-OP ☐ Grant: ☐ Other:

Project Requirements: ☑ M/WBE ☐ DBE ☐ Section 3 ☐ N/A

Tax Incentive: ☐ LCRA ☐ TIF ☐ PIEA ☐ N/A ☐ Other:

Prevailing Wage: ☑ Yes ☐ No

Davis-Bacon: ☐ Yes ☑ No

Construction Employment Program: ☑ Yes: Workforce goals are 10% Minority & 2% Women. There are over 800 Workforce hours and project cost is $300,000 or more.
☐ No: Workforce hours are less than 800 and project cost is less than $300,000.

Contract Goals:	Contractor Utilization Plan Achievement:
Self-Perform: ____%	Self-Perform: ____%
MBE: 11 %	MBE: 11 %
WBE: 11 %	WBE: 11 %
Non-certified firms: ____%	Non-certified firms: ____%

Contract Type (select one): ◉ Construction ○ Design-Build ○ Design Professional ○ Professional Services ○ General Services ○ Facilities Maintenance/Repair/Renovation ○ Concessions ○ Co-operative ○ Revenue Sharing ○ Non-Municipal Agency ○ Other Goods & Services ○ Other_____

Project Manager: Kevin White Email: kevin.white@kcmo.org

Additional Information:

This document is submitted with all available facts. Intentionally falsifying this document or omitting pertinent facts is grounds for disciplinary action pursuant to KCMO Human Resources Rules & Policy Manual (eff. August 4, 2014).

FOR CIVIL RIGHTS & EQUAL OPPORTUNITY DEPARTMENT (CREO) USE ONLY:

The Contractor Utilization Plan is:

☒ Approved ☐ Disapproved

14 % MBE	14.8 % WBE	_____ % DBE

The Request for Good Faith Efforts Waiver is:

☐ Approved ☐ Disapproved ☐ Not Applicable

Appeal Sent to FICB or Incentive Agency? ☐ Yes _____ FICB _____ Incentive Agency ☐ No

CREO Signature: DocuSigned by: Mark Runge 6AFEC964B03641A... Date: 1/23/2025

Comments:

This project will have a second phase and the goals of 11% MBE and 11% WBE will also apply to that phase.

CREO KC INSTRUCTIONS
FOR CONSTRUCTION CONTRACTS

PART A. ECONOMIC EQUITY & INCLUSION GOALS--MBE/WBE PROGRAM

I. City's Economic Equity & Inclusion Goals--MBE/WBE Program.

A. The City has adopted an Economic Equity & Inclusion Goals--Minority/Women Business Enterprise ("MBE/WBE") Program (Sections 3-421 through 3-469, Code of Ordinances) (the "Program") to implement the City's policy of supporting the fullest possible participation in City contracts and change orders of firms owned and controlled by minorities and women. Each construction contract may have an MBE and/or WBE goal for participation. An MBE or WBE goal is a numerical objective the City has set for the contract that may be awarded pursuant to these bid specifications. Goals are stated as a percentage of contract dollars. For example, if an MBE goal for a contract is 10% and a Bidder submits a bid of $100,000, the goal for MBE participation would equal $10,000. The specific MBE/WBE goals on this contract are set forth elsewhere in the bid specifications.

B. These Civil Rights & Equal Opportunity Department ("CREO KC") Forms & Instructions are part of the BIDDING DOCUMENTS and CONTRACT DOCUMENTS as defined in the General Conditions. By submitting a Bid, the Bidder agrees, as a material term of the contract, to carry out the City's MBE/WBE Program by making good faith efforts to include certified MBE/WBEs in the contract work to the extent of the goals listed for the contract and to the fullest extent consistent with submitting the lowest and best bid to the City. Bidder agrees that the Program is incorporated into this document and agrees to follow the Program. Although it is not a requirement that a Bidder in fact meet or exceed both the MBE and WBE Goals, it is a requirement for approval of the Bid that a Bidder objectively demonstrate to the City that good faith efforts have been made to meet the Goals. Bidders must attempt to meet both the MBE and WBE goals and request a waiver if either is not met.

C. The following CREO KC Forms are attached and must be used for MBE/WBE submittals:

1. Contractor Utilization Plan/Request for Waiver (CREO KC Form 8); and
2. Letter of Intent to Subcontract (CREO KC Form 00450.01); and
3. Timetable for MBE/WBE Utilization (CREO KC Form 10); and
4. Request for Modification or Substitution (CREO KC Form 11); and
5. Contractor Affidavit for Final Payment (Form 01290.14); and
6. Subcontractor Affidavit for Final Payment (Form 01290.15).

Warning: The City only gives MBE/WBE credit for a Bidder's use of City certified MBE/WBEs. A certified MBE/WBE firm is a firm that has been certified by the City's Civil Rights & Equal Opportunity Department as such. An MBE/WBE firm must be certified before the date on which the contractor utilization plan is due. Certified MBEs and WBEs are listed in the M/W/DBE Kansas City Mo. Online Directory, which is available on the City's website at www.kcmo.org. Before a Bidder submits a bid, Bidder

should contact CREO KC and consult the directory to make sure any firm proposed for use for MBE/WBE participation has been certified.

II. Required Submissions Following Bid Opening.

A. Bidder must submit the following documents within forty-eight (48) hours of bid opening:

1. **Contractor Utilization Plan/Request for Waiver (CREO KC Form 8).** This form states a Bidder's plan to use specific certified MBE/WBEs in the performance of the contract and includes the following:

   a. The work to be performed by each MBE/WBE and the amounts each is to be paid for the work; and

   b. The name, address, race or ethnic origin, gender and employer identification number or social security number of each MBE/WBE that will perform the work.

   c. An automatic request for waiver in the event Bidder has not met or exceeded the MBE and/or WBE goals for the contract but believes that it has made good faith efforts to meet or exceed the goals and desires a waiver of the goals. If a waiver is requested, CREO KC will examine the Bidder's documentation of good faith efforts and make a recommendation to grant or deny the waiver. CREO KC will recommend a waiver be granted only if the Bidder has made good faith efforts to obtain MBE/WBE participation.

2. **Letter(s) of Intent to Subcontract (CREO KC Form 00450.01).** A letter must be provided from each MBE/WBE listed on the Contractor Utilization Plan. These letters verify that the MBE/WBE has agreed to execute a formal agreement for the work and indicate the scope of work to be performed and the price agreed upon for the work.

III. Required Submission when Requested by City.

A. Bidder must submit the following documents when requested by City:

1. **Timetable for MBE/WBE Utilization (CREO KC Form 10).**
2. **Documentation of good faith efforts.**

IV. Required Monthly Submissions during term of Contract.

A. Bidder must submit the following report on a monthly basis if awarded the contract:

1. **M/WBE Monthly Utilization Report.** This report must be submitted to the Director by the 15th of each month. Failure to submit timely reports may result in delays in processing of current and future contract approvals and payment applications. The method of submission of this report is through the B2GNow Diversity Management System (B2GNow).

V. Required Submittals for Final Contract Payment.

A. Contractor must submit the following documents with its request for final payment under

the contract:

1. **Contractor Affidavit for Final Payment (Form 01290.14)**
2. **Subcontractor Affidavit(s) for Final Payment (Form 01290.15)**
3. **Final B2GNow Monthly Contract Audit Report with all payment audits confirmed.**

VI. Additional Submittals.

A. Contractor may be required to make additional submittals during the term of the Contract, including **Request for Modification or Substitution (CREO KC Form 11)**. Refer to Section IX, Modification of the Contractor Utilization Plan or Substitution of an MBE/WBE, for additional instructions on when this form must be submitted.

VII. MBE/WBE Participation Credit.

A. The following shall be credited towards achieving the goals:

1. The total contract dollar amount that a prime contractor has paid or is obligated to pay to a subcontractor that is a certified MBE or WBE, except as otherwise expressly provided for herein.
2. The total contract dollar amount that a prime contractor that is a certified MBE or WBE performed itself.
3. Sixty percent (60%) of the total dollar amount paid or to be paid by a prime contractor to obtain supplies or goods from a supplier who is a certified MBE or WBE.
4. Ten percent (10%) of the total dollar amount paid or to be paid by a prime contractor to obtain supplies or goods from a supply broker who is a certified MBE or WBE.
5. One hundred percent (100%) of the total dollar amount paid or to be paid by a prime contractor to a manufacturer of construction supplies who is a certified MBE or WBE.
6. Subcontractor participation with a lower tier MBE/WBE subcontractor using one of the above methods of participation.

B. **NO CREDIT**, however, will be given for the following:

1. Participation in a contract by a MBE or WBE that does not perform a commercially useful function as defined by the Program; and
2. Any portion of the value of the contract that an MBE or WBE subcontractor subcontracts back to the prime contractor or any other contractor who is not a qualified MBE/WBE; and
3. Materials and supplies used on the contract unless the MBE/WBE is responsible for negotiating the price, determining quality and quantity, ordering the materials and installing (where applicable) and paying for material itself; and
4. Work performed by an MBE or WBE in a scope of work other than that in which the MBE or WBE is currently certified.

VIII. Methods for Securing Participation of MBE/WBEs and Good Faith Efforts.

A. A bidder is required to make good faith efforts to achieve the MBE/WBE goals. Good faith efforts are efforts that, given all relevant circumstances, a Bidder actively and aggressively seeking to meet the goals can reasonably be expected to make. Good faith efforts must be made before the Bidder submits a Contractor Utilization Plan, in other words, within 48 hours of bid opening. However, efforts made to increase participation of MBEs and WBEs following submission of the CUP can be considered as evidence of good faith efforts to meet the goals.

B. In evaluating good faith efforts, the Director of CREO KC will consider whether the Bidder has performed the following, along with any other relevant factors:

1. Advertised for at least 15 calendar days prior to the bid or proposal due date opportunities to participate in the contract in general circulation media, trade and professional association publications, small and minority business media, and publications of minority and women's business organizations which are included in a list along with their current contact information identified on the directory as the list of publications available to publish such advertisements, which list shall be updated by CREO KC no less than every three (3) month.

2. Sent written notices at least fifteen (15) calendar days prior to the bid or proposal due date containing the information required in section (9) below, by certified mail, e-mail, or facsimile, to at least 80% of MBEs and WBEs which are included in a list along with their contact information identified on the directory as the list of organizations available to receive such notices, which list shall be updated by CREO KC no less than every three (3) months.

3. Sent written notices, containing the information required by section (9) below, by certified mail, e-mail or facsimile, to at least 80% of MBEs and WBEs listed on the directory certified in the applicable scopes of work for the particular bid soliciting their participation in the contract at least 15 calendar days prior to the bid or proposal due date.

4. Attempted to identify portions of the work for qualified MBE and/or WBE participation in order to increase the likelihood of meeting the goals, including breaking down contracts into economically feasible units that take into consideration the capacity of available MBE/WBEs appearing on the CREO KC directory.

5. At any time prior to submission of the CUP or submittal of a request for modification of a CUP, requested assistance in achieving the goals from the Director and acted on the Director's recommendations.

6. Conferred with certified MBEs and WBEs which inquired about or responded to the bid solicitation and explained to such MBEs and WBEs the scope and requirements of the work for which their bids or proposals were solicited, and if not all certified MBEs and WBEs in the particular scopes listed on the directory have inquired about or responded to the bid solicitation for each scope of work, then contact by certified mail, e-mail or telephone the greater of ten (10) or 80% of additional certified MBEs and WBEs in the particular scopes of work listed on the directory and offer to confer with such MBEs and WBEs for such particular scope of work and request such MBEs

and WBEs to submit a proposal.

7. Attempted to negotiate in good faith with certified MBEs and WBEs which responded to the bid solicitation or those certified MBEs and WBEs that were conferred with as contemplated in section (6) above, and other qualified MBEs and WBEs, at the option of the bidder, proposer, or contractor, as applicable, to perform specific subcontracts, not rejecting them as unqualified without sound reasons based on a thorough investigation of their capabilities by the bidder, proposer, or contractor; in the event an MBE or WBE is the low bid, but rejected as unqualified, the bidder, proposer, or contractor and the director or board, as applicable, shall provide sound reasons for rejecting such MBE or WBE.
8. Attended pre-bid meeting when such meetings were indicated in the solicitation of bids or otherwise by the bidder, proposer, or contractor, as applicable or by the director provided the director provides written direction to the bidder, proposer, or contractor at the time the goals are recommended.
9. Written notices and advertisements to be provided pursuant to sections (1), (2) and (3) above shall include the following information:
    a. The bid due date;
    b. The name of the project;
    c. The address or general location of the project;
    d. The location of plans and specifications for viewing;
    e. Contact information of the prime contractor;
    f. A general description of the scopes of work that are the subject of the solicitation;
    g. The goals established for the applicable contract, and if the goals are still subject to board approval, then a statement that the goals as stated are preliminary and are subject to board approval;
    h. If the project or any portion of the project is subject to prevailing wage then a statement that all or a portion of the project will be subject to prevailing wage, as applicable; and if only a portion of the scopes are subject to prevailing wage, then identification of such scopes provided that such scopes are known as of the time of bid solicitation;
    i. The date and time of any pre-bid meeting(s), if any, which have been scheduled by the bidder, proposer, contractor or developer as of the bid solicitation; and

    Any other information deemed relevant by the bidder, proposer, contractor or developer, as applicable, or the director to the extent the director provides written direction to the bidder, proposer, contractor or developer of such additional information at the time the goals are recommended by the director. 8. Within five (5) working days after drawing the bid specifications, sent certified letters, verifiable e-mails or proof of facsimiles to certified MBEs and WBEs listed in the M/W/DBE Kansas City Mo. Online Directory.

C. A Bidder may be required to give the City documentation to prove that it made good faith efforts. The Bidder will be contacted by the City with further instructions about when this documentation must be submitted.

IX. Modification of the Contractor Utilization Plan or Substitution of an MBE/WBE.

A. After bid opening, a Bidder or Contractor may need to substitute an MBE and/or WBE or request that the amount of MBE/WBE participation listed in its Contractor Utilization Plan be modified. Bidder or Contractor must file a **Request for Modification or Substitution (CREO KC Form 11) prior to actual substitution and within a reasonable time after learning that a modification or substitution is necessary.** The Director may approve substitutions or modifications and upon approval, the modifications and substitutions will become an amendment to the Contractor Utilization Plan. Modifications or substitutions may be approved when:

1. The Director finds that the Bidder or Contractor made and provided evidence of good faith efforts to substitute the MBE/WBE listed on the Contractor Utilization Plan with other certified MBE/WBEs for the scope of work or any other scope of work in the contract; and
2. The Bidder or Contractor has not attempted intentionally to evade the requirements of the program and it is in the best interests of the City to allow a modification or substitution; and
3. The Director also finds one of the following:
    a. The listed MBE/WBE is non-responsive or cannot perform; or
    b. The listed MBE/WBE has increased its previously quoted price to the bidder, proposer or contractor without a corresponding change in the scope of the work; or
    c. The listed MBE/WBE has committed a material default or breach of its contract with the contractor; or
    d. Requirements of the scope of work of the contract have changed and render subcontracting not feasible or not feasible at the levels required by the goals established for the contract; or
    e. The listed MBE/WBE is unacceptable to the contracting department; or
    f. The listed MBE/WBE thereafter had its certification revoked; or

B. A modification shall not be made unless the modification or substitution has first been requested and approved by the Director. Once a modification has been made, a Construction Contractor Employee Identification Report (CREO KC Form 0485.04) for the newly approved subcontractor must be submitted at least ten (10) days prior to the approved subcontractor commencing work on a City contract.

X. Appeals.

A. In conformance with the Act, appeals may be made to the City Fairness in Construction Board or Fairness in Professional Services and Goods Board on the following:

1. The grant or denial of a Request for Waiver;
2. Substitution for an MBE/WBE listed on a Contractor Utilization Plan;
3. Modification of the percentage of MBE/WBE participation on a Contractor Utilization Plan;
4. Liquidated Damages;
5. The amount of MBE/WBE credit the Contractor may receive for MBE/WBE participation identified in the contractor utilization plan.

B. Any appeal must be filed in writing with the Director within fifteen (15) calendar days of notice of the determination. Mailing, faxing, personal delivery or posting at CREO KC of determinations shall constitute notice. The appeal shall state with specificity why the Bidder or Contractor believes the determination is incorrect

C. Failure to file a timely appeal shall constitute a waiver of a Bidder's or Contractor's right to appeal such determination and such person shall be estopped to deny the validity of any determination which could have been timely appealed.

XI. Access to Documents and Records.

A. By submitting a Bid, each Bidder agrees to permit the City, its duly authorized agents or employees, access at all reasonable times to all books and business records of Bidder as may be necessary to ascertain compliance with the requirements of this document and the Act, within ten (10) calendar days of the date of the written request.

B. All Bidders agree to cooperate with the contracting department and CREO KC in studies and surveys regarding the MBE/WBE program.

XII. Miscellaneous.

A. A Bidder or Contractor shall bear the burden of proof with regard to all issues on appeal.

B. In the event of any conflict between this document and the Program, the provisions of the Program shall control. The terms used in this document are defined in the Program.

C. Oral representations are not binding on the City.

D. The City Council may waive the requirements of this document and the Program and award the contract to the lowest and best bidder if the City Council determines a waiver is in the best interests of the City.

E. The Director may grant extensions of time to Bidders to submit Letters of Intent to Subcontract (CREO KC Form 00450.01).

XIII. Liquidated Damages – Economic Equity & Inclusion Goals--MBE/WBE Program.

A. If Contractor fails to achieve the MBE/WBE goals stated in its Contractor Utilization Plan, as amended, the City will sustain damages, the exact extent of which would be difficult or impossible to ascertain. Therefore, in order to liquidate those damages, the monetary difference between either (1) the amount of the MBE/WBE goals set forth in the Contractor Utilization Plan, as amended, or (2) the goals established (whichever is lower) and the amount actually paid to qualified MBEs and WBEs for performing a commercially useful function will be deducted from the Contractor's payments as

liquidated damages. In determining the amount actually paid to qualified MBEs and WBEs, no credit will be given for the portion of participation that was not approved by the Director, unless the Director determines that the Contractor acted in good faith. No deduction for liquidated damages will be made when, for reasons beyond the control of the Contractor, the MBE/WBE participation stated in the Contractor Utilization Plan, as amended and approved by the Director is not met.

PART B. CONSTRUCTION EMPLOYMENT PROGRAM REQUIREMENTS

IMPORTANT: This Part B is applicable to City construction contracts estimated by the City prior to solicitation as: (1) requiring more than 800 construction labor hours and (2) valued in excess of $300,000.00. This program is distinguished from the M/WBE Program in that it is based on workforce hours of the Bidder and *all* its participating subcontractors rather than the actual contract value of work. The instructions herein detail the specifics related to this program. This program is in *addition* to the M/WBE program.

I. City's Construction Employment Program.

A. The City has adopted a Construction Employment Program (Sections 3-501 through 3-525, Code of Ordinances) (the "Workforce Program" or "Program") to implement the City's policy of supporting the fullest possible utilization of minority and women workers in the construction industry.

B. The minimum workforce goals are currently set by ordinance at 10% for minorities and 2% for women. These goals are separate from M/WBE goals. Public recognition may be provided if the bidder achieves at least twice the minimum participation.

C. Construction contracts subject to the Workforce Program and the company-wide and project-specific workforce goals ("workforce goals") are those contracts to construct, reconstruct, improve, enlarge or alter any fixed work that is estimated by the City prior to solicitation to: (1) require more than 800 construction labor hours, (2) has estimated costs that exceed $300,000.00, and (3) involve the expenditure of public funds.

D. The successful bidder may meet company-wide goals by counting the bidder's utilization of minorities and women throughout the Kansas City metropolitan statistical area. In addition, the successful Bidder is responsible to ensure that it and its subcontractors cumulatively make good faith efforts to meet project-specific goals for utilization of minorities and women.

E. These Civil Rights & Equal Opportunity Department ("CREO KC") Forms & Instructions are part of the BIDDING DOCUMENTS and CONTRACT DOCUMENTS as defined in the General Conditions. By submitting a Bid, the Bidder agrees, as a material term of the contract, to carry out the City's Construction Employment Program by making good faith efforts to utilize minority and women workers to the fullest extent consistent with submitting the lowest and best bid to the City. Bidder agrees that the Program is incorporated into this document and agrees to follow the Program. Although it is not a requirement that a Bidder in fact meet or exceed the construction employment goals to receive approval from CREO KC, a Bidder not doing so is required to

objectively demonstrate to CREO KC that good faith efforts have been made.

F. The following reports are to be used for Construction Employment Program submittals:

1. Project Workforce Monthly Report
2. Company-Wide Workforce Monthly Report

II. Required Submissions.

A. Within forty-eight (48) hours after bid opening, the construction contractor shall submit the **Construction Employee Identification Report** (CREO KC Form 00485.04) and shall include: the name, home address, job title, sex and race/ethnicity of each person working for the Prime. The individuals to be listed on the form are those which the construction contractor *anticipates* will be performing construction labor hours creditable towards the minimum workforce goals applicable to the construction contractor individually.

The following circumstances also require the submission of a Construction Employee Identification Report:

a. Prior to contract execution for those City construction contracts awarded pursuant to a request for proposals (RFP), the construction contractor shall submit a **Construction Employee Identification Report** (CREO KC Form 00485.04).

b. At least ten (10) days prior to the date upon which any subcontractor is to commence work under a City construction contract, the Prime shall submit a **Construction Employee Identification Report** (CREO KC Form 00485.04) for the subcontractor.

B. The CREO KC Director has established the B2GNow Diversity Management System ("B2GNOW") (an online reporting tool) as the preferred method for fulfilling reporting requirements of the Workforce Program. The CREO KC Director will allow paper submission in lieu of on-line submission if the on-line submission process presents a hardship to the contractor.

C. Bidder must submit the following documents through B2GNow on a monthly basis if awarded the contract:

1. **Project Workforce Monthly Report.** This report is contract specific. This report must be submitted to the Director by the 15th of each month for the Contractor and each subcontractor. It will be utilized to report the Contractor's own workforce compliance data with regard to the City's construction contract. Failure to submit timely reports may result in delays in processing of current and future contract approvals and payment applications.

2. **Company-Wide Workforce Monthly Report.** This report is not contract specific; it is used to report on the utilization of women and minorities, by trade, company-wide. This report must be submitted to the Director by the 15th of each month. It will be utilized to report the Contractor's own workforce compliance data with regard to

every contract (both privately and publicly funded) that the Contractor has in progress throughout the Kansas City Metropolitan Statistical Area. Failure to submit timely reports may result in delays in processing of current and future contract approvals and payment applications.

III. Submittal Required for Final Contract Payment.

A. The final Project Workforce Monthly Report(s) and Company-Wide Workforce Monthly Report must be submitted before final payment will be made and/or retainage released. Contractor shall note the submittal of the final reports by notation in the box entitled "Final Report"

IV. Methods for Securing Workforce Participation and Good Faith Efforts.

A. A bidder is required to make good faith efforts to achieve the construction employment goals and ensure its subcontractors are making good faith efforts to achieve the construction employment goals. If a Bidder or its subcontractors will be unable to secure enough minority and female participation to meet or exceed the construction employment goals, a bidder must, within a reasonable time after so learning, request a waiver or modification of the goals by the Director of CREO KC. The Director will request evidence of the Bidder's and its' subcontractors' good faith efforts to meet the goals. The Director will examine the Bidder's request and the Bidder's documentation of good faith efforts for itself and its subcontractors. The Director will examine the Bidder's request and the Bidder's documentation of good faith efforts and grant or deny a waiver or modification. The Director will grant a waiver or modification only if the Bidder has made good faith efforts to secure minority and female participation.

IMPORTANT: The Bidder's subcontractors on a city construction contract must meet the workforce goals collectively. The bidder is responsible to ensure the subcontractors make good faith efforts to meet the workforce goals. Bidders are required to include language in its subcontracts that ensure the subcontractors make good faith efforts to meet or exceed the workforce goals.

B. In evaluating good faith efforts, the Director will consider whether the Bidder and its subcontractors have performed the following:

1. For those bidders that are not signatories to a collective bargaining agreement with organized labor:

    a. Requested in writing the assistance of the Director with respect to efforts to promote the utilization of minorities and women in the workforce and acted upon the Director's recommendations; and

    b. Advertised in minority or women trade association newsletters and/or minority or women owned media at least 15 calendar days prior to the utilization of any construction services on the city construction contract and used terminology that sufficiently describes the work available, the pay scale, the application process, and anything else that one might reasonably be expected to be informed of relevant to the position being advertised; and

    c. Maintained copies of each advertisement and a log identifying the publication and date of publication; and

d. Conducted real and substantial recruitment efforts, both oral and written, targeting resident, minority and women community-based organization, schools with a significant minority student population, and training organizations serving the recruitment area; and

e. Established and maintained a current list of resident, minority and women recruitment sources, providing written notification to the recruitment sources of available employment opportunities, and maintained records of the notices submitted to the organizations and any responses thereto; and

f. Maintained a current file for the time period of the city construction contract with the name, address, and telephone number of each resident, minority and woman job applicant, the source of the referral, whether or not the person was hired, and in the event that the applicant was not hired, the reason therefore; and

g. Promoted the retention of minorities and women in its workforce with the goals of achieving sufficient annual hours for minorities and women to qualify for applicable benefits; and

h. Required by written contract that all subcontractors comply with the above efforts.

2. For those bidders that are signatories to collective bargaining agreements with organized labor:

   a. Requested in writing from each labor union representing crafts to be employed that:

      i. the labor union make efforts to promote the utilization of residents of the City, minorities and women in the workforce; and

      ii. the labor union identify any residents of the City, minorities and women in its membership eligible for employment; and

   b. Collaborated with labor unions in promoting mentoring programs for journeypersons intended to assist minorities and women in increasing retention with the goals of achieving sufficient annual hours to qualify for applicable benefits; and

   c. Maintained a current file with the name, address, and telephone number of each resident, minority and women worker identified by the labor union, whether or not the person was hired, and in the event the person was not hired, the reason therefore.

   d. To the extent the good-faith efforts applicable to bidders that are signatories to collective bargaining agreements with organized labor conflict with the procedures implemented by the bidder in order to comply with the relevant bargaining agreement, the bidder shall substitute other procedures as may be approved by the Director in writing, in order to accomplish the purpose and intent of this section.

C. In the event workforce goals are not met or there is anticipation that goals will not be

met, a Bidder will be required to give the City documentation to prove that it and/or it's subcontractors made good faith efforts. The Bidder will be contacted by the City with further instructions about when this documentation must be submitted.

V. Access to Documents and Records.

A. By submitting a Bid, each Bidder agrees to permit the City, its duly authorized agents or employees, access at all reasonable times to all books and business records of Bidder as may be necessary to ascertain compliance with the requirements of this document and the Program, within ten (10) days of the date of the written request. Each bidder further agrees to require, if awarded the contract, that every subcontractor permit the City the same access to documents and records.

B. All Bidders agree to cooperate with the contracting department and CREO KC in studies and surveys regarding the construction employment program.

VI. Appeals.

A. In conformance with the Program, appeals may be made to the Construction Workforce Board on the following:

1. Determinations by the Director that a contractor did not meet the construction employment goals and did not make a good faith effort to meet the goals;
2. Recommendations by the Director to assess liquidated damages;
3. Recommendation by the Director that a contractor be declared ineligible to receive any city construction contract for a period of time up to one year.

B. Any appeal must be filed in writing with the Director within ten (10) working days of notice of the recommendation or determination. The appeal shall state with specificity why the Bidder or Contractor believes the recommendation or determination is incorrect.

C. Failure to file a timely appeal shall constitute a waiver of a Bidder's or Contractor's right to appeal such determination or recommendation and such person shall be estopped to deny the validity of any order, determination, recommendation or action of CREO KC which could have been timely appealed.

VII. Miscellaneous.

A. A Bidder or Contractor shall bear the burden of proof with regard to all issues on appeal.

B. The successful bidder may be required to meet with the Director of CREO KC or the Director's designee for the purpose of discussing the construction employment program, the bidder's efforts to realize the goals, and any other problems and/or issues affecting the realization of the goals or the program in general.

C. In the event of any conflict between this document and the Program, the provisions of the Program shall control. The terms used in this document are defined in the Program.

D. Oral representations are not binding on the City.

VIII. Failure to Meet Workforce Goals

A. If Contractor or its subcontractors fail to achieve the construction employment goals or make good faith efforts to achieve those goals without having previously obtained a

waiver or modification of those goals, the City will sustain damages, the exact extent of which would be difficult or impossible to ascertain. These damages are magnified if the failure to abide by the requirements of the Workforce Program is recurring. Therefore, if the directory finds that the contractor or subcontractor have not met, or made good faith efforts to meet, the construction employment goals for any quarter, the director may:

1. Assess liquidated damages against the construction contractor, as specified in the city construction contract;
2. Require the contractor to attend mandatory training, as specified in the construction contract;
3. Declare the contractor ineligible to receive any city construction contract or participate as a subcontractor under any city construction contract for a period of time up to six months, as specified in the construction contract.

IX. First Source Program

A. The City has established a labor force recruiting program intended to assist contractors in identifying, interviewing and hiring qualified job applicants residing in Kansas City, Missouri. While the contractor awarded a City construction contract is not prohibited from hiring persons residing outside Kansas City, Missouri, the recruiting resource provided for herein (the "First Source Program") must be utilized by the contractor subject to the construction employment goals as set forth in this **PART B, CONSTRUCTION EMPLOYMENT PROGRAM REQUIREMENTS.**

B. The City utilizes the services of the Full Employment Council, Inc., to administer the First Source Program. The contractor shall contact the Full Employment Council within 48 hours of contract award, regardless of whether the contractor has any hiring needs at that time, and within 48 hours following any job vacancy which the contractor reasonably anticipates filling during the term of the City construction contract. The contractor shall comply with the First Source Program requirements as implemented by the Full Employment Council unless otherwise excused in writing by the Director of CREO KC for good cause shown. To ensure compliance with the First Source Program, the contractor shall contact those persons at the Full Employment Council responsible for administering the program, which may be identified by visiting their website at www.feckc.org and clicking on the link for KCMO First Source Hiring Program. The contractor shall not hire any individual to provide construction services on a City construction contract unless the contractor has met the requirements of the First Source Program.

C. The contractor shall require that its subcontractors utilize the First Source Program to the same extent that the contractor is required to do so, and shall incorporate the requirements of this Section IX into every subcontract. Every subcontractor shall be required to contact the Full Employment Council within 48 hours of subcontract award, regardless of whether the subcontractor has any hiring needs at that time, and within 48 hours following any job vacancy which the subcontractor reasonably anticipates filling during the term of their subcontract on a City construction project.

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

CONTRACTOR UTILIZATION PLAN/REQUEST FOR WAIVER

Project Number 81000999 CN: 1751

Project Title Blue River WWTP Grit Removal and Fine Screens Project

(Department Project) Department

Goodwin Bros. Construction Co.

(Bidder/Proposer)

STATE OF Missouri)
) ss
COUNTY OF Platte)

I, Doug Wachsnicht, of lawful age and upon my oath state as follows:

1. This Affidavit is made for the purpose of complying with the provisions of the MBE/WBE submittal requirements on the above project and the MBE/WBE Program and is given on behalf of the Bidder/Proposer listed below. It sets out the Bidder/Proposer's plan to utilize MBE and/or WBE contractors on the project.

2. The project target goals are 11 **% MBE** and 11 **% WBE.**

3. Bidder/Proposer assures that it will utilize a minimum of the following percentages of MBE/WBE participation in the above project:

   - **BIDDER/PROPOSER PARTICIPATION:** 14.4 **% MBE** 14.8 **% WBE**

   - **POST-BID/POST-RFP ESTIMATED BUDGET: $** 12,722,536.00

4. The following are the M/WBE subcontractors whose utilization Bidder/Proposer warrants will meet or exceed the above-listed Bidder/Proposer Participation. Bidder/Proposer warrants that it will utilize the M/WBE subcontractors to provide the goods/services described in the applicable Letter(s) of Intent to Subcontract, copies of which shall collectively be deemed incorporated herein). ***(All firms must currently be certified by Kansas City, Missouri)***

   Name of M/WBE Firm Richardson Hauling
   Address 14800 E Kentucky Rd, Independence, MO 64050
   Telephone No. 816.252.0664
   I.R.S. No. 43-1605887

Name of M/WBE Firm Genesis
Address 8422 S 7th Hwy, Blue Springs, MO 64104
Telephone No. 816.229.5900
I.R.S. No. 20-1763158

Name of M/WBE Firm CJ Industries
Address 610 S 78th St, Ste 1, Kansas City, KS 66111
Telephone No. 913.788.1104
I.R.S. No. 61-1721934

Name of M/WBE Firm Whatever It Takes Electrical Contractors, LLC (WITEC)
Address 9709 East 56th St, Raytown, MO 64133
Telephone No. 816.743.0770
I.R.S. No. 59-3775731

Name of M/WBE Firm Custom Engineering
Address 12760 East US Highway 40, Independence, MO 64055
Telephone No. 816.350.1473
I.R.S. No. 43-1031915

Name of M/WBE Firm DuBois Consultants
Address 7611 State Line Road, Ste 103, Kansas City, MO 64114
Telephone No. 816.333.7700
I.R.S. No. 43-1494206

(List additional M/WBEs, if any, on additional page and attach to this form)

4. The following is a breakdown of the percentage of the total contract amount that Bidder/Proposer agrees to pay to each listed M/WBE:

MBE/WBE BREAKDOWN SHEET

MBE FIRMS:

Name of MBE Firm	Supplier/Broker/Contractor	Subcontract Amount*	Weighted Value**	% of Total Contract
Genesis	Supplier	$ 1,300,000.00	$ 100.00	10.20
WITEC	Supplier	$ 50,000.00	$ 100.00	0.40
Custom Engineering	Supplier	$ 234,105.00	$ 100.00	1.80
DuBois Consultants	Supplier	$ 176,185.00	$ 100.00	1.40
TSI Geotechnical, Inc	Supplier	$ 69,516.00	$ 100.00	0.50

TOTAL MBE $ / TOTAL MBE %: $ 1,829,806.00 14.40 %

WBE FIRMS:

Name of WBE Firm	Supplier/Broker/Contractor	Subcontract Amount*	Weighted Value**	% of Total Contract
Richardson Hauling	Supplier	$ 1,445,000.00	$ 100.00	11.40
CJ Industries	Supplier	$ 100,000.00	$ 100.00	0.80
Environmental Advisors & Engineers	Supplier	$ 175,319.00	$ 100.00	1.40
TREKK Design Group, LLC	Supplier	$ 161,055.00	$ 100.00	1.30

TOTAL WBE $ / TOTAL WBE %: $ 1,881,374.00 14.80 %

*"Subcontract Amount" refers to the dollar amount that Bidder/Proposer has agreed to pay each M/WBE subcontractor as of the date of contracting and is indicated here solely for the purpose of calculating the percentage that this sum represents in proportion to the total contract amount. Any contract amendments and/or change orders changing the total contract amount may alter the amount due an M/WBE under their subcontract for purposes of meeting or exceeding the Bidder/Proposer participation.

**"Weighted Value" means the portion of the subcontract amount that will be credited towards meeting the Bidder/Proposer participation. See CREO KC Forms and Instructions for allowable credit and special instructions for suppliers.

5. Bidder/Proposer acknowledges that the monetary amount to be paid each listed M/WBE for their work, and which is approved herein, is an amount corresponding to the percentage of the total contract amount allocable to each listed M/WBE as calculated in the MBE/WBE Breakdown Sheet. Bidder/Proposer further acknowledges that this amount may be higher than the subcontract amount listed therein as change orders and/or amendments changing the total contract amount may correspondingly increase the amount of compensation due an M/WBE for purposes of meeting or exceeding the Bidder/Proposer participation

6. Bidder/Proposer acknowledges that it is responsible for considering the effect that any change orders and/or amendments changing the total contract amount may have on its ability to meet or exceed the Bidder/Proposer participation. Bidder/Proposer further acknowledges that it is responsible for submitting a Request for Modification or Substitution if it will be unable to meet or exceed the Bidder/Proposer participation set forth herein.

7. If Bidder/Proposer has not achieved both the M/WBE goal(s) set for this Project, Bidder/Proposer hereby requests a waiver of the MBE and/or WBE goal(s) that Bidder/Proposer has failed to achieve

8. Bidder/Proposer will present documentation of its good faith efforts, a narrative summary detailing its efforts and the reasons its efforts were unsuccessful when requested bythe City.

9. I hereby certify that I am authorized to make this Affidavit on behalf of the Bidder/Proposer named below and who shall abide by the terms set forth herein:

Bidder/Proposer primary contact: Doug Wachsnicht
Address: 6455 Universal Ave, Kansas City, MO 64120

Phone Number: 636.931.6084 x107
Facsimile number: 636.931.6085
E-mail Address: dougw@goodwinbros.com

By: Doug Wachsnicht
Title: Vice President
Date: 12/11/2024
(Attach corporate seal if applicable)

Subscribed and sworn to before me this 11th day of December, 2024.

Sara C Buckler

My Commission Expires: April 16, 2027

Sara C Buckler
Notary Public

SARA C BUCKLER
Notary Public - Notary Seal
Platte County - State of Missouri
Commission Number 02395426
My Commission Expires Apr 16, 2027

Name of M/WBE Firm Environmental Advisors & Engineers
Address 19211 W 64th Terrace, Shawnee, KS 66218
Telephone No. 913.599.4326
I.R.S. No. 43-1806626

Name of M/WBE Firm TREKK Design Group
Address 1411 East 104th Street, Kansas City, MO 64131
Telephone No. 816.874.4655
I.R.S. No. 43-1953275

Name of M/WBE Firm TSi Geotechnical, Inc
Address 8248 NW 101st Terr, Ste 5, Kansas City, MO 64133
Telephone No. 816.839.5505
I.R.S. No. 43-1535463

LETTER OF INTENT TO SUBCONTRACT

Check one:
Original LOI: ✔
Updated LOI: ☐

Project Name/Title Blue River Grit Removal and Fine Screens Project

Project Location/Number 81000999 CN: 1751

PART I: Prime Contractor Goodwin Bros. Construction Co. agrees to enter into a contractual agreement with M/W/DBE Subcontractor Richardson Hauling who will provide the following goods/services in connection with the above-reference contract: [Insert a brief narrative describing goods/services to be provided. Broad Categorizations (e.g., "electrical," "plumbing," etc.) or the listing of NAICS Codes in which M/W/DBE Subcontractor is certified are insufficient and may result in denial of this Letter of Intent to Subcontract.]

Ash Removal

for an estimated amount of $ 1,445,000 (or _____% of the total estimated contract value.)

M/WBE Vendor type:

- [X] Subcontractor/manufacturer (counts as 100% of contract value towards goals)
- [ ] Supplier (counts as 60% of the total dollar amount paid or to be paid by a prime contractor for supplies or goods towards goals)
- [ ] Broker (counts as 10% of the total dollar amount paid or to be paid by a prime contractor for supplies or goods towards goals)

M/W/DBE Subcontractor is, to the best of Prime Contractor's knowledge, currently certified with the City of Kansas City's Civil Rights & Equal Opportunity Department to perform in the capacities indicated herein. Prime Contractor agrees to utilize M/W/DBE Subcontractor in the capacities indicated herein, and M/W/DBE Subcontractor agrees to work on the above-referenced contract in the capacities indicated herein, contingent upon award of the contract to Prime Contractor.

PART 2: This section is to be completed by the M/W/DBE subcontractor listed above. Please attach additional sheets as needed for more than one intended sub-tier contract. **IMPORTANT: Falsification of this document will result in denial and other remedies available under City Code.**

Select one: *

- [X] The M/WBE Subcontractor listed above **IS NOT** subcontracting any portions of the above-stated scope of work(s). (Continue to Part 3.)
- [ ] The M/W/DBE Subcontractor listed above **IS** subcontracting certain portions of the above stated scope of work(s) to:

(1) Company name: _____

Full address: _____ (Street number and name) _____ (City, State and Zip Code)

Primary contact: _____ (Name) _____ (Phone)

a) This subcontractor is (select one): ☐MBE ☒WBE ☐DBE N/A

i: If this subcontractor is an M/W/DBE certified with the City of Kansas City, Missouri, a separate Letter of Intent must be attached to this document.

ii. If this subcontractor is NOT a certified M/W/DBE certified with the City of Kansas City, Missouri, the firm must still be listed for reporting purposes but a Letter of Intent is not required.

b) Scope of work to be performed: _____

c) The dollar value of this agreement is: _____

* At this time per my conversation with the contractor, I plan do perform in-house.

PART 3:

NOTE: SIGNATURES AND NOTARIZATIONS REQUIRED FOR NEW LETTERS OF INTENT (LOI); SIGNATURES ONLY FOR UPDATED LOI (ADDING VALUE TO EXISTING CONTRACT).

PRIME CONTRACTOR BUSINESS NAME: Goodwin Bros. Construction Co.

Doug Wachsnicht
Signature: Prime Contractor

Doug Wachsnicht
Print Name

Vice President
Title

12/11/2024
Date

State of Missouri)
County of Platte)

I, Sara Buckler, state that the above and foregoing is based on my best knowledge and belief.

Subscribed and sworn to before me, a notary public, on this 11th day of December, 20 2024

My Commission Expires: April 16, 2027

Sara C Buckler
Notary Public

STAMP:

SARA C BUCKLER
Notary Public - Notary Seal
Platte County - State of Missouri
Commission Number 02395426
My Commission Expires Apr 16, 2027

MWDBE SUBCONTRACTOR BUSINESS NAME: Richardson Trucking Inc.

Dianna Richardson
Signature: Subcontractor

Dianna Richardson
Print Name

President
Title

12-12-24
Date

State of MO)
County of Jackson)

I, Dianna Richardson, state that the above and foregoing is based on my best knowledge and belief.

Subscribed and sworn to before me, a notary public, on this 12 day of Dec, 2024

My Commission Expires: 07-13-2025

Wanda Teresa Drake
Notary Public

STAMP:

WANDA TERESA DRAKE
NOTARY PUBLIC - NOTARY SEAL
STATE OF MISSOURI
MY COMMISSION EXPIRES JULY 13, 2025
JACKSON COUNTY
COMMISSION #21536458

LETTER OF INTENT TO SUBCONTRACT

Check one:
Original LOI: ☑
Updated LOI: ☐

Project Name/Title Blue River Grit Removal and Fine Screens Project

Project Location/Number 81000999 CN: 1751

PART I: Prime Contractor Goodwin Bros. Construction Co. agrees to enter into a contractual agreement with M/W/DBE Subcontractor Genesis who will provide the following goods/services in connection with the above-reference contract: [Insert a brief narrative describing goods/services to be provided. Broad Categorizations (e.g., "electrical," "plumbing," etc.) or the listing of NAICS Codes in which M/W/DBE Subcontractor is certified are insufficient and may result in denial of this Letter of Intent to Subcontract.]

Ash Removal

for an estimated amount of $ 1,300,000 (or _____% of the total estimated contract value.)

M/WBE Vendor type:
- ☒ Subcontractor/manufacturer (counts as 100% of contract value towards goals)
- ☐ Supplier (counts as 60% of the total dollar amount paid or to be paid by a prime contractor for supplies or goods towards goals)
- ☐ Broker (counts as 10% of the total dollar amount paid or to be paid by a prime contractor for supplies or goods towards goals)

M/W/DBE Subcontractor is, to the best of Prime Contractor's knowledge, currently certified with the City of Kansas City's Civil Rights & Equal Opportunity Department to perform in the capacities indicated herein. Prime Contractor agrees to utilize M/W/DBE Subcontractor in the capacities indicated herein, and M/W/DBE Subcontractor agrees to work on the above-referenced contract in the capacities indicated herein, contingent upon award of the contract to Prime Contractor.

PART 2: This section is to be completed by the M/W/DBE subcontractor listed above. Please attach additional sheets as needed for more than one intended sub-tier contract. **IMPORTANT: Falsification of this document will result in denial and other remedies available under City Code.**

Select one:
- ☒ The M/W/DBE Subcontractor listed above **IS NOT** subcontracting any portions of the above-stated scope of work(s). (Continue to Part 3.)
- ☐ The M/W/DBE Subcontractor listed above **IS** subcontracting certain portions of the above stated scope of work(s) to:

(1) Company name: _____

Full address: _____

Primary contact: _____
Name Phone

a) This subcontractor is (select one): ☐MBE ☐WBE ☐DBE N/A

i: If this subcontractor is an M/W/DBE certified with the City of Kansas City, Missouri, a separate Letter of Intent must be attached to this document.

ii. If this subcontractor is NOT a certified M/W/DBE certified with the City of Kansas City, Missouri, the firm must still be listed for reporting purposes but a Letter of Intent is not required.

b) Scope of work to be performed: _____

c) The dollar value of this agreement is: _____

PART 3:

NOTE: SIGNATURES AND NOTARIZATIONS REQUIRED FOR NEW LETTERS OF INTENT (LOI); SIGNATURES ONLY FOR UPDATED LOI (ADDING VALUE TO EXISTING CONTRACT).

PRIME CONTRACTOR BUSINESS NAME: Goodwin Bros. Construction Co.

Doug Wachsnicht
Signature: Prime Contractor

Doug Wachsnicht
Print Name

Vice President
Title

12/11/2024
Date

State of Missouri)

County of Platte)

I, Sara Buckler, state that the above and foregoing is based on my best knowledge and belief.

Subscribed and sworn to before me, a notary public, on this 11th day of December, 2024

My Commission Expires: April 16, 2027

Sara C Buckler
Notary Public

STAMP:

SARA C BUCKLER
Notary Public - Notary Seal
Platte County - State of Missouri
Commission Number 02395426
My Commission Expires Apr 16, 2027

MWDBE SUBCONTRACTOR BUSINESS NAME: Genesis Environmental Solutions, Inc.

M. Shaun Thomas
Signature: Subcontractor

M. Shaun Thomas
Print Name

President
Title

12/11/2024
Date

State of Missouri)

County of Jackson)

I, Meghan Stowell, state that the above and foregoing is based on my best knowledge and belief.

Subscribed and sworn to before me, a notary public, on this day of 11 December 20 2024

My Commission Expires: 1/17/28

Notary Public

STAMP:

MEGAN STOWELL
My Commission Expires
01-17-2028
NOTARY SEAL
Lafayette
County
Commission # 24925734
NOTARY PUBLIC - STATE OF MISSOURI

LETTER OF INTENT TO SUBCONTRACT

Check one:
Original LOI: ☑
Updated LOI: ☐

Project Name/Title Blue River Grit Removal and Fine Screens Project

Project Location/Number 81000999 CN: 1751

PART I: Prime Contractor Goodwin Bros. Construction Co. agrees to enter into a contractual agreement with M/W/DBE Subcontractor CJ Industries who will provide the following goods/services in connection with the above-reference contract: [Insert a brief narrative describing goods/services to be provided. Broad Categorizations (e.g., "electrical," "plumbing," etc.) or the listing of NAICS Codes in which M/W/DBE Subcontractor is certified are insufficient and may result in denial of this Letter of Intent to Subcontract.]

Dewatering system piping

for an estimated amount of $ 100,000 (or _____% of the total estimated contract value.)

M/WBE Vendor type:

- [X] Subcontractor/manufacturer (counts as 100% of contract value towards goals)
- [ ] Supplier (counts as 60% of the total dollar amount paid or to be paid by a prime contractor for supplies or goods towards goals)
- [ ] Broker (counts as 10% of the total dollar amount paid or to be paid by a prime contractor for supplies or goods towards goals)

M/W/DBE Subcontractor is, to the best of Prime Contractor's knowledge, currently certified with the City of Kansas City's Civil Rights & Equal Opportunity Department to perform in the capacities indicated herein. Prime Contractor agrees to utilize M/W/DBE Subcontractor in the capacities indicated herein, and M/W/DBE Subcontractor agrees to work on the above-referenced contract in the capacities indicated herein, contingent upon award of the contract to Prime Contractor.

PART 2: This section is to be completed by the M/W/DBE subcontractor listed above. Please attach additional sheets as needed for more than one intended sub-tier contract. **IMPORTANT: Falsification of this document will result in denial and other remedies available under City Code.**

Select one:

- [X] The M/W/DBE Subcontractor listed above **IS NOT** subcontracting any portions of the above-stated scope of work(s). (Continue to Part 3.)
- [ ] The M/W/DBE Subcontractor listed above **IS** subcontracting certain portions of the above stated scope of work(s) to:

(1) Company name: _____

Full address: _____
Street number and name City, State and Zip Code

Primary contact: _____
Name Phone

a) This subcontractor is (select one): ☐MBE ☐WBE ☐DBE N/A

i: If this subcontractor is an M/W/DBE certified with the City of Kansas City, Missouri, a separate Letter of Intent must be attached to this document.

ii. If this subcontractor is NOT a certified M/W/DBE certified with the City of Kansas City, Missouri, the firm must still be listed for reporting purposes but a Letter of Intent is not required.

b) Scope of work to be performed: _____

c) The dollar value of this agreement is: _____

PART 3:

NOTE: SIGNATURES AND NOTARIZATIONS REQUIRED FOR NEW LETTERS OF INTENT (LOI); SIGNATURES ONLY FOR UPDATED LOI (ADDING VALUE TO EXISTING CONTRACT).

PRIME CONTRACTOR BUSINESS NAME: Goodwin Bros. Construction Co.

Doug Wachsnicht
Signature: Prime Contractor

Doug Wachsnicht
Print Name

Vice President
Title

12/11/2024
Date

State of Missouri)
County of Platte)

I, Sara Buckler, state that the above and foregoing is based on my best knowledge and belief.

Subscribed and sworn to before me, a notary public, on this 11th day of December, 20 2024

My Commission Expires: April 16, 2027

Sara C Buckler
Notary Public

STAMP:

SARA C BUCKLER
Notary Public - Notary Seal
Platte County - State of Missouri
Commission Number 02395426
My Commission Expires Apr 16, 2027

MWDBE SUBCONTRACTOR BUSINESS NAME: CJ Industries

Melinda K. Rocha
Signature: Subcontractor

Melinda K. Rocha
Print Name

President
Title

12-11-24
Date

State of KS)
County of Wy)

I, Joni Nicks, state that the above and foregoing is based on my best knowledge and belief.

Subscribed and sworn to before me, a notary public, on this 11th day of December, 20 24

My Commission Expires: 8/25/26

Joni Nicks
Notary Public

STAMP:

JONI NICKS
Notary Public
State of Kansas
My Commission Expires 8/25/26

LETTER OF INTENT TO SUBCONTRACT

Check one:
Original LOI: ✓
Updated LOI: ☐

Project Name/Title Blue River Grit Removal and Fine Screens Project

Project Location/Number 81000999 CN: 1751

PART 1: Prime Contractor Goodwin Bros. Construction Co. agrees to enter into a contractual agreement with M/W/DBE Subcontractor Whatever It Takes Electrical Company (WITEC) who will provide the following goods/services in connection with the above-reference contract: [Insert a brief narrative describing goods/services to be provided. Broad Categorizations (e.g., "electrical," "plumbing," etc.) or the listing of NAICS Codes in which M/W/DBE Subcontractor is certified are insufficient and may result in denial of this Letter of Intent to Subcontract.]

Dewatering

for an estimated amount of $ 50,000 (or _____% of the total estimated contract value.)

M/WBE Vendor type:
- [X] Subcontractor/manufacturer (counts as 100% of contract value towards goals)
- [ ] Supplier (counts as 60% of the total dollar amount paid or to be paid by a prime contractor for supplies or goods towards goals)
- [ ] Broker (counts as 10% of the total dollar amount paid or to be paid by a prime contractor for supplies or goods towards goals)

M/W/DBE Subcontractor is, to the best of Prime Contractor's knowledge, currently certified with the City of Kansas City's Civil Rights & Equal Opportunity Department to perform in the capacities indicated herein. Prime Contractor agrees to utilize M/W/DBE Subcontractor in the capacities indicated herein, and M/W/DBE Subcontractor agrees to work on the above-referenced contract in the capacities indicated herein, contingent upon award of the contract to Prime Contractor.

PART 2: This section is to be completed by the M/W/DBE subcontractor listed above. Please attach additional sheets as needed for more than one intended sub-tier contract. **IMPORTANT: Falsification of this document will result in denial and other remedies available under City Code.**

Select one:
- [X] The M/W/DBE Subcontractor listed above **IS NOT** subcontracting any portions of the above-stated scope of work(s). (Continue to Part 3.)
- [ ] The M/W/DBE Subcontractor listed above **IS** subcontracting certain portions of the above stated scope of work(s) to:

(1) Company name: _____

Full address: _____
Street number and name City, State and Zip Code

Primary contact: _____
Name Phone

a) This subcontractor is (select one): ☐MBE ☐WBE ☐DBE N/A

i: If this subcontractor is an M/W/DBE certified with the City of Kansas City, Missouri, a separate Letter of Intent must be attached to this document.

ii. If this subcontractor is NOT a certified M/W/DBE certified with the City of Kansas City, Missouri, the firm must still be listed for reporting purposes but a Letter of Intent is not required.

b) Scope of work to be performed: _____

c) The dollar value of this agreement is: _____

PART 3:

NOTE: SIGNATURES AND NOTARIZATIONS REQUIRED FOR NEW LETTERS OF INTENT (LOI); SIGNATURES ONLY FOR UPDATED LOI (ADDING VALUE TO EXISTING CONTRACT).

PRIME CONTRACTOR BUSINESS NAME: Goodwin Bros. Construction Co.

Doug Wachsnicht — Signature: Prime Contractor

Doug Wachsnicht — Print Name

Vice President — Title

12/11/2024 — Date

State of Missouri)

County of Platte)

I, Sara Buckler, state that the above and foregoing is based on my best knowledge and belief.

Subscribed and sworn to before me, a notary public, on this 11th day of December, 20 2024

Sara C Buckler

My Commission Expires: April 16, 2027

Sara C Buckler — Notary Public

STAMP:

SARA C BUCKLER
Notary Public - Notary Seal
Platte County - State of Missouri
Commission Number 02195416
My Commission Expires Apr 16, 2027

MWDBE SUBCONTRACTOR BUSINESS NAME: Whatever It Takes Electrical Contractors, LLC.

Signature: Subcontractor

John Rolls — Print Name

President — Title

12/11/24 — Date

State of MO)

County of Clinton)

I, Mckayla Daugherty, state that the above and foregoing is based on my best knowledge and belief.

Subscribed and sworn to before me, a notary public, on this 11th day of Dec, 20 24

My Commission Expires: 02/26/28

Notary Public

STAMP:

MCKAYLA DAUGHERTY
Notary Public - Notary Seal
Clinton County - State of Missouri
Commission Number 20483471
My Commission Expires Feb 26, 2028

LETTER OF INTENT TO SUBCONTRACT

Check one:
Original LOI: ☑
Updated LOI: ☐

Project Name/Title Blue River WWTP Grit Removal and Fine Screens Project

Project Location/Number Kansas City, MO / PN 81000999 / CN 1751

PART I: Prime Contractor Black & Veatch Corporation agrees to enter into a contractual agreement with M/W/DBE Subcontractor Custom Engineering who will provide the following goods/services in connection with the above-reference contract: [Insert a brief narrative describing goods/services to be provided. Broad Categorizations (e.g., "electrical," "plumbing," etc.) or the listing of NAICS Codes in which M/W/DBE Subcontractor is certified are insufficient and may result in denial of this Letter of Intent to Subcontract.]

Provide project management and professional services to perform building mechnical engineering (plumbing) during the development of the basis of design report and 30 percent detailed design for the fine screening and grit facility.

for an estimated amount of $ 234,105 (or _____% of the total estimated contract value.)

M/WBE Vendor type:

- ☑ Subcontractor/manufacturer (counts as 100% of contract value towards goals)
- ☐ Supplier (counts as 60% of the total dollar amount paid or to be paid by a prime contractor for supplies or goods towards goals)
- ☐ Broker (counts as 10% of the total dollar amount paid or to be paid by a prime contractor for supplies or goods towards goals)

M/W/DBE Subcontractor is, to the best of Prime Contractor's knowledge, currently certified with the City of Kansas City's Civil Rights & Equal Opportunity Department to perform in the capacities indicated herein. Prime Contractor agrees to utilize M/W/DBE Subcontractor in the capacities indicated herein, and M/W/DBE Subcontractor agrees to work on the above-referenced contract in the capacities indicated herein, contingent upon award of the contract to Prime Contractor.

PART 2: This section is to be completed by the M/W/DBE subcontractor listed above. Please attach additional sheets as needed for more than one intended sub-tier contract. **IMPORTANT: Falsification of this document will result in denial and other remedies available under City Code.**

Select one:

- ☑ The M/W/DBE Subcontractor listed above **IS NOT** subcontracting any portions of the above-stated scope of work(s). (Continue to Part 3.)
- ☐ The M/W/DBE Subcontractor listed above **IS** subcontracting certain portions of the above stated scope of work(s) to:

(1) Company name: _____

Full address: _____
Street number and name City, State and Zip Code

Primary contact: _____
Name Phone

a) This subcontractor is (select one): ☑MBE ☐WBE ☐DBE ☐N/A

i: If this subcontractor is an M/W/DBE certified with the City of Kansas City, Missouri, a separate Letter of Intent must be attached to this document.

ii. If this subcontractor is NOT a certified M/W/DBE certified with the City of Kansas City, Missouri, the firm must still be listed for reporting purposes but a Letter of Intent is not required.

b) Scope of work to be performed: _____

c) The dollar value of this agreement is: _____

PART 3:

NOTE: SIGNATURES AND NOTARIZATIONS REQUIRED FOR NEW LETTERS OF INTENT (LOI); SIGNATURES ONLY FOR UPDATED LOI (ADDING VALUE TO EXISTING CONTRACT).

PRIME CONTRACTOR BUSINESS NAME: Black & Veatch Corporation

Signature: Prime Contractor

Suzie Carpenter
Print Name

Associate Vice President
Title

12/5/2024
Date

State of Missouri)

County of Jackson)

I, Suzie Carpenter, state that the above and foregoing is based on my best knowledge and belief.

Subscribed and sworn to before me, a notary public, on this 5 day of December, 2024

My Commission Expires: 1/8/2027

Notary Public

STAMP:

JENNIFER ENYART
Notary Public-Notary Seal
STATE OF MISSOURI
Jackson County
My Commission Expires 1/8/2027
Commission #23853879

MWDBE SUBCONTRACTOR BUSINESS NAME: Custom Engineering

Signature: Subcontractor

Joseph T. Davis
Print Name

CEO
Title

12/09/2024
Date

State of MO)

County of Jackson)

I, Joseph T. Davis, state that the above and foregoing is based on my best knowledge and belief.

Subscribed and sworn to before me, a notary public, on this December 9 day of 24

My Commission Expires: 1-19-26

Notary Public

STAMP:

ERIN DECKER
Notary Public, Notary Seal
State of Missouri
Jackson County
Commission # 22430958
My Commission Expires 01-19-2026

LETTER OF INTENT TO SUBCONTRACT

Check one:
Original LOI ☑
Updated LOI ☐

Project Name/Title Blue River WWTP Grit Removal and Fine Screens Project

Project Location/Number Kansas City, MO / PN 81000999 / CN 1751

PART I: Prime Contractor Black & Veatch Corporation agrees to enter into a contractual agreement with M/W/DBE Subcontractor DuBois Consultants who will provide the following goods/services in connection with the above-reference contract: [Insert a brief narrative describing goods/services to be provided. Broad Categorizations (e.g., "electrical," "plumbing," etc.) or the listing of NAICS Codes in which M/W/DBE Subcontractor is certified are insufficient and may result in denial of this Letter of Intent to Subcontract.]

Assist with structural design of the new fine screening and grit basin structures. DuBois will be the lead structural engineer at the upstream tie location located in the Blue River Pump Station and the downstream tie in location which will include a new junction structure upstream of primary treatment.

for an estimated amount of $ 176,185 (or_____% of the total estimated contract value.)

M/WBE Vendor type:
- ☑ Subcontractor/manufacturer (counts as 100% of contract value towards goals)
- ☐ Supplier (counts as 60% of the total dollar amount paid or to be paid by a prime contractor for supplies or goods towards goals)
- ☐ Broker (counts as 10% of the total dollar amount paid or to be paid by a prime contractor for supplies or goods towards goals)

M/W/DBE Subcontractor is, to the best of Prime Contractor's knowledge, currently certified with the City of Kansas City's Civil Rights & Equal Opportunity Department to perform in the capacities indicated herein. Prime Contractor agrees to utilize M/W/DBE Subcontractor in the capacities indicated herein, and M/W/DBE Subcontractor agrees to work on the above-referenced contract in the capacities indicated herein, contingent upon award of the contract to Prime Contractor.

PART 2: This section is to be completed by the M/W/DBE subcontractor listed above. Please attach additional sheets as needed for more than one intended sub-tier contract. **IMPORTANT: Falsification of this document will result in denial and other remedies available under City Code.**

Select one:
- ☒ The (M)/W/DBE Subcontractor listed above **IS NOT** subcontracting any portions of the above-stated scope of work(s). (Continue to Part 3.)
- ☐ The M/W/DBE Subcontractor listed above **IS** subcontracting certain portions of the above stated scope of work(s) to:

(1) Company name: _____

Full address: _____
Street number and name City, State and Zip Code

Primary contact: _____
Name Phone

a) This subcontractor is (select one): ☐MBE ☐WBE ☐DBE ☐N/A

i: If this subcontractor is an M/W/DBE certified with the City of Kansas City, Missouri, a separate Letter of Intent must be attached to this document.

ii. If this subcontractor is NOT a certified M/W/DBE certified with the City of Kansas City, Missouri, the firm must still be listed for reporting purposes but a Letter of Intent is not required.

b) Scope of work to be performed: _____

c) The dollar value of this agreement is: _____

PART 3:

NOTE: SIGNATURES AND NOTARIZATIONS REQUIRED FOR NEW LETTERS OF INTENT (LOI); SIGNATURES ONLY FOR UPDATED LOI (ADDING VALUE TO EXISTING CONTRACT).

PRIME CONTRACTOR BUSINESS NAME: Black & Veatch Corporation

Signature: Prime Contractor

Suzie Carpenter
Print Name

Associate Vice President
Title

12/5/2024
Date

State of Missouri)

County of Jackson)

I, Suzie Carpenter, state that the above and foregoing is based on my best knowledge and belief.

Subscribed and sworn to before me, a notary public, on this 5 day of December, 2024

My Commission Expires: 1/8/2027

Notary Public

STAMP:

JENNIFER ENYART
Notary Public-Notary Seal
STATE OF MISSOURI
Jackson County
My Commission Expires 1/8/2027
Commission #23853879

MWDBE SUBCONTRACTOR BUSINESS NAME: DuBois Consultants, Inc.

Signature: Subcontractor

Cervente D. Sudduth
Print Name

President
Title

12-06-2024
Date

State of Missouri)

County of Jackson)

I, Dana Bartch, state that the above and foregoing is based on my best knowledge and belief.

Subscribed and sworn to before me, a notary public, on this 6th day of December 20 24

My Commission Expires: 04/27/2027

Dana Bartch
Notary Public

STAMP:

DANA BARTCH
NOTARY PUBLIC - NOTARY SEAL
STATE OF MISSOURI
MY COMMISSION EXPIRES APRIL 27, 2027
CLAY COUNTY
COMMISSION #23333566

LETTER OF INTENT TO SUBCONTRACT

Check one:
Original LOI: ☑
Updated LOI: ☐

Project Name/Title Blue River WWTP Grit Removal and Fine Screens Project

Project Location/Number Kansas City, MO / PN 81000999 / CN 1751

PART 1 Prime Contractor Black & Veatch Corporation agrees to enter into a contractual agreement with M/W/DBE Subcontractor Environmental Advisors and Engineers, Inc. who will provide the following goods/services in connection with the above-reference contract: [Insert a brief narrative describing goods/services to be provided. Broad Categorizations (e.g., "electrical," "plumbing," etc.) or the listing of NAICS Codes in which M/W/DBE Subcontractor is certified are insufficient and may result in denial of this Letter of Intent to Subcontract.]

Provide project management and architectural services during development of the Basis of Design Report and 30 percent detailed design for the new fine screening and grit basin structure.

for an estimated amount of $ 175,319 (or_____% of the total estimated contract value.)

M/W/BE Vendor type:

- ☑ Subcontractor/manufacturer (counts as 100% of contract value towards goals)
- ☐ Supplier (counts as 60% of the total dollar amount paid or to be paid by a prime contractor for supplies or goods towards goals)
- ☐ Broker (counts as 10% of the total dollar amount paid or to be paid by a prime contractor for supplies or goods towards goals)

M/W/DBE Subcontractor is, to the best of Prime Contractor's knowledge, currently certified with the City of Kansas City's Civil Rights & Equal Opportunity Department to perform in the capacities indicated herein. Prime Contractor agrees to utilize M/W/DBE Subcontractor in the capacities indicated herein, and M/W/DBE Subcontractor agrees to work on the above-referenced contract in the capacities indicated herein, contingent upon award of the contract to Prime Contractor.

PART 2 This section is to be completed by the M/W/DBE subcontractor listed above. Please attach additional sheets as needed for more than one intended sub-tier contract. **IMPORTANT: Falsification of this document will result in denial and other remedies available under City Code.**

Select one:

- ☑ The M(W)DBE Subcontractor listed above **IS NOT** subcontracting any portions of the above-stated scope of work(s). (Continue to Part 3.)
- ☐ The M/W/DBE Subcontractor listed above **IS** subcontracting certain portions of the above stated scope of work(s) to:

(1) Company name: _____

Full address: _____
Street number and name City, State and Zip Code

Primary contact: _____
Name Phone

a) This subcontractor is (select one): ☐MBE ☐WBE ☐DBE ☐N/A

i: If this subcontractor is an M/W/DBE certified with the City of Kansas City, Missouri, a separate Letter of Intent must be attached to this document.

ii. If this subcontractor is NOT a certified M/W/DBE certified with the City of Kansas City, Missouri, the firm must still be listed for reporting purposes but a Letter of Intent is not required.

b) Scope of work to be performed: _____

c) The dollar value of this agreement is: _____

PART 3:

NOTE: SIGNATURES AND NOTARIZATIONS REQUIRED FOR NEW LETTERS OF INTENT (LOI); SIGNATURES ONLY FOR UPDATED LOI (ADDING VALUE TO EXISTING CONTRACT).

PRIME CONTRACTOR BUSINESS NAME: Black & Veatch Corporation

Signature: Prime Contractor

Suzie Carpenter
Print Name

Associate Vice President
Title

12/5/2024
Date

State of Missouri)
County of Jackson)

I, Suzie Carpenter, state that the above and foregoing is based on my best knowledge and belief.

Subscribed and sworn to before me, a notary public, on this 5 day of December, 2024

My Commission Expires: 1/8/2027

Notary Public

STAMP:

JENNIFER ENYART
Notary Public-Notary Seal
STATE OF MISSOURI
Jackson County
My Commission Expires 1/8/2027
Commission #23853879

MWDBE SUBCONTRACTOR BUSINESS NAME: Environmental Advisors and Engineers, Inc.

Signature: Subcontractor

Jill R. Biesma
Print Name

President
Title

12/5/2024
Date

State of Kansas)
County of Johnson)

I, Jill R. Biesma, state that the above and foregoing is based on my best knowledge and belief.

Subscribed and sworn to before me, a notary public, on this 5th day of December, 2024

My Commission Expires: 11-30-2025

Linda Lozano-Dickerson
Notary Public

STAMP:

LINDA LOZANO-DICKERSON
Notary Public, State of Kansas
My Appointment Expires
11-30-2025

LETTER OF INTENT TO SUBCONTRACT

Check one:	
Original LOI:	☑
Updated LOI:	☐

Project Name/Title Blue River WWTP Grit Removal and Fine Screens Project

Project Location/Number Kansas City, MO / PN 81000999 / CN 1751

PART 1: Prime Contractor Black & Veatch Corporation agrees to enter into a contractual agreement with M/W/DBE Subcontractor TREKK Design Group, LLC who will provide the following goods/services in connection with the above-reference contract: [Insert a brief narrative describing goods/services to be provided. Broad Categorizations (e.g., "electrical," "plumbing," etc.) or the listing of NAICS Codes in which M/W/DBE Subcontractor is certified are insufficient and may result in denial of this Letter of Intent to Subcontract.]

Provide project management and site civil engineering during development of the Basis of Design Report and 30 percent detailed design for the new fine screening and grit basin structure.

for an estimated amount of $ 161,055 (or _____% of the total estimated contract value.)

M/W/BE Vendor type:

- ☑ Subcontractor/manufacturer (counts as 100% of contract value towards goals)
- ☐ Supplier (counts as 60% of the total dollar amount paid or to be paid by a prime contractor for supplies or goods towards goals)
- ☐ Broker (counts as 10% of the total dollar amount paid or to be paid by a prime contractor for supplies or goods towards goals)

M/W/DBE Subcontractor is, to the best of Prime Contractor's knowledge, currently certified with the City of Kansas City's Civil Rights & Equal Opportunity Department to perform in the capacities indicated herein. Prime Contractor agrees to utilize M/W/DBE Subcontractor in the capacities indicated herein, and M/W/DBE Subcontractor agrees to work on the above-referenced contract in the capacities indicated herein, contingent upon award of the contract to Prime Contractor.

PART 2: This section is to be completed by the M/W/DBE subcontractor listed above. Please attach additional sheets as needed for more than one intended sub-tier contract. **IMPORTANT: Falsification of this document will result in denial and other remedies available under City Code.**

Select one:

- ☑ The M/W/DBE Subcontractor listed above **IS NOT** subcontracting any portions of the above-stated scope of work(s). (Continue to Part 3.)
- ☐ The M/W/DBE Subcontractor listed above **IS** subcontracting certain portions of the above stated scope of work(s) to:

(1) Company name: _____

Full address: _____
Street number and name City, State and Zip Code

Primary contact: Name _____ Phone _____

a) This subcontractor is (select one): ☐MBE ☑WBE ☐DBE ☐N/A

i: If this subcontractor is an M/W/DBE certified with the City of Kansas City, Missouri, a separate Letter of Intent must be attached to this document.

ii. If this subcontractor is NOT a certified M/W/DBE certified with the City of Kansas City, Missouri, the firm must still be listed for reporting purposes but a Letter of Intent is not required.

b) Scope of work to be performed: _____

c) The dollar value of this agreement is: _____

PART 3:

NOTE: SIGNATURES AND NOTARIZATIONS REQUIRED FOR NEW LETTERS OF INTENT (LOI); SIGNATURES ONLY FOR UPDATED LOI (ADDING VALUE TO EXISTING CONTRACT).

PRIME CONTRACTOR BUSINESS NAME: Black & Veatch Corporation

Signature: Prime Contractor

Suzie Carpenter
Print Name

Associate Vice President
Title

12/5/2024
Date

State of Missouri)

County of Jackson)

I, Suzie Carpenter, state that the above and foregoing is based on my best knowledge and belief.

Subscribed and sworn to before me, a notary public, on this 5 day of December, 2024

My Commission Expires: 1/8/2027

Notary Public

STAMP:

JENNIFER ENYART
Notary Public-Notary Seal
STATE OF MISSOURI
Jackson County
My Commission Expires 1/8/2027
Commission #23853879

MWDBE SUBCONTRACTOR BUSINESS NAME: TREKK Design Group, LLC

Signature: Subcontractor

Trent Robinett
Print Name

President
Title

12/5/24
Date

State of Missouri)

County of Jackson)

I, Linda S Dodson, state that the above and foregoing is based on my best knowledge and belief.

Subscribed and sworn to before me, a notary public, on this 5th day of Dec, 2024

My Commission Expires: 6/30/2026

Linda S Dodson
Notary Public

STAMP:

LINDA S DODSON
Notary Public - Notary Seal
Jackson County - State of Missouri
Commission Number 14991560
My Commission Expires Jun 30, 2026

LETTER OF INTENT TO SUBCONTRACT

Check one:
Original LOI: ☑
Updated LOI: ☐

Project Name/Title Blue River WWTP Grit Removal and Fine Screens Project

Project Location/Number Kansas City, MO / PN 81000999 / CN 1751

PART 1: Prime Contractor Black & Veatch Corporation agrees to enter into a contractual agreement with M/W/DBE Subcontractor TSi Geotechnical, Inc. who will provide the following goods/services in connection with the above-reference contract: [Insert a brief narrative describing goods/services to be provided. Broad Categorizations (e.g., "electrical," "plumbing," etc.) or the listing of NAICS Codes in which M/W/DBE Subcontractor is certified are insufficient and may result in denial of this Letter of Intent to Subcontract.]

Provide subsurface exploration, geotechnical data report, and geotechnical engineering evaluation for use in the design and construction of the new fine screening and grit facility.

for an estimated amount of $ 69,516 (or _____% of the total estimated contract value.)

M/WBE Vendor type:

- ☑ Subcontractor/manufacturer (counts as 100% of contract value towards goals)
- ☐ Supplier (counts as 60% of the total dollar amount paid or to be paid by a prime contractor for supplies or goods towards goals)
- ☐ Broker (counts as 10% of the total dollar amount paid or to be paid by a prime contractor for supplies or goods towards goals)

M/W/DBE Subcontractor is, to the best of Prime Contractor's knowledge, currently certified with the City of Kansas City's Civil Rights & Equal Opportunity Department to perform in the capacities indicated herein. Prime Contractor agrees to utilize M/W/DBE Subcontractor in the capacities indicated herein, and M/W/DBE Subcontractor agrees to work on the above-referenced contract in the capacities indicated herein, contingent upon award of the contract to Prime Contractor.

PART 2: This section is to be completed by the M/W/DBE subcontractor listed above. Please attach additional sheets as needed for more than one intended sub-tier contract. **IMPORTANT: Falsification of this document will result in denial and other remedies available under City Code.**

Select one:

- ☑ The M/W/DBE Subcontractor listed above **IS NOT** subcontracting any portions of the above-stated scope of work(s). (Continue to Part 3.)
- ☐ The M/W/DBE Subcontractor listed above **IS** subcontracting certain portions of the above stated scope of work(s) to:

(1) Company name: _____

Full address: _____
Street number and name City, State and Zip Code

Primary contact: _____
Name Phone

a) This subcontractor is (select one): ☐MBE ☐WBE ☐DBE ☐N/A

i: If this subcontractor is an M/W/DBE certified with the City of Kansas City, Missouri, a separate Letter of Intent must be attached to this document.

ii. If this subcontractor is NOT a certified M/W/DBE certified with the City of Kansas City, Missouri, the firm must still be listed for reporting purposes but a Letter of Intent is not required.

b) Scope of work to be performed: _____

c) The dollar value of this agreement is: _____

PART 3:

NOTE: SIGNATURES AND NOTARIZATIONS REQUIRED FOR NEW LETTERS OF INTENT (LOI); SIGNATURES ONLY FOR UPDATED LOI (ADDING VALUE TO EXISTING CONTRACT).

PRIME CONTRACTOR BUSINESS NAME: Black & Veatch Corporation

Signature: Prime Contractor

Suzie Carpenter
Print Name

Associate Vice President
Title

12/5/2024
Date

State of Missouri)

County of Jackson)

I, Suzie Carpenter, state that the above and foregoing is based on my best knowledge and belief.

Subscribed and sworn to before me, a notary public, on this 5 day of December, 20 24

My Commission Expires: 1/6/2027

Notary Public

STAMP:

JENNIFER ENYART
Notary Public-Notary Seal
STATE OF MISSOURI
Jackson County
My Commission Expires 1/6/2027
Commission #23853879

MWDBE SUBCONTRACTOR BUSINESS NAME: TSI Geotechnical, Inc.

Signature: Subcontractor

Denise B. Hervey
Print Name

CEO
Title

12/09/2024
Date

State of Missouri)

County of St. Louis)

I, Denise B. Hervey, state that the above and foregoing is based on my best knowledge and belief.

Subscribed and sworn to before me, a notary public, on this 9th day of December, 20 24

My Commission Expires: 9-25-27

Notary Public

STAMP:

MOLLY K. HARRIS
MY COMMISSION EXPIRES 09/25/2027
NOTARY PUBLIC
NOTARY SEAL ID NO. 15388406
MISSOURI

TIMETABLE FOR MBE/WBE UTILIZATION

(This form should be submitted to the City after contract award.)

I, Doug Wachsnicht, acting in my capacity as Vice President
(Name) *(Position with Firm)*
of Goodwin Bros. Construction Co., with the submittal of this Timetable, certify that
(Name of Firm)
the following timetable for MBE/WBE utilization in the fulfillment of this contract is correct and true to the best of my knowledge.

ALLOTTED TIME FOR THE COMPLETION OF THIS CONTRACT
(Check one only)

15 days	☐	75 days	☐	135 days	☐
30 days	☐	90 days	☐	150 days	☐
45 days	☐	105 days	☐	165 days	☐
60 days	☐	120 days	☐	180 days	☐

Other 1032 days (Specify)

Throughout _____ Beginning 1/3 _____
Middle 1/3 _____ Final 1/3 _____
Beginning 1/3 20 % Middle 1/3 40 % Final 1/3 40 %

PLEASE NOTE: Any changes in this timetable require approval of the Civil Rights & Equal Opportunity Department in advance of the change.

If you have any questions regarding the completion of this form, please contact the Civil Rights & Equal Opportunity Department at: (816) 513-1836.

Doug Wachsnicht
(Signature)

Vice President
(Position with Firm)

12/11/2024
(Date)

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

REQUEST FOR MODIFICATION OR SUBSTITUTION

*(This Form **must** be submitted to CREO KC to request substitutions for an MBE/WBE listed in the Contractor Utilization Plan or for modification of the amount of MBE/WBE participation listed in the Contractor Utilization Plan. This Form shall be an amendment to the Contractor Utilization Plan.)*

BIDDER/PROPOSER/CONTRACTOR: _____
ADDRESS: _____
PROJECT NUMBER OR TITLE: _____
AMENDMENT/CHANGE ORDER NO: (if applicable) _____

Project Goals:	_____% MBE	_____% WBE
Contractor Utilization Plan:	_____% MBE	_____% WBE

1. I am the duly authorized representative of the above Bidder/Contractor/Proposer and am authorized to request this substitution or modification on behalf of the Bidder/Contractor/Proposer.

2. I hereby request that the Director of CREO KC recommend or approve: (check appropriate space(s))

   a. ☐ A substitution of the certified MBE/WBE firm _____,
   (Name of new firm)
   to perform _____,
   (Scope of work to be performed by new firm)
   for the MBE/WBE firm _____ which is currently
   (Name of old firm)
   listed on the Bidder's/Contractor's/Proposer's Contractor Utilization Plan to perform the following scope of work: _____.
   (Scope of work of old firm)

   b. ☐ A modification of the amount of MBE/WBE participation currently listed on the Bidder's/Contractor's/Proposer's Contractor Utilization Plan from

   _____% MBE_____% WBE *(Fill in % of MBE/WBE Participation currently listed on Contractor Utilization Plan)*

   TO

   _____% MBE _____% WBE *(Fill in New % of MBE/WBE Participation requested for Contractor Utilization Plan)*

   c. Attach 00450.01 Letter of Intent to Subcontract letter for each new MBE/WBE to be added.
   d. Attach a copy of the most recent 00485.01 or on-line M/WBE Monthly Utilization Report

3. Bidder/Contractor/Proposer states that a substitution or modification is necessary because: (check applicable reason(s))

☐ The MBE/WBE listed on the Contractor Utilization Plan is non-responsive or cannot perform.

☐ The MBE/WBE listed on the Contractor Utilization Plan has increased its previously quoted price without a corresponding change in the scope of work.

☐ The MBE/WBE listed on the Contractor Utilization Plan has committed a material default or breach of its contract.

___ Requirements of the scope of work of the contract have changed and make subcontracting not feasible or not feasible at the levels required by the goals established for the contract.

___ The MBE/WBE listed on the Contractor Utilization Plan is unacceptable to the City contracting department.

___ Bidder/Contractor/Proposer has not attempted intentionally to evade the requirements of the Act and it is in the best interests of the City to allow a modification or substitution.

4. The following is a narrative summary of the Bidder's/Contractor's/Proposer's good faith efforts exhausted in attempts to substitute the MBE/WBE firm named above which is currently listed on the Contractor Utilization Plan with other qualified, certified MBE/WBE firms for the listed scope of work or any other scope of work in the project:

5. Bidder/Proposer/Contractor will present documentation when requested by the City to evidence its good faith efforts.

Dated:_____

_____
(Bidder/Proposer/Contractor)

By: _____
(Authorized Representative)

CREO KC MONTHLY REPORTING INSTRUCTIONS

M/WBE Monthly Utilization Report Instructions

1. MBE/WBE Reporting applies to Contracts that have approved MBE/WBE goals assigned.
2. The City will utilize a web-based MBE/WBE Reporting System in the administration of this Contract. This web-based application database is a collaboration tool selected and provided by the City, which will allow Contractors and Consultants/Subcontractors and Subconsultants to enter data and report on compliance.

Prevailing Wage Certified Payroll Report Instructions

1. Prevailing Wage Certified Payroll Report applies to Contracts that include Prevailing Wage or Davis Bacon Provisions.
2. This web-based application database is provided by the City for reporting certified payrolls and other related prevailing wage data.
3. Computer Requirements: Minimum Intel Pentium® 4 Processor 2.4 GHz or equivalent processor with 512MB of RAM; recommended Centrino Duo® Processors 1.6 GHz or equivalent with 2GB of RAM, or higher.
    a. Computer Operation System: Windows XP, Windows Vista, or Windows 7
    b. Web Browser: Google Chrome
    c. Connection Speed/Minimum Bandwidth: DSL, ADSL or T1 Line for transferring a minimum of 3 Mbps Downstream and 512 Kbps Upstream
4. City will assist Contractor in providing training of personnel and Subcontractor's personnel.
5. Contractor and Subcontractors shall have the responsibility for visiting the web site and entering data in on timely basis, and as necessary to be in compliance with Prevailing Wage Requirements included in their contracts.

Workforce Monthly Report Instructions

1. Workforce Monthly Reporting only applies to Construction Contracts greater than $300,000 and greater than 800 projected labor hours.
2. The City will utilize a web-based Reporting System in the administration of this Contract. This web-based application database is a collaboration tool selected and provided by the City, which will allow Contractors and Subcontractors to enter data and report on Workforce compliance.

CITY OF KANSAS CITY, MISSOURI
Human Relations Department
M/WBE MONTHLY UTILIZATION REPORT

Report Date:	**Project Name:**		**City Project Number:**					
Project Address:			**Contract Award Date:**			**City Vendor ID:**		
General Contractor (GC):			**City Contract Number:**			**City Department Name**		
Contact Person/Phone:			**General Contract Amount:** $		**Total Amount Paid By City To Date:** $			
General Contractor Address:			**Contract Goals:**		____% DBE ____% MBE ____% WBE			
Email Address:			**Total Contract Days:**			**Completion Date:**		
MBE/DBE Subcontractor	**Date of Certification**	**Date of Subcontract**	**Subcontract Amount**	**% of Total Contract**	**Estimated Start date**	**Amount Paid This Period**	**Amount Paid To Date**	**% of Contract Paid to Date**
WBE/DBE Subcontractor								
Totals								

Contractor should submit report by the 15th of each month.

Phillip Yelder, Director
Human Relations Department
414 E. 12th Street, 4th Floor
Kansas City, MO 64106
Phone: 816-513-1836
FAX: 816-513-1805

Narrative: _____

Report Submitted By: _____ **Date** _____

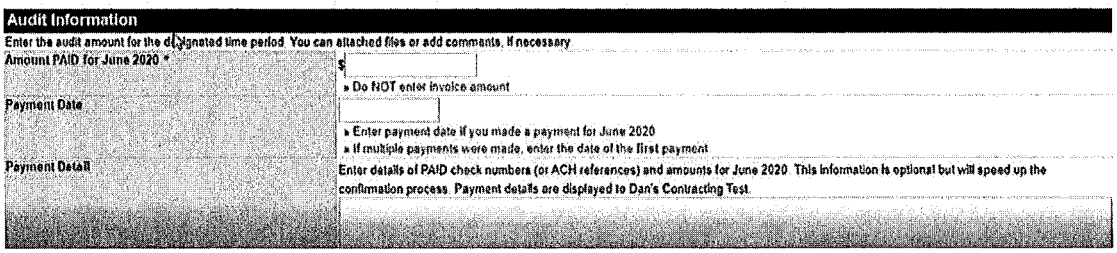
REMINDER: CONTRACTOR is responsible for meeting or exceeding the the D/M/WBE participation amounts in its Contractor Utilization Plan (CUP) as amended by any previously approved Request for Modification/Substitution. Any Change Orders or amendements modifying the amount CONTRACTOR is to be compensated will have correspondingly impacted the amount of compensation due D/M/WBEs for purposes of meeting or exceeding the Bidder/Proposer participation. CONTRACTOR is again advised to consider the effect of any Change Order or amendment, and to submit a Request for Modification/Substitution if appropriate.

M/WBE Monthly Compliance Audit Online Reporting Instructions

PRIME INSTRUCTIONS:

The Prime's responsibility is to report payments made to subcontractors for the prior month.

1. Log into B2GNow Diversity Management System (B2GNow)
2. On the Dashboard, click Contract Audits.
3. Select the specific audit that needs to be completed. Any and all money that changed hands during the month of the audit must be reported to the specific audit month.
4. To complete audit select Report 1 Subcontractor Payment. Under the actions column, select Submit Response for the specific subcontractor that needs reporting or select the Submit ALL Incomplete Records button to go to all the subcontractors to report amounts. Under the audit information answer the following questions:

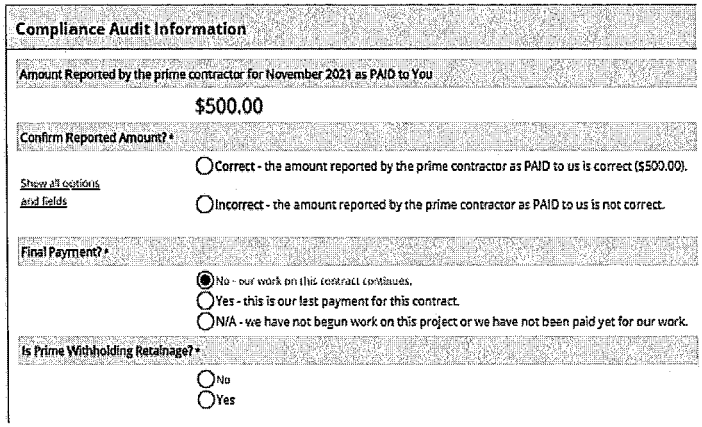


Once information has been entered, select review and save. Complete same steps for all subcontractors. If there were subcontractors that did not receive a payment for the specific audit month, click the Mark Remaining Subcontractors as Zero button to mark remaining subcontractors as 0.

SUBCONTRACTOR INSTRUCTIONS:

The responsibility of the Subcontractor is to confirm payment received for specific audit month.

1. Log in to B2GNow Diversity Management System (B2GNow)
2. On the Dashboard, select Contract Audits.
3. Select the specific audit that needs to be completed.
4. To complete audit, select Confirm Payment Received. There will be two options: correct or incorrect. Select correct if payment was in fact received OR if payment was not received or amount was different select incorrect. Answer all questions and select save to complete.



NOTE: Complete one M/WBE report per project.

An email notice will be sent from our organization monthly to notify Prime & Subcontractor users of incomplete audits.

Project Specific Monthly Report

Human Relations Department - City of Kansas City Missouri

Report Date:		Reporting Period:		Project Description:	
Project Name:		Contractor:		Contract Awarded Date:	
City Project Number:		Contractor Address:		City Contract Number:	
Project Address:				City Vendor ID:	
		Contact Person/Phone:		Contractor Report ☐	Subcontractor Report ☐
E-mail Address:				Final Cumulative Report:	☐ Yes ☐ No

Report the total monthly hours of work performed by all workers on the City Construction Contract. Enter the total hours on all lines and in all columns.
Reported workforce hours should be based on payroll records.

JOB CATEGORIES	OVERALL TOTAL (Sum of all Columns, A thru F Male & Female)	A Total Hours White Employees		B Total Hours Black Employees		C Total Hours Hispanic Employees		D Total Hours Asian/Pacific Islander		E Total Hours Native American Employee		F Total Hours Other/Unknown Race Employee		G KCMO Resident Hours
		M	F	M	F	M	F	M	F	M	F	M	F	Total #
Foreman/Supervisor														
Asbestos Worker Journeyman														
Asbestos Worker Apprentice														
Boilermaker Journeyman														
Boilermaker Apprentice														
Bricklayer Journeyman														
Bricklayer Apprentice														
Carpenter Journeyman														
Carpenter Apprentice														
Cement Mason Journeyman														
Cement Mason														
Electrician Journeyman														
Electrician Apprentice														
Elevator Constructor Journeyman														
Elevator Constructor Apprentice														
Glazier Journeyman														
Glazier Apprentice														
Iron Worker Journeyman														
Iron Worker Apprentice														
Laborer Journeyman														
Laborer Apprentice														
Operating Engineer Journeyman														
Operating Engineer Apprentice														
Painter Journeyman														
Painter Apprentice														
Pipe Fitter/Plumber Journeyman														
Pipe Fitter/Plumber Apprentice														
Plasterer Journeyman														
Plasterer Apprentice														
Roofer Journeyman														
Roofer Apprentice														
Sheet Metal Journeyman														
Sheet Metal Apprentice														
Sprinkler Fitter														
Sprinkler Fitter Apprentice														
Truck Driver Journeyman														
Truck Driver Apprentice														
Welder Journeyman														
Welder Apprentice														
Other														
Monthly Total Hours														-
Total % of Monthly Hrs.														

Contractor shall submit report by the 15th of each month.

Report Submitted By: _____

Date: _____

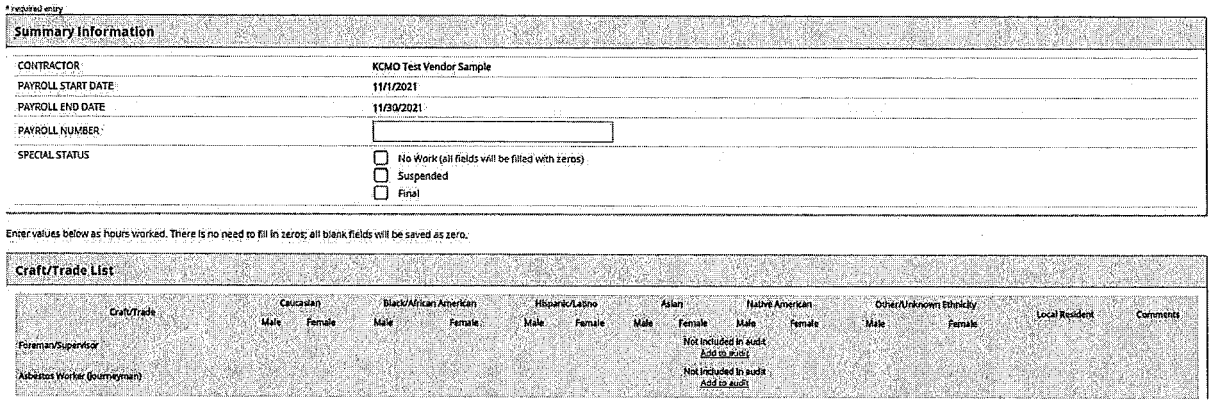
Phillip Yelder, Director Human Relations Department
414 E. 12th Street, 4th Floor Kansas City, MO 64106
Phone: 816-513-1836 Email HRDcontractcompliance@kcmo.org

Workforce Monthly Report Forms only apply to Construction Contracts greater than $300,000.00 with greater than 800 projected labor hours.

Workforce Monthly Report Instructions

(Instructions for online reporting)

Completing a Workforce Audit:
To report your workforce hours:
1. Log into B2GNow Diversity Management System (B2GNow)
2. Click on the red underlined number of 'Incomplete audits' under Workforce Audits
3. Click View for the incomplete audit that needs to be completed.
4. Click Fill in Audit
5. Complete the form including the Payroll Number. Select Add to Audit to report hours worked for specific Craft/Trade.



* required entry

Summary Information

CONTRACTOR	KCMO Test Vendor Sample
PAYROLL START DATE	11/1/2021
PAYROLL END DATE	11/30/2021
PAYROLL NUMBER	
SPECIAL STATUS	☐ No Work (all fields will be filled with zeros) ☐ Suspended ☐ Final

Enter values below as hours worked. There is no need to fill in zeros; all blank fields will be saved as zero.

Craft/Trade List

Craft/Trade	Caucasian		Black/African American		Hispanic/Latino		Asian		Native American		Other/Unknown Ethnicity		Local Resident	Comments
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female		
Foreman/Supervisor								Not included in audit Add to audit						
Asbestos Worker (Journeyman)								Not included in audit Add to audit						

6. Scroll down and select review once hours have been reported.
7. Save and Certify to submit OR Save but Certify Later (to save a draft of your audit response). Audit must be certified for the workforce audit to be submitted for review. If there is an audit where no work was performed, and have 0 hours to report, select the Mark as No Work Audit button on step 4 to report 0 hours for all your employees. Select Certify & Release to Organization to complete. Mark Final for Special Status if the audit being completed is the last month of work, this will notify the system to stop generating monthly audits.

NOTE: If subcontractor has completed Workforce Audit, Prime MUST either accept audit and release to the organization or reject audit back to Subcontractor for correction.

An email notice will be sent from our organization monthly to notify Prime & Subcontractor users of incomplete audits.

Company-Wide Workforce Monthly Report

Human Relations Department - City of Kansas City, Missouri

Report Date:		Reporting Period:		Contract Awarded Date:	
Contractor:				City Vendor ID:	
Contact Person/Phone:		Contractor Address:		Contractor Report ☐	Subcontractor Report ☐
E-mail Address:		Have you hired any new construction workers this month?	☐ Yes #: ☐ No	Final Cumulative Report:	☐ Yes ☐ No

Report total of all hours of work performed company-wide on all projects in the KCMO Metropolitan Statistical Area (MSA). Enter the total hours on all lines and in all columns. Workforce hours should be based on payroll records.

JOB CATEGORIES	OVERALL TOTAL (Sum of all Columns, A thru F Male & Female)	A Total Hours White Employees		B Total Hours Black Employees		C Total Hours Hispanic Employees		D Total Hours Asian/Pacific Islander		E Total Hours Native American Employee		F Total Hours Other/Unknown Race Employee		G KCMO Resident Hours
		M	F	M	F	M	F	M	F	M	F	M	F	Total #
Foreman/Supervisor														
Asbestos Worker Journeyman														
Asbestos Worker Apprentice														
Boilermaker Journeyman														
Boilermaker Apprentice														
Bricklayer Journeyman														
Bricklayer Apprentice														
Carpenter Journeyman														
Carpenter Apprentice														
Cement Mason Journeyman														
Cement Mason Apprentice														
Electrician Journeyman														
Electrician Apprentice														
Elevator Constructor Journeyman														
Elevator Constructor Apprentice														
Glazier Journeyman														
Glazier Apprentice														
Iron Worker Journeyman														
Iron Worker Apprentice														
Laborer Journeyman														
Laborer Apprentice														
Operating Engineer Journeyman														
Operating Engineer Apprentice														
Painter Journeyman														
Painter Apprentice														
Pipe Fitter/Plumber Journeyman														
Pipe Fitter/Plumber Apprentice														
Plasterer Journeyman														
Plasterer Apprentice														
Roofer Journeyman														
Roofer Apprentice														
Sheet Metal Journeyman														
Sheet Metal Apprentice														
Sprinkler Fitter														
Sprinkler Fitter Apprentice														
Truck Driver Journeyman														
Truck Driver Apprentice														
Welder Journeyman														
Welder Apprentice														
Other														
Total Monthly Hours														-
Total % of Hours														

Contractor shall submit report by the 15th of each month.

Tip Yelder, Director Human Relations Department
E. 12th Street, 4th Floor, Kansas City, MO 64106
Phone: 816-513-1836 Email HRDcontractcompliance@kcmo.org

Report Submitted By: _____

Date: _____

City of Kansas City, Missouri
Civil Rights & Equal Opportunity Department
Construction Contractor Employee Identification Report

Company Name: Goodwin Bros. Construction Co.
Company Address: 6455 Universal Ave
Company City, State, Zip: Kansas City, MO 64120

Prime's Name:
KCMO Project Name: Blue River WWTP Grit Removal & Fine Screens
KCMO Project Number: 81000999

Name of Person Completing Report: Sara Buckler
Phone Number: 816.529.3490
Email: sbuckler@goodwinbros.com

Today's Date: 12/11/2024
City Department:

Instructions:

1) Each applicable Prime Contractors **must complete this form for its company within 48 hours of bid opening**
2) The Civil Rights & Equal Opportunity Department strongly recommends usage of the electronic version of this form. This form may be obtained by visiting www.kcmo.gov website. The website is enabled with a "search" function on the Home page on the right corner. Select the magnifying glass and type in the search field "Contract Central". Select the first result, then click on the link to Standard City Contract Forms. Scroll down to Construction Contractor Employee Identification Report and click the link to open this document. Complete the fields in the Employee section; the Official Use Only section will automatically populate. NOTE: This form can be printed and attached to other required Bid documents.
3) All subcontractors shall be required to complete this form and submit to the Prime Contractor. For each subcontractor, the Prime must submit this form to City at least at least (10) days prior to the date the subcontractor shall commence work under a city construction contract.
4) Complete this form if you are the Prime contractor on a City construction project estimated over **$300,000 & over 800 man hours.**
5) Complete this form with data from your **current construction workforce** (no office personnel).
6) Prime contractor is responsible to ensure subcontractor completes this form as required in #3 above.

Official Use Only

Females		*KCMO Resident*
African American	0	0
Asian/Pacific Islander American	0	0
Caucasian American	0	0
Hispanic/Latino American	0	0
Native American	0	0
Other	0	0
	0	0

Males		*KCMO Resident*
African American	0	0
Asian/Pacific Islander American	0	0
Caucasian American	0	0
Hispanic/Latino American	0	0
Native American	0	0
Other	0	0
	0	0

Number of KCMO Residents	0
Number of Journeyman	0
Number of Apprentice	0

	Journeyman	*Apprentice*
Foreman/Supervisor	0	--
Asbestos Worker	0	0
Boilermaker	0	0
Bricklayer	0	0
Carpenter	0	0
Cement Mason	0	0
Electrician	0	0
Elevator Constructor	0	0
Glazier	0	0
Iron Worker	0	0
Laborer	0	0
	0	0

	Journeyman	*Apprentice*
Operating Engineer	0	0
Painter	0	0
Pipe Fitter/Plumber	0	0
Plasterer	0	0
Roofer	0	0
Sheet Metal	0	0
Sprinkler Fitter	0	0
Truck Driver	0	0
Welder	0	0
Other	0	--
	0	0

Company Name: Goodwin Bros Construction Co KCMO Project Name: Blue River WWTP Grit Removal & Fine Screens KCMO Project Number: 81000999

	Name		Job Title (*use drop down menu*)	Address	City	State	Zip Code	KCMO Resident	Gender	Ethnicity
	Last	First								
1	Onka	Kevin	Operator Foreman	405 N Forest Ave Apt 6011	Liberty	MO	64068	N	M	Caucasian
2	Francy	David	Operator	801 Clay St	Pleasant Hill	MO	64080	N	M	Caucasian
3	Katzenmeier	Jess	Operator	23115 Ross Rd	Weston	MO	64098	N	M	Caucasian
4	Parrish	Joshua	Operator	410 N 3rd St	Gower	MO	64454	N	M	Caucasian
5	Kaminski	Tomasz	Operator Apprentice	5423 N Hickory St	Kansas City	MO	64118	N	M	Caucasian
6	Sylvester	Kyle	Operator	800 S Elizabeth St	Independence	MO	64056	N	M	Caucasian
7	Vandament	Timothy	Laborer Foreman	1427 Park West Ct Apt 200	Imperial	MO	63052	N	M	Caucasian
8	Hyatt	Jimmy	Laborer Superintendent	21 E Highlander	Marshall	MO	65340	N	M	Caucasian
9	Zabor	Matthew	Laborer Foreman	408 N Speck Ave	Independence	MO	64056	N	M	Caucasian
10	Nelson	Matthew	Carpenter	3005 Maplewood Dr	Wood Heights	MO	64024	N	M	Caucasian
11	Zarda	Kyle	Carpenter	511 E Cynthia St	McClouth	KS	66054	N	M	Caucasian
12	Cline	Randy	Laborer Foreman	703 SE State Rte V	Polo	MO	64671	N	M	Caucasian
13	Reed	Zackery	Laborer	755 S Main St	Warrensburg	MO	64093	N	M	Caucasian
14	Elliott	Timothy	Laborer	606 Cedar Dr	Raymore	MO	64083	N	M	Caucasian
	Martin	Brian	Laborer Foreman	407 S State Rte 7	Pleasant Hill	MO	64080	N	M	Caucasian
16	Trimble	Patrick	Laborer	1216 N Vista Dr	Independence	MO	64056	N	M	Caucasian

Company Name: Goodwin Bros Construction Co KCMO Project Name: Blue River WWTP Grit Removal & Fine Screens KCMO Project Number: 81000999

	Name		Job Title (*use drop down menu*)	Address	City	State	Zip Code	KCMO Resident	Gender	Ethnicity
	Last	First								
17	Lyons	Jason	Laborer	6110 N.E. Russell Rd	Kansas City	MO	64117	N	M	Caucasian
18	Huey	James	Laborer Foreman	4744 Lally Dr	House Springs	MO	63051	N	M	Caucasian
19	West	Sydney	Laborer Apprentice	526 NE 68th St Apt 57	Kansas City	MO	64118	N	F	Caucasian
20	Thompson	Jacob	Laborer Apprentice	147 Rainbow Dr	Belton	MO	64012	N	M	Caucasian
21	Fallert	Seth	Superintendent	11298 Kimmel Lake Rd	Ste Genevieve	MO	63670	N	M	Caucasian
22	New	Brandon	Carpenter	19400 Hwy 41	Blackwater	MO	65322	N	M	Caucasian
23	Nicoli	Stephan	Carpenter Foreman	1513 SW 6th St	Blue Springs	MO	64014	N	M	Caucasian
24	Logan	Trevor	Carpenter Foreman	506 Russell St	Lathrop	MO	64465	N	M	Caucasian
25	Buasri	Chalee	Superintendent	209 W Sierra Dr	Raymore	MO	64083	N	M	Asian
26	Charlton	Timothy	Carpenter	2408 SW Jackson St	Blue Springs	MO	64015	N	M	Caucasian
27	Allsup	Robert	Carpenter	916 SW Southgate Ct	Blue Springs	MO	64015	N	M	Caucasian
28	Miles	Jonathan	Carpenter	108 W 7th St	Urich	MO	64788	N	M	Caucasian
29	Sheeley-Whitted	Tesla	Carpenter Apprentice	7709 NE 54th St	Kansas City	MO	64119	N	F	Caucasian
30	Hughes	Charles	Carpenter	221 W 224 Hwy	Wellington	MO	64097	N	M	Caucasian
31	Alberts	Justin	Carpenter	13 Riverside Dr	Boonville	MO	65233	N	M	Caucasian
32	Resseguie	Kirk	Superintendent	19307 E Centennial Rd	Garber	OK	73738	N	M	Caucasian
34										
35										
36										
37										
38										
39										
40										
41										
42										
43										
44										
45										
46										
47										
48										
49										

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

AFFIDAVIT OF TRAINING PROGRAM

This form must be submitted with 48 hours of Bid Opening

Bidder Goodwin Bros. Construction Co.

Project Title and Number Blue River WWTP Grit Removal and Fine Screens Project / 81000999/1751

STATE OF MISSOURI)
) ss:
COUNTY OF Platte)

After being duly sworn the person whose name and signature appears below hereby states under penalty of perjury that:

1. I am the duly authorized officer of the business indicated above ("Bidder") and I make this affidavit on behalf of Bidder.
2. Bidder certifies that it presently participates in a training program that facilitates entry into the construction industry and which may include an on-the-job or in-house training program, further described as follows:

(attach additional pages, if necessary)

3. If requested by the City, Bidder agrees to provide City further documentation of, or other information about, this training program within 48 hours of the request.
4. Bidder acknowledges that failure to submit this form to the City within 48 hours of the Bid Opening will automatically render its bid non-responsive.

I am authorized to make this Affidavit on behalf of the Bidder named below as:

Vice President (Title) of Goodwin Bros. Construction Co. (Name of Bidder)

Dated: 12/11/2024 By: Doug Wachsmuth (Affiant)

Subscribed and sworn to before me this 11th day of December, 20 24.

SARA C BUCKLER
Notary Public - Notary Seal
Platte County - State of Missouri
Commission Number 02395426
My Commission Expires Apr 16, 2027

My Commission Expires: April 16, 2027

Sara C Buckler
Notary Public

AFFIRMATIVE ACTION PROGRAM AFFIDAVIT

(required for any contractor with 50 or more employees and
a contract with the City of Kansas City, Missouri, in excess of $300,000.00)

STATE OF Missouri)
) ss
COUNTY OF Platte)

On this 11th day of December, 20 24, before me appeared Doug Wachsnicht, personally known by me or otherwise proven to be the person whose name is subscribed on this affidavit and who, being duly sworn, stated as follows:

I am of sound mind, capable of making this affidavit, and personally swear or affirm that the statements made herein are truthful to the best of my knowledge. I am the Vice President (title) of Goodwin Bros. Construction Co. (business entity) and I am duly authorized, directed or empowered to act with full authority on behalf of the business entity in making this affidavit.

I hereby swear or affirm that [*enter business entity name*] has an affirmative action program (the "Program") in place and will maintain the Program for the duration of its contract with the City of Kansas City, Missouri ("City") as required by Chapter 3 of the City's Code of Ordinances.

I hereby additionally swear or affirm that attached hereto is a true copy of the Program.

I hereby additionally swear or affirm that the business entity shall not discriminate against any employee or applicant for employment because of race, color, sex, religion, national origin or ancestry, disability, sexual orientation, gender identity or age in a manner prohibited by Chapter 3 of the City's Code of Ordinances.

I acknowledge that I am signing this affidavit as the free act and deed of the business entity and that I am not doing so under duress.

Doug Wachsnicht
Affiant's signature

Subscribed and sworn to before me this 11th day of December, 2024.

Sara C Buckler
Notary Public

My Commission expires: April 16, 2027

SARA C BUCKLER
Notary Public - Notary Seal
Platte County - State of Missouri
Commission Number 02395426
My Commission Expires Apr 16, 2027

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

Pre Contract Bidder's Certification

Project Number 81000999 / 1751

Project Title Blue River WWTP Grit Removal and Fine Screens Project

STATE OF Missouri)
) SS
COUNTY OF Platte)

Before me, the undersigned authority, personally appeared, who, being by me duly sworn deposed as follows:

I am authorized to make this affidavit on behalf of the named Bidder. I am of sound mind, capable of making this affidavit, and personally acquainted with the facts herein stated:

A. Bidder is current on payment of its Federal and State Income tax withholding and unemployment insurance payments, either in Missouri for companies doing business in Missouri, or in the state in which Bidder has its principal office; and

B. Bidder declares one of the following, regarding all work performed two (2) years immediately preceding the date of the Bid (check one):

☐ Contract by contract listing of all of Bidder's written notices of violations of any Federal or State prevailing wage statute in which prevailing wage penalties were assessed against the Bidder or paid by the Bidder (Complete and attach additional sheets if necessary):

1. _____
2. _____
3. _____

☒ There have been no written notices of violations of any Federal or State prevailing wage statute in which prevailing wage penalties were assessed against the Bidder or paid by the Bidder.

C. Bidder is currently in good standing with the Missouri Secretary of State or Bidder has filed a Registration of Fictitious Name with the Missouri Secretary of State.

Goodwin Bros. Construction Co.
(Bidder's Name)

12/11/2024
(Date)

SARA C BUCKLER
Notary Public - Notary Seal
Platte County - State of Missouri
Commission Number 02395426
My Commission Expires Apr 16, 2027

Signature of Person Making This Affidavit

In witness whereof, I have hereunto subscribed my name and affixed my official seal this 11th day of December, 2024.

Sara C Buckler

00500 – CONTRACT FOR PROGRESSIVE DESIGN-BUILD SERVICES

This **CONTRACT FOR PROGRESSIVE DESIGN-BUILD SERVICES** ("Agreement") is entered into this 9 day of April, 2025 ("Agreement Date") by and between the City of Kansas City, Missouri ("Owner") and Goodwin Brothers Construction Co. ("Design-Builder"). In consideration of the mutual covenants and obligations contained herein, Owner and Design-Builder hereby agree as follows:

WITNESSETH:

WHEREAS, on or about July 2, 2024, Owner issued a Request for Qualifications ("RFQ") soliciting interested parties to submit a Statement of Qualifications ("SOQ") to serve as the design-builder for the Project; and

WHEREAS, on or about November 14, 2024, ("Proposal Submittal Date"), Design-Builder submitted its proposal ("Proposal") in response to the RFP; and

WHEREAS, on or about February 11, 2025, Owner notified Design-Builder that it was the successful proposer; and

WHEREAS, on or about _____, Owner awarded Design- Builder this Agreement.

NOW, THEREFORE, in consideration of the mutual covenants and obligations contained herein, Owner and Design-Builder hereby agree as follows:

Article 1
The Project

1.1 The Project is generally referred as the Blue River WWTP Grit Removal and Fine Screens Project (Project No. 81000999)/Contract #1751, and is specifically defined in the Contract Documents.

Article 2
The Work

2.1 General Services

2.1.1 Design-Builder shall complete all Work as specified or indicated in the Contract Documents.

2.1.2 Owner shall provide Design-Builder with Owner's project criteria and preferences during Phase 1 and as comments to design documents or other written means.

2.2. Phased Services

2.2.1 Phase 1 Services. Design-Builder shall perform the services of design, pricing, and other services for the Project based on Owner's project criteria and preferences, in accordance with Section 2.1 hereof, and as set forth in Exhibit 2.2.1, Phase 1 Scope of Services. Design-Builder shall perform such services to the level of completion required for Design-Builder and Owner to establish

the Contract Price for Phase 2, as set forth in Section 2.3 below. The Contract Price for Phase 2 shall be developed during Phase 1 on an "open-book" basis. Design-Builder's Compensation for Phase 1 Services is set forth in Section 4.0 herein. The level of completion required for Phase 1 Services is defined in Exhibit 2.2.1, Phase 1 Scope of Services.

2.2.2 Phase 2 Services. Design-Builder's Phase 2 services shall consist of the completion of design services for the Project, the procurement of all materials and equipment for the Project, the performance of construction services for the Project, the start-up, testing, and commissioning of the Project, and the provision of warranty services, all as further described in the Phase 2 Contract Price Amendment. Upon receipt of Design-Builder's proposed Contract Price for Phase 2, Owner may proceed as set forth in Article 2.3. Owner and Design Builder may mutually agree to break Phase 2 into multiple phases.

2.3 Phase 2 Proposal. Upon completion of the Phase 1 Services and any other Basis of Design Documents upon which the parties may agree, Design-Builder shall submit a proposal to Owner (the "Phase 2 Proposal") for the completion of the design and construction for the Project for the Contract Price, which may be based on either; a) Design-Builder's Fee and Cost of the Work with an option for a Guaranteed Maximum Price (GMP), or; b) a Lump Sum / Fixed Price.

2.3.1. The Phase 2 Proposal shall include the following unless the parties mutually agree otherwise:

(a) The Contract Price;

(b) The Design Documents, which are set forth in detail and are attached to the Phase 2 Proposal;

(c) A list of the assumptions, clarifications, and exclusions made by Design-Builder in the preparation of the Phase 2 Proposal, which list is intended to supplement the information contained in the drawings and specifications and is specifically included as part of the Design Documents;

(d) The Scheduled Substantial Completion Date and a Baseline Schedule for the Work;

(e) If applicable, a list of Allowance Items, Allowance Values, and a statement of their basis;

(f) If applicable, a schedule of alternate prices;

(g) If applicable, a schedule of unit prices;

(h) If applicable, a schedule of Additional Services which may be performed but which are not included in the Phase 2 Proposal, and which, if performed, shall be the basis for an increase in the Contract Price and/or Contract Time(s);

(i) The time limit for acceptance of the Phase 2 Proposal;

(j) If applicable, a permit and easement list, detailing the individual permits and governmental approvals that Owner and Design-Builder will each bear responsibility to obtain; and

(k) A Schedule of Values for Phase 2.

2.3.2 Review and Adjustment to Phase 2 Proposal

(a) After submission of the Phase 2 Proposal, Design-Builder and Owner shall meet to discuss and review the Proposal. If Owner has any comments regarding the Phase 2 Proposal, or finds any inconsistencies or inaccuracies in the information presented, it shall promptly give written notice to Design-Builder of such comments or findings. If appropriate, Design-Builder shall, upon receipt of Owner's notice, make appropriate adjustments to the Phase 2 Proposal.

(b) Acceptance of Phase 2 Proposal. If Owner accepts the Phase 2 Proposal, as may be amended by Design-Builder, the Contract Price and its basis shall be set forth in an amendment to this Agreement, when mutually agreed between the parties (Phase 2 Contract Price Amendment). The Phase 2 Proposal will become Exhibit 2.3.2 Phase 2 Services. Once the parties have agreed upon the Contract Price and Owner has issued a Notice to Proceed with Phase 2, Design-Builder shall perform the Phase 2 Services, all as further described in the Phase 2 Contract Price Amendment, as it may be revised.

(c) Failure to Accept the Phase 2 Proposal. If Owner rejects the Phase 2 Proposal, or fails to notify Design-Builder in writing on or before the date specified in the Phase 2 Proposal that it accepts the Phase 2 Proposal, the Phase 2 Proposal shall be deemed withdrawn and of no effect. In such event, Owner and Design-Builder shall meet and confer as to how the Project will proceed, with Owner having the following options;

i. Owner may suggest modifications to the Phase 2 Proposal, whereupon, if such modifications are accepted in writing by Design-Builder, the Phase 2 Proposal shall be deemed accepted and the parties shall proceed in accordance with Section 2.3.2.b above.

ii. Owner may authorize Design-Builder to continue to proceed with the Work on the basis of reimbursement as provided in Section 4.1.2 hereof without a Contract Price, in which case all reference in this Agreement to the Contract Price shall not be applicable; or

iii. Owner may terminate this Agreement for convenience in accordance with Section 11.6 of the General Conditions of Contract.

If Owner fails to exercise any of the above options, Design-Builder shall have the right to

(a) suspend performance of Work in accordance with Section 11.3.1 of the General Conditions of Contract, or (b) may give written notice to Owner that it considers this Agreement completed. If Owner fails to exercise any of the options under Section 2.3.2 within ten (10) days of receipt of Design-Builder's notice, then this Agreement shall be deemed completed. If Owner terminates the relationship with Design-Builder under Section 2.3.2.c(iii), or if this Agreement is deemed completed under this paragraph, then Design-Builder shall have no further liability or obligations to Owner under this Agreement.

Article 3
Contract Times

3.1 Commencement Date. The Phase 1 Services shall commence within five (5) days of Design-Builder's receipt of Owner's Notice to Proceed unless the parties mutually agree otherwise in writing. Design-Builder shall commence the Phase 2 Services upon receipt of the Owner's Notice to Proceed for Phase 2 Services ("Commencement Date"). The Commencement Date shall be no later than fifteen (15) days after the Agreement Date, unless the Parties mutually agree otherwise in writing.

3.2 Contract Times

3.2.1 Scheduled Substantial Completion Date. Design-Builder shall achieve Substantial Completion of the Work no later than the date set forth in the Phase 2 Contract Price Amendment ("Scheduled Substantial Completion Date").

3.2.2 Scheduled Final Completion Date. Final Completion of the Work shall be achieved as expeditiously as reasonably practicable, but in no event later than ninety (90) days after the Substantial Completion Date (the last day of such 90-day period being referred to as the "Scheduled Final Completion Date").

3.3 Schedule Adjustments. All of the scheduled completion dates set forth in Section 3.2 above (collectively referred to as "Contract Time(s)") shall be subject to adjustment in accordance with the General Conditions of Contract.

3.4 Time of the Essence. Owner and Design-Builder mutually agree that the Scheduled Substantial Completion Date and Scheduled Final Completion Date, individually and collectively, are of the essence of this Agreement.

3.5 Delay Liquidated Damages. Design-Builder understands that if certain of the Contract Time(s) are not attained, Owner will suffer damages which are difficult to determine and accurately specify. To compensate Owner for such damages, Design-Builder hereby agrees to pay Owner Delay Liquidated Damages as follows:

3.5.1 Substantial Completion. If the Substantial Completion Date has not been achieved on or before the Scheduled Substantial Completion Date, then Design-Builder shall pay to Owner Delay Liquidated Damages of Ten Thousand Dollars ($10,000) per day for each day between the Scheduled Substantial Completion Date and the Substantial Completion Date.

3.5.2. Final Completion. If the Final Completion Date has not been achieved by the Scheduled Final Completion Date, Designer-Builder shall pay to Owner Delay Liquidated Damages of Twenty-Five Hundred Dollars ($2,500) per day for each

day between the Scheduled Final Completion Date and the Final Completion Date.

3.5.3. Sole and Exclusive Remedy. Delay Liquidated Damages shall be the sole and exclusive liability of Contractor and the sole and exclusive remedy of Owner for Contractor's unexcused delay in performing the Work.

Article 4
Contract Price

4.1 Contract Price.

4.1.1. Owner shall pay Design-Builder in accordance with Article 6 of the General Conditions of Contract a not to exceed sum of Twelve Million Seven Hundred Twenty-Two Thousand Five Hundred Thirty Six Dollars ($12,722,536.00) for the Phase 1 Services, subject to adjustments made in accordance with the General Conditions of Contract. Unless otherwise provided in the Contract Documents, the Phase 1 Services compensation is deemed to include all sales, use, consumer and other taxes mandated by applicable Legal Requirements.

4.1.2 For Phase 2 Services, Owner shall pay Design-Builder in accordance with Article 6 of the General Conditions of Contract a contract price ("Contract Price") equal to the amount set forth in the Phase 2 Contract Price Amendment, subject to adjustments made in accordance with the General Conditions of Contract. For the avoidance of doubt, when Owner authorizes multiple Phase 2 Contract Price Amendment, Total Contract Price is the summation of each Contract Price as authorized per each Amendment.

4.2 Allowance Payment Items and Allowance Payment Values

4.2.1 General. The Contract Price for the Phase 1 Services includes all Allowance Payment Items, as well as their corresponding Allowance Payment Values, as set forth in Exhibit 2.2.1, Phase 1 Scope of Services. The Contract Price for Phase 2 Services includes all Allowance Payment Items, as well as their corresponding Allowance Payment Values, as set forth in the Phase 2 Contract Price Amendment.

4.2.2 Performance of Work on Allowance Payment Items. No work shall be performed on any Allowance Payment Item without Design-Builder first obtaining in writing advanced authorization to proceed from Owner.

4.2.3 Reconciliation of Allowance Payment Values. If the actual costs for an Allowance Payment Item differ from the stated Allowance Payment Value, the Contract Price shall ultimately be adjusted accordingly by Change Order. If, at the time the Final Application for Payment, the actual costs for any Allowance Payment Value are less than the corresponding Allowance Payment Value, such difference shall be reflected in a Change Order that reduces the Contract Price by such difference.

Article 5
Payment Procedures

5.1 Progress Payments for Phase 1 Services. Design-Builder and Owner agree upon the following method for partial and final payment to Design-Builder for the services hereunder; Design-Builder will submit an Application for Payment to Owner each month based on work completed during the period since the last Application for Payment was submitted.

5.2 Progress Payments for Phase 2 Services.

5.2.1 Submission. Design-Builder shall submit to Owner on the Fifth (5th) day of each month, beginning with the first month after the Commencement Date, Applications for Payment in accordance with Article 6 of the General Conditions of Contract.

5.2.2 Payment. Owner shall make payment within thirty (30) days after Owner's receipt of each properly submitted and accurate Application for Payment in accordance with Article 6 of the General Conditions of Contract, but in each case less the total of payments previously made, and less amounts properly withheld under Section
6.3 of the General Conditions of Contract or otherwise.

5.3 Retainage on Progress Payments.

5.3.1 Retainage. No retainage will be held for Phase 1. For Phase 2, Owner will withhold retainage in the amount of five percent (5%) on progress payments due Design-Builder. After fifty percent (50%) of the Total Contract Price has been completed and requisitioned through Applications for Payment, and two and one-half (2.5%) of the Contract Price has been retained, Owner shall cease withholding any retainage from future progress payments owing to Design-Builder hereunder, *provided, however*, that Design-Builder's performance is deemed satisfactory by Owner, in its sole discretion. If Design-Builder is forecasting Substantial Completion to be forty-five (45) calendar days beyond the Scheduled Substantial Completion Date, the progress will be considered unsatisfactory and Owner shall resume withholding five percent (5%) of each invoiced amount from future payments until Owner and Design-Builder have agreed upon a plan for mitigating such delay.

5.3.2 Reduction of Retainage. Within thirty (30) days after the Substantial Completion Date, Owner shall release to Design-Builder all retainage, less an amount equal to: (a) two hundred percent (200%) of the reasonable value of all remaining Punch List items as of the Substantial Completion Date; and (b) all other amounts Owner is entitled to withhold pursuant to Section 6.3 of the General Conditions of Contract.

5.3.3 Letter of Credit. Design-Builder shall have the right to substitute an irrevocable letter of credit in lieu of cash for all or any portion of the retainage, provided that the letter of credit shall: (a) be a direct pay letter of credit payable immediately upon presentation by Owner, issued by a financial institution, and on a form, approved by Owner in its sole discretion; (b) permit partial draws and be in the amount of one hundred percent (100%) of the required retainage amount, or such lesser amount as Owner agrees in writing from time-to-time to reflect reductions in required retainage; and (c) name Owner as sole payee and

beneficiary. Owner shall be entitled to draw upon the letter of credit to provide the requisite cash to satisfy any of Design-Builder's obligations under the Contract Documents. Owner shall further be entitled to draw upon the letter of credit, and hold the proceeds as retainage, if the letter of credit is not renewed or extended at least thirty (30) days prior to its expiration.

5.4 Final Payment. Owner shall pay the outstanding retention at Final Payment, in accordance with Section 6.6 of the General Conditions of Contract.

5.5 Interest. All amounts not paid when due as provided in Article 6 of the General Conditions of Contract shall bear interest in accordance with Mo. Rev. Stat. §34.057, at the rate of one and one-half percent (1.5%) per month.

5.6 Owner's Rights to Offset. Owner shall have the right to withhold Liquidated Damages from any monies unpaid, otherwise due, or to become due, to Design-Builder, to demand and receive payment from Design-Builder of such Liquidated Damages, and to initiate applicable dispute resolution procedures under Article 10 of the General Conditions of Contract to recover such Liquidated Damages. The withholding of such damages from any monies unpaid, otherwise due, or to become due shall be in addition to retainage under the Contract Documents. Owner has the discretion to allow Liquidated Damages to accrue without withholding and by doing so does not waive any rights to withhold them at a later time.

Article 6
Limitations of Liability

6.1 Limitations of Liability.

6.1.1 Limitation of Liability for Liquidated Damages. Design-Builder's total aggregate liability to Owner for the payment of Liquidated Damages under Section 3.5 above shall not exceed an amount equal to five percent (5%) of the Contract Price.

6.1.2 Maximum Liability Cap. Notwithstanding any provision to the contrary herein, in no event shall Design-Builder's total aggregate liability to Owner under the Contract Documents for any and all damages and losses from any and all causes exceed in the total aggregate an amount equal to one hundred percent (100%) of the Total Contract Price ("Maximum Liability Cap"). Owner hereby releases Design-Builder from all liability in excess of the Maximum Liability Cap, whether such liability arises in contract, tort (including negligence) or any other legal theory, except as set forth in Section 6.1.3 below.

6.1.3 Exclusions to the Maximum Liability Cap. Notwithstanding Section 6.1.2 above, or anything else in the Contract Documents, Design-Builder's liability for the following shall not be limited or released in any way for the following liabilities, losses, damages, costs or expenses:

(a) not used;

(b) Any loss, cost or expense arising out of or connected with Design-Builder's fraud, fraudulent misrepresentation, intentional misconduct, Gross Negligence, or criminal acts;

(c) Any loss, cost or expense incurred by Design-Builder in connection with Design-Builder's indemnification obligations for third party claims set forth in Article 7 of the General Conditions of Contract; and

(d) Any loss, cost, expense or penalties incurred by Design-Builder to any person or entity other than Owner in any legal proceedings.

6.2 Consequential Damages.

6.2.1 Waiver of Consequential Damages. To the fullest extent permitted by law, and notwithstanding any other provision of the Contract Documents other than those below in this Section 6.2, in no event, whether arising out of contract, breach of warranty (express or implied), tort (including negligence), strict liability, indemnity, contribution, or any other cause of or form of action whatsoever, shall either Party be liable to the other for any consequential, incidental, indirect, special, exemplary, or punitive damages (including damages for loss of use, loss of profits or anticipated profits, loss of revenue or anticipated revenue, loss of goodwill, claims from Owner's customers, borrowing or financing, productivity or shop space, increased cost of capital, punitive damages, and loss of business opportunity) arising out of or in connection with the performance or non-performance of its obligations under the Contract Documents.

6.2.2 Exceptions to Waiver. The waiver of consequential damages set forth in Section 6.2.1 above shall not be deemed to affect or waive:

(a) Design-Builder's obligation to pay Liquidated Damages in accordance with Section 3.5 above;

(b) Design-Builder's liability for fraud, fraudulent misrepresentation, intentional misconduct, Gross Negligence, or criminal acts of Design-Builder or any DB-Related Entity; and

(c) Design-Builder's liability for its indemnity obligations for third party claims under Article 7 of the General Conditions of Contract.

6.3 Liability Limitation Period. Notwithstanding anything to the contrary in the Contract Documents, Design-Builder shall not be liable to Owner for any claims, causes of action, or demands: (1) that accrue more than five (5) years from the Substantial Completion Date; or (2) for which Design-Builder has not received written notice from Owner within five (5) years from the Substantial Completion Date, *provided, however*, that the above-referenced liability limitations shall not apply to:

6.3.1 Design-Builder's liability for fraud, fraudulent misrepresentation, intentional misconduct, Gross Negligence, or criminal acts of Design-Builder or any DB-Related Entity; or

6.3.2 Design-Builder's liability for its indemnity obligations under Article 7, but only to the extent that Design-Builder could have been sued directly by, and would have been liable directly to, the third party in the underlying action.

The liability limitation in this Section 6.3 shall not be construed to impact Owner's rights against any Subcontractors for any extended warranty periods that Design-Builder has obtained from Subcontractors.

6.4 Applicability

6.4.1 Other Persons and Entities. The provisions of this Article 6 shall be binding on and extend to the benefit of all successors, assignees, employees, officers, directors and Affiliates of each Party; *provided, however*, that the amount of Design-Builder's liability shall not exceed in the aggregate the limits set forth in Section 6.1.2.

6.4.2 Binding Effect. Except to the extent prohibited by applicable Legal Requirements or specific terms to the contrary in this Article 6, the releases, waivers, limitations of liability and other terms in this Article 6 shall apply even in the event of the fault, negligence (in whole or in part), tort, strict liability, breach of contract or otherwise, of the person or entity in whose favor such provisions operate.

Article 7
Design-Builder's Representations

7.1 Representations. Design-Builder makes the following representations as of the Agreement Date:

1. Design-Builder examined, carefully studied, and thoroughly understood the RFP Documents, including the Addenda.
2. Design-Builder will become familiar with and be satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work as set forth in Section 4.2.1 of the General Conditions of Contract.
3. Design-Builder is familiar with and is satisfied as to all Legal Requirements that may affect cost, progress, or performance of the Work.
4. Design-Builder has examined, carefully studied, and thoroughly understands: (a) the reports and drawings (if any) of explorations and tests of subsurface conditions at or contiguous to the Site; (b) all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified or made available by Owner; (c) environmental reports; and (d) conditions and restrictions of site access and egress.
5. Design-Builder is aware of the nature of other work that will be undertaken by Owner's Separate Contractors, and of the relationship of such other work to the Work as indicated in the Project Requirements.
6. Design-Builder has correlated the Project Requirements with the information known to Design-Builder, information obtained from the geotechnical and environmental reports, observations made during visits to the Site, reports and drawings identified in the RFP Documents, and all additional examinations, investigations, explorations, tests, studies and data made known to Design-Builder.

7. Design-Builder has given Owner written notice of all conflicts, errors, ambiguities, or discrepancies that Design-Builder has discovered in the RFP Documents as of the Agreement Date and the written resolution thereof by Owner is acceptable to Design-Builder.

8. The RFP Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

9. Design-Builder shall be bound by and shall perform its obligations in full compliance with the Contract Documents.

Article 8
Bonds and Insurance

8.1 Insurance.

8.1.1 Insurance Requirements. Design-Builder shall procure and maintain the insurance required by Exhibit 8.1.

8.1.2 Evidence of Insurance. No later than seven (7) days after the Agreement Date, Design-Builder shall deliver to Owner the certificates, endorsements, and other evidence of insurance required to be provided by Design-Builder in accordance with Section 5.1.3(a) of the General Conditions.

8.2 Performance and Maintenance Bond and Payment Bond.

8.2.1 Provision of the Bonds. No later than seven (7) days after execution of the Phase 2 Contract Price Amendment, Design-Builder shall deliver to Owner:

(a) a Performance and Maintenance Bond in the penal amount equal to one hundred percent (100%) of the Contract Price, which bond shall cover the faithful performance of all Design-Builder's obligations under the Contract Documents (the "Performance and Maintenance Bond"); and

(b) a Payment Bond in the penal amount equal to one hundred percent (100%) of the Contract Price (the "Payment Bond").

8.2.2 Surety Rating. The surety for the Performance and Payment Bonds shall: (a) have a rating of A- or better in the latest revision of the A.M. Best Owner's Insurance Report; (b) be authorized by law to do business in Missouri; and (c) be listed in the most recent U.S. Department of Treasury Circular 570.

8.2.3 Form of Bonds. The Performance and Maintenance Bond shall be in the form set forth in Exhibit 8.2.3(a) and the Payment Bond shall be in the form set forth in Exhibit 8.2.3(b).

8.2.4 Duration of Performance Bond. The Performance Bond shall remain valid for a period of two (2) years after Final Completion.

Article 9
Contract Documents

9.1 Contract Documents. The Contract Documents consist of the documents listed below:

9.1.1. This Agreement and all of the Exhibits;

9.1.2. General Conditions of Contract;

9.1.3. Project Requirements;

9.1.4. The following, which shall be designated, completed, delivered, prepared, or issued after the Agreement Date and are not attached hereto:

(a) The Released for Construction Documents.

(b) Any and all written amendments, Change Orders, Work Change Directives, and Minor Changes amending, modifying, or supplementing the Contract Documents.

9.2 Amending the Contract Documents. The Contract Documents may only be amended, modified, or supplemented through a written amendment executed by the Parties or a Change Order, Work Change Directive, or Minor Change issued in accordance with Article 9 of the General Conditions of Contract.

9.3 Order of Precedence of the Contract Documents. The Contract Documents comprise the entire agreement between Owner and Design-Builder governing the Work. The Contract Documents are complementary; what is called for by one is as binding as if called for by all. The Contract Documents will be construed in accordance with the laws of the State of Missouri. The following order of precedence shall apply in the case of direct, irresolvable conflicts between or among Contract Documents:

1. Written amendments and Change Orders
2. Work Change Directives
3. Minor Changes
4. This Agreement, and all of the Exhibits
5. The General Conditions of Contract
6. Released for Construction Documents
7. Project Requirements

Article 10
Miscellaneous

10.1 Defined Terms. Terms used in this Agreement will have the meanings indicated in the General Conditions of Contract.

10.2 Notice. Whenever the Contract Documents require that notice be provided to the other Party, notice will be deemed to have been validly given: (a) if delivered in person to the individual intended to receive such notice; or (b) four (4) days after being sent by

registered or certified mail, postage pre-paid, with return receipt requested, to the address indicated in the Agreement, or (c) one (1) business day after being sent by overnight delivery via a nationally recognized courier service (e.g., FedEx or UPS), postage, transmittal or shipping charges prepaid, to the addresses set forth below:

If to Design-Builder:
Doug Wachsnicht, Principal-In-Charge
Goodwin Brothers Construction Co.
4885 Baumgartner Road
St. Louis, MO 63129

If to Owner:

10.3 MBE/WBE Requirements. Owner has adopted a Minority/Women Business Enterprise ("MBE/WBE") Program (Sections 3-421 through 3-469, Code of Ordinances). Design-Builder shall comply with all MBE/WBE requirements set forth in such Program in performing its obligations under the Contract Documents.

10.4 Workforce Program and Prevailing Wage Requirements

10.4.1 Workforce Program Requirements. Owner has adopted a Construction Employment ("Workforce") Program (Sections 3-501 through 3-525, Code of Ordinances). Design-Builder shall comply with all Workforce requirements set forth in such Program in performing its obligations under the Contract Documents.

10.4.2 Prevailing Wages. Design-Builder shall comply and require each of its Subcontractors to comply with:

(a) Sections 290.210 to 290.340, RSMO the State of Missouri Prevailing Wage Law (the "Law");

(b) 8 CSR 30-3.010 to 8 CSR 30-3.060, the Prevailing Wage Law Rules (the "Rules");

(c) The Annual Wage Order (the "Wage Order") issued by the State of Missouri's Department of Labor and Industrial Relations; and

(d) Any applicable Annual Incremental Wage Increase (the "Wage Increase") to the Annual Wage Order.

The Law, Rules, Annual Wage Order and any Wage Increase are incorporated into and made part hereof the Contract Documents and shall be collectively referred to in this Section 10.4.2 as the "Prevailing Wage Requirements." Design-Builder shall pay and require each of its Subcontractors to pay to all workers performing the Work not less than the prevailing hourly rate of wages for the class or type of work performed by the worker in accordance with the Prevailing Wage Requirements. Design-Builder shall take whatever steps are necessary to insure that the prevailing hourly wage rates are paid and that all workers for Design-Builder and each of its Subcontractors are paid for the class or type of work performed by the worker

Docusign Envelope ID: 7D9942A0-C642-468C-AD28-EEC0C85BD056

in accordance with the Prevailing Wage Requirements. If Design-Builder shall fail to start to perform Design-Builder's obligations under the Contract Documents within sixty (60) days from the Agreement Date, Design-Builder and each of its Subcontractors shall be obligated to pay all workers in accordance with any new Wage Order, as subsequently amended by any applicable Wage Increase, issued by the Department of Labor and Industrial Relations within the aforementioned sixty (60) day period. The new Wage Order and any applicable Wage Increase shall govern notwithstanding the fact that the Wage Order being replaced might be physically attached or incorporated in the Contract Documents.

10.5 Liquidated Damages Not Penalty. The Parties acknowledge, recognize and agree on the following:

10.5.1 that because of the unique nature of the Project, it is difficult or impossible to determine with precision the amount of damages that would or might be incurred by Owner as a result of Design-Builder's failure to complete the Work on or before the applicable Contract Time(s);

10.5.2 that any sums which would be payable under this Agreement as Delay Liquidated Damages are in the nature of liquidated damages, and not a penalty, and are fair and reasonable and such payment represents a reasonable estimate of fair compensation for the losses that may reasonably be anticipated from such failure;

10.5.3 that any sums which would be payable under this Agreement as Delay Liquidated Damages shall be in lieu of all liability for any and all extra costs, losses, expenses, claims, penalties and any other damages, whether special or consequential, and of whatsoever nature incurred by Owner which are occasioned by, as applicable, any delay in achieving the applicable Contract Time(s). Notwithstanding the above, Delay Liquidated Damages are not intended to excuse Design-Builder from liability for any other breach of its obligations under the Contract Documents; and

10.5.4 that, in recognition of the acknowledgments above, Design-Builder is expressly estopped from arguing, and waives any rights it may have to argue, that the Delay Liquidated Damages are a penalty and that they are not enforceable.

10.6 Exhibits. The following exhibits ("Exhibits") are specifically made part of, and incorporated by reference into, this Agreement:

Exhibit 2.2.1	Phase 1 Scope of Services
Exhibit 2.3.2	Phase 2 Services
Exhibit 8.1	Phase 2 Insurance Requirements
Exhibit 8.2.3(a)	Form of Performance and Maintenance Bond
Exhibit 8.2.3(b)	Form of Payment Bond
Exhibit 10.6(a)	Phase 1 Engineering & Preconstruction Schedule
Exhibit 10.6(b)	Phase 1 Proposed Schedule of Values
Exhibit 10.6(c)	List of Key Personnel and Named Team Members

10.7 Self-Performance Requirements. Design-Builder shall perform with its own organization, or an Affiliate of Design-Builder, not less than thirty-five percent (35%) of the Total Contract Price,

Docusign Envelope ID: 89EB7973-3C33-4488-A7AB-00D14BBAEA02
Docusign Envelope ID: 7D9942A0-C642-468C-AD28-EEC0C85BD056

exclusive of the Extended Commissioning Phase Services. The dollar value included in the above percentage shall include the value of labor, equipment and materials directly performed or procured by Design-Builder or its Affiliate and shall not include the value of work performed or provided by Design Consultants or Subcontractors. Owner may require the Design-Builder to competitively bid on the packages identified for self-performance.

IN WITNESS WHEREOF, Owner and Design-Builder have signed this Agreement in duplicate. One counterpart each has been delivered to Owner and Design-Builder.

OWNER:

City of Kansas City, Missouri

Signed by: Kenneth Morgan
47CA3801D3B6446...

(Signature)

Kenneth Morgan

(Printed Name)

Water Director

(Title)

Date: 3/20/2025

PROGRESSIVE DESIGN-BUILDER:

Goodwin Brothers Construction Co.

Signed by:
80D5C87B4643491...

(Signature)

Doug Wachsnicht

(Printed Name)

VP/COO

(Title)

Date: 2/27/2025

Approved as to form:

DocuSigned by: Mark Jones
0909E44CF75D420...

Assistant City Attorney

I hereby certify that there is a balance, otherwise unencumbered, to the credit of the appropriation to which the foregoing expenditure is to be charged, and a cash balance, otherwise unencumbered, in the Treasury, to the credit of the fund from which payment is to be made, each sufficient to meet the obligation hereby incurred.

DocuSigned by: Anne Kaps
996237FFA75F404...

4/9/2025

Director of Finance Date

GENERAL CONDITIONS OF CONTRACT

Article 1
General

1.1 Mutual Obligations

1.1.1 Owner and Design-Builder commit at all times to cooperate fully with each other, and proceed on the basis of trust and good faith, to permit each Party to realize the benefits afforded under the Contract Documents.

1.2 Basic Definitions

1.2.1 For the purposes of the Contract Documents, the following words and terms shall have the meanings specified below (other words and abbreviations that have well-known technical or trade meanings are used in the Contract Documents in accordance with such recognized meanings), *provided, however*, that capitalized terms defined in other Contract Documents, including but not limited to the Agreement, shall have the meanings specified in such document. For convenience, this Section 1.2 includes an index of capitalized terms used in the Agreement and the General Conditions of Contract.

Affiliate means, (a) any person or entity which directly or indirectly through one or more intermediaries controls, or is controlled by, or is under common control with, Design-Builder or any of its members, partners or shareholders holding an interest in Design-Builder; and (b) any person or entity for which ten percent (10%) or more of the equity interest in such person or entity is held directly or indirectly, beneficially or of record by: (i) Design-Builder; (ii) any of Design- Builder's members, partners or shareholders that own ten percent (10%) or more of Design- Builder or Design-Builder's members, partners or shareholders; or (iii) any Affiliate of Design- Builder under clause (a) of this definition. For purposes of this definition the term "control" means the possession, directly or indirectly, of the power to cause the direction of the management of a person and/or entity, whether through voting securities, by contract, family relationship or otherwise.

Agreement has the meaning set forth in the Preamble, and refers to the document titled "Contract for Progressive Design-Build Services," signed by both Parties, and further includes all Exhibits expressly identified in Section 10.6 of the Agreement.

Agreement Date has the meaning set forth in the Preamble.

Allowance Payment Item means an item or portion of the Work which has not been defined sufficiently, or for which Owner has yet to make certain decisions necessary, to permit pricing by Design-Builder.

Allowance Payment Value means the estimated dollar amount included in the Schedule of Values as a placeholder value for an Allowance Payment Item, pending acceptance by Owner of pricing offered by Design-Builder and other applicable terms.

Application for Payment means a request for payment in form acceptable to Owner that is submitted by Design-Builder to Owner on a monthly basis, or other periodic basis acceptable to Owner, and which includes, without limitation, all supporting documentation and information required by Owner or the Contract Documents.

Bankrupt Party has the meaning set forth in Section 11.5.1 below.

Baseline Schedule has the meaning set forth in Section 2.1.3 below. The Baseline Schedule, among other things, shall identify certain events that are critical to the orderly progress and timely completion of the Work and the dates by which such events are required to occur.

The Baseline Schedule shall be in a critical path method format, and shall include all information, data, and detail required by the Project Requirements.

Books and Records means all documents (whether paper, electronic, or other media) and electronically stored information, including, but not limited to, any and all books, correspondence, receipts, vouchers, estimates, records, contracts, cost data, schedules, Subcontracts, schedules, job cost reports, and other data, including computations and projections, of Design-Builder and any of its Subcontractors related to bidding, negotiating, pricing, or performing the Work.

Builder's Risk Insurance means the policy of insurance required under Exhibit 8.1 of the Agreement identified as the Builder's Risk policy, which policy is intended to provide property insurance for the construction Work in progress and other coverages.

Certificate of Final Completion means a certification issued by Owner to Design-Builder, stating that Design-Builder, to the best of Owner's actual knowledge and belief, has achieved Final Completion, and confirming that date upon which such event occurred as well as other information as more specifically set forth in Section 8.4 below.

Certificate of Substantial Completion means a certification issued by Owner to Design- Builder, stating that Design-Builder, to the best of Owner's actual knowledge and belief, has achieved Substantial Completion, and confirming that date upon which such event occurred as well as other information as more specifically set forth in Section 8.2 below.

Change Order has the meaning set forth in Section 9.1.3 below.

Commencement Date has the meaning set forth in Section 3.1 of the Agreement.

Compensable Delays has the meaning set forth in Section 8.7.1 below.

Confidential Information has the meaning set forth in Section 15.1.1 below.

Contract Documents means those documents specifically referenced and listed in the Section 9.1 of the Agreement as Contract Documents.

Contract Price has the meaning set forth in Section 4.1 of the

Agreement. *Contract Time(s) has the meaning set forth in Section 3.2 of*

the Agreement. Cost of the Work has the meaning set forth in Section

9.8.1 below.

COVID-19 Baseline Assumptions means that the Project will not be subject to any physical distancing, restrictions on large gatherings or self-isolation guidelines and requirements under Legal Requirements in effect as of the Agreement Date.

day or *days* mean calendar days unless otherwise specifically noted in the Contract Documents.

DB-Related Entity means Design Consultants, Subcontractors, Sub-Subcontractors, and anyone for whose acts any of them may be legally or contractually responsible.

Delay Liquidated Damages mean those liquidated damages associated with the failure of Design-Builder to achieve Substantial Completion on or before the Scheduled Substantial Completion Date and/or Final Completion on or before the Scheduled Final Completion Date.

Design-Builder has the meaning set forth in the Preamble.

Design-Builder's Project Manager means that person designated by Design-Builder under Section 2.1.4 below, who will be the principal representative of Design-Builder with respect to the performance of the Work.

Design-Builder's Representative means that person designated by Design-Builder under Section 2.1.4 below, who shall be the principal representative of Design-Builder with

respect to contractual matters, and shall have full authority to act on behalf of Design-Builder and make binding decisions on behalf of Design-Builder with respect to any matter arising out of or relating to the Contract Documents.

Design-Builder's Safety Representative means that person designated by Design-Builder under Section 2.8.1 below, whose principal duty shall be the prevention of accidents and the protection of all persons and property located on or adjacent to the Site. Design-Builder's

Safety Representative shall take such action as appropriate to ensure the proper implementation of, and compliance with, safety policies, precautions, procedures and plans.

Design-Builder Proposed Change Order means a proposed change order submitted to Owner from Design-Builder in accordance with Section 9.5 below.

Design Consultant is a qualified, licensed design professional, eligible to provide professional engineering, architectural and/or land surveying services, who may be an employee of Design-Builder, or may be retained by Design-Builder or any DB-Related Entity, to furnish design services required under the Contract Documents.

Differing Site Conditions has the meaning set forth in Section 4.3.1 below.

Directive Letter has the meaning set forth in Section 9.6.1 below.

Electronic Data has the meaning set forth in Section 13.1.1 below.

Equipment and Materials shall mean all of the equipment, materials, machinery, apparatus, structures, supplies and other goods required by the terms of the Contract Documents to complete the Work and to be incorporated into the Project or provided to Owner. The term "Equipment and Materials" shall not be construed to include any construction equipment, supplies, materials, apparatus or tools owned by Design-Builder or any DB-Related Entity that are used to complete the Work but are not contemplated under the Contract Documents to become incorporated into the Project or to be provided to Owner.

Excusable Delay has the meaning set forth in Section 8.5.1 below.

Exhibits has the meaning set forth in Section 10.6 of the Agreement.

Final Application for Payment means the Application for Payment submitted by Design- Builder to Owner after Design-Builder has achieved Final Completion, requesting payment of the unpaid balance of the Contract Price (less any amounts properly withheld by Owner).

Final Completion has the meaning set forth in Section 8.4 below.

Final Completion Date means the date that Final Completion occurs.

Force Majeure Events are those events that are beyond the reasonable control of Design-Builder, all DB-Related Entities, and Owner, including but not limited to the events of war, terrorism, floods, labor disputes (other than those set forth in Section 8.5.2(b)), earthquakes, fires, hurricanes, tornadoes, epidemics, pandemics, public health emergencies, unusually severe and abnormal weather conditions, and other acts of God.

General Conditions of Contract refers to this document.

Good Engineering and Construction Practice means those methods, techniques, standards, and practices which, at the time they are to be employed and in light of the circumstances known or reasonably believed to exist at such time, are generally recognized and accepted as good engineering, equipping, installation, construction, commissioning, and testing practices for the design, construction, and improvement of capital projects in a similar industry to the Project in scope and complexity using the design-build delivery method, under similar circumstances, as followed in the United States.

Governmental Approval means any authorization, consent, approval, license, lease,

ruling, permit, certification, exemption, or registration by or with any Governmental Unit.

Governmental Unit means any national, state or local government, any political subdivision thereof, or any governmental, quasi-governmental, judicial, public or statutory instrumentality, administrative agency, authority, body or other person and/or entity having jurisdiction over the Site, performance of the Work, the Project or the Parties.

Gross Negligence means: such wanton or reckless conduct or omissions as constitutes, in effect, a disregard for harmful, foreseeable, and avoidable risks or consequences; provided that Gross Negligence does not include any act or failure to act insofar as it: (i) constituted mere ordinary negligence; or (ii) was done or omitted in accordance with the written instructions or written approval of the Parties.

Hazardous Environmental Condition means the presence of Hazardous Materials in such quantities or circumstances that may be reasonably considered to present an imminent or substantial safety or health hazard for Owner, Design-Builder, any DB-Related Entity, and their respective employees, agents or representatives, the general public or the surrounding environment.

Hazardous Materials means any materials, waste, substances and chemicals deemed to be hazardous under applicable Legal Requirements.

Key Personnel means those individuals designated as such in Exhibit 10.6(c) to the Agreement.

Legal Requirements means all applicable federal, state and local laws, codes, ordinances (including the Code of Ordinances of Kansas City, Missouri), rules, statutes, regulations, orders and decrees, and other requirements of any Governmental Unit, including, without limitation, any interpretation of such items by the applicable Governmental Unit.

Liquidated Damages means Delay Liquidated Damages.

Maximum Liability Cap has the meaning set forth in Section 6.1.2 of the Agreement.

Named Team Members means those persons or entities specifically identified in Exhibit 10.6(c) to the Agreement.

Notice of Design-Builder Claim for Change Order has the meaning set forth in Section 9.5.1 below.

Notice of Termination for Convenience means a written notice from Owner to Design- Builder that terminates the right of Design-Builder to perform all or a portion of the Work, specifying the date upon which such notice shall be deemed effective and any other applicable terms.

Operations and Maintenance Data (O&M Data) mean the manual(s) and other information as required by the Project Requirements that provide overall operating approach and strategy for the Project, as well as the Services Manuals required for operating and maintaining the Equipment and Materials, facilities and systems, including the related computer programs prepared by Design-Builder containing detailed standard procedures and other specific instructions, policies, directives, routines, schedules and other matters relating to the Project, developed and maintained as required by Section 2.10 below.

Overhead and Profit Markup means all field, Project, and home office overhead, including, but not limited to: (a) field supervision and administration above the general foreman level, such as superintendents, assistant superintendents, purchasing agents, accountants, clerks, timekeepers, office managers, and all others on the field staff; (b) office supplies; (c) drinking water; (d) temporary heat, light and power; (e) field toilets; (f) costs of services; (g) small tools and expendable materials required for, or consumed in, the performance of the Work; (h) telephone system and charges; (i) facsimile machines, telephones, telegrams, and the charges associated therewith; (j) photographs; (k) photocopying; (l) postage; (m) insurance; (n) taxes; (o) general and administrative expenses

incurred at the home, branch, and/or district offices; and (p) profit.

Owner is the City of Kansas City, Missouri.

Owner Indemnitee means and includes Owner, Owner's Advisor, and their officers, directors, employees, representatives, and agents.

Owner's Representative means that person designated by Owner under Section 3.2.1 below, who shall have full authority to act on behalf of Owner with respect to the Project.

Party or *Parties* has the meaning set forth in the Preamble.

Payment Bond has the meaning set forth in Section 8.2.1(b) of the Agreement.

Performance and Maintenance Bond has the meaning set forth in Section 8.2.1(a) of the Agreement.

Phase 1 Engineering & Preconstruction Schedule means that schedule attached as Exhibit 10.6(a) to the Agreement.

Phase 2 Contract Price Amendment means the amendment to the Agreement for Phase 2 services comprised of the accepted Proposal as developed by Design-Builder in accordance with Section 2.3 of the Agreement between Owner and Design-Builder.

Phase 2 Proposal means that proposal developed by Design-Builder in accordance with Section 2.3 of the Agreement.

Preamble means the introductory paragraphs of the Agreement that identify, among other things, the Agreement Date, the Parties and the background to the Parties entering into the Agreement.

Pre-Existing Intellectual Property means Design-Builder's proprietary algorithms, software, hardware, databases and other background technology and intellectual property that Design-Builder developed or licensed from third parties prior to the Agreement Date.

Project is the Dr. Jeremiah Cameron Park and Westport Stormwater Improvements Project.

Project Requirements mean any and all the requirements as set forth in the Scope of Services attached as Exhibit 2.2.1 to the Agreement, Division 00 and 01 specifications, and requirements issued with the Request for Proposal.

Project Warranties has the meaning set forth in Section 2.9.1 below.

Project Warranties Term means that period from the Agreement Date through the date that is two (2) years following the Substantial Completion Date, as such period may be extended pursuant to Section 2.9.6, *provided, however*, that if the Contract Documents require a longer warranty period for a specific element of the Work, the Project Warranties Term for such specific element of the Work shall be that longer warranty period.

Proposed Phase 2 Baseline Schedule means that schedule attached to the Phase 2 Proposal.

Proposed Schedule of Values means that schedule of values attached as Exhibit 10.6(b) to the Agreement.

Punch List means that list of Work that has been identified as incomplete in accordance with Section 2.11 below.

Released for Construction Documents mean those final, complete design documents that: (a) are to be used for performing the construction and in correlation with all applicable Governmental Approvals, (b) have been signed and sealed by a properly licensed Design Consultant or a properly licensed employee of Design-Builder; and (c) have been approved by Owner in accordance with Section 2.4.4 below.

Scheduled Final Completion Date means the date that is set forth in Section 3.2.2 of

the Agreement.

Scheduled Substantial Completion Date means the date that is set forth in Section 3.2.1 of the Agreement, and is the date by which Design-Builder is obligated to achieve Substantial Completion of the entire Work.

Schedule of Values means a tabulation or breakdown of the entire Contract Price as estimated, allocating such Contract Price to various portions of the Work and other line-items, prepared by Design-Builder in such form and detail, and supported by such data to substantiate its accuracy, as Owner may require.

Separate Contractor means a person and/or entity, other than Design-Builder, retained by Owner to perform work or to provide services, or Equipment and Materials, in connection with the Project.

Site is the parcels of land or premises on which the Project is located, as more specifically described in the Project Requirements.

Subcontract means any and all agreements between Design-Builder and any DB-Related Entity.

Subcontractor means any person or entity (other than Design Consultants) with whom Design-Builder has entered into any Subcontract for such person or entity to perform any portion of the Work, including Suppliers.

Substantial Completion has the meaning set in Section 8.2 below.

Substantial Completion Date means the date on which Substantial Completion occurs.

Sub-Subcontractor is any person or entity (other than a Design Consultant) retained by a Subcontractor as an independent contractor to perform any portion of a Subcontractor's Work, including Suppliers.

Supplier is any person or entity retained by Design-Builder or a DB-Related Entity to provide Equipment and Materials, or construction equipment, supplies or other goods to be used in the performance of the Work but not incorporated into the Work.

Total Contract Price has the meaning set forth in Section 4.1 of the Agreement.

Training Plan means Design-Builder's plan for the training of Owner employees in the long-term operations and maintenance of the Project, as developed and executed by Design- Builder, in conjunction with the qualified technical trainers of Subcontractors, Sub-Subcontractors and Suppliers, and in accordance with the Project Requirements.

Work means all work, services, activities and other obligations to be performed by Design-Builder under the Contract Documents, including without limitation, design, engineering, permitting, procurement of Equipment and Materials, project management, supervision, construction, commissioning, start-up, and testing.

Work Change Directive means a written order prepared and signed by Owner, directing a change in the Work prior to agreement on an adjustment in any Contract Time, Contract Price, or other terms in the Contract Documents pertaining to the change in the Work.

Work Product means all drawings, specifications, calculations, data, models, images, materials, products, and documents identified as deliverables in the Contract Documents, including, without limitation all materials, products, and such items developed or produced by all Design Consultants, Subcontractors and Sub-Subcontractors, whether in hard-copy, digital or electronic data, or any other medium.

Article 2
Design-Builder's Services and Responsibilities

2.1 General.

2.1.1 The parties will meet within seven (7) days after the Commencement Date to discuss issues affecting the administration of the Work and to implement the necessary procedures, including those relating to submittals and payment, to facilitate the ability of the parties to perform their obligations under the Contract Documents.

2.1.2 The Phase 1 Engineering and Preconstruction Schedule shall be the basis for monitoring Design-Builder's performance of the Work during Phase 1. Likewise, the Phase 1 Schedule of Values shall be used as the basis for payment for Design-Builder's activities during Phase 1. The Phase 1 Engineering and Preconstruction Schedule will be updated each month to indicate planned and actual progress and forecast activities within Phase 1.

2.1.3 At the time the Design-Builder submits the Phase 2 Proposal, Design-Builder shall submit to Owner, for its review and approval, the following:

(a) A proposed Baseline Schedule that includes, among other things: (1) the order in which Design-Builder proposes to carry out the Work; and (2) the times when submissions and approvals or consents by Owner are required (*provided, however*, that such times shall be no less than Owner's minimum review duration identified in Section 3.1 below). The proposed Baseline Schedule shall meet the format and other requirements established by the Contract Documents to demonstrate that all major Project components, activities, and events are being performed in a logical sequence for Design-Builder to achieve the Contract Times. Owner acknowledges that Design-Builder's schedule margin (e.g., float) shown in the Baseline Schedule is owned and controlled by Design-Builder and may not be used or consumed on account of an event that allows Design-Builder the right to seek a Change Order.

(b) A proposed Phase 2 Schedule of Values that shall consist of a detailed breakdown of the Contract Price into measurable components of the completed Work for the purpose of making payment to Design-Builder during Phase 2. The Phase 2 Schedule of Values shall be compatible with and representative of the Baseline Schedule.

(c) A proposed forecast of monthly cash flow requirements for the entire Project, incorporating the actual cash flow for the time elapsed since the Commencement Date.

(d) If Owner does not approve a proposed submission under Paragraphs (a), (b), or (c) above, Design-Builder shall submit a revised submission to Owner within seven (7) days of its receipt of Owner's comments on such submission. This process shall continue until such time as the submission is so approved by Owner, which submission shall be then deemed, as applicable, the Baseline Schedule, Schedule of Values, and forecast of monthly cash flow Requirements. Design-Builder shall provide Owner with updates of these documents as set forth in the Contract Documents.

(e) Owner's review and approval of the Baseline Schedule shall not be construed as relieving Design-Builder of its complete and exclusive control over the means, methods, sequences and techniques for executing the Work.

2.1.4 Design-Builder shall designate a member of its Key Personnel as its Project manager (the "Design-Builder's Project Manager"), who shall be reasonably available to Owner and shall have the necessary expertise and experience required to supervise the Work. Design-Builder's Project Manager will be stationed in the Design-Builder's Kansas City office and present at all appropriate times. Design-Builder will have a representative at the Site authorized to act on its behalf when Design-Builder's Project Manager is not present. Design-Builder shall also designate a qualified member of its Key Personnel as its Project representative (the "Design-

Builder's Representative"), who shall communicate regularly with Owner and shall be vested with the authority to act on behalf of Design-Builder. Neither Design-Builder's Project Manager or Design-Builder's Representative may be replaced without prior written approval of Owner, with such approval not to be unreasonably withheld, and any replacement shall be acceptable to Owner.

2.1.5 Design-Builder shall provide management, supervision and professional staff for the Work in accordance with the organizational chart set forth in Exhibit 10.6(c) referred to as List of Key Personnel. Design-Builder acknowledges the importance of its Key Personnel in successfully performing the Project. Absent separation of employment, none of the Key Personnel may be withdrawn from the Project without prior written approval of Owner, with such approval not to be unreasonably withheld. It is understood and agreed that Design-Builder will provide Owner with at least thirty (30) days written notice of any request to withdraw any Key Personnel or Named Team Member. Any replacement personnel shall have equivalent skill, experience and reputation. Design-Builder shall remove or replace, or have removed or replaced, any personnel performing the Work if Owner has a reasonable objection to such individual.

2.1.6 Design-Builder shall participate in monthly progress meetings with Owner. During such meetings, progress during the prior month shall be reviewed. These meetings shall be attended by, among other: (a) Design-Builder's Project Manager and other required Design-Builder personnel, as well as key Subcontractors and Design Consultants responsible for Work completed during the specified duration and Work scheduled during the upcoming reporting duration; and (b) Owner representatives and others as designated by Owner. Owner may direct that personnel from Design-Builder and DB-Related Entities attend any or all meetings if Owner believes, in its sole opinion, that such personnel are necessary to have at such meetings.

2.1.7 Design-Builder assumes responsibility to Owner for the proper performance of the Work of all DB-Related Entities and any acts and omissions in connection with such performance.

2.2 Design Professional Services.

2.2.1 Design-Builder shall, consistent with applicable state licensing laws, provide or furnish through Design Consultants or qualified, licensed design professionals employed by Design-Builder, the necessary design services, including architectural, engineering and other design professional services, for the preparation of the required drawings, specifications and other design submittals to permit Design-Builder to complete the Work consistent with the Contract Documents.

2.2.2 Design-Builder shall incorporate all obligations and understandings of the Contract Documents applicable to design services in its respective contracts with any Design Consultant and Subcontractors, including but not limited to the obligations relative to ownership and use of the Work Product set forth in Article 12 below.

2.3 Standard of Care.

2.3.1 Design-Builder shall perform the Work in accordance with: (a) the Contract Documents; (b) applicable Legal Requirements and Governmental Approvals; and (c) Good Engineering and Construction Practice. Notwithstanding the above, if any of (a), (b) or (c) in the preceding sentence conflict, Design-Builder shall be obligated to perform the Work in accordance with the more stringent standard.

2.4 Design Development Services.

2.4.1 Design-Builder assumes and shall have exclusive responsibility for the accuracy and efficacy of the Released for Construction Documents. Accordingly, in no event shall Design-Builder be entitled to any price, schedule or performance relief associated with any error, omission or deficiency in the Released For Construction Documents, and shall bear full responsibility for correcting errors and deficiencies in accordance with the Contract Documents.

2.4.2 Design-Builder shall conduct such additional geotechnical evaluations and potholing surveys as are required by Good Engineering and Construction Practices and incorporate such evaluations and surveys into its design.

2.4.3 Owner shall review and act upon design submittals as set forth in the Project Requirements. Notwithstanding anything to the contrary in the Contract Documents, Owner's review, comment and/or approval of any design submittal, including but not limited to the Released for Construction Documents, shall not be deemed to transfer any design liability from Design- Builder to Owner or relieve Design-Builder of any of its obligations under the Contract Documents or liability for the design services that are part of the Work.

2.4.4 The Released for Construction Documents shall be consistent with the latest set of approved interim design submissions, and shall be submitted to Owner and approved by Owner in accordance with the Contract Documents. Design-Builder shall proceed with construction in accordance with the approved Released for Construction Documents. Any modifications to the Released for Construction Documents will constitute a change to the Contract Documents and Design-Builder shall seek Owner approval in advance of issuing such revisions.

2.4.5 To the extent not prohibited by the Contract Documents or Legal Requirements, Design- Builder may prepare interim design submissions and Released for Construction Documents for a portion of the Work to permit construction to proceed on that portion of the Work prior to completion of the Released for Construction Documents for the entire Work.

2.5 Legal Requirements.

2.5.1 Design-Builder shall perform the Work in accordance with all Legal Requirements and shall provide all notices applicable to the Work as required by the Legal Requirements.

2.5.2 Design-Builder may request an appropriate Change Order, in accordance with the requirements of Articles 8 and 9 herein, that the Contract Price and/or Contract Time(s) be adjusted to compensate Design-Builder for the impacts of any changes in the Legal Requirements enacted after the Agreement Date. Such impacts may include, without limitation, revisions Design-Builder is required to make to the Released for Construction Documents because of such changes in Legal Requirements. For the avoidance of doubt, any tariff adopted, promulgated, issued, or modified by the U.S. federal government after the Agreement Date shall be treated as a change in Legal Requirements under this Section 2.5.2, provided that such tariff or modification was not scheduled prior to the Agreement Date. Notwithstanding the above, the relief afforded by this Section 2.5.2 shall not apply to changes in Legal Requirements relating to: (a) Design-Builder's or any DB- Related Entity's corporate existence or the maintenance of its business; (b) changes in Legal Requirements affecting payroll taxes or other taxes associated with labor; or (c) changes in Legal Requirements affecting taxes imposed on an entity's gross revenue, income or profits.

2.5.3 Not Used.

2.6 Government Approvals and Permits.

2.6.1 Except as specifically identified in Section 3.4.1 below, Design-Builder shall obtain, maintain, and pay for all costs to obtain and maintain (including all application, permit and filing fees) for all necessary Governmental Approvals from or by any Governmental Unit that may be

required for the proper prosecution and execution of the Work, including any additional Governmental Approval identified in the Project Requirements as the responsibility of Design-Builder. If any such Governmental Approval is required to be formally issued in the name of Owner, Design-Builder shall undertake all commercially reasonable efforts to obtain such Governmental Approvals with Owner's reasonable support and cooperation. Design-Builder shall develop all data and technical documents for Governmental Approval submittals, prepare and submit all applications, participate in meetings with Governmental Units and Owner as required, and expedite all Governmental Approvals to meet Project schedule requirements. Governmental Approval applications and other documentation required in connection with a Governmental Approval shall be subject to approval by Owner. Design-Builder shall deliver to Owner, promptly after Design- Builder's receipt, a copy of each such Governmental Approval, with a listing of the status of all such Governmental Approvals included in the monthly reports required by the Contract Documents.

2.6.2 Design-Builder shall provide all commercially reasonable assistance to Owner to obtain those Governmental Approvals that are the responsibility of Owner under Section 3.4.1 below. No construction activity will commence until: (a) all Governmental Approvals required for the relevant construction activity (including any activity that may disturb the Site) have been obtained; (b) Owner has been notified that such Governmental Approvals have been obtained; and (c) Owner has, after reviewing the validity and scope of the Governmental Approval, authorized Design-Builder to proceed.

2.6.3 Design-Builder shall ensure that the Work conforms to the requirements and stipulations of all Governmental Approvals. Design-Builder shall not be entitled to an adjustment in the Contract Price and/or Contract Time(s) for any events arising from or related to Design-Builder or any DB- Related Entity violating or failing to comply with any Governmental Approval, including but not limited to suspensions arising therefrom. Such violations and failures to comply shall be at the sole risk of Design-Builder.

2.7 Design-Builder's Construction Services.

2.7.1 Unless otherwise provided in the Contract Documents to be the responsibility of Owner or a Separate Contractor, Design-Builder shall provide through itself or Subcontractors the necessary supervision, labor, inspection, commissioning, start-up, testing, Equipment and Materials, construction equipment, supplies, temporary utilities and other temporary facilities and other related services to permit Design-Builder to achieve Substantial Completion and Final Completion of the Project consistent with the Contract Documents. Except as otherwise expressly set forth in the Agreement or these General Conditions of Contract, Design-Builder retains all market risk, whether or not foreseeable, pertaining to cost and availability of labor, Equipment and Materials, and all other items required or used in connection with the performance of the Work.

2.7.2 Design-Builder shall perform all construction activities efficiently and with the requisite expertise, skill and competence to satisfy the requirements of the Contract Documents. Design-Builder shall at all times exercise complete and exclusive control over the means, methods, sequences and techniques of construction.

2.7.3 Design-Builder shall employ only Subcontractors who are duly licensed in Missouri and qualified to perform the Work consistent with the Contract Documents. Owner may reasonably object to Design-Builder's selection of any Subcontractor. Those Subcontractors who are Key Personnel or Named Team Members shall be deemed acceptable to Owner for the scope of Work designated in Design-Builder's Named Team Members.

2.7.4 Design-Builder shall coordinate the activities of all Subcontractors. If any Separate Contractor performs work on, adjacent, or in proximity to the Project or the Site, or has any element of work that interfaces or affects the Work, Design-Builder agrees to reasonably

cooperate and coordinate its activities with those of such Separate Contractors so that the Project can be completed in an orderly and coordinated manner without unreasonable disruption. Design-Builder specifically agrees to attend and participate in any coordination meetings that are held by Owner to manage and coordinate the work of Design-Builder and Separate Contractors.

2.7.5 Design-Builder shall keep the Site reasonably free from debris, trash and construction wastes to permit Design-Builder to perform its construction services efficiently, safely and without interfering with the use of adjacent land areas. Upon Substantial Completion of the Work, Design- Builder shall remove all debris, trash, construction wastes, materials, equipment, machinery and tools arising from the Work.

2.7.6 Subject to Section 4.3 below, Design-Builder shall be responsible for all utility relocations necessary or convenient to its performance of the Work. For all such relocations, Design-Builder will meet all of Owner's requirements, procedures and standards.

2.7.7 Design-Builder shall be responsible for making arrangements to obtain, provide and pay for all temporary and permanent utilities associated with the Work, except for those utilities specifically identified in the Contract Documents as being provided by Owner and furnished without cost to Design-Builder.

2.7.8 During any adverse weather (including but not limited to unusually severe and abnormal weather conditions as referenced in Section 8.5.3 below), Design-Builder shall take commercially reasonable precautions so that the Work may progress properly.

2.8 Design-Builder's Responsibility for Project Safety.

2.8.1 Design-Builder recognizes the importance of performing the Work in a safe manner so as to prevent damage, injury or loss to: (a) all individuals at the Site, whether working or visiting; (b) the Work, including Equipment and Materials incorporated into the Work or stored on-Site or off- Site; and (c) all other property at the Site or adjacent thereto. Design-Builder assumes responsibility for implementing and monitoring all safety precautions and programs related to the performance of the Work. Design-Builder shall, prior to commencing construction, designate a member of its Key Personnel with the necessary qualifications and experience to supervise the implementation and monitoring of all safety precautions and programs related to the Work ("Design-Builder's Safety Representative"). Unless otherwise required by the Contract Documents, Design-Builder's Safety Representative shall be an individual stationed at the Site who may have responsibilities on the Project in addition to safety. The Safety Representative shall make routine daily inspections of the Site and shall hold weekly safety meetings with Design-Builder's personnel, Subcontractors of any tier, and others as applicable.

2.8.2 Design-Builder and Subcontractors shall comply with all Legal Requirements relating to safety, as well as any Owner-specific safety requirements set forth in the Contract Documents, provided that such Owner-specific requirements do not violate any applicable Legal Requirement. Design-Builder will immediately report in writing any safety-related injury, loss, damage or accident arising from the Work to Owner's Representative and, to the extent mandated by Legal Requirements, to all Governmental Units having jurisdiction over safety-related matters involving the Project or the Work. Owner shall have the right to suspend any or all Work if Design-Builder fails to comply with its obligations hereunder.

2.8.3 Design-Builder's responsibility for safety under this Section 2.8 is not intended in any way to relieve Subcontractors of any tier of their own contractual and legal obligations and responsibility for: (a) complying with all Legal Requirements, including those related to health

and safety matters; and (b) taking all necessary measures to implement and monitor all safety precautions and programs to guard against injuries, losses, damages or accidents resulting from their performance of the Work.

2.9 Design-Builder's Project Warranties.

2.9.1 Design-Builder warrants to Owner that the Work shall, through the Project Warranties Term: (1) be new and of good quality; (2) conform to the requirements of the Contract Documents; and (3) be free of construction faults or defects, as established by the Project Requirements (collectively the "Project Warranties"). The Project Warranties are subject to the following:

(a) The Project Warranties include remedy for damages or defects caused by testing performed by Design-Builder.

(b) The Project Warranties exclude remedy for damages or defects caused by modifications not undertaken or executed by Design-Builder under this Agreement. In addition, the Project Warranties exclude remedy for damages or defects caused by Owner's improper or insufficient maintenance, Owner's improper operation, or normal wear and tear under normal usage.

2.9.2 Design-Builder shall perform or cause to be performed all warranty work in a manner that will minimize interference with the ongoing operations of the Project. Design-Builder shall provide a written plan for all proposed warranty work, unless expressly waived by Owner.

2.9.3 If Owner determines at any time during the Project Warranties Term that any of the Work is not in conformance with the requirements of the Project Warranties, it shall provide written notice to Design-Builder of such determination. Design-Builder shall, within seven (7) days of receipt of such written notice, take meaningful steps to commence correction of such nonconforming Work, including the correction, removal or replacement of the nonconforming Work and any damage caused to other parts of the Work affected by the nonconforming Work. Notwithstanding the above, Design-Builder shall respond to a verbal or electronic notification from Owner of an emergency warranty condition that could cause serious loss or damage within twenty-four (24) hours of such notification. Such response shall require that a competent representative or representatives of Design-Builder familiar with the Project, including its specific equipment, design and operational requirements, inspect the Work and, while on Site: (a) correct the problem; (b) if the problem cannot be corrected while on Site, mitigate while on Site the imminent harm from the emergency; and (c)fully correct the problem within a reasonable period of time. If Design-Builder fails to commence the necessary steps within, as applicable, such seven (7) day period (or in the event of any emergency warranty condition, respond within a twenty-four (24) hour period and correct and/or mitigate the problem as set forth in the preceding sentence), Owner, in addition to any other remedies provided under the Contract Documents, may provide Design-Builder with written notice that Owner will commence correction of such nonconforming Work with its own forces or with third party contractors. If Owner does perform such corrective Work, Design-Builder shall be responsible for all reasonable costs incurred by Owner in performing such correction, including but not limited to any retesting and reinspection costs.

2.9.4 Owner may, based on good cause, direct Design-Builder to perform a "root cause" analysis of any defect in the Work. If Design-Builder fails to perform such analysis as directed by Owner, or if Owner concludes that the "root cause" analysis is flawed, Owner may elect to conduct an independent analysis of the alleged defect, whereupon Design-Builder shall cooperate with Owner and provide such information relevant to the alleged defect as Owner

may request. If the "root cause" or independent analysis reveals a defect or defects in any part of the Work, Design-Builder shall be responsible for the costs and expenses of remedying such defects, including the costs of the "root cause" or independent analysis. If the "root cause" or independent analysis demonstrates that there is no defect, then Owner shall bear the reasonable costs and expenses of such analyses. All remedial measures related to defects revealed by any "root cause" or independent analysis must be approved by Owner prior to implementation by Design-Builder.

2.9.5 Nothing contained in this Section 2.9 shall be construed to establish a period of limitation with respect to other obligations that Design-Builder has under the Contract Documents.

2.9.6 If, after the Substantial Completion Date, any Work is modified, corrected, repaired, replaced and/or reperformed by Design-Builder pursuant to Section 2.9.3, then the Project Warranties Term applicable to such portion of the Work that has been modified, corrected, repaired, replaced and/or reperformed shall be extended for one year from the date of completion of the modification, correction, repair, replacement or reperformance, but in no event longer than three
(3) years after the Substantial Completion Date.

2.9.7 During the Project Warranties Term, Design-Builder and Owner shall be permitted to enforce all warranties provided by Suppliers with respect to the Work. However, no such warranty shall relieve Design-Builder of any obligation with respect to the Project Warranties.

2.9.8 Design-Builder acknowledges and agrees that:

(a) It shall be fully responsible for the costs associated with all warranty work as provided in Section 2.9.3, and shall reimburse Owner for its costs resulting from a breach of its obligations under Section 2.9.3 with respect to the Project Warranties, subject to the terms and conditions of the Contract Documents.

(b) The provisions of this Section 2.9 shall survive the termination of the Agreement.

2.9.9 Without limiting any of the Project Warranties, Design-Builder shall, for the protection of Owner, obtain from all Subcontractors and Suppliers from which Design-Builder procures Equipment and Materials such warranties and guarantees as are normally provided with respect thereto and as may be specifically required by the Contract Documents, each of which shall be assigned to Owner to the full extent of the terms thereof. No such warranty or guarantee shall relieve Design-Builder of any obligation hereunder, and no failure of any warranted or guaranteed structures, improvements, or Equipment or Materials shall be the cause for any increase in the Contract Price or otherwise excuse Design-Builder from the performance of any Work or warranty obligation. For the avoidance of doubt, disclaimers and limitations in specific Equipment and Materials that conflict with this Section 2.9 shall not be construed to limit Design-Builder's obligations or Owner's rights under this Section 2.9.

2.9.10 Nothing in the Contract Documents is intended to limit any third party warranty that provides Owner with greater warranty rights than those provided under the Project Warranties.

2.9.11 EXCEPT FOR THE EXPRESS WARRANTIES SET FORTH IN THE CONTRACT DOCUMENTS, DESIGN-BUILDER MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESS OR IMPLIED, LATENT OR PATENT, INCLUDING ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PURPOSE RELATING TO THE WORK PERFORMED UNDER THE CONTRACT DOCUMENTS, AND ALL SUCH OTHER WARRANTIES ARE HEREBY EXPRESSLY EXCLUDED AND DISCLAIMED. THE REMEDIES SET FORTH IN THIS SECTION 2.9 ARE THE SOLE AND EXCLUSIVE REMEDIES OF OWNER FOR ANY NONCONFORMING WORK,

WHETHER DESIGN-BUILDER'S LIABILITY IS BASED ON CONTRACT, WARRANTY, STRICT LIABILITY, TORT (INCLUDING NEGLIGENCE), OR OTHERWISE.

2.10 O&M Data.

2.10.1 Design-Builder shall develop comprehensive O&M Data in accordance with the Project Requirements. The O&M Data shall: (a) contain a detailed description of the means and methods of properly operating and maintaining the Project; (b) document standard operating procedures and predictive, preventive and corrective maintenance procedures, practices and schedules; and (c) otherwise be sufficiently detailed to permit the Project to be operated and maintained by Owner's operations and maintenance staff.

2.10.2 Design-Builder shall submit O&M Data in accordance with the Project Requirements.

2.11 Punch List Requirements.

2.11.1 Design-Builder shall submit a proposed Punch List to Owner when Design-Builder believes that the Work has achieved Substantial Completion in compliance with the Contract Documents. Owner shall have the right to approve each Punch List in its reasonable discretion. The failure to include any items on such list does not alter the responsibility of Design-Builder to complete all Work in accordance with the Contract Documents.

2.11.2 Design-Builder shall promptly complete all items on the Punch List. Owner shall have the option to correct or otherwise resolve any and all Punch List items not promptly completed by Design-Builder by using its own forces or by hiring others. The reasonable cost of such correction or resolution of remaining punch list items by Owner or others shall be deducted from the final payment to Design-Builder.

2.12 Care, Custody and Control, Risk of Loss and Damage to Owner Property

2.12.1 Design-Builder shall have care, custody, and control of the Work (including but not limited to having responsibility for the security of the Site) until the Substantial Completion Date.

2.12.2 Design-Builder shall bear all risk of loss concerning the Work until the Substantial Completion Date, regardless of: (a) subject to the extent to which the loss was insured or the availability of insurance proceeds; and/or (b) whether Owner had title to the Work or paid for any of the Work that was subject to a loss. After Substantial Completion, Owner shall bear all risk of loss for the Work and shall have care, custody and control of the Project (including but not limited to having responsibility for the security of the Site) and shall be accountable and responsible for any loss or damage to any part of the Work, including property of any kind and including uninsured losses and deductibles. Owner will cause its property insurers to issue a waiver of subrogation in favor of Design-Builder and its Subcontractors while Work is being performed and after Substantial Completion consistent with the rights and obligations of this Section.

2.12.3 Notwithstanding anything in the Contract Documents to the contrary, after the Substantial Completion Date, Design-Builder's total liability to Owner for the repair and/or replacement of

Owner's existing property, structures, materials or equipment (other than the Work itself) shall be limited to One Million Dollars ($1,000,000) per occurrence and in the aggregate, to the extent the damage is caused by Design-Builder, and Owner shall release Design-Builder from liability for any claim, loss or damage exceeding such amount. Owner will cause its insurers to issue a waiver of subrogation in favor of Design-Builder and any other DB-Related Entity consistent with the rights and obligations of this Section 2.12.3.

Article 3
Owner's Services and Responsibilities

3.1 Duty to Cooperate.

3.1.1 Owner shall, throughout the performance of the Work, cooperate with Design-Builder and perform its responsibilities, obligations and services in a timely manner to facilitate Design-Builder's timely and efficient performance of the Work and so as not to delay or interfere with Design- Builder's performance of its obligations under the Contract Documents.

3.1.2 Owner shall provide Design-Builder with reasonable access to the Site, including land rights and areas for storage reasonably sufficient that Design-Builder may perform the Work in accordance with the Contract Times.

3.1.3 Owner shall provide timely reviews and approvals (where required) of interim design submissions and the Released for Construction Documents consistent with the turnaround times set forth in the Contract Documents and the Baseline Schedule, provided, however that, unless stated otherwise in the Contract Documents, Owner shall have twenty-one (21) days after receipt of such submissions to act upon such submissions, unless: (a) a shorter review period is specifically indicated in the Project Requirements; or (b) Design-Builder and Owner mutually agree upon a shorter review period for a specific submission. Design-Builder may, for more complex or time- sensitive submittals, request joint review meetings with Owner in the interest of expediting such reviews, and Owner will, to the extent it is reasonably able to do so, attempt to satisfy such requests. Owner approval, or narrative indicating approval by Owner or indication that Owner is approving, means that Owner is reviewing for conformance with the Contract Documents and indicating its belief at a specific time that submittals being reviewed are in conformance. In providing such approval, Owner is not accepting any responsibility or liability for itself or relieving responsibility for performance of the Design-Builder under the Contract Documents, for which the Design-Builder remains wholly responsible..

3.1.4 Owner shall give Design-Builder prompt and timely notice of any Work that Owner notices to be defective or not in compliance with the Contract Documents.

3.2 Owner's Representative.

3.2.1 Owner shall designate a representative responsible for providing Owner-Furnished Information and approvals in a timely manner to permit Design-Builder to fulfill its obligations under the Contract Documents ("Owner's Representative"). Owner's Representative shall also provide Design-Builder with prompt notice if it observes any failure on the part of Design-Builder to fulfill its contractual obligations, including any errors, omissions or defects in the performance of the Work. Owner's Representative shall communicate regularly with Design-Builder and shall be vested with the authority to act on behalf of Owner.

3.2.2 Owner's Representative shall have full authority to act on behalf of Owner with respect to matters requiring Owner's approval or authorization. Owner's Representative may delegate all or a portion of its authority to others by written notice to Design-Builder, which delegated authority may be revoked or modified at any time by written notice to Design-Builder.

3.2.3 Owner's Representative may be replaced with seven (7) days' prior written notice to Design-Builder, and may delegate its authority and responsibilities to assistants with written notice to Design-Builder.

3.3 Government Approvals.

3.3.1 Owner shall obtain and pay for only the Governmental Approvals expressly set forth in

the Project Requirements as being the sole responsibility of Owner.

3.3.2 Owner shall provide reasonable assistance to Design-Builder in obtaining those Governmental Approvals that are Design-Builder's responsibility.

3.4 Separate Contractors.

3.4.1 Owner is responsible for all work performed on the Project or at the Site by Separate Contractors with whom Owner has contracted. Owner shall contractually require its Separate Contractors to cooperate, and coordinate their activities so as not to interfere, with Design-Builder in order to enable Design-Builder to timely complete the Work consistent with the Contract Documents.

Article 4
Hazardous Environmental Conditions and Differing Site Conditions

4.1 Hazardous Environmental Conditions.

4.1.1 Owner has advised Design-Builder of any known Hazardous Materials or Hazardous Environmental Conditions at the Site.

4.1.2 If Design-Builder encounters any unknown Hazardous Environmental Conditions at the Site, it shall stop Work immediately in the affected part of the Work to the extent required to avoid any such safety or health hazard until it has taken such action as is necessary, in accordance with applicable Legal Requirements, to protect the interests of any affected party. Design-Builder shall, immediately upon encountering any Hazardous Environmental Conditions at the Site, notify Owner and, if required by Legal Requirements, assist Owner in providing notifications to all Governmental Units having jurisdiction over the Project or Site.

4.1.3 Unless mutually agreed by Design-Builder, Owner shall take all necessary measures required to ensure that Hazardous Environmental Conditions are remediated or rendered harmless in accordance with applicable Legal Requirements.

4.1.4 Except for those Hazardous Materials and Hazardous Environmental Conditions set forth in Section 4.1.6 below, Design-Builder will be entitled, in accordance with these General Conditions of Contract, to an adjustment in the Contract Price and/or Contract Time(s) to the extent Design- Builder's cost and/or time of performance have been adversely impacted by the presence of unknown Hazardous Environmental Conditions.

4.1.5 To the fullest extent permitted by Legal Requirements, Owner shall indemnify, defend, and hold harmless Design-Builder from and against any and all claims, losses, damages, liabilities and expenses, including attorneys' fees and expenses, arising out of or resulting from unknown Hazardous Environmental Conditions. Nothing in this Section 4.1.5 shall obligate Owner to indemnify or hold harmless Design-Builder from and against the consequences of Hazardous Materials brought to the Site by Design-Builder or any DB-Related Entity.

4.1.6 Notwithstanding anything to the contrary in this Section 4.1, Design-Builder shall bear full responsibility for the handling, treatment, storage, removal, remediation, avoidance, or other appropriate action (if any), with respect to: (a) any Hazardous Material brought to the Site by Design-Builder or any DB-Related Entity; and (b) the exacerbation of a Hazardous Environmental Condition of which Owner notified Design-Builder pursuant to Section 4.1.1, to the extent caused by the breach of contract, negligence, recklessness or willful misconduct of Design-Builder or any DB-Related Entity. To the fullest extent permitted by Legal Requirements, Design-Builder shall indemnify, defend and hold harmless

each Owner Indemnitee from and against all claims, losses, damages, liabilities and expenses, including attorneys' fees and expenses, arising out of or resulting from Items (a) and (b) above.

4.1.7 As between Owner and Design-Builder, Owner is the generator of any pre-existing Hazardous Materials or Hazardous Environmental Condition.

4.1.8 Owner represents that the Site has not been designated as a "Superfund" site by the United States Environmental Protection Agency.

4.2 Inspection of Site Conditions.

4.2.1 Design-Builder represents and warrants that it has, as of the date the Phase 2 Proposal is submitted, ascertained the nature and location of the Work, the character and accessibility of the Site, the existence of obstacles to construction which are ascertainable or visible upon a thorough investigation of the Site, the availability of facilities and utilities, the location and character of existing or adjacent work or structures, the surface conditions, and other general and local conditions (including labor) which might affect its performance of the Work or the cost thereof.

4.2.2 Design-Builder shall, after the Agreement Date, undertake such testing, inspections and investigations as may be necessary to perform its obligations under the Contract Documents, including but not limited to additional geotechnical evaluations or Hazardous Materials studies. All reports or analyses generated by Design-Builder's testing, inspections and investigations, including but not limited to additional geotechnical testing, shall be furnished to Owner promptly after such reports or analyses are generated.

4.3 Differing Site Conditions.

4.3.1 Concealed or latent physical conditions or subsurface conditions at the Site that: (a) materially differ from the conditions indicated in the Contract Documents; or (b) are of an unusual nature, differing materially from the conditions ordinarily encountered and generally recognized as inherent in the Work, are collectively referred to herein as "Differing Site Conditions." If Design- Builder encounters a Differing Site Condition, Design-Builder will be entitled to an adjustment in the Contract Price and/or Contract Time(s) to the extent Design-Builder's cost and/or time of performance are adversely impacted by the Differing Site Condition. The term "Differing Site Conditions" excludes: (a) conditions of which Design-Builder had actual knowledge as of the Agreement Date; and (b) conditions that should have been discovered through a reasonable Site investigation performed in accordance with Section 4.2. For the avoidance of doubt, Hazardous Environmental Conditions are not deemed Differing Site Conditions, and shall be treated as set forth under Section 4.1 above.

4.3.2 Upon encountering a Differing Site Condition, Design-Builder shall provide prompt written notice to Owner of such condition, which notice shall not be later than fourteen (14) days after such condition has been encountered. Design-Builder shall, to the extent reasonably possible, provide such notice before the Differing Site Condition has been substantially disturbed or altered.

Article 5
Insurance and Bonds

5.1 Design-Builder's Insurance Requirements.

5.1.1 Design-Builder shall obtain and maintain, at its own cost and expense, the insurance coverages specified in Exhibit 8.1 of the Agreement, which insurance shall be in accordance with this Section 5.1.

5.1.2 All insurance required by Section 5.1 shall be from insurance companies that are authorized to do business in the state of Missouri, and have a current policyholder's management and financial size category rating of not less than "A-:VIII" according to A.M. Best's Financial Strength and Financial Size Category.

5.1.3 Design-Builder shall deliver to Owner, with copies to each additional insured, the following:

(a) Certificates of insurance and relevant endorsements establishing that Design-Builder has obtained and is maintaining the policies and coverages required hereunder, with the understanding that updated, compliant certificates of insurance and relevant endorsements shall be delivered annually, prior to the expiration of any policy, to evidence renewal of the required insurance coverages.

(b) Upon request by Owner or any additional insured, evidence of such required insurance on an Acord certificate insurance as evidence of insurance required to be purchased and maintained by Design-Builder, Design Consultants, or Subcontractors.

(c) Failure of Owner or any additional insured to demand the documents required by this Section 5.1.3, or failure of Owner to identify a deficiency in compliance from the evidence provided, will not be construed as a waiver of the obligation of the relevant party (i.e., Design-Builder, Design Consultant, or Subcontractor) to obtain and maintain such insurance.

5.1.4 Design-Builder shall use commercially reasonable efforts to require its Design Consultants and Subcontractors to purchase and maintain adequate insurance coverages specific to their scope of Work.

5.1.5 Owner does not represent that insurance coverage and limits established in Section 8.1 of the Agreement will be adequate to protect the interests of Design-Builder, Design Consultants, or Subcontractors. Each such party is responsible for determining whether such coverage and limits are adequate to protect its interests, and for obtaining and maintaining any additional insurance that Design-Builder deems necessary.

5.1.6 Design-Builder, Design Consultants, and Subcontractors shall be solely responsible for any and all deductibles or self-insured retentions that shall apply under any required, or otherwise purchased, insurances and shall have no recourse against Owner for any such costs.

5.1.7 All policies of insurance that Design-Builder is required to purchase and maintain under the Agreement shall:

(a) Contain a provision requiring the insurer to give not less than thirty (30) days' prior notice to Owner whenever the insurer gives Design-Builder a notice of cancellation or non-renewal with respect to the policy (except in the case of any non-premium payment, not less than ten (10) days' prior notice, which the insurer shall be obligated to give to Owner simultaneously with providing such notice to Design-Builder). The provision required by the preceding sentence shall not be deemed to infer a right of cancellation that would otherwise not exist in the absence of such provision.

(b) Delete any specific design-build or similar exclusions that could compromise coverage because of Design-Builder's involvement in the design-build process.

(c) Other than for professional liability insurance, workers compensation/employer's liability insurance and builder's risk insurance, where additional

insured coverage is required include cross-liability clauses allowing one insured to bring a claim against another insured party. With regard to pollution liability insurance, a cross-liability clause will be allowed as long as it does not impact Owner's ability to sue another insured party and collect under the policy.

(d) Other than for professional liability insurance and workers compensation/employer's liability insurance, be endorsed so that the insurer agrees to waive, to the extent permitted by law, all rights of subrogation or action that it may have or acquire against Owner, Owner Indemnitees, or any additional insured.

(e) Other than for professional liability insurance, workers compensation/employer's liability insurance, automobile liability insurance, railroad protective liability insurance and contractor pollution liability insurance, contain a provision under which the insurer agrees that the failure of one insured to observe and fulfill the terms of the policy will not prejudice the coverage of the other insureds.

(f) For commercial general liability and umbrella/excess liability insurance, , not include defense costs within the limits of coverage or permit erosion of coverage limits by defense costs.

(g) Design-Builder's required commercial general liability, automobile liability, umbrella or excess, and pollution liability must:

1. Include and list as additional insureds Owner and the Owner Indemnitees, and include coverage for the respective officers, directors, members, partners, and employees of all such additional insureds;

2. Afford primary coverage to these additional insureds for claims covered thereby (for those claims caused by Design-Builder's Work including both ongoing and completed operations coverage);

3. Not seek contribution from insurance maintained by the additional insured; and

4. As to commercial general liability insurance, apply to additional insureds with respect to liability caused in whole or in part by Design-Builder's acts or omissions, or the acts and omissions of DB-Related Entities, in the performance of Design-Builder's Work.

5.2 Performance and Maintenance Bonds and Payment Bond.

5.2.1 Design-Builder shall provide Owner with the Performance and Maintenance Bond and Payment Bond in accordance with Section 8.2 of the Agreement.

Article 6
Payment

6.1 General.

6.1.1 Owner shall pay Design-Builder for the Work in accordance with Articles 4 and 5 of the Agreement and this Article 6.

6.1.2 Owner shall pay Design-Builder through monthly progress payments described in Section 6.2 below, with payments to be based upon the Schedule of Values agreed upon by the Parties pursuant to Section 2.1.3 above. In making such progress payments, Owner shall retain the amounts set forth in Section 5.3.1 of the Agreement, as well as other amounts permitted under

the Contract Documents or at law.

6.2 Monthly Progress Payments.

6.2.1 On or before the date established in the Agreement, Design-Builder shall submit for Owner's review and approval its Application for Payment requesting payment for all Work performed as of the date of the Application for Payment. The Application for Payment shall be accompanied by all supporting documentation required by the Contract Documents, including,without limitation, such documents, information and data as Owner may require to: (a) waive or release lien rights for all Work performed for which compensation has been received (other than with respect to any retainage then withheld); and (b) evaluate or verify the right to receive payment of any amount requested for payment.

6.2.2 The Application for Payment may request payment for Equipment and Materials not yet incorporated into the Project, provided that: (a) Owner is satisfied that the Equipment and Materials are suitably stored at either the Site or another acceptable location; (b) the Equipment and Materials are protected by suitable insurance; and (c) upon the earlier of incorporation into the Project or payment, Owner will receive the Equipment and Materials free and clear of all liens and encumbrances.

6.2.3 The Application for Payment shall constitute Design-Builder's representation that the Work described therein has been performed consistent with the Contract Documents, has progressed to the point indicated in the Application for Payment, and that title to all Work will pass to Owner free and clear of all claims, liens, encumbrances, and security interests upon the incorporation of the Work into the Project, or upon Design-Builder's receipt of payment, whichever occurs earlier. The passage of title shall not be construed as relieving Design-Builder from the sole responsibility for all Work upon which payments have been made (including but not limited to risk of loss or the restoration of any damaged Work), or as waiving the right of Owner to require the fulfillment of all of the terms of the Contract Documents.

6.3 Withholding of Payments.

6.3.1 On or before the date established in the Agreement, Owner shall pay Design-Builder all amounts properly due. If Owner determines that Design-Builder is not entitled to all or part of an Application for Payment as a result of Design-Builder's failure to meet its obligations hereunder, it will notify Design-Builder in writing at least five (5) days prior to the date payment is due. The notice shall indicate the specific amounts Owner intends to withhold, the reasons and contractual basis for the withholding, and the specific measures Design-Builder must take to rectify Owner's concerns. Design-Builder and Owner will attempt to resolve Owner's concerns prior to the date payment is due. If the Parties cannot resolve such concerns, Design-Builder may pursue its rights under the Contract Documents, including those under Article 10 below.

6.3.2 Notwithstanding anything to the contrary in the Contract Documents, Owner shall pay Design-Builder all undisputed amounts in an Application for Payment within the times required by the Agreement. Payments which Owner disputes in good faith shall not be deemed due.

6.4 Right to Stop Work and Interest.

6.4.1 If Owner fails to pay timely Design-Builder any amount that becomes due and is not subject to a good faith dispute, then Design-Builder, in addition to all other remedies provided in the Contract Documents, may stop Work pursuant to Section 11.3 below. All payments due and unpaid, other than those subject to a good faith dispute, shall bear interest at the rate set forth in the Agreement.

6.5 Design-Builder's Payment Obligations.

6.5.1 Design-Builder will pay its Design Consultants and Subcontractors, in accordance with its contractual obligations to such parties, all the amounts Design-Builder has received from Owner on account of their work. Design-Builder will impose similar requirements on Design Consultants and Subcontractors to pay those parties with whom they have contracted. Design-Builder will indemnify and defend Owner against any claims for payment and mechanic's liens as set forth in Section 7.3 below.

6.6 Final Payment.

6.6.1 Upon achieving Final Completion in accordance with Section 8.4 below, Design-Builder shall provide Owner with a Final Application for Payment. The Final Application for Payment shall be accompanied by all supporting documentation required by the Contract Documents, including, without limitation the following:

(a) An affidavit that there are no claims, obligations or liens outstanding or unsatisfied for labor, services, Equipment or Materials, construction equipment, taxes or other items performed, furnished or incurred for or in connection with the Work which will in any way affect Owner's interests.

(b) A general release executed by Design-Builder waiving all claims, except for receipt of final payment by Design-Builder and those claims previously made in writing to Owner and remaining unsettled at the time of final payment, which previously made claims shall be specifically listed in an attachment to the general release.

(c) Consent of Design-Builder's surety to final payment.

(d) Certificates of insurance confirming that required coverages will remain in effect consistent with the requirements of the Contract Documents.

(e) Final Project Workforce Monthly Report and Final Companywide Workforce Monthly Report.

6.6.2 After receipt of a proper Final Application for Payment from Design-Builder, Owner shall make final payment by the time required in the Agreement. If Owner is not in agreement with said Application, Owner shall return the final Application for Payment to Design-Builder, indicating in writing the reasons for not recommending final payment, in which case Design-Builder shall make the necessary corrections and resubmit the Final Application for Payment.

6.6.3 Final payment shall be an absolute bar to the assertion of any claim of any type by Design- Builder other than those expressly set forth in the attachment set forth in Section 6.6.1(b) above.

Article 7
Indemnification

7.1 Intellectual Property Infringement.

7.1.1 Design-Builder shall defend any action or proceeding brought against any Owner Indemnitee based on any claim that the Work, or any part thereof, or the operation or use of the Work or any part thereof, constitutes infringement or unauthorized use of any patent, trademark, copyright, or trade secret now or hereafter issued. Owner shall give prompt written notice to Design- Builder of any such action or proceeding and will reasonably provide authority,

information and assistance in the defense of same. Design-Builder shall indemnify and hold harmless Owner Indemnitees from and against all damages and costs, including but not limited to attorneys' fees and expenses awarded against Owner Indemnitees or Design-Builder in any such action or proceeding. Design-Builder agrees to keep all Owner Indemnitees regularly informed of all developments in the defense of such actions.

7.1.2 If any Owner Indemnitee is enjoined from the operation or use of the Work, or any part thereof, as the result of any patent, trademark, copyright or trade secret suit, claim, or proceeding, Design-Builder shall at its sole expense take reasonable steps to procure the right to operate or use the Work. If Design-Builder cannot so procure such right within a reasonable time, Design- Builder shall promptly, at Design-Builder's option and at Design-Builder's expense: (a) modify the Work so as to avoid infringement of any such patent, trademark copyright, or trade secret; or (b) replace said Work with Work that does not infringe or violate any such patent, trademark, copyright or trade secret; *provided, however*, that any such modification or replacement shall not adversely affect the performance, use, operation, or any material characteristic of the Project, and shall be subject to the approval of the Owner Indemnitees.

7.1.3 Sections 7.1.1 and 7.1.2 above shall not be applicable to any suit, claim or proceeding based on infringement or violation of a patent, trademark, copyright or trade secret: (a) relating solely to a particular process or product of a particular manufacturer specified by Owner and not offered or recommended by Design-Builder to Owner; or (b) arising from modifications to the Work by Owner or its agents after the Substantial Completion Date. If the suit, claim or proceeding is based upon events set forth in the preceding sentence, Owner shall defend, indemnify and hold harmless Design-Builder to the same extent Design-Builder is obligated to defend, indemnify and hold harmless Owner in Section 7.1.1 above.

7.2 Tax Claim Indemnification.

7.2.1 If, in accordance with Owner's direction, an exemption for all or part of the Work is claimed for taxes, Owner shall indemnify, defend and hold harmless Design-Builder from and against any liability, penalty, interest, fine, or tax assessment imposed by the applicable Governmental Unit, and reasonable attorneys' fees or other expenses or costs incurred by Design-Builder as a result of defending a claim caused by any action taken by Design-Builder in accordance with Owner's directive with respect to such claimed tax exemption. Owner shall furnish Design-Builder with any applicable tax exemption certificates necessary to obtain such exemption, upon which Design- Builder may rely.

7.3 Payment Claim Indemnification.

7.3.1 Provided that Owner is not in breach of its contractual obligation to make payments to Design-Builder for the Work, Design-Builder shall indemnify, defend and hold harmless Owner Indemnitees from any claims or mechanic's liens brought against Owner Indemnitees or against the Project as a result of the failure of Design-Builder or any DB-Related Entity to pay for any services, Equipment and Materials, materials, labor, equipment, taxes or other items or obligations furnished or incurred for or in connection with the Work. Within three (3) days of receiving written notice from any Owner Indemnitee that such a claim has been asserted or mechanic's lien has been filed, Design-Builder shall commence to take the steps necessary to discharge said claim or lien, including, if necessary, the furnishing of a mechanic's lien bond that will remove such claim or lien from title. If Design-Builder fails to do so, Owner Indemnitees will have the right to discharge the claim or lien and hold Design-Builder liable for costs and expenses incurred, including attorneys' fees.

7.4 Design-Builder's General Indemnification.

7.4.1 Design-Builder, to the fullest extent permitted by law, shall indemnify, hold harmless and defend Owner Indemnitees from and against claims, losses, damages, liabilities, including attorneys' fees and expenses, for bodily injury, sickness or death, and third party property damage or destruction (other than to the Work itself) to the extent resulting from the intentional misconduct or negligent acts or omissions of Design-Builder or any DB-Related Entity. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 7.4.

7.4.2 If an employee of any Design-Builder or any DB-Related Entity has a claim against any Owner Indemnitee, Design-Builder's indemnity obligation set forth in Section 7.4.1 above shall not be limited by any limitation on the amount of damages, compensation or benefits payable by or for Design-Builder or any DB-Related Entity under any employee benefit acts, including workers' compensation or disability acts.

7.5 Defense and Indemnification Procedures.

7.5.1 If any Owner Indemnitee receives notice of or otherwise has actual knowledge of a claim which it believes is within the scope of Design-Builder's indemnification under the Contract Documents, it shall by writing as soon as practicable: (a) inform Design-Builder of such claim; (b) send to Design-Builder a copy of all written materials Owner Indemnitee has received asserting such claim; and (c) notify Design-Builder that either: (i) the defense of such claim is being tendered to Design-Builder; or (ii) Owner Indemnitee has elected to conduct its own defense for a reason set forth below.

7.5.2 If the insurer under any applicable insurance policy accepts tender of defense, Design-Builder and Owner Indemnitee shall cooperate in the defense as required by the insurance policy. If no defense is provided by insurers under potentially applicable insurance policies, then the following provisions shall apply.

7.5.3 If the defense is tendered to Design-Builder, it shall within forty-five (45) days of said tender deliver to Owner Indemnitee a written notice stating that Design-Builder: (a) accepts the tender of defense and confirms that the claim is subject to full indemnification hereunder without any "reservation of rights" to deny or disclaim full indemnification thereafter; (b) accepts the tender of defense but with a "reservation of rights" in whole or in part; or (c) rejects the tender of defense if it reasonably determines it is not required to indemnify against the claim under the Contract Documents. If such notice is not delivered within such forty-five (45) days, the tender of defense shall be deemed rejected.

7.5.4 If Design-Builder accepts the tender of defense, Design-Builder shall have the right to select legal counsel for Owner Indemnitee, subject to reasonable approval of Owner Indemnitee, and Design-Builder shall otherwise control the defense of such claim, including settlement, and bear the fees and costs of defending and settling such claim. During such defense: (a) Design- Builder shall, at Design-Builder's expense, fully and regularly inform Owner Indemnitee of the progress of the defense and of any settlement discussions; and (b) Owner Indemnitee shall, at Design-Builder's expense for all of Owner Indemnitee's reasonable out-of-pocket third party expenses, fully cooperate in said defense, provide to Design-Builder all materials and access to personnel it requests as necessary for defense, preparation and trial and which or who are under the control of or reasonably available to Owner Indemnitee and maintain the confidentiality of all communications between it and Design-Builder concerning such defense to the extent allowed by law.

7.5.5 Owner Indemnitee shall be entitled to select its own legal counsel and otherwise control the defense of such claim if: (a) the defense is tendered to Design-Builder and it refuses the tender of defense, or fails to accept such tender within forty-five (45) days, or reserves any right to deny or disclaim such full indemnification thereafter; or (b) Owner Indemnitee, at the time it gives notice of the claim or at any time thereafter, reasonably determines that: (i) a conflict

exists between it and Design-Builder which prevents or potentially prevents Design-Builder from presenting a full and effective defense; or (ii) Design-Builder is otherwise not providing an effective defense in connection with the claim and Design-Builder lacks the financial capability to satisfy potential liability or to provide an effective defense. Owner Indemnitee may assume its own defense pursuant to the above by delivering to Design-Builder written notice of such election and the reasons thereof.

7.5.6 If Owner Indemnitee is entitled and elects to conduct its own defense pursuant hereto, all reasonable costs and expenses it incurs in investigating and defending and claim for which it is entitled to indemnification hereunder (and any settlements or judgments resulting there from) shall be reimbursed by Design-Builder after completion of the proceeding.

7.5.7 If Owner Indemnitee is entitled to and elects to conduct its own defense, then it shall have the right to settle or compromise the claim with Design-Builder's prior written consent, which shall not be unreasonably withheld or delayed, or with approval of the court, and with the full benefit of Design-Builder's indemnity. Notwithstanding the foregoing, if Owner Indemnitee elects to conduct its own defense and it is later determined that no indemnification obligation existed as to the particular claim, Owner Indemnitee shall pay its own costs and expenses relating thereto. In addition, if Owner Indemnitee elects to conduct its own defense because it perceives a conflict of interest, Owner Indemnitee shall pay its own costs and expenses relating thereto.

7.6 Survival.

7.6.1 All of Design-Builder's obligations under this Article 7 shall survive any termination of the Agreement, whether for cause or convenience.

Article 8
Contract Times

8.1 General.

8.1.1 Design-Builder agrees that it will commence performance of the Work and achieve completion of the Work within the Contract Time(s) in accordance with Article 3 of the Agreement.

8.1.2 Design-Builder shall perform the Work, as applicable, in accordance with the Phase 1 Engineering and Preconstruction Schedule and the Baseline Schedule. Design-Builder shall provide Owner with monthly updates, or more frequently as required by conditions and progress of the Work, comparing actual progress to the Baseline Schedule, but such updates shall not be deemed to modify the Baseline Schedule or Contract Time(s), nor relieve Design-Builder of its obligations to complete the Work within the Contract Time(s), as may be adjusted in accordance with this Article 8.

8.1.3 The conditions for Substantial Completion of the entire Work are set forth in Sections 8.2 below. Design-Builder acknowledges that Owner may want to take-over and operate some elements of the Work before Substantial Completion of the entire Work. To accomplish this, the Parties will discuss and agree upon the terms upon which Owner may do so, including but not limited to the impact of such on Design-Builder's responsibility for risk of loss, insurance and warranty.

8.2 Substantial Completion.

8.2.1 Substantial Completion shall be deemed to have occurred when all of the following conditions have been satisfied:

(a) Design-Builder has submitted and Owner has approved in writing, such approval not to be unreasonably withheld or delayed, a certification by Design-Builder that, except for the items on the Punch List, all physical Work is complete and in compliance with the Contract Documents.

(b) Design-Builder has completed all testing required by the Contract Documents associated with Substantial Completion.

(c) Design-Builder and Owner have agreed in writing upon the Punch List (or, if they are unable to agree, Owner shall have prepared and issued the Punch List to Design-Builder within thirty (30) days of Design-Builder having submitted its proposed Punch List to Owner).

(d) Design-Builder has delivered to Owner written certification from the Equipment manufacturers (including information technology systems and instrumentation and controls) that all major Equipment included in the Project have been properly installed and tested in accordance with the manufacturers' recommendations and requirements.

(e) Design-Builder shall be in possession of, and shall have delivered to Owner, copies of the warranties of Equipment and Materials, together with copies of all related operating manuals provided by Suppliers.

(f) Design-Builder has delivered to Owner and Owner has approved in writing, such approval not to be unreasonably withheld or delayed, all O&M Data required by the Contract Documents as a condition of Substantial Completion.

(g) Design-Builder has delivered to Owner all applicable draft Record Documents and other closeout documents required by the Project Requirements, as applicable to Substantial Completion.

(h) Design-Builder has satisfied all of the requirements for Substantial Completion set forth in the Phase 2 Contract Price Amendment.

(i) Design-Builder and Owner have executed a Certification of Substantial Completion that all of the foregoing conditions have been satisfied.

8.2.2 When Design-Builder considers that the Work has achieved Substantial Completion, Design-Builder shall request in writing that Owner perform a Substantial Completion inspection. Design-Builder shall give Owner at least thirty (30) days' prior written notice of the expected date of Substantial Completion. Owner shall determine, within seven (7) days of its inspection, whether it concurs that Substantial Completion has been achieved. If Owner disagrees, it shall promptly send written notice to Design-Builder of the basis for its disagreement. Design-Builder shall expeditiously complete the Work and shall re-request in writing that Owner perform a Substantial Completion inspection. The preceding process will be repeated until Owner determines that Substantial Completion has been achieved.

8.2.3 The Substantial Completion Date shall be the day on which Design-Builder has given Owner notice pursuant to Section 8.2.2 and the Owner has concurred that Substantial Completion has been achieved.

8.3 NOT USED.

8.4 Final Completion.

8.4.1 Final Completion shall be deemed to have occurred when all of the following conditions have been satisfied:

(a) Design-Builder has achieved Substantial Completion in accordance with Section 8.2 above.

(b) All Work (including all repairs and Work identified on the Punch List and all clean- up and removal of construction materials, demolition debris and temporary facilities) is complete, and in all respects is in compliance with the Contract Documents.

(c) Design-Builder shall have delivered to Owner all final Record Documents, the final BIM model, and all closeout documents and other deliverables required by the Contract Documents.

(d) Design-Builder's surety has consented to the release of final payment to Design-Builder.

(e) Design-Builder has certified to Owner that all of its claims against Owner have been resolved, except for those set forth in the attachment to the general release described in Section 6.6.1(b) above.

(f) All Liquidated Damages due under the Agreement have been paid or otherwise satisfied.

(g) Design-Builder has satisfied all of the requirements for Final Completion set forth in Division 01s..

(h) Design-Builder and Owner have executed a Certification of Final Completion that all of the foregoing conditions have been satisfied.

8.4.2 When Design-Builder considers that Final Completion has been achieved, it shall so notify Owner in writing. Owner shall determine, within twenty-one (21) days following its receipt of such notice, whether it concurs that Final Completion has been achieved. If Owner disagrees, it shall promptly send written notice to Design-Builder of the basis for its disagreement. Design-Builder shall expeditiously correct the conditions raised by Owner in order to achieve Final Completion. The preceding process will continue until Owner determines that Final Completion has been achieved

8.4.3 The Final Completion Date shall be the day on which Owner has executed the Certificate of Final Completion. However, for the sole purpose of determining Design-Builder's liability to Owner for Delay Liquidated Damages for failure to achieve Final Completion on or before the Scheduled Final Completion Date, Final Completion shall be deemed effective as of the date Design-Builder has executed the Certificate of Final Completion.

8.5 Excusable Delays.

8.5.1 The term "Excusable Delay" shall refer to delays in or other adverse impacts on the performance of the Work to the extent caused directly by acts, omissions, conditions, events, or circumstances beyond the reasonable control of Design-Builder and all DB-Related Entities, including, by way of example, acts or omissions of Owner or anyone under Owner's control (including Owner's Separate Contractors), changes in the Work, Differing Site Conditions, unknown Hazardous Environmental Conditions, Force Majeure Events, a change in Legal Requirements, and suspensions of work under Section 11.1 below.

8.5.2 Notwithstanding Section 8.5.1 above, all cost, time, and other risks arising from the following events or circumstances shall be borne exclusively by Design-Builder, shall not be

deemed Excusable Delays, and shall not be the basis for any relief, monetary or otherwise, to Design-Builder:

(a) general market and economic conditions affecting the availability, supply or cost of labor, Equipment and Materials, construction equipment, supplies, or commodities, provided, however, that the term "general market and economic conditions shall not be deemed to include the effects on market or economic conditions arising from epidemics or pandemics or other Force Majeure Events;

(b) strikes, labor disputes, work slowdowns, work stoppages, boycotts or other similar labor disruptions, unless such strikes, disputes, slowdowns, stoppages, boycotts or disruption affect a specific trade on a national or regional level and were not caused by the improper acts or omissions of Design-Builder or any DB-Related Entity;

(c) delays in obtaining or delivery of Equipment and Materials, or any other goods or services, from any DB-Related Entity, unless the DB-Related Entity's reason for delay arises from an event that would otherwise be excusable to Design-Builder under these General Conditions of Contract;

(d) delays of common carriers, unless the common carrier's reason for the delay arises from an event that would otherwise be excusable to Design-Builder under these General Conditions of Contract;

(e) bankruptcy or insolvency of any DB-Related Entity;the inability of a DB-Related Entity to perform, unless such inability would be otherwise excusable to Design-Builder under these General Conditions of Contract;

(f) any acts, omissions, conditions, events, or circumstances that were caused by or arose from the negligent acts, omissions, fault, recklessness, willful misconduct, breach of contract, or violation of law by Design-Builder or any DB-Related Entity; and

(g) the exercise of any right or any act by Owner permitted under the Contract Documents, except to the extent the Contract Documents expressly require an adjustment in the Contract Time(s) as a result of such exercise or act (e.g., a change in the Work that will delay performance).

8.5.3 If Design-Builder intends to seek Excusable Delay classification for any weather condition, it shall demonstrate, as a condition to qualifying for an Excusable Delay, that the actual weather encountered was unusually severe and abnormal compared with the five-year average weather statistics compiled by the United States National Oceanic and Atmospheric Administration for the time of year and locality of the weather condition.

8.5.4 If Design-Builder intends to seek Excusable Delay classification for a delay in the issuance of a Governmental Approval, it shall demonstrate that: (a) Design-Builder and all applicable DB- Related Entities have submitted all applications, data, studies, reports, responses and other information required under Legal Requirements in order to obtain the Governmental Approval; (b) Design-Builder and all applicable DB-Related Entities have in all respects used commercially reasonable efforts to obtain the Governmental Approval; and (c) Design-Builder and all applicable DB-Related Entities have consistently maintained a fully responsive, engaged and respectful professional relationship with the staff and management of the Governmental Unit in a manner that, while not expressly required under Legal Requirements, is generally recognized among regular practitioners in the permitting field as necessary on a practical level to secure similar Governmental Approvals in a timely manner in light of the discretion accorded Governmental Units under Legal Requirements.

8.6 Adjustment of Contract Time(s).

8.6.1 Design-Builder shall be entitled to request a Change Order adjusting the Contract Time(s) to reflect not more than the amount of time Design-Builder is actually delayed by an Excusable Delay, expressly conditioned upon Design-Builder demonstrating that: (a) Design-Builder has complied with the procedural requirements of Section 8.5 and this Section 8.6; (b) the delay impacts the critical path of the Work as demonstrated by Section 8.6.3 below; (c) the delay was not foreseeable as of the Agreement Date by Design-Builder, and would not have been foreseen as of the Agreement Date by a reasonably experienced design-builder; (d) Design-Builder, in view of all the circumstances, has exercised reasonable efforts to avoid and mitigate the delay and did not, through itself or any DB-Related Entity, cause the delay; and (e) the delay for which relief is requested is not within the scope of those events or circumstances described in Section 8.5.2.

8.6.2 If Design-Builder intends to seek an adjustment in the Contract Time(s) as the result of an Excusable Delay, it shall comply with Sections 8.6.3 and 9.4 below.

8.6.3 Design-Builder shall demonstrate the critical path impact of an Excusable Delay and the impact on the Contract Time(s) through a written time impact analysis ("TIA") establishing the influence of the event on the most current monthly updated Baseline Schedule. Each TIA shall include a fragmentary network, and for events that have yet to occur (such as an Owner proposed change), the fragmentary network shall demonstrate how Design-Builder proposes to incorporate such event into the most current monthly updated Baseline Schedule. The TIA shall demonstrate:
(a) the time impact based on the date the event occurred, or, in the instance of an Owner proposed change, the date such proposed change was given to Design-Builder; (b) the status of the Work at such point in time; and (c) the time computation of all affected activities.

8.7 Compensation for Delays

8.7.1 Design-Builder shall be entitled to request an adjustment of the Contract Price pursuant to the provisions of Article 9 for all Excusable Delays for which Design-Builder is entitled to a time extension pursuant to Section 8.6 above ("Compensable Delays"), *provided, however*, that Compensable Delays shall not be deemed to include: (a) the Force Majeure Reserve; or (b) Excusable Delays where Design-Builder's performance was or would have been concurrently delayed or interrupted by any event that does not otherwise qualify as an Excusable Delay ("Concurrent Delay"). Design-Builder's sole remedy for a Concurrent Delay is an extension of the Contract Time(s), provided that Design-Builder has complied with the requirements of Section 8.6 above.

8.8 Recovery Schedules

8.8.1 Notwithstanding the right of Design-Builder to request a time extension for an Excusable Delay pursuant to this Article 8, Design-Builder agrees that it will, if directed by Owner, develop and implement a recovery schedule and plan to improve progress and take such measures to overcome such delay. Should Owner have a reasonable belief that the Contract Time(s) will not be met, then Owner has the right, but not the obligation, to so notify Design-Builder and direct Design-Builder to overcome such delay by working additional overtime, engaging additional personnel and taking such other measures as necessary to complete the Work within the Contract Time(s). If such delay is not an Excusable Delay, Design-Builder shall bear all costs related to such overtime, additional personnel and other measures if such delay will reasonably result in a delay in achieving the Contract Time(s). If such delay is an Excusable Delay, and Design-Builder has met the requirements of this Article 8 for an adjustment to the Contract Time(s) for such delay, then Design- Builder may request an adjustment to the Contract Price in accordance with the requirements of Article 9 for the increase in costs incurred by Design-Builder directly related to such overtime, additional personnel and other measures.

Article 9
Changes to the Contract Price and Contract Times

9.1 Right of Owner to Make Changes.

9.1.1 Without invalidating the Agreement, Owner may by written order, at any time and from time-to-time, authorize and/or request changes in, additions to, or deletions in the Work, including but not limited to those involving: (a) changes in, additions to, or deletions in the Contract Documents; (b) changes in the method, manner, sequence and time of performance of the Work (provided that Design-Builder retains and accepts full responsibility for all associated construction means, methods, techniques, sequences, and procedures); (c) changes in Owner-furnished services or deliverables, or (d) a direction to accelerate performance of the Work. If Owner proposes making a change in the Work, Owner shall advise Design-Builder and Design-Builder shall follow the processes set forth in Section 9.2 below.

9.1.2 No oral instruction, order or statement by Owner or Owner's Representative shall constitute a change under this Article 9. If Design-Builder believes that any oral instruction, order or statement by Owner may result in a change in the Work or require an adjustment to the Contract Price or the Contract Time(s), Design-Builder shall request that the oral instruction, order or statement be given in writing and shall thereafter comply with the provisions of this Article 9.

9.1.3 A "Change Order" is a written instrument issued after execution of the Agreement signed by Owner and Design-Builder, stating their agreement upon the scope of a change in the Work, and the agreed adjustment, if any, to the Contract Price, Contract Time(s), or any other requirement of the Contract Documents. Unless specifically stated to the contrary in the Change Order, an executed Change Order shall constitute the final and complete compensation and satisfaction for all costs and schedule impacts related to: (a) the implementation of the changes that are the subject of the Change Order; and (b) the cumulative impact of effects resulting from such changes on all prior Work and changes in the Work to be performed as scheduled.

9.1.4 All changes in the Work authorized by applicable Change Order shall be performed under the applicable conditions of the Contract Documents. Owner and Design-Builder shall negotiate in good faith and as expeditiously as possible the appropriate adjustments for such changes.

9.2 Work Change Directives.

9.2.1 A Work Change Directive is a written order prepared and signed by Owner directing a change in the Work prior to agreement on an adjustment in the Contract Price and/or the Contract Time(s).

9.2.2 Upon receipt of a Work Change Directive, Design-Builder shall promptly proceed with the change in the Work involved, unless Owner directs otherwise. Owner and Design-Builder shall negotiate in good faith and as expeditiously as possible the appropriate adjustments for the Work Change Directive. Upon reaching an agreement, the Parties shall prepare and execute an appropriate Change Order reflecting the terms of the agreement.

9.2.3 If the Parties are not able to agree on the method for adjusting the Contract Price for a Work Change Directive within a reasonable time, then Owner shall pay Design-Builder for such Work on a Cost of the Work basis as set forth in Section 9.7.1(c) below.

9.3 Minor Changes in the Work.

9.3.1 Minor changes in the Work do not involve an adjustment in the Contract Price and/or Contract Time(s) and do not materially and adversely affect the Work, including the design, quality, performance and workmanship required by the Contract Documents.

9.3.2 Owner may request minor changes in the Work that do not involve an adjustment in the Contract Price or Contract Time(s), and do not materially or adversely affect the Work. If Design- Builder disputes that such order involves a minor change, Design-Builder shall notify Owner in accordance with Section 9.4 below.

9.3.3 Design-Builder may make minor changes in the Work consistent with the intent of the Contract Documents, *provided, however*, that Design-Builder shall promptly inform Owner, in writing, of any such changes and record such changes on the documents maintained by Design-Builder.

9.4 Procedures Following Owner's Notice of Proposed Change.

9.4.1 Design-Builder shall, within twenty-one (21) days after receipt of notice of a proposed Owner change, prepare and submit to Owner in writing the information set forth in Section 9.5.2 below as if such change were the subject of a Design-Builder Proposed Change Order, and such other information and data as Owner may reasonably request. Owner shall endeavor to review Design-Builder's submittal with Design-Builder within twenty-one (21) days of its receipt of such submittal. If the Parties reach agreement on the terms of Owner's proposed change and Owner elects to proceed with such change, a Change Order shall be executed by the Parties. If the Parties are unable to reach agreement on the terms of the proposed change, Owner shall have the right, in its sole discretion, to direct Design-Builder to proceed with the change by issuing a Work Change Directive to Design-Builder.

9.4.2 Owner shall have the right, at any time and at its sole discretion, not to undertake any proposed change. If Owner elects not to undertake a proposed change for which Design-Builder performed design and preconstruction services in developing its submittal under Section 9.4.1 above, Design-Builder shall be paid its reasonable design and preconstruction costs incurred for such submittal.

9.5 Design-Builder Proposed Change Orders.

9.5.1 If Design-Builder believes that it is entitled under the Contract Documents to an adjustment to the Contract Price, Contract Time(s), or other relief due to any event or situation arising out of or related to the Work (including but not limited to alleged Excusable Delays, disputes over Owner's instructions or interpretation of the Contract Documents), Design-Builder shall, within seven (7) days after Design-Builder knows, or should have reasonably known, the impact of such event or situation giving rise to the requested relief, submit to Owner a written notice labeled "Notice of Design-Builder Proposed Change Order." The Notice of Design-Builder Proposed Change Order shall describe the general nature of the event or situation and, if such Notice involves an Excusable Delay, the probable duration thereof.

9.5.2 Design-Builder shall, within fourteen (14) days after providing Owner with a Notice of Design-Builder Proposed Change Order, submit to Owner in writing: (a) a description of the facts, circumstances and contractual basis for the relief sought, with sufficient specificity for Owner to assess the matter; (b) the cost data supporting any proposed adjustments to the Contract Price; and (c) the scheduling information and analysis required under Section 8.6.3 above to support any request for adjustment to the Contract Time(s).

9.5.3 Owner shall endeavor to review Design-Builder's submittal under Section 9.5.2 above within fourteen (14) days of its receipt of such submittal. If Owner believes that Design-Builder's

request is justified, in whole or in part, Owner shall advise Design-Builder and an appropriate Change Order shall be executed. If Owner disputes Design-Builder's request, and the Parties are unable to resolve the dispute, such dispute shall be resolved in accordance with Article 10 below. Owner may request clarifications and/or additional information to assist with its decision to such proposed change order.

9.6 Owner Directive Letters

9.6.1 If the Parties are unable to reach agreement on the terms of a Design-Builder Proposed Change Order under the processes set forth in Section 9.5 above, then Owner may, in its sole discretion, issue to Design-Builder a written notice ("Directive Letter") that directs Design-Builder to proceed in accordance with the terms of such notice notwithstanding the inability of the Parties to reach agreement on the terms of the Design-Builder Proposed Change Order. Design-Builder shall fully comply with all Directive Letters, and shall have the right to pursue its remedies under Article 10 below.

9.7 Contract Price Adjustments.

9.7.1 The increase or decrease in the Contract Price resulting from a change in the Work shall be determined by one or more of the following methods:

(a) Unit prices set forth in the Agreement or as subsequently agreed to between the Parties;

(b) A mutually accepted lump sum, properly itemized and supported by sufficient substantiating data to permit evaluation by Owner; or

(c) If the Parties have not reached agreement on the basis of (a) or (b) above, the Contract Price shall be adjusted based upon the Cost of the Work and Overhead and Profit Markup as set forth in Section 9.8 below.

9.8 Cost of the Work and Overhead and Profit Markup.

9.8.1 The term "Cost of the Work" shall mean costs: (i) reasonably, actually and properly incurred by Design-Builder in the proper performance of the Work associated with the change; (ii) reasonably documented; and (iii) that would not have been incurred but for the change in the Work.

The Cost of the Work shall include only the following:

(a) Craft Labor.

(1) Actual wages shall be computed on the base hourly rates paid by Design-Builder to its craft labor for all levels general foreman (or equivalent level) and below to perform the changed Work at the Site or, with Owner's agreement, at locations off the Site. No supervision or project management time above the general foreman level shall be included by Design-Builder as a direct labor cost, as this is covered by the Overhead Markup.

(2) Labor burden shall be established as a percent of the actual wages paid for each craft under (a) above. The burden shall be limited to payment for: vacation allowance, health and welfare, pension, apprenticeship programs and other similar programs as required for each craft, social security, unemployment insurance, and workers' compensation insurance. Labor burden shall not include expenses relating to employee profit sharing plans, bonuses, voluntary employee contributions to charities, savings plans, or general liability insurance

(b) Equipment and Materials. Design-Builder's net cost, including freight and transportation F.O.B Site, for all Equipment and Materials. All actually received quantity discounts and prompt payment discounts shall be reflected as credits for any Equipment and Materials purchased.

(c) Small Tools and Supplies. Small tools and supplies shall be paid based on five percent (5%) of the labor costs allowed in Item .1 above. Equipment and tools having a replacement value of $500 or less, whether or not consumed or used, shall be considered small tools compensated by the preceding percentage and no separate payment will be made therefor under any other category of cost.

(d) Construction Equipment.

(1) All construction equipment leased specifically for changes in the Work shall be at Design-Builder's net invoiced cost.

(2) If construction equipment is owned and actually engaged in the performance of the change in the Work, hourly rates will be computed based on the latest version of the "Blue Book Rental Rate for Construction Equipment." Hourly rates will be computed by dividing monthly Blue Book rates (excluding operating costs) by 176, and adjusting for region and depreciation. In the case of any machinery or equipment not referred to in the Blue Book Rental Rates, a monthly rental rate shall be computed on the basis of an amount that is the equivalent of 3% of the purchased price of such equipment. The hourly rate in such cases will be determined by dividing the monthly rate by 176 when actually operating. Payment for equipment idled as a direct result of the change, if applicable, shall be based on 40% of the rate determined herein, without inclusion of operating costs.

(e) Subcontractors. Payments properly made by Design-Builder to Subcontractors for performance of portions of the Work, including any bond premiums incurred by Subcontractors. Each Subcontractor will price its change in the Work based upon the requirements set forth in Items
(a) through (d) above.

(f) Design and Engineering Changes.

(1) Payment will be made for the cost of labor for design and engineering services, whether provided by Design-Builder or a Design Consultant, equal to the sum of the following: (i) the hourly rates established in Design-Builder's Phase 2 Proposal; plus (ii) an overhead rate to be agreed-upon between Owner and Design-Builder, not to exceed the applicable audited overhead rate. For Design Consultants, up to an additional ten percent (10%) on the total of such labor and overhead costs may be allowed to account for profit on design and engineering service labor.

(2) Payment will be made for the recovery of necessary expenses for other direct costs incurred in performing the work of a design and/or engineering change order, whether incurred by Design-Builder or a Design Consultant, provided that such costs are not included in Design-Builder's or Design Consultant's indirect cost or overhead rate. Costs for travel, meals and lodging shall be reimbursed in accordance with Owner's Travel Reimbursement Guidelines.

(g) Bond and Builder's Risk Insurance. Payment for additional bond cost will be based upon a rate that reflects the actual additional bond premiums. Payment for additional Builder's Risk Insurance premiums will be based on the actual additional premium for the

change.

(h) Miscellaneous. Other costs reasonably and properly incurred in the performance of the Work may be considered Cost of the Work to the extent approved in writing by Owner.

9.8.2 The Overhead and Profit Markup to be applied to the Cost of the Work for a change shall be as follows:

.1 For: (a) craft labor engaged under Section 9.8.1(a) above; (b) Equipment and Materials furnished under Section 9.8.1(b) above; (c) small tools and supplies furnished under Section 9.8.1(c) above; (d) rented and owned construction equipment under Section 9.8.1(d) above; and (e) miscellaneous costs under Section 9.8.1 (h) above, an Overhead and Profit Markup of ten percent (10%) will be applied.

.2 For design professional services labor engaged under Section 9.8.1(f) above, an Overhead and Profit Markup of ten percent (10%) will be applied.

.3 For bonds and Builder's Risk Insurance under Section 9.8.1(g) above, no Overhead and Profit Markup will be applied.

.4 Contractor and each higher-tier Subcontractor not performing the Work will be allowed to apply an Overhead and Profit Markup of five percent (5%) on the lower-tier Subcontractor's direct costs (i.e., excluding the lower-tier Subcontractor's Overhead and Profit Markup, regardless of the tier of the Subcontractor.

9.8.3 In the event of a Compensable Delay, Design-Builder will be entitled to recover for its time- related Project overhead costs that would not have been incurred but for the Excusable Delay. Overhead and Profit Markup of ten percent (10%) will be applied to such Project overhead costs.

9.9 Emergencies.

9.9.1 In any emergency affecting the safety of persons and/or property, Design-Builder shall act, at its discretion, to prevent threatened damage, injury or loss. Any change in the Contract Price and/or Contract Time(s) on account of emergency work shall be determined as provided in this Article 9.

9.10 Duty to Proceed.

9.10.1 Except only for Design-Builder's right to stop work under Section 11.3.1 below, no dispute between Design-Builder and Owner, including but not limited to those relating to the entitlement, cost or time associated with a notice of proposed Owner change or Design-Builder Notice of Proposed Change Order, shall interfere with the progress of the Work. Design-Builder shall have the duty to diligently proceed with the Work in accordance with Owner's instructions despite any dispute, including but not limited to those events where the Parties are in disagreement as to whether instructions from Owner constitute a change to the Work and justify adjustments to the Contract Price and/or Contract Time(s). Design-Builder's sole recourse in the event of such a dispute will be to pursue its rights under Article 10 below.

9.11 Burden of Proof.

9.11.1 Design-Builder shall bear the burden of proof in establishing its entitlement to relief under this Article 9, including but not limited to adjustments in the Contract Price and Contract

Time(s).

Article 10
Contract Adjustments and Disputes

10.1 Requests for Contract Adjustments and Relief.

10.1.1 If either Design-Builder or Owner believes that it is entitled to relief against the other for any event arising out of or related to the Work or Project, such Party shall provide written notice to the other Party of the basis for its claim for relief. Such notice shall, if possible, be made prior to incurring any cost or expense and in accordance with any specific notice requirements contained in applicable sections of these General Conditions of Contract. In the absence of any specific notice requirement, written notice shall be given within a reasonable time, not to exceed twenty-one (21) days, after the occurrence giving rise to the claim for relief or after the claiming Party reasonably should have recognized the event or condition giving rise to the request, whichever is later. Such notice shall include sufficient information to advise the other Party of the circumstances giving rise to the claim for relief, the specific contractual adjustment or relief requested and the basis of such request.

10.2 Dispute Avoidance and Resolution.

10.2.1 The Parties are fully committed to working with each other throughout the Project and agree to communicate regularly with each other at all times so as to avoid or minimize and resolve and any disputes. If any disputes do arise, Design-Builder and Owner each commit to resolving such disputes in an amicable, professional and expeditious manner.

10.2.2 Design-Builder and Owner will first attempt to resolve disputes at the field level through discussions between Design-Builder's Project Manager and Owner's Representative. Such discussions shall conclude within fourteen (14) days of the written notice provided for in Section 10.1.1 unless Owner and Design-Builder mutually agree otherwise.

10.2.3 If a dispute is not resolved at the field level within fourteen (14) days of the written notice provided for in Section 10.1.1, then, upon the written request of either Party, the dispute shall be elevated to Design-Builder's senior representative and Owner's Director or designee. Such individuals shall meet as soon as conveniently possible, but in no case later than thirty (30) days after such a request is made, to attempt to resolve such dispute. Five (5) days prior to any meetings between such individuals, the Parties will exchange relevant information that will assist the Parties in resolving the dispute.

10.2.4 Either Party shall have the right to exercise its right to initiate its rights to litigation under Section 10.4 below if a dispute has not been resolved within sixty (60) days of the request of a Party under Section 10.2.3 above to elevate the dispute to the individuals set forth in Section 10.2.3 above.

10.3 Mediation.

10.3.1 If, after the meeting set forth in Section 10.2.3 above, the senior representatives determine that the dispute cannot be resolved on terms satisfactory to both Parties, the Parties may mutually agree to mediate the dispute. For the avoidance of doubt, mediation is voluntary and will not be a condition precedent to the initiation of litigation. Any mediation will be based upon a process mutually agreed upon by the Parties.

10.4 Litigation.

10.4.1 Any and all legal proceedings between the Parties shall be solely and exclusively initiated and maintained in the state or federal courts of Jackson County, Missouri. Owner and Design- Builder each irrevocably consents to the jurisdiction of such courts in any such proceeding and each Party waives any objection it may have to the jurisdiction of any such proceeding. Any legal proceedings shall consist of a bench trial and not a trial by jury, and each party hereby waives its right to a jury trial in connection with any legal proceedings.

10.4.2 Notwithstanding Section 10.4.1 above, any prevailing Party may seek enforcement of any judgment rendered in a court in any jurisdiction where the non-prevailing Party or its property may be located.

10.5 Duty to Continue Performance.

10.5.1 Unless provided to the contrary in the Contract Documents, Design-Builder shall continue to perform the Work and Owner shall continue to satisfy its payment obligations to Design-Builder, pending the final resolution of any Dispute between Design-Builder and Owner.

Article 11
Stop Work and Termination Rights

11.1 Owner's Right to Stop Work.

11.1.1 Owner may, at any time, without cause and for its convenience, order Design-Builder in writing to stop and suspend the Work. Such suspension shall not exceed either sixty (60) consecutive days or in the aggregate more than ninety (90) days.

11.1.2 Design-Builder is entitled to seek an adjustment of the Contract Price and/or Contract Time(s) under Articles 8 and 9 above if its cost or time to perform the Work has been adversely impacted by any suspension or stoppage of the Work by Owner under Section 11.1.1.

11.2 Owner's Right to Perform and Terminate for Cause.

11.2.1 If Design-Builder, at any time, fails to: (a) provide a sufficient number of skilled workers to meet the Contract Times and Baseline Schedule; (b) supply the Equipment and Materials required by the Contract Documents; (c) comply with applicable Legal Requirements; (d) timely pay, without cause, Design Consultants or Subcontractors; (e) achieve Substantial Completion by the time the Limitation of Liability for Liquidated Damages has been reached, as such date may be adjusted pursuant to Article 8 above; or (f) perform material obligations under the Contract Documents that are not subject to Liquidated Damages, then Owner, in addition to any other rights and remedies provided in the Contract Documents, by Legal Requirements, or at law or in equity, shall have the rights set forth in Sections 11.2.2 and 11.2.3 below, and as provided at law.

11.2.2 Upon the occurrence of an event set forth in Section 11.2.1 above, Owner may provide written notice to Design-Builder that it intends to terminate the Agreement unless the problem cited is cured, or commenced to be promptly cured, within seven (7) days of Design-Builder's receipt of such notice. If Design-Builder fails to cure, or reasonably commence and diligently continue to cure, such problem, then Owner may give a second written notice to Design-Builder of its intent to terminate within an additional seven (7) day period. If Design-Builder, within such second seven
(7) day period, fails to cure, or reasonably commence and diligently continue to cure, such problem, then Owner may declare the Agreement terminated for default by providing written notice to Design- Builder of such declaration. Notwithstanding anything to the contrary, if Owner has provided Design-Builder with three (3) initial notices of Owner's intent to terminate the Agreement for any of the reasons set forth in Section 11.2.1 above, then Owner shall have no

further obligation to provide Design-Builder with an opportunity to cure, and may terminate the Agreement for cause as set forth in a written notice from Owner.

11.2.3 Upon declaring the Agreement terminated pursuant to Section 11.2.2 above, Owner may enter upon the Site and take possession, for the purpose of completing the Work, of all Work Product, Equipment and Materials, construction equipment, supplies, scaffolds, tools, appliances and other items thereon, which have been purchased or provided for the performance of the Work, all of which Design-Builder hereby transfers, assigns and sets over to Owner for such purpose, and to employ any person or persons to complete the Work and provide all of the required labor, services, Equipment and Materials, construction equipment, supplies, and other items; provided, however, that Owner shall not take possession of any construction equipment, supplies, scaffolds, tools, appliances and other similar items owned or rented by Design-Builder.

11.2.4 In the event of such termination, Design-Builder shall not be entitled to receive any further payments under the Contract Documents until the Work shall be finally completed in accordance with the Contract Documents. If the unpaid balance of the Contract Price exceeds the costs of finishing the Work, excluding Liquidated Damages, Design-Builder will only be entitled to be paid for Work performed prior to its default (unless otherwise agreed to by the Parties), and the balance will be for the account of and retained by Owner. If the actual and reasonable costs of finishing the Work exceed the unpaid balance, Design-Builder shall, within thirty (30) days of receipt of written notice setting out the amount of the excess costs, pay the difference to Owner. Such costs and expense shall include the reasonable cost of completing the Work (including costs to accelerate the Work as necessary to achieve Substantial Completion as near as possible to the Scheduled Substantial Completion Date), subject to the waiver of consequential damages and limitations of liability set forth in Article 6 of the Agreement.

11.2.5 If Owner improperly terminates the Agreement for cause, the termination for cause will be converted automatically to and treated as a termination for convenience under the provisions of Section 11.6 below.

11.3 Design-Builder's Right to Stop Work.

11.3.1 Design-Builder may, in addition to any other rights afforded under the Contract Documents or at law, stop the Work if Owner has failed to pay amounts properly due under Design-Builder's Application for Payment, *provided, however*, that amounts subject to a good faith dispute shall not be deemed properly due.

11.3.2 Should the event set forth in Section 11.3.1 above occur, Design-Builder has the right to provide Owner with written notice that Design-Builder will stop the Work unless said event is cured within seven (7) days from Owner's receipt of Design-Builder's notice. If Owner does not cure the problem within such seven (7) day period, Design-Builder may stop the Work. In such case, Design- Builder shall be entitled to make a claim for adjustment to the Contract Price and/or Contract Time(s) to the extent it incurs additional Costs of the Work or the progress of the Work has been adversely impacted by such stoppage.

11.4 Design-Builder's Right to Terminate for Cause.

11.4.1 Design-Builder, in addition to any other rights and remedies provided in the Contract Documents, may terminate the Agreement for cause for the following reasons:

(a) The Work has been stopped for sixty (60) consecutive days, or more than ninety (90) days in the aggregate, because of a Force Majeure Event, including a court order, any Government Unit having jurisdiction over the Work, failure of Owner to obtain Governmental

Approvals that are Owner's responsibility under the Contract Documents, or orders by Owner under Section 11.1.1 above, provided that such stoppages are not due to the acts or omissions of Design-Builder or any DB-Related Entity; and

(b) Owner's failure to cure the problems set forth in Section 11.3.1 above within sixty (60) days after Design-Builder has stopped the Work.

11.4.2 Upon the occurrence of an event set forth in Section 11.4.1 above, Design-Builder may provide written notice to Owner that it intends to terminate the Agreement unless the problem cited is cured, or commenced to be cured, within seven (7) days of Owner's receipt of such notice. If Owner fails to cure, or reasonably commence to cure, such problem, then Design-Builder may give a second written notice to Owner of its intent to terminate within an additional seven (7) day period. If Owner, within such second seven (7) day period, fails to cure, or reasonably commence to cure, such problem, then Design-Builder may declare the Agreement terminated for default by providing written notice to Owner of such declaration. In such case, Design-Builder shall be entitled to recover in the same manner as if Owner had terminated the Agreement for its convenience under Section
11.6 below.

11.5 Bankruptcy of Owner or Design-Builder.

11.5.1 If either Owner or Design-Builder institutes or has instituted against it a case under the United States Bankruptcy Code (such Party being referred to as the "Bankrupt Party"), such event may impair or frustrate the Bankrupt Party's ability to perform its obligations under the Contract Documents. Accordingly, should such event occur:

(a) The Bankrupt Party, its trustee or other successor, shall furnish, upon request of the non-Bankrupt Party, adequate assurance of the ability of the Bankrupt Party to perform all future material obligations under the Contract Documents, which assurances shall be provided within ten
(10) days after receiving notice of the request; and

(b) The Bankrupt Party shall file an appropriate action within the bankruptcy court to seek assumption or rejection of the Agreement within sixty (60) days of the institution of the bankruptcy filing and shall diligently prosecute such action.

If the Bankrupt Party fails to comply with its foregoing obligations, the non-Bankrupt Party shall be entitled to request the bankruptcy court to reject the Agreement, declare the Agreement terminated and pursue any other recourse available to the non-Bankrupt Party under this Article 11.

11.5.2 The rights and remedies under Section 11.5.1 above shall not be deemed to limit the ability of the non-Bankrupt Party to seek any other rights and remedies provided by the Contract Documents or by law, including its ability to seek relief from any automatic stays under the United States Bankruptcy Code or the right of Design-Builder to stop Work under any applicable provision of these General Conditions of Contract.

11.6 Owner's Right to Terminate for Convenience.

11.6.1 Design-Builder's performance of Work under the Agreement may be terminated by Owner in accordance with this Section 11.6 in whole or in part, without cause or whenever Owner shall determine that such termination is in the best interest of Owner. Any such termination shall be effected by delivery to Design-Builder of a Notice of Termination for Convenience, specifying the extent to which performance of Work under the Agreement is terminated, and the date upon which such termination becomes effective.

11.6.2 Design-Builder shall comply with instructions in the Notice of Termination for Convenience and, unless such notice directs otherwise:

(a) Immediately discontinue the Work on the date specified in such notice and to the extent specified in such notice;

(b) Place no further orders or Subcontracts except as may be necessary for completion or such portion of the Work as is not discontinued;

(c) Assign to Owner any Subcontract relating to the performance of Work that is discontinued that Owner elects in writing, at its sole election and without obligation, to have assigned to it, with Owner assuming, and Design-Builder being relieved of, all obligations under the Subcontract;

(d) Promptly cancel or terminate, on terms reasonably and commercially appropriate, all Subcontracts that Owner does not elect to have assigned to Owner to the extent that such Subcontracts relate to the performance of Work that is discontinued;

(e) Complete performance of such part of the Work as shall not have been terminated by the Notice of Termination for Convenience;

(f) Take such action as may be necessary, or as Owner may direct, for the protection and preservation of the property related to the Agreement which is in the possession of Design-
Builder and in which Owner has or may acquire an interest; and

(g) Deliver to Owner all Work Product produced during the period commencing on the Agreement Date to the date of the termination, which Work Product shall, for the avoidance of doubt, become the property of Owner (except for the intellectual property set forth in Section 12.3 below), to the extent that it may not have been the property of Owner before the date of termination.

Design-Builder shall proceed immediately with the performance of the above obligations notwithstanding any delay in determining or adjusting the cost, or any item of reimbursable cost, under this Section 11.6.

11.6.3 In the event of a termination for convenience, Design-Builder shall be entitled to receive only the following with respect to the terminated portion of the Project (to the extent not previously paid or subject to a good faith dispute) as its sole and exclusive remedy for such termination:

(a) Its costs performed through the date of termination in accordance with the Schedule of Values;

(b) The reasonable costs incurred by Design-Builder in the performance of its obligations under Section 11.6.2 above directly resulting directly from such termination, including all actual and reasonable demobilization costs and amounts due in settlement of terminated Subcontracts; and

(c) A fair and reasonable Overhead and Profit Markup attributable to the Work performed on the terminated portion of the Work up to the time of termination.

Design-Builder shall not be entitled to recover any overhead costs or profit on unperformed portions of the Work. In no case shall Design-Builder or any DB-Related Entity be entitled to

anticipatory or unearned profits, unabsorbed overhead, opportunity costs, or consequential or other damages as a result of a termination for convenience under this Section 11.6.

11.6.4 The obligation of Owner to pay amounts due in settlement of Subcontracts under Section 11.6.3 above shall be limited to the reasonable costs incurred by Design-Builder in settling and closing out Subcontracts that Owner does not elect to have assigned to it under Section 11.6.3 above and shall be subject to cost substantiation. Any convenience termination settlement payment under any Subcontract shall be calculated in the same manner as provided in Section
11.6.3 above with respect to the convenience termination settlement payment to Design-Builder.

11.6.5 The total sum to be paid to Design-Builder under Section 11.6.3 above shall not exceed the Total Contract Price as reduced by the amount of payments otherwise made and as further reduced by the price of Work not terminated.

Article 12
Ownership of Work Product

12.1 Ownership of Work Product

12.1.1 Owner shall own all rights, title and interest in the Work Product upon its receipt of and compensation for such Work Product. Owner's ownership rights, include without restriction or limitation, the right of Owner, and anyone contracting with Owner, to incorporate any ideas or information from the Work Product into any other contract awarded in reference to the Project. The rights conferred herein to Owner include, without limitation, Owner's ability to use the Work Product without the obligation to notify or seek permission from Design-Builder.

12.2 Use of Work Product at Owner's Risk

12.2.1 Owner's use of the Work Product on any subsequent procurement by Owner on another project shall be at Owner's sole risk, and Design-Builder neither warrants nor represents that the Work Product is suitable for use on another project without modification. Design-Builder shall have no liability for errors or omissions in any designs, documents or other Work Product that is not completed due to a termination by either party prior to final completion of Design-Builder's Work. Owner waives any rights to seek recovery from Design-Builder for any claims, damages, liabilities, losses and expenses arising out of or resulting from Owner's use of the Work Product on another project or use of incomplete Work Product.

12.3 Pre-Existing Intellectual Property

12.3.1 Owner acknowledges and agrees that in the performance of the Work hereunder Design- Builder will use Pre-Existing Intellectual Property. Design-Builder shall retain all right, title and interest in Pre-Existing Intellectual Property used or modified in the performance of the Work. Design-Builder hereby grants to Owner licenses to the Pre-Existing Intellectual Property on a non- exclusive, cost free, irrevocable, perpetual basis for use by Owner. Owner shall not license, transfer or otherwise make available Pre-Existing Intellectual Property to any third-party without the written consent of Design-Builder, which consent is hereby granted for purposes of completing, operating, maintaining or repairing the Project following the termination or completion of this Agreement. Owner's use of any such Pre-Existing Intellectual Property for purposes other than in connection with the Project shall be at its own risk and Design-Builder shall have no liability therefor.

Article 13

Electronic Data

13.1 Electronic Data.

13.1.1 The Parties recognize that Contract Documents, including drawings, specifications and three-dimensional modeling (such as Building Information Models) and other Work Product may be transmitted among Owner, Design-Builder and others in electronic media as an alternative to paper hard copies (collectively "Electronic Data").

13.2 Transmission of Electronic Data.

13.2.1 Owner and Design-Builder shall agree upon the software and the format for the transmission of Electronic Data. Each Party shall be responsible for securing the legal rights to access the agreed-upon format, including, if necessary, obtaining appropriately licensed copies of the applicable software or electronic program to display, interpret and/or generate the Electronic Data.

13.2.2 Neither Party makes any representations or warranties to the other with respect to the functionality of the software or computer program associated with the electronic transmission of Work Product. Unless specifically set forth in the Agreement, ownership of the Electronic Data does not include ownership of the software or computer program with which it is associated, transmitted, generated or interpreted.

13.2.3 By transmitting Work Product in electronic form, the transmitting Party does not transfer or assign its rights in the Work Product. The rights in the Electronic Data shall be as set forth in Article 12 above. Under no circumstances shall the transfer of ownership of Electronic Data be deemed to be a sale by the transmitting Party of tangible goods.

13.3 Electronic Data Protocol.

13.3.1 The Parties acknowledge that Electronic Data may be altered or corrupted, intentionally or otherwise, due to occurrences beyond their reasonable control or knowledge, including but not limited to compatibility issues with user software, manipulation by the recipient, errors in transcription or transmission, machine error, environmental factors, and operator error. Consequently, the Parties understand that there is some level of increased risk in the use of Electronic Data for the communication of design and construction information and, in consideration of this, agree, and shall require their independent contractors, Subcontractors and Design Consultants to agree, to the following protocols, terms and conditions set forth in this Section 13.3.

13.3.2 Electronic Data will be transmitted in the format agreed upon in Section 13.2.1 above, including file conventions and document properties, unless prior arrangements are made in advance in writing.

13.3.3 The Electronic Data represents the information at a particular point in time and is subject to change. Therefore, the Parties shall agree upon protocols for notification by the author to the recipient of any changes which may thereafter be made to the Electronic Data, which protocol shall also address the duty, if any, to update such information, data or other information contained in the electronic media if such information changes prior to Final Completion of the Project.

13.3.4 The transmitting Party specifically disclaims all warranties, expressed or implied, including, but not limited to, implied warranties of merchantability and fitness for a particular purpose, with respect to the media transmitting the Electronic Data. However, transmission of the Electronic Data via electronic means shall not invalidate or negate any duties pursuant to

the applicable standard of care with respect to the creation of the Electronic Data, unless such data is materially changed or altered after it is transmitted to the receiving Party, and the transmitting Party did not participate in such change or alteration.

Article 14
Retention and Owner's Access to Books and Records

14.1 Owner's Right to Examine, Copy and Audit.

14.1.1 Owner shall have the right to examine, copy and audit all Books and Records in connection with Work to be performed on a Cost of the Work or similar basis, including adjustments for Compensable Delays under Section 9.8.3 and disputes. In the event that Design-Builder is a joint venture, said right to examine, copy and audit shall apply collaterally and to the same extent to the Books and Records of the joint venture sponsor, and those of each individual joint venture member. No audit rights shall extend to any lump-sum amount, rates, or unit price once the parties have agreed upon such amount, rates, or price.

14.1.2 Upon written notice by Owner, Design-Builder immediately shall make available at its office at all reasonable times the Books and Records for examination, audit, or reproduction. Notice shall be in writing, delivered by hand or by certified mail, and shall provide not fewer than five (5) days' notice of the examination and/or audit. Owner may take possession of such Books and Records

by reproducing such Books and Records for off-site review or audit. When requested in Owner's written notice of examination and/or audit, Design-Builder shall provide Owner with copies of electronic and electronically stored Books and Records in a reasonably usable format that allows Owner to access and analyze all such Books and Records. For Books and Records that require proprietary software to access and analyze, Design-Builder shall provide Owner with two licenses with maintenance agreements authorizing Owner to access and analyze all such Books and Records. If Design-Builder is unable to provide the licenses, Design-Builder shall provide Owner with access to Design-Builder's project accounting system whereby Owner can obtain applicable Books and Records, including job cost reports, material distribution reports, labor cost reports, labor productivity reports, standard time/overtime analysis reports, manhour reports, and the like.

14.1.3 Owner has sole discretion as to the selection of an examiner or auditor and the scope of the examination or audit.

14.1.4 Design-Builder shall preserve all of its Books and Records, and Owner may examine, audit, or reproduce the Books and Records, from the Agreement Date until the later of three (3) years after: (a) final payment under this Contract; (b) final settlement of a termination for convenience under Section 11.6; or, in the event of litigation between the Parties, (c) the final resolution of any such litigation.

14.1.5 Failure by Design-Builder to make available to Owner its Books and Records or Design-Builder's refusal to cooperate with a notice of audit shall be deemed a material breach of the Contract and grounds for termination.

14.1.6 Design-Builder shall insert a clause containing all the provisions of this Article 14 in all Subcontracts over $10,000.

Article 15
Miscellaneous

15.1 Confidential Information.

15.1.1 Confidential Information is defined as information which is determined by the transmitting Party to be of a confidential or proprietary nature and: (a) the transmitting Party identifies as either confidential or proprietary; (b) the transmitting Party takes steps to maintain the confidential or proprietary nature of the information; and (c) the document is not otherwise available in or considered to be in the public domain, and was not available to the receiving Party prior to its disclosure on a non-confidential basis (provided that the source of the information is not known by the receiving Party to be bound by a confidentiality agreement or otherwise prohibited from transmitting such information by a contractual, legal or fiduciary duty), or was not independently developed by the receiving Party without the use of any Confidential Information by the disclosing Party. The receiving Party agrees to maintain the confidentiality of the Confidential Information and agrees to use the Confidential Information solely in connection with the Project.

15.1.2 Design-Builder may share Confidential Information with the other DB-Related Entities as appropriate for the procurement and execution of the Work.

15.1.3 The confidentiality obligations herein shall expire within three (3) years of the Final Completion Date.

15.2 Assignment.

15.2.1 Neither the Agreement nor any right, privilege, delegation, or interest thereunder may be assigned or transferred in whole or in part by Owner or Design-Builder without the prior written consent of the other Party, and any attempted assignment or transfer without such written consent shall be void, except as set forth in Section 15.3 below.

15.3 Successorship.

15.3.1 Design-Builder and Owner intend that the provisions of the Contract Documents are binding upon the Parties, their employees, agents, heirs, successors and permitted assigns.

15.4 Governing Law.

15.4.1 This Agreement and all Contract Documents shall be governed by the laws of Missouri, without giving effect to its conflict of law principles or any provision of the laws of Missouri that would void or make unenforceable any waiver, release or limitation on liability or remedies set forth in or required by this Agreement or the Contract Documents.

15.5 Severability.

15.5.1 If any provision or any part of a provision of the Contract Documents shall be finally determined to be superseded, invalid, illegal, or otherwise unenforceable pursuant to any applicable Legal Requirements, such determination shall not impair or otherwise affect the validity, legality, or enforceability of the remaining provision or parts of the provision of the Contract Documents, which shall remain in full force and effect as if the unenforceable provision or part were deleted.

15.6 Third Party Rights.

15.6.1 Except as set forth below, this Agreement is exclusively for the benefit of Owner and Design-Builder and shall not provide any third parties with any remedy, claim, liability, reimbursement, cause of action or other rights. Notwithstanding the above, it is understood and

agreed that: (a) Owner is an intended third-party beneficiary of all Subcontracts; (b) Owner Indemnitees are intended beneficiaries of the indemnification rights afforded to them under the Contract Documents; and (c) nothing shall impair the rights of any DB-Related Entity to seek recovery under Builder's Risk Insurance.

15.7 No Waiver.

15.7.1 The failure of either Design-Builder or Owner to insist, in any one or more instances, on the performance of any of the obligations required by the other under the Contract Documents shall not be construed as a waiver or relinquishment of such obligation or right with respect to future performance.

15.8 Headings.

15.8.1 The headings used in these General Conditions of Contract, or any other Contract Document, are for ease of reference only and shall not in any way be construed to limit or alter the meaning of any provision.

15.9 Amendments.

15.9.1 The Contract Documents may not be changed, altered, or amended in any way except in writing signed by a duly authorized representative of each Party.

END OF GENERAL CONDITIONS OF CONTRACT

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

Exhibit 2.2.1
Phase 1 Scope of Services

Project Number: 81000999 – Contract Number: 1751
Project Title: Blue River WWTP Grit Removal and Fine Screens Project

Exhibit 8.1
Insurance Requirements

A. Design-Builder's Insurance Coverages

Design-Builder shall obtain and maintain the following insurance coverages during the performance of the Work. Policy coverage limits may be achieved through a combination of insurance policies (e.g., primary and/or excess). Owner and all additional insureds identified in Article 5 of the General Conditions of Contract shall be included as additional insureds on a primary, non-contributory basis for the coverages set forth in Paragraphs 2, 3, 4, and 7 below.

1. **Workers' Compensation and Employer's Liability Insurance** with statutory workers' compensation (Coverage A) limits and employer's liability (Coverage B) limits of $1 million bodily injury by accident, each accident, and $1 million bodily injury by disease, each employee. Coverage will be extended, if needed, to cover any claims under the United States Longshore and Harbor Workers' Compensation Act (33 U.S.C. §§ 901-950) and the Jones Act (46 U.S.C. §30104).

2. **Commercial General Liability Insurance** including coverage for premises and operations, independent contractors, personal injury, product and completed operations, explosion, collapse and underground, and broad form contractual liability of limits of $2 million per occurrence and $4 million annual aggregate. Completed operations coverage shall continue to be carried for a period of five (5) years after the Substantial Completion Date.

3. **Automobile Liability Insurance** with a limit of $2 million combined single limit for bodily injury and property damage covering all owned (if any), non-owned, hired, or borrowed vehicles on site or off.

4. **Builder's Risk Insurance** on an "all risks" completed value basis, including permanent and temporary works, site preparation, and foundations. Covered causes of loss shall include, but not be limited to, fire, explosion, collapse, earth movement (including subsidence, sinkhole and collapse), flood, windstorm, theft, collapse, terrorism and vandalism. The Builder's Risk insurance must be project-specific and will cover Owner, Design-Builder and all DB-Related Entities during construction of the Work through the Acceptance Date, with a limit equal to the full value of the Contract Price. Further, the policy shall include extensions of coverage with minimum sub-limits as follows: (a) $10 million for off-site storage and transit; (b) 20% for debris removal and demolition; and (c) $5 million for increased costs of construction, expediting expenses, soft costs (including $2 million for Owner's continuing project administration expenses), professional fees and loss adjustment expenses. The policy also will include replacement cost coverage for the Work, including any buildings, structures, materials, supplies, equipment, machinery, and fixtures that will become a part of the Project. Coverage will include, but not be limited to, the following (provided that commercially reasonably sub-limits will be accepted where typical): right to partial occupancy; London Engineering Group (LEG) 2 type or equivalent coverage for damages resulting from Design-Builder's design error, faulty workmanship, and/or faulty materials, testing, and change in ordinance or law.

Builder's Risk Insurance must be in place before the commencement of construction activities and through the Acceptance Date. Design-Builder shall submit to Owner on or before the Agreement Date: (a) a letter of certification from Design-Builder or Design-Builder's insurance broker confirming that Builder's Risk Insurance compliant with the requirements contained herein will be placed prior to the commencement of construction of the Work; and (b) a specimen Builder's Risk Insurance policy, including all attachments and sub-limits. Upon placement, Design-Builder shall submit a copy of the full Builder's Risk Insurance policy, including all attachments and sub-limits.

5. **Contractor's Equipment** to include "all-risk" insurance covering all risk of physical damage to equipment to be used at the Site by Design-Builder, whether leased, rented, borrowed, or used at the Site, unless covered under the Builder's Risk Insurance policy described above. Such coverage shall have limits equal to the replacement cost of such equipment unless Owner approves lower limits.

6. **Contractor's Pollution Liability Insurance** includes coverage for bodily injury, property damage, cleanup/remediation costs or other amounts which Design-Builder is legally obligated to pay arising out of the Work. Such insurance will have limits of $5 million any one claim and in the aggregate and will remain in full force and effect for the period of the Work and a five (5)-year extended reporting period after the Acceptance Date.

7. **Professional Liability Insurance** covering Design-Builder's negligent acts, errors, or omissions caused by the Work, for $4 million any one claim and in the aggregate. This insurance may be on a "claims-made" basis and, if so, shall have an extended reporting or discovery "tail" period, or be renewed for a period, of 5 years after the Substantial Completion. It shall also have a retroactive date effective before the commencement of any design, and shall not include any exclusionary language relating to joint ventures or partnerships or both.

8. **Cyber Liability Insurance**, if applicable, with limits not less than $2,000,000 per occurrence or claim, $2,000,000 aggregate. Coverage shall be sufficiently broad to respond to the duties and obligations as is undertaken by Design Professional in this agreement and shall include, but not be limited to, claims involving security breach, system failure, data recovery, business interruption, cyber extortion, social engineering, infringement of intellectual property, including but not limited to infringement of copyright, trademark, trade dress, invasion of privacy violations, information theft, damage to or destruction of electronic information, release of private information, and alteration of electronic information. The policy shall provide coverage for breach response costs, regulatory fines and penalties as well as credit monitoring expenses.

B. Insurance to be Maintained by Design Consultants and Subcontractors

Design-Builder will cause all of its Design Consultants and Subcontractors to obtain and maintain the following insurance coverages or be responsible for maintaining such coverages on behalf of each party. Owner and all additional insureds identified in Article 5 of the General Conditions of Contract shall be included as additional insureds on a primary, non-contributory basis for the coverages set forth in Paragraphs 2, 3 and 4 below.

1. **Workers' Compensation and Employer's Liability Insurance** with statutory workers' compensation (Coverage A) limits and employer's liability (Coverage B) limits

of $500,000 bodily injury by accident, each accident, and $500,000 bodily injury by disease, each employee. Coverage will be extended, if needed, to cover any claims under the United States Longshore and Harbor Workers' Compensation Act (33 U.S.C. §§ 901-950) and the Jones Act (46 U.S.C. § 30104).

2. **Commercial General Liability Insurance** including coverage for premises and operations, independent contractors, personal injury, product and completed operations, explosion, collapse and underground, and contractual liability. Limits for Design Consultants and Subcontractors with contracts valued at less than or equal to $1 million shall be $1 million per occurrence and $1 million in the aggregate annually. For those Design Consultants and Subcontractors with contracts valued at greater than $1 million, such coverage shall have limits of $1 million per occurrence and $2 million in the aggregate annually.

3. **Automobile Liability Insurance** with a limit of $1 million combined single limit for bodily injury and property damage covering all owned (if any), non-owned, hired, or borrowed vehicles on site or off. Should Design-Builder implement a CCIP, all Design Consultants and Subcontractors shall nevertheless comply with this requirement.

4. **Umbrella/Excess Liability Insurance** in excess of the underlying limits noted above for employer's liability, commercial general liability, and automobile liability in the amount of $1 million per occurrence and in the aggregate. For contracts valued at more than $1 million, coverage shall be in the amount of $4 million per occurrence and in the aggregate.

Should Design-Builder implement a contractor-controlled insurance program (CCIP) providing compliant insurance for all participants with regard to on-site activities, all Construction Subcontractors enrolled in the CCIP shall still be responsible for procuring and maintaining automobile liability insurance and the other insurance coverages noted above with regard to off- site work. Owner and all additional insureds identified in Article 5 of the General Conditions of Contract shall be included as additional insureds on a primary, non-contributory basis for the applicable insurance coverages set forth in Paragraphs 2, 3 and 4 above.

STATE OF MISSOURI

Denny Hoskins
Secretary of State

CORPORATION DIVISION
CERTIFICATE OF GOOD STANDING

I, DENNY HOSKINS, Secretary of State of the State of Missouri, do hereby certify that the records in my office and in my care and custody reveal that

GOODWIN BROS. CONSTRUCTION CO.
00127101

was created under the laws of this State on the 22nd day of December, 1967, and is in good standing, having fully complied with all requirements of this office.

IN TESTIMONY WHEREOF, I hereunto set my hand and cause to be affixed the GREAT SEAL of the State of Missouri. Done at the City of Jefferson, this 13th day of February, 2025.

Denny Hoskins
Secretary of State

Certification Number: CERT-02132025-0016

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

CONTRACT REQUIRED SUBMISSIONS

Project/Contract Number_____

Project/Contract Title/Description_____

These instructions are to assist Contractor in providing all necessary documents to enter into a contract with the City.

MISSOURI SECRETARY OF STATE BUSINESS ENTITY REGISTRATION

- ☐ For a corporation, current Certificate of Good Standing from the Missouri Secretary of State ((816) 889-2925 or (816) 889-2926 or a web site print-out, dated no more than ninety (90) days before the date furnished to the City – One Copy.
- ☐ For a business that is not a corporation and not doing business in the exact name of the proprietor, a copy from the Secretary of State, ((816) 889-2925 or (816) 889-2926 of the filed Registration of Fictitious Name dated no more than ninety (90) days before the date furnished to the City – One Copy.

EMPLOYEE ELIGIBILITY VERIFICATION AFFIDAVIT [Required if the contract exceeds $5,000.00]

- ☐ 00515.01 Employee Eligibility Verification Affidavit – One Executed Affidavit
- ☐ First and last pages of the E-Verify Program Memorandum of Understanding that your company has received from the U.S. Department of Homeland Security verifying enrollment in the program. For assistance, contact E-Verify Operations at 888-464-4218 – One Copy.

SUBCONTRACTORS LISTING [Applicable form provided]

- ☐ Non-Construction Subcontractors List – One Copy
- ☐ 01290.09 Subcontractors & Major Material Suppliers List – One Copy

PAYMENT BONDS (If applicable)

- ☐ Each copy of the Payment bond must be signed and properly dated by the following, as applicable:

  Corporation - A corporate officer authorized to sign on behalf of the corporation and the signature must be attested by a witness to the signature; OR

  Limited Liability Company - A member of the limited liability company authorized to sign on behalf of the company and a witness to the signature must attest the signature; OR

  Partnership - A partner authorized to sign on behalf of the partnership and the signature must be attested by a witness to the signature; OR

  Sole Proprietor - By the proprietor and the signature must be attested by a witness to the signature; OR

  Joint Venture - The parties to the Joint Venture authorized to sign on behalf of each party to the Joint Venture, or a person authorized by each party to the Joint Venture to sign on behalf of all parties to the Joint Venture; AND

  Surety - A person authorized by the Surety to sign on behalf of the Surety. A power of attorney issued by the Surety Company authorizing its representative to sign the Agreement must be attached to the Agreement and each copy.

PERFORMANCE AND MAINTENANCE BOND (If applicable)

☐ As applicable, each copy of the Performance and Maintenance bond must be signed and properly dated by:

Corporation - A corporate officer authorized to sign on behalf of the corporation and the signature must be attested by a witness to the signature; OR

Limited Liability Company - A member of the limited liability company authorized to sign on behalf of the company and a witness to the signature must attest the signature; OR

Partnership - A partner authorized to sign on behalf of the partnership and the signature must be attested by a witness to the signature; OR

Sole Proprietor - By the proprietor and the signature must be attested by a witness to the signature; OR

Joint Venture - The parties to the Joint Venture authorized to sign on behalf of each party to the Joint Venture, or a person authorized by each party to the Joint Venture to sign on behalf of all parties to the Joint Venture; AND

Surety - A person authorized by the Surety to sign on behalf of the Surety. A power of attorney issued by the Surety Company authorizing its representative to sign the Agreement must be attached to the Agreement and each copy.

CERTIFICATES OF INSURANCE [Sample form provided] - If you have any questions regarding requirements for insurance certificates, please contact the City's Risk Management Office, 816 513-1299.

☐ Provide a certificate of insurance for all insurance that may be required in the contract such as:

Commercial General Liability
Workers' Compensation and Employers' Liability
Commercial Automobile Liability
Railroad Protective Liability
Environmental Liability
Asbestos Liability
Longshoremen's Insurance
Property Insurance

☐ List the NAIC Number (National Association of Insurance Commissioners) or A.M. Best Number for each Insurer listed on the Certificate of Insurance.

☐ Certificate "Kansas City, Missouri" must named as an Additional Insured.

☐ Check the insurance requirements of the Contract. If Contract Documents require that other entities be included as additional insureds, each entity shall be listed on the certificate(s).

☐ Description of Operations must include Project/Contract Number and Project/Contract Title/Description as contained in the Contract Documents. The Certificate Holder and address block shall be completed as follows:

Kansas City, Missouri
[Name of applicable City Department]
[Name of Contract Administrator, Buyer, or Project Manager]
[Department Address]
Kansas City, Missouri **[Zip Code]**

☐ If your insurance agent prepares an ACORD form, the automobile insurance must be "any auto" or better for acceptance by the City.

AFFIRMATIVE ACTION REQUIREMENTS

☐ Proposed Affirmative Action Program or a copy of a Certificate of Affirmative Action Compliance – One copy.

PRE-CONTRACT BIDDER'S CERTIFICATION (Prevailing Wage Contracts; Form provided)

☐ Submit form 00490 - Bidder's Pre-Contract Certification (provided).

HEALTH AND SAFETY PLAN (If applicable)

☐ Bidder's Health and Safety Plan – One copy or one CD Rom.

EMPLOYEE ELIGIBILITY VERIFICATION AFFIDAVIT

(Required for any contract with the City of Kansas City, Missouri in excess of $5,000.00)

STATE OF Missouri)
) ss
COUNTY OF Platte)

On this 11th day of December, 2024, before me appeared Doug Wachsnicht, personally known by me or otherwise proven to be the person whose name is subscribed on this affidavit and who, being duly sworn, stated as follows:

I am of sound mind, capable of making this affidavit, and personally swear or affirm that the statements made herein are truthful to the best of my knowledge. I am the Vice President (title) of Goodwin Bros Construction Co (business entity) and I am duly authorized, directed or empowered to act with full authority on behalf of the business entity in making this affidavit.

I hereby swear or affirm that the business entity does not knowingly employ any person in connection with the contracted services who does not have the legal right or authorization under federal law to work in the United States as defined in 8 U.S.C. § 1324a(h)(3).

I hereby additionally swear or affirm that the business entity is enrolled in an electronic verification of work program operated by the United States Department of Homeland Security (E-Verify) or an equivalent federal work authorization program operated by the United States Department of Homeland Security to verify information of newly hired employees, under the Immigration Reform and Control Act of 1986, and that the business entity will participate in said program with respect to any person hired by the business entity to perform any work in connection with the contracted services. I have attached hereto documentation sufficient to establish the business entity's enrollment and participation in the required electronic verification of work program.

I am aware and recognize that unless certain contractual requirements are satisfied and affidavits obtained as provided in Section 285.530, RSMo, the business entity may face liability for violations committed by its subcontractors, notwithstanding the fact that the business entity may itself be compliant.

I acknowledge that I am signing this affidavit as the free act and deed of the business entity and that I am not doing so under duress.

Affiant's signature

Subscribed and sworn to before me this _ 11th_ day of ____December_____, 20_24 _.

Notary Public

My Commission expires: April 16, 2027

SARA C BUCKLER
Notary Public - Notary Seal
Platte County - State of Missouri
Commission Number 02395426
My Commission Expires Apr 16, 2027

E-Verify

Company ID Number: 187574

THE E-VERIFY MEMORANDUM OF UNDERSTANDING FOR EMPLOYERS

ARTICLE I
PURPOSE AND AUTHORITY

The parties to this agreement are the Department of Homeland Security (DHS) and the GOODWIN BROS. CONSTRUCTION CO. (Employer). The purpose of this agreement is to set forth terms and conditions which the Employer will follow while participating in E-Verify.

E-Verify is a program that electronically confirms an employee's eligibility to work in the United States after completion of Form I-9, Employment Eligibility Verification (Form I-9). This Memorandum of Understanding (MOU) explains certain features of the E-Verify program and describes specific responsibilities of the Employer, the Social Security Administration (SSA), and DHS.

Authority for the E-Verify program is found in Title IV, Subtitle A, of the Illegal Immigration Reform and Immigrant Responsibility Act of 1996 (IIRIRA), Pub. L. 104-208, 110 Stat. 3009, as amended (8 U.S.C. § 1324a note). The Federal Acquisition Regulation (FAR) Subpart 22.18, "Employment Eligibility Verification" and Executive Order 12989, as amended, provide authority for Federal contractors and subcontractors (Federal contractor) to use E-Verify to verify the employment eligibility of certain employees working on Federal contracts.

ARTICLE II
RESPONSIBILITIES

A. RESPONSIBILITIES OF THE EMPLOYER

1. The Employer agrees to display the following notices supplied by DHS in a prominent place that is clearly visible to prospective employees and all employees who are to be verified through the system:

   a. Notice of E-Verify Participation

   b. Notice of Right to Work

2. The Employer agrees to provide to the SSA and DHS the names, titles, addresses, and telephone numbers of the Employer representatives to be contacted about E-Verify. The Employer also agrees to keep such information current by providing updated information to SSA and DHS whenever the representatives' contact information changes.

3. The Employer agrees to grant E-Verify access only to current employees who need E-Verify access. Employers must promptly terminate an employee's E-Verify access if the employer is separated from the company or no longer needs access to E-Verify.

E-Verify

Company ID Number: 187574

Approved by:

Employer GOODWIN BROS. CONSTRUCTION CO.	
Name (Please Type or Print) NEHLEY B GOODWIN	Title Vice President
Signature Electronically Signed	Date 02/04/2009
Department of Homeland Security – Verification Division	
Name (Please Type or Print) USCIS Verification Division	Title
Signature Electronically Signed	Date 02/04/2009

E-Verify

Company ID Number: 187574

Information Required for the E-Verify Program	
Information relating to your Company:	
Company Name	GOODWIN BROS. CONSTRUCTION CO.
Company Facility Address	4885 BAUMGARTNER RD ST LOUIS, MO 63129
Company Alternate Address	4885 BAUMGARTNER RD ST LOUIS, MO 63129
County or Parish	SAINT LOUIS
Employer Identification Number	430899611
North American Industry Classification Systems Code	237
Parent Company	
Number of Employees	100 to 499
Number of Sites Verified for	1

Reset Form | Print Form

Form **5060**

Missouri Department of Revenue
Project Exemption Certificate

This form is to be completed and given to your contractor.

Exempt Entity and Project Information

Name of Exempt Entity Issuing the Certificate			Missouri Tax Exemption Number
Address	City	State	ZIP Code
E-mail Address			
Project Number	Project Begin Date (MM/DD/YYYY) __ __/__ __/__ __ __ __		Estimated Project End Date (MM/DD/YYYY) __ __/__ __/__ __ __ __
Description of Project			
Project Location			Certificate Expiration Date (MM/DD/YYYY) __ __/__ __/__ __ __ __

Provide a signed copy of this certificate, along with a copy of the exempt entity's Missouri Sales and Use Tax Exemption Letter to each contractor or subcontractor who will be purchasing tangible personal property for use in this project. It is the responsibility of the exempt entity to ensure the validity of the information on the certificate. The exempt entity must issue a new certificate if any of the information changes.

Signature of Authorized Exempt Entity	Printed Name of Authorized Exempt Entity	Date (MM/DD/YYYY) __ __/__ __/__ __ __ __

Contractor

The Missouri exempt entity named above hereby authorizes the purchase, without sales tax, of tangible personal property to be incorporated or consumed in the construction project identified herein and no other, pursuant to **Section 144.062, RSMo**. Under penalties of perjury, I declare that the above information and any attached supplement is true, complete, and correct.

Name of Purchasing Contractor	Signature of Contractor	Date (MM/DD/YYYY) __ __/__ __/__ __ __ __
Address	City	State / ZIP Code

Subcontractor

Contractors - Present this to your supplier in order to purchase the necessary materials tax exempt. Complete the Subcontractor portion if extending the certificate to your subcontractor. The contractor must sign the form in the space provided below.

Name of Purchasing Subcontractor			
Address	City	State	ZIP Code
Signature of Contractor	Contractor's Printed Name	Date (MM/DD/YYYY) __ __/__ __/__ __ __ __	

Form 5060 (Revised 08-2015)

Taxation Division
P.O Box 358
Jefferson City, MO 65105-0358

Phone: (573) 751-2836
Fax: (573) 522-1271
E-mail: salestaxexemptions@dor.mo.gov

Visit **http://dor.mo.gov/business/sales/sales-use-exemptions.php** for additional information.

State of Missouri

EXEMPTION FROM MISSOURI SALES AND USE TAX ON PURCHASES

Issued to:

CITY OF KANSAS CITY
414 E 12TH ST 3RD FLOOR
KANSAS CITY MO 64106

Missouri Tax ID Number: 12490466

Effective Date: 07/11/2002

Your application for sales/use tax exempt status has been approved pursuant to Section 144.030.1, RSMo. This letter is issued as documentation of your exempt status.

Purchases by your Agency are not subject to sales or use tax if within the conduct of your Agency's exempt functions and activities. When purchasing with this exemption, furnish all sellers or vendors a copy of this letter. This exemption may not be used by individuals making personal purchases.

A contractor may purchase and pay for construction materials exempt from sales tax when fulfilling a contract with your Agency only if your Agency issues a project exemption certificate and the contractor makes purchases in compliance with the provisions of Section 144.062, RSMo.

Sales by your Agency are subject to all applicable state and local sales taxes. If you engage in the business of selling tangible personal property or taxable services at retail, you must obtain a Missouri Retail Sales Tax License and collect and remit sales tax.

This is a continuing exemption subject to legislative changes and review by the Director of Revenue. If your Agency ceases to qualify as an exempt entity, this exemption will cease to be valid. This exemption is not assignable or transferable. It is an exemption from sales and use taxes only and is not an exemption from real or personal property tax.

Any alteration to this exemption letter renders it invalid.

If you have any questions regarding the use of this letter, please contact the Division of Taxation and Collection, P.O. Box 3300, Jefferson City, MO 65105-3300, phone 573-751-2836.

(DTC030)

CITY OF FOUNTA
HEART OF THE NAT

Bond Number: 39S226617

PERFORMANCE AND MAINTENANCE BOND

Project Number 81000999/1751
Project Title
Blue River WWTP Grit Removal and Fine Screens

KNOW ALL MEN BY THESE PRESENTS: That Goodwin Bros Construction Co, as PRINCIPAL (CONTRACTOR), and Liberty Mutual Insurance Company, (SURETY), licensed to do business as such in the State of Missouri, hereby bind themselves and their respective heirs, executors, administrators, successors, and assigns unto Kansas City, Missouri, a constitutionally chartered municipal corporation, (OWNER), as obligee, in the penal sum of Twelve Million Seven Hundred Twenty Two Thousand Five Hundred Thirty Six Dollars Dollars ($ 12,722,536.00) for the payment whereof CONTRACTOR and SURETY bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS,

CONTRACTOR has entered into a Contract with OWNER for Blue River WWTP Grit Removal and Fine Screens which Contract, including any present or future amendment thereto, is incorporated herein by reference and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if CONTRACTOR shall promptly and faithfully perform said Contract including all duly authorized changes thereto, and including any maintenance requirements contained therein, according to all the terms thereof, including those under which CONTRACTOR agrees to pay legally required wage rates including the prevailing hourly rate of wages in the locality, as determined by the Department of Labor and Industrial Relations or by final judicial determination, for each craft or type of workman required to execute the Contract and, further, shall defend, indemnify, and hold harmless OWNER from all damages, including but not limited to, liquidated damages, loss and expense occasioned by any failure whatsoever of said CONTRACTOR and SURETY to fully comply with and carry out each and every requirement of the Contract, then this obligation shall be void; otherwise, it shall remain in full force and effect.

WAIVER. That SURETY, for value received, hereby expressly agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the Work to be performed thereunder, shall in any way affect the obligations of this Bond; and it does hereby waive notice of any such change, extension of time, or alteration or addition to the terms of the Contract or the Work to be performed thereunder.

IN WITNESS WHEREOF, the above parties have executed this instrument the 11th day of February, 2025.

CONTRACTOR
Name, address and facsimile number of Contractor
Goodwin Bros Construction Co
4885 Baumgartner Road, St Louis, MO 63129
636-931-6085

I hereby certify that I have authority to execute this document on behalf of Contractor.

By: _____
Title: Vice President

(Attach corporate seal if applicable)

SURETY

Name, address and facsimile number of Surety:

Liberty Mutual Insurance Company

175 Berkeley Street, Boston, MA 02116

866-548-4962

I hereby certify that (1) I have authority to execute this document on behalf of Surety; (2) Surety has an A.M. Best rating of A-, V, or better; (3) Surety is named in the current list of "Companies Holding Certificates of Authority as Acceptable Reinsuring Companies: as published in Circular 570 (most current revision) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury; and (4) Surety is duly licensed to issue bonds in the State of Missouri and in the jurisdiction in which the Project is located.

By:

Title: Erin Wrather, Attorney In Fact

Date: 2/12/2025

(Attach seal and Power of Attorney)

Bond Number: 39S226617

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

PAYMENT BOND

Project Number: 81000999/1751

Project Title: Blue River WWTP Grit Removal and Fine Screens

KNOW ALL MEN BY THESE PRESENTS: That Goodwin Bros Construction Co, as PRINCIPAL (CONTRACTOR), and Liberty Mutual Insurance Company, (SURETY), licensed to do business as such in the State of Missouri, hereby bind themselves and their respective heirs, executors, administrators, successors, and assigns unto Kansas City, Missouri, a constitutionally chartered municipal corporation, (OWNER), as obligee, in the penal sum of Twelve Million Seven Hundred Twenty Two Thousand Five Hundred Thirty Six Dollars Dollars ($12,722,536.00) for the payment whereof CONTRACTOR and SURETY bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS,

CONTRACTOR has entered into a contract with OWNER for Blue River WWTP Grit Removal and Fine Screens, which Contract, including any present or future amendment thereto, is incorporated herein by reference and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if in connection with the Contract, including all duly authorized modifications thereto, prompt payment shall be made to all laborers, subcontractors, teamsters, truck drivers, owners or other suppliers or for equipment employed on the job, and other claimants, for all labor performed in such work whether done for CONTRACTOR, a subcontractor, SURETY, a completion contractor or otherwise (at the full wage rates required by any law of the United States or of the State of Missouri, where applicable), for services furnished and consumed, for repairs on machinery, for equipment, tools, materials, lubricants, oil, gasoline, water, gas, power, light, heat, oil, telephone service, grain, hay, feed, coal, coke, groceries and foodstuffs, either consumed, rented, used or reasonably required for use in connection with the construction of the work or in the performance of the Contract and all insurance premiums, both for compensation and for all other kinds of insurance on the work, for sales taxes and for royalties in connection with, or incidental to, the completion of the Contract, in all instances whether the claim be directly against CONTRACTOR, against SURETY or its completion contractor, through a subcontractor or otherwise, and, further, if CONTRACTOR shall defend, indemnify and hold harmless OWNER from all such claims, demands or suits by any such person or entity, then this obligation shall be void; otherwise, it shall remain in full force and effect.

Any conditions legally required to be included in a Payment Bond on this Contract, including but not limited to those set out in §107.170 RSMo.are included herein by reference.

SURETY agrees that, in the event that CONTRACTOR fails to make payment of the obligations covered by this Bond, it will do so and, further, that within forty-five (45) days of receiving, at the address given below, a claim hereunder stating the amount claimed and the basis for the claim in reasonable detail, it (a) will send an answer to the claimant, with a copy to OWNER stating the amounts that are undisputed and the basis for challenging any amounts that are disputed, and (b) will pay any amounts that are undisputed. The amount of this Bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder.

While this Bond is in force, it may be sued on at the instance of any party to whom any such payment is due, in the name of OWNER to the use for such party. OWNER shall not be liable for the payment of any costs or expenses of any such suit.

No suit shall be commenced or pursued hereunder other than in a state court of competent jurisdiction in Jackson, Clay or Platte County, Missouri, or in the United States District Court for the Western District of Missouri.

WAIVER. That SURETY, for value received, hereby expressly agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the Work to be performed thereunder, shall in any way affect the obligations of this Bond; and it does hereby waive notice of any such change, extension of time, or alteration or addition to the terms of the Contract or the Work to be performed thereunder.

IN WITNESS WHEREOF, the above parties have executed this instrument the 11th day of February, 2025.

CONTRACTOR
Name, address and facsimile number of Contractor
Goodwin Bros Construction Co
4885 Baumgartner Road, St Louis, MO 63129
636-931-6085

I hereby certify that I have authority to execute this document on behalf of Contractor.

By: _____
Title: Vice President

(Attach corporate seal if applicable)

SURETY
Name, address and facsimile number of Surety:
Liberty Mutual Insurance Company
175 Berkeley Street, Boston, MA 02116
866-548-4962

I hereby certify that (1) I have authority to execute this document on behalf of Surety; (2) Surety has an A.M. Best rating of A-. or better; (3) Surety is named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (most current revision) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury; and(4) Surety is duly licensed to issue bonds in the State of Missouri and in the jurisdiction in which the Project is located.

By: _____
Title: Erin Wrather, Attorney in Fact
Date: 2/12/2025

(Attach seal and Power of Attorney)

Liberty Mutual SURETY

This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

Liberty Mutual Insurance Company
The Ohio Casualty Insurance Company
West American Insurance Company

Certificate No: **8204711 - 983132**

POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS: That The Ohio Casualty Insurance Company is a corporation duly organized under the laws of the State of New Hampshire, that Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, and West American Insurance Company is a corporation duly organized under the laws of the State of Indiana (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Barbara M. Flieg, Bethany Chappell, Gregory T. Lottes, Kacey R. Gegg, R. Lee Lottes, Vickie L. Winkler, Elise M. Hattenhauer, Melissa Elder, Erin Wrather, all of the city of Ste. Genevieve, state of MO and Jason S. Spore, Thomas O. Spore, Gary T. Cooper Jr., Matthew B. Hodge, Kathy Hoffard, Abigail A. Pierce

all of the city of St. Louis state of MO each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 8th day of January, 2021.

Liberty Mutual Insurance Company
The Ohio Casualty Insurance Company
West American Insurance Company

By: _____
David M. Carey, Assistant Secretary

State of PENNSYLVANIA
County of MONTGOMERY ss

On this 8th day of January, 2021 before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of Liberty Mutual Insurance Company, The Ohio Casualty Company, and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at King of Prussia, Pennsylvania, on the day and year first above written.

COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Teresa Pastella, Notary Public
Upper Merion Twp., Montgomery County
My Commission Expires March 28, 2021
Member, Pennsylvania Association of Notaries

By: _____
Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-laws and Authorizations of The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company which resolutions are now in full force and effect reading as follows:

ARTICLE IV – OFFICERS: Section 12. Power of Attorney.
Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and execution of any such instruments and to attach thereto the seal of the Corporation. When so executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

ARTICLE XIII – Execution of Contracts: Section 5. Surety Bonds and Undertakings.
Any officer of the Company authorized for that purpose in writing by the chairman or the president, and subject to such limitations as the chairman or the president may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Company by their signature and execution of any such instruments and to attach thereto the seal of the Company. When so executed such instruments shall be as binding as if signed by the president and attested by the secretary.

Certificate of Designation – The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

Authorization – By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Renee C. Llewellyn, the undersigned, Assistant Secretary, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 11th day of February, 2025.

By: _____
Renee C. Llewellyn, Assistant Secretary

Not valid for mortgage, loan, letter of credit, currency rate, interest rate or residual value guarantees.

For bond and/or Power of Attorney (POA) verification inquiries, please call 610-832-8240 or email HOSUR@libertymutual.com.



GOODWIN-01 JANTHONY

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY) 2/12/2025

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME: Jennifer Anthony
JD Kutter Charles L. Crane Agency Co. 400 Chesterfield Center, Suite 100 Chesterfield, MO 63017	PHONE (A/C, No, Ext): (314) 444-4843 FAX (A/C, No): (314) 444-4970 E-MAIL ADDRESS: jennifer@jdkutter.com

INSURED	INSURER(S) AFFORDING COVERAGE		NAIC #
Goodwin Brothers Construction Co. 4885 Baumgartner Road St. Louis, MO 63129	INSURER A : Hartford Fire Insurance Co.	A+	19682
	INSURER B : Company To Be Determined		NONE
	INSURER C : Hartford Underwriters Ins Co.	A+	30104
	INSURER D : Indian Harbor Insurance Co.	A+	36940
	INSURER E :		
	INSURER F :		

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X COMMERCIAL GENERAL LIABILITY [ ] CLAIMS-MADE [X] OCCUR X CONTRACTUAL LIABILIT X $0 LIABILITY DEDUCT GEN'L AGGREGATE LIMIT APPLIES PER: [ ] POLICY [X] PRO-JECT [X] LOC X OTHER: MAX $10MIL AGGREGATE			84UENOE0326	4/1/2024	4/1/2025	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$ 1,000,000 $ 300,000 $ 10,000 $ 1,000,000 $ 2,000,000 $ 2,000,000
	AUTOMOBILE LIABILITY X ANY AUTO [ ] OWNED AUTOS ONLY [ ] SCHEDULED AUTOS X HIRED AUTOS ONLY [X] NON-OWNED AUTOS ONLY X $0 LIABILITY DEDUCT			84UENOE0327	4/1/2024	4/1/2025	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	$ 1,000,000 $ $ $
B	[ ] UMBRELLA LIAB [X] OCCUR X EXCESS LIAB [ ] CLAIMS-MADE [ ] DED [X] RETENTION $ 0			VARIOUS*	4/1/2024	4/1/2025	EACH OCCURRENCE AGGREGATE	$ 27,000,000 $ 27,000,000
C	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) Y/N [N] N/A If yes, describe under DESCRIPTION OF OPERATIONS below			84WEOE0B29	4/1/2024	4/1/2025	X PER STATUTE [ ] OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	$ 1,000,000 $ 1,000,000 $ 1,000,000
D	POLLUTION LIABILITY			CEO744696308	7/1/2024	7/1/2025	PER OCCURRENCE LIMIT	5,000,000
D	PROFESSIONAL LIAB			CEO744696308	7/1/2024	7/1/2025	PER CLAIM LIMIT	5,000,000

SURETY VERIFIED BY Delois Moore 2/26/25

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

*EXCESS LIABILITY - EFFECTIVE 4/1/2024 - 4/1/2025 CARRIERS:
$ 5,000,000 - COLUMBIA CASUALTY #7091876314
$ 5,000,000 - FAIR AMERICAN SELECT #CSX8000484
$ 5,000,000 - GREAT AMERICAN #EXC5608897
$12,000,000 - WESTFIELD SPECIALTY #XSL404644G-00

SEE ATTACHED ACORD 101

CERTIFICATE HOLDER

City of Kansas City, Missouri
Water Services Department
414 East 12th Street, Room 102W
Kansas City, MO 64106

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

© 1988-2015 ACORD CORPORATION. All rights reserved.
The ACORD name and logo are registered marks of ACORD

AGENCY CUSTOMER ID: GOODWIN-01 JANTHONY

LOC #: 1

ADDITIONAL REMARKS SCHEDULE

AGENCY		NAMED INSURED
JD Kutter		Goodwin Brothers Construction Co. 4885 Baumgartner Road St. Louis, MO 63129
POLICY NUMBER		
SEE PAGE 1		
CARRIER	NAIC CODE	EFFECTIVE DATE: SEE PAGE 1
SEE PAGE 1	SEE P 1	

ADDITIONAL REMARKS

THIS ADDITIONAL REMARKS FORM IS A SCHEDULE TO ACORD FORM,

FORM NUMBER: ACORD 25 FORM TITLE: Certificate of Liability Insurance

Description of Operations/Locations/Vehicles:

POLLUTION:	PROFESSIONAL:
$25,000 RETENTION	$100,000 RETENTION

Project No. 81000999/1751 – Blue River WWTP Grit Removal and Fine Screens

City of Kansas City, Missouri and Design Professional and any other entities required are included as additional insureds as required by written contract on the General Liability policy, Auto Liability policy, Pollution Liability policy and Excess/Umbrella Liability policy with respect to work performed by the named insured. Such coverage is primary and non-contributory.

Excess/Umbrella Liability follows form over the terms, conditions & exclusions of the underlying policies (General Liability, Automobile Liability, Employers Liability).

Waiver of subrogation is applicable where permitted by law.

© 2008 ACORD CORPORATION. All rights reserved.
The ACORD name and logo are registered marks of ACORD

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 2/13/2025

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Lakenan 890 Rozier Street Ste. Genevieve MO 63670	CONTACT NAME: PHONE (A/C, No, Ext): 573-883-7446 FAX (A/C, No): 573-883-3981 E-MAIL ADDRESS: COI@lakenan.com
INSURED GOODW-1 Goodwin Bros Construction Co 4855 Baumgartner St Louis MO 63129	INSURER(S) AFFORDING COVERAGE — NAIC # INSURER A : American Alternative Insurance Corporation A+ — 19720 INSURER B : TRAVELERS INSURANCE COMPANY A++ — 19038 INSURER C : INSURER D : INSURER E : INSURER F :

COVERAGES **CERTIFICATE NUMBER:** 2139796483 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
	COMMERCIAL GENERAL LIABILITY ☐ CLAIMS-MADE ☐ OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: ☐ POLICY ☐ PRO-JECT ☐ LOC OTHER:			SURETY VERIFIED BY Debbie Moore 2/26/25			EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$ $ $ $ $ $
	AUTOMOBILE LIABILITY ☐ ANY AUTO ☐ OWNED AUTOS ONLY ☐ SCHEDULED AUTOS ☐ HIRED AUTOS ONLY ☐ NON-OWNED AUTOS ONLY						COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	$ $ $ $
	☐ UMBRELLA LIAB ☐ OCCUR ☐ EXCESS LIAB ☐ CLAIMS-MADE ☐ DED ☐ RETENTION $						EACH OCCURRENCE AGGREGATE	$ $
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANYPROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) Y/N ☐ N/A If yes, describe under DESCRIPTION OF OPERATIONS below						☐ PER STATUTE ☐ OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	$ $ $
B A	Inland Marine Aviation Policy			QT6308N34324ATIL24 9021115	7/1/2024 12/23/2024	4/1/2025 4/1/2025	Leased/Rented Liability Limit	1,000,000 10,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

Project/Contract No. 81000999/1751 – Blue River WWTP Grit Removal and Fine Screens

Cyber Liability Eff: 7/1/24 – 4/1/25 $2,000,000 Limit – Cowbell Cyber DBA Cowbell Insurance Pol#OBD-CB-SSZGNGEIU-003

CERTIFICATE HOLDER

City of Kansas City, Missouri
Procurement Division/KC Water
4800 E. 63rd Street
Kansas City MO 64130

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

© 1988-2015 ACORD CORPORATION. All rights reserved.

The ACORD name and logo are registered marks of ACORD

AUTHORIZATION TO RELEASE
A
REVENUE CLEARANCE LETTER

Revenue Division
414 East 12th Street, 2nd floor, Room 202 W
Kansas City, MO 64106 Phone (816) 513-1135 Fax (816) 513-1077 email: revenue@kcmo.org

I authorize the City of Kansas City, Missouri, Finance Department, Revenue Division, to release a Revenue Clearance Letter for:

Name of Taxpayer: _____ Tax I.D.# _____
(PRINT)

Address: _____

Check this box and the City will send the Clearance Letter to you or the contractor designated.

☐ **I authorize the City to provide a copy of the Taxpayer's Revenue Clearance Letter to the following:**

NAME *(PRINT)*	**BUSINESS NAME**	**TITLE**

ADDRESS	**CITY, STATE, ZIP CODE**

PHONE NUMBER	**FAX NUMBER**	**E-MAIL ADDRESS**

☐ **I authorize the City to provide the Taxpayer's Revenue Clearance Letter to all City Departments and to publish on the City's internet/intranet website that the Taxpayer is in compliance with the tax ordinances administered by the City's Commissioner of Revenue.**

Please send my 1st Revenue Clearance Letter to: _____
(Print Name of City Department/Contact Person/E-mail/Fax Number)

This authorization shall expire one (1) year from the date of the signature.

The City, Commissioner of Revenue and the Revenue Division personnel (hereinafter "the City"), are hereby held harmless from any and all liability relating to unauthorized disclosure of confidential tax information resulting from release of information under all applicable confidentiality laws including federal, state, or local including any damages sustained by wrongful transmission of confidential tax information to any other person.

UNDER PENALTIES OF PERJURY, I DECLARE THAT I HAVE EXAMINED THIS AUTHORIZATION, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT IS TRUE, CORRECT AND COMPLETE.

I hereby certify that I am the Taxpayer named herein or that I have the authority to execute this authorization and hold harmless agreement on behalf of the Taxpayer.

NAME *(PRINT)*	**TITLE** *(IF APPLICABLE)*	
SIGNATURE	**PHONE NUMBER**	**DATE**

A FACSIMILE OF THIS DOCUMENT SHALL CONSTITUTE AN ORIGINAL

KANSAS CITY
MISSOURI

Finance Department

Revenue Division

414 E 12th St. 1st Floor
Kansas City, MO 64106-2786

Phone: (816) 513-1120
Fax: (816) 513-1264
Email: revenue@kcmo.org
Website: kcmo.gov/tax

Letter Id: L1254295296
Date: 15-Aug-2024
Taxpayer Id: **-***9611

GOODWIN BROS CONSTRUCTION CO.
4885 BAUMGARTNER RD
SAINT LOUIS MO 63129-2819

TAX CLEARANCE STATUS: APPROVED

As of this date, this notice is to inform you that GOODWIN BROS CONSTRUCTION CO. is current with all taxes and license fees with the City of Kansas City, Mo., Finance Department/ Revenue Division.

Please note this could change if we perform a full review of your accounts in the future. We will let you know if we need to review your accounts. You will need to pay any amounts that are found due at that time.

Eric Davison
Commissioner of Revenue

Visit kcmo.gov/quicktax to view the status of your account and for online filing.

SECTION 00830

PREVAILING WAGE

1. Annual Wage Order No. 31
2. **0830.03 Division of Labor Standards Rules & Regulations** are incorporated into and made part of this Contract and are available at http://s1.sos.mo.gov/cmsimages/adrules/csr/current/8csr/8c30-3.pdf

Missouri
Division of Labor Standards
WAGE AND HOUR SECTION

MICHAEL L. PARSON, Governor

Annual Wage Order No. 31

Section 048
JACKSON COUNTY

In accordance with Section 290.262 RSMo 2000, within thirty (30) days after a certified copy of this Annual Wage Order has been filed with the Secretary of State as indicated below, any person who may be affected by this Annual Wage Order may object by filing an objection in triplicate with the Labor and Industrial Relations Commission, P.O. Box 599, Jefferson City, MO 65102-0599. Such objections must set forth in writing the specific grounds of objection. Each objection shall certify that a copy has been furnished to the Division of Labor Standards, P.O. Box 449, Jefferson City, MO 65102-0449 pursuant to 8 CSR 20-5.010(1). A certified copy of the Annual Wage Order has been filed with the Secretary of State of Missouri.

Original Signed by
Todd Smith, Director
Division of Labor Standards

Filed With Secretary of State: **March 8, 2024**

Last Date Objections May Be Filed: **April 8, 2024**

Prepared by Missouri Department of Labor and Industrial Relations

OCCUPATIONAL TITLE	**Prevailing Hourly Rate
Asbestos Worker	$69.50
Boilermaker	$39.44*
Bricklayer-Stone Mason	$62.06
Carpenter	$64.94
Lather	
Linoleum Layer	
Millwright	
Pile Driver	
Cement Mason	$58.02
Plasterer	
Communication Technician	$62.38
Electrician (Inside Wireman)	$70.32
Electrician Outside Lineman	$61.40
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Elevator Constructor	$93.11
Glazier	$59.07
Ironworker	$70.66
Laborer	$52.42
General Laborer	
First Semi-Skilled	
Second Semi-Skilled	
Mason	$50.24
Marble Mason	
Marble Finisher	
Terrazzo Worker	
Terrazzo Finisher	
Tile Setter	
Tile Finisher	
Operating Engineer	$66.05
Group I	
Group II	
Group III	
Group III-A	
Group IV	
Group V	
Painter	$54.25
Plumber	$78.88
Pipe Fitter	
Roofer	$60.69
Sheet Metal Worker	$76.38
Sprinkler Fitter	$69.92
Truck Driver	$54.27
Truck Control Service Driver	
Group I	
Group II	
Group III	
Group IV	

*The Division of Labor Standards received fewer than 1,000 reportable hours for this occupational title. The public works contracting minimum wage is established for this occupational title *using data provided by Missouri Economic Research and Information Center.*
**The Prevailing Hourly Rate includes any applicable fringe benefit amounts for each occupational title as defined in RSMo Section 290.210.

OCCUPATIONAL TITLE	**Prevailing Hourly Rate
Asbestos Worker	$69.50
Boilermaker	$39.44*
Bricklayer-Stone Mason	$62.06
Carpenter	$64.94
Lather	
Linoleum Layer	
Millwright	
Pile Driver	
Cement Mason	$58.02
Plasterer	
Communication Technician	$62.38
Electrician (Inside Wireman)	$70.32
Electrician Outside Lineman	$61.40
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Elevator Constructor	$93.11
Glazier	$59.07
Ironworker	$70.66
Laborer	$52.42
General Laborer	
First Semi-Skilled	
Second Semi-Skilled	
Mason	$50.24
Marble Mason	
Marble Finisher	
Terrazzo Worker	
Terrazzo Finisher	
Tile Setter	
Tile Finisher	
Operating Engineer	$66.05
Group I	
Group II	
Group III	
Group III-A	
Group IV	
Group V	
Painter	$54.25
Plumber	$78.88
Pipe Fitter	
Roofer	$60.69
Sheet Metal Worker	$76.38
Sprinkler Fitter	$69.92
Truck Driver	$54.27
Truck Control Service Driver	
Group I	
Group II	
Group III	
Group IV	

*The Division of Labor Standards received fewer than 1,000 reportable hours for this occupational title. The public works contracting minimum wage is established for this occupational title using data provided by Missouri Economic Research and Information Center.
**The Prevailing Hourly Rate includes any applicable fringe benefit amounts for each occupational title as defined in RSMo Section 290.210.

OVERTIME
and
HOLIDAYS

OVERTIME

For all work performed on a Sunday or a holiday, not less than twice (2x) the prevailing hourly rate of wages for work of a similar character in the locality in which the work is performed or the public works contracting minimum wage, whichever is applicable, shall be paid to all workers employed by or on behalf of any public body engaged in the construction of public works, exclusive of maintenance work.

For all overtime work performed, not less than one and one-half (1½) the prevailing hourly rate of wages for work of a similar character in the locality in which the work is performed or the public works contracting minimum wage, whichever is applicable, shall be paid to all workers employed by or on behalf of any public body engaged in the construction of public works, exclusive of maintenance work or contractual obligation. For purposes of this subdivision, **"overtime work"** shall include work that exceeds ten hours in one day and work in excess of forty hours in one calendar week; and

A thirty-minute lunch period on each calendar day shall be allowed for each worker on a public works project, provided that such time shall not be considered as time worked.

HOLIDAYS

January first;
The last Monday in May;
July fourth;
The first Monday in September;
November eleventh;
The fourth Thursday in November; and
December twenty-fifth;

If any holiday falls on a Sunday, the following Monday shall be considered a holiday.

Rules of
Department of Labor and Industrial Relations
Division 30—Division of Labor Standards
Chapter 3—Prevailing Wage Law Rules

Title		Page
8 CSR 30-3.010	Applicable Wage Rates for Public Works Projects	3
8 CSR 30-3.020	Definitions	4
8 CSR 30-3.030	Apprentices and Entry-Level Workers	4
8 CSR 30-3.040	Classifications of Construction Work	5
8 CSR 30-3.050	Posting of Prevailing Wage Rates	5
8 CSR 30-3.060	Occupational Titles of Work Descriptions	5

Title 8—DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS
Division 30—Division of Labor Standards
Chapter 3—Prevailing Wage Law Rules

8 CSR 30-3.010 Applicable Wage Rates for Public Works Projects

PURPOSE: This rule sets forth applicable wage requirements relative to work performed by workers on public funded projects.

(1) All public bodies of Missouri, before advertising for bids or undertaking construction work, must obtain from the department an annual wage order which sets forth the applicable hourly rate of wages (the prevailing wage or the public works contracting minimum wage as provided in section 290.257) in the locality. The rates so determined shall be incorporated in the contract specifications and made a part of those specifications, except that construction contracts of the State Highway and Transportation Commission need not list specific wage rates to apply, but may refer to the wage rates contained in the appropriate General Wage Orders issued by the department, as applicable.

(2) Request for annual wage orders shall be initiated at least ten (10) calendar days before advertisement of the specifications for the contract for which the determination is sought. An exception from this provision will be made by the department only upon a proper showing of extenuating circumstances. The department has prepared and printed Form No. PW-3 for use in making a request. The form may be secured by writing Division of Labor Standards, PO Box 449, Jefferson City, MO 65102 or by visiting the following website: https://labor.mo.gov/sites/labor/files/pubs_forms/PW-3-AI.pdf.

(3) A project notification form PW-2 must be filed for each separate project by the public body, except the State Highways and Transportation Commission, which will be furnished prevailing wage determinations under General Wage Orders.

(4) The annual wage order issued by the department contains the current applicable wage rates in the locality at the time the annual wage order is issued. Hours worked during the calendar year are used to set the prevailing wage rates in the annual wage order issued in March of the following year. The department will consider hours submitted for use in its initial determination of the prevailing wage rates to be included in a particular year's wage order only if those hours are received from a contractor, by either paper submission on a form provided by the department or in electronic format, no later than January 31 of that year. Handwritten submissions will not be accepted. For purposes of submitting reportable hours, the term "contractor" shall include a "subcontractor." The department will not include the following hours in the calculation of the annual wage order:

(A) Hours not readily identifiable as being submitted by a contractor;

(B) Hours worked by federally-registered apprentices or entry-level workers;

(C) Hours worked on residential construction projects.

(5) Section 290.262.8, RSMo, provides that the annual wage order for a particular occupational title may be altered once each year with an incremental increase. A public body shall specify in the call for bids for each contract the applicable hourly rate of wages in the locality for each type of worker as set forth in the annual wage order or any replacement page(s) identifying the annual incremental increase issued by the department for the prevailing hourly rate of wages. The wage rates attached to, and made a part of, the call for bids for a contract shall remain in effect for the duration of that particular contract.

(6) It should be understood by all interested parties that the certified applicable wage rates determined by the department are minimum wage rates. The contractor may not pay less than the applicable wage rates determined by the department for the project or contract awarded to him/her as set forth in the proposal on which s/he submitted his/her bid. Employees are free to bargain for a higher rate of pay and employers are free to pay a higher rate of pay.

(7) Each month the successful bid contractors shall submit certified copies of their current payrolls to the contracting public body. The public body, upon receipt of the payrolls on a project, shall keep the payrolls on file for a period of one (1) year from the date of submission of the final payrolls by the contractor. Payroll records shall set out accurately and completely, for each individual, the following information which shall be specifically recorded by occupational title classification and type of worker (journeyman, entry-level worker, or federally-registered apprentice): name and address of each worker, rate of pay, daily and weekly number of hours worked, deduction made, and actual wages paid. The payroll records shall be available at all times for inspection by authorized representatives of the Department of Labor and Industrial Relations.

(8) The public body shall make examinations of the payrolls and other records of each contractor or subcontractor as may be necessary to assure compliance with the provisions of the law. In connection with those examinations, particular attention should be given to the correctness of classifications and any disproportionate employment of any workers. The examinations shall be of a frequency that may be necessary to assure conformity with the provisions of the law. An examination shall be made after the project has been substantially completed but prior to the acceptance of the affidavit as required by section 290.290, RSMo. If any violation of sections 290.210–290.580, RSMo, is discovered by the inspecting public body, it is their duty under section 290.250, RSMo, to withhold and retain from payments to the contractor all sums and amounts due and owing as a result of any violation. Any violation shall be immediately reported to the Division of Labor Standards at PO Box 449, Jefferson City, MO 65102 or by telephone or electronically.

AUTHORITY: section 290.240.2, RSMo Supp. 2018. Original rule filed Dec. 18, 1975, effective Dec. 28, 1975. Amended: Filed July 24, 1984, effective Nov. 11, 1984. Amended: Filed Aug. 24, 1990, effective April 29, 1991. Emergency amendment filed Sept. 15, 1994, effective Sept. 25, 1994, expired Jan. 13, 1995. Emergency amendment filed Dec. 9, 1994, effective Jan. 14, 1995, expired May 13, 1995. Emergency amendment filed May 1, 1995, effective May 14, 1995, expired Sept. 10, 1995. Amended: Filed May 1, 1995, effective Aug. 30, 1995. Amended: Filed July 17, 1995, effective Jan. 30, 1996. Amended: Filed March 27, 2000, effective Oct. 30, 2000. Amended: Filed Nov. 9, 2000, effective May 30, 2001. Emergency amendment filed Nov. 10, 2015, effective Nov. 20, 2015, expired May 17, 2016. Amended: Filed Nov. 10, 2015, effective April 30, 2016. Emergency amendment filed Nov. 21, 2018, effective Dec. 1, 2018, expired May 29, 2019. Amended: Filed Nov. 21, 2018, effective July 30, 2019.*

**Original authority: 290.240, RSMo 1957, amended 1969, 2018.*

***Woodman Engineering Company v. Butler,** 442 SW2d 83 (Mo. App. 1969). The function of reviewing court in prevailing wage cases is to decide if the determination of the commission was authorized by law and was supported by competent and substantial evidence upon the whole record. A decision clearly contrary to the evidence should be set aside. However, all pertinent evidence and factors must be considered in determining the applicable prevailing wage.*

City of Joplin v. Industrial Commission of Missouri, 329 SW2d 687 (Mo. En Banc 1959). Administrative agencies do not have authority to determine constitutionality of legislation. Determination of prevailing wage earnings by commission must be based upon all current relevant factors.

8 CSR 30-3.020 Definitions

PURPOSE: This rule sets forth the definition of certain terms for purposes of issuance and use of annual and general wage orders under the Prevailing Wage Law, sections 290.210–290.580, RSMo and the rules in this chapter.

(1) The term construction of public works generally includes construction activity as distinguished from manufacturing, furnishing of materials or servicing and maintenance work. The term includes, without limitation, the construction of buildings, structures and improvements of all types, such as bridges, dams, plants, highways, parkways, streets, subways, tunnels, sewers, mains, power lines, pumping stations, heavy generators, railways, airports, terminals, docks, piers, wharves, ways, lighthouses, buoys, jetties, breakwaters, levees, canals, dredging, shoring, rehabilitation and reactivation of plants, scaffolding, drilling, blasting, excavating, clearing and landscaping. The manufacture or furnishing of materials, articles, supplies or equipment is not construction of public works within the meaning of the Prevailing Wage Law unless conducted in connection with and at the site of construction. The term construction of public works also means all work done in the construction or development of a public works project, including without limitation, altering, remodeling, demolishing existing structures, installation on the site of the construction of items fabricated off-site, painting and decorating, the transporting of materials and supplies to or from the site of the construction by the employees of the construction contractor or construction subcontractor, and the manufacturing or furnishing of materials, articles, supplies or equipment on the site of the construction by persons employed by the contractor or subcontractor.

(2) The term site of the building or construction job means the physical place(s) where the public works are to be constructed, and also means other adjacent or nearby property used by the contractor or subcontractor in that construction which can reasonably be said to be included in the site. Except as otherwise provided in this section, fabrication plants, mobile factories, batch plants, borrow pits, job headquarters, tool yards and the like, are part of the site of the building or construction job provided they are dedicated in a substantial degree to the performance of the public works project, and are so located in proximity to the actual construction location that it would be reasonable to include them. The dedication of seventy-five percent (75%) or more of the output of a fabrication plant, batch plant and the like, to the public works project raises a rebuttable presumption that the facility is part of the site of the building or construction job. The presumption may be rebutted by evidence showing that the facility was established for other legitimate commercial purposes that make the facility useful well after the public works project has been completed. Not included in the site of the building or construction job are permanent home offices, branch plant establishments, fabrication plants and tool yards of a contractor or subcontractor whose location and continuance in operation are determined wholly without regard to a particular public works project. In addition, fabrication plants, batch plants, borrow pits, job headquarters, tool yards and the like, of a commercial supplier or materialman which are established by a supplier of materials for the project before opening of bids and not on the project site are not included in the site of the building or construction job. The permanent, previously established facilities are not a part of the site of the building or construction job, even where the operations for a period of time may be dedicated exclusively, or nearly so, to the performance of a public works project.

AUTHORITY: section 290.240, RSMo 1994. Original rule filed Aug. 24, 1990, effective April 29, 1991. Amended: Filed July 17, 1995, effective Jan. 30, 1996.*

**Original authority: 290.240, RSMo 1957, amended 1959.*

8 CSR 30-3.030 Apprentices and Entry-Level Workers

PURPOSE: This rule sets forth the requirements for the payment of wages to apprentices and entry-level workers employed on public works subject to the Prevailing Wage Law.

PUBLISHER'S NOTE: The secretary of state has determined that the publication of the entire text of the material which is incorporated by reference as a portion of this rule would be unduly cumbersome or expensive. This material as incorporated by reference in this rule shall be maintained by the agency at its headquarters and shall be made available to the public for inspection and copying at no more than the actual cost of reproduction. This note applies only to the reference material. The entire text of the rule is printed here.

(1) Journeymen's rate of pay shall be paid to all workers employed on public works construction except entry-level workers or apprentices registered and participating in apprentice programs registered with the United States Department of Labor, Employment and Training Administration; and apprentices registered and participating in programs certified by the Secretary of the United States Department of Transportation as promoting equal opportunity in connection with federal-aid highway construction programs. Such workers shall be paid not less than fifty percent (50%) of the applicable wage rate for a journeyman worker under the appropriate occupational title for a specific locality. In calculating the applicable wage rate for a journeyman worker, fringe benefits shall be included.

(2) As set forth in section 290.235, "on-the-job training workers" are defined as follows:

(A) "Federally-registered apprentices" – Workers participating in programs administered by the United States Department of Labor and subject to their specific requirements (*See 29 U.S.C. section 50 and 29 C.F.R. 29)* and workers participating in programs administered by the United States Department of Transportation and subject to their specific requirements. (*See 23 U.S.C. section 113 and 23 C.F.R. 230);* and

(B) "Entry-level workers"—Any worker who is not a journeyman and who is not otherwise enrolled in a federally-registered apprenticeship program but is participating in an on-the-job training program provided by the contractor for whom they perform work on a public construction project.

(3) Workers employed on federal-aid highway construction projects may be paid at an apprentice rate of pay if enrolled in an apprenticeship or skill training program which has been certified by the Secretary of the United States Department of Transportation pursuant to 23 U.S.C. 113. In the event the Secretary of Transportation withdraws approval of a program, the contractor will no longer be permitted to pay workers less than the applicable predetermined rate for the work performed until an acceptable program is approved.

AUTHORITY: section 290.240, RSMo Supp. 2018. Original rule filed Aug. 24, 1990, effective April 29, 1991. Amended: Filed July 17, 1995, effective Jan. 30, 1996. Emergency amendment filed Nov. 21, 2018, effective Dec. 1, 2018, expired May 29, 2019. Amended:*

Filed Nov. 21, 2018, effective July 30, 2019.

**Original authority: 290.240, RSMo 1957, amended 1969, 2018.*

8 CSR 30-3.040 Classifications of Construction Work

PURPOSE: The Department of Labor and Industrial Relations has the responsibility under section 290.260, RSMo to determine the prevailing hourly rate of wages to be paid to workers engaged in work of a similar character. This rule establishes classifications of construction work for the department to use in determining the prevailing hourly rate of wages for work of a similar character.

(1) All public works construction, for which the prevailing hourly rate of wages or the public works contracting minimum wage of workers are to be determined, shall be classified as either—

(A) Building construction; or

(B) Highway and heavy construction.

(2) Building construction shall mean the following:

(A) Building structures, including modification, additions or repairs, or both, to be used for shelter, protection, comfort, convenience, entertainment or recreation, or for protection of people or equipment;

(B) Buildings at an airport project, such as terminal buildings, freight buildings, and any other construction necessary for the operation of the airport facilities;

(C) Stadiums, athletic fields, dressing rooms, bleachers, and all other buildings needed in connection with an athletic or entertainment facility;

(D) Entire buildings that are built aboveground in connection with highway, subway, or tunnel projects, such as tool stations or housing for mechanical equipment;

(E) Excavation for the building itself, including backfilling inside and outside the building;

(F) Storm and sanitary sewers inside the building and to the curb line;

(G) Work in connection with telephone, electrical, water, oil, gas, or fuel lines, or other utility or communication lines inside a building and to the curb line;

(H) Sidewalks other than those that are poured in connection with a street or road project;

(I) Driveways that are built to serve a building;

(J) Parking lots connected to a building and all structures built as parking facilities;

(K) Retaining walls built in conjunction with a building project;

(L) Demolition of a building(s) as part of the site preparation for new building construction;

(M) Landscaping of building sites or the planting of all shrubbery that is incidental to building construction as defined in section (2); and

(N) Work on water and wastewater treatment plants within the fence line.

(3) Highway and heavy construction shall mean the following:

(A) Work in connection with roads, streets, parkways, alleys and highways including, but not limited to, grading, paving, curbing, signs, fences, guard rails, bridges, lighting, retaining walls, and landscaping;

(B) Work on viaducts, overpasses, underpasses, drainage projects, aqueducts, irrigation projects, flood control projects, reclamation projects, reservoir filtration and supply projects, water power, duct lines, distribution lines, pipe lines, locks, dikes, levees, revetments projects, excluding work specifically defined as building construction;

(C) Work in connection with underground construction on tunnels and shafts;

(D) Railroad work in its entirety, including elevated railroads;

(E) Main and side sewers;

(F) Work in connection with airports, such as runways, roads, and streets, but excluding that which is listed as building construction;

(G) Work in connection with telephone, electrical, water, oil, gas, or fuel lines, or any other utility or communication lines from the curb line;

(H) Sidewalks when poured incidental to a street or road project;

(I) Parking lots not incidental to a building construction project; and

(J) Demolition of all buildings as part of site preparation for any highway and heavy construction as is otherwise defined in section (3).

AUTHORITY: section 290.240, RSMo Supp. 2018. Original rule filed Aug. 24, 1990, effective April 29, 1991. Amended: Filed July 17, 1995, effective Jan. 30, 1996. Emergency amendment filed Nov. 21, 2018, effective Dec. 1, 2018, expired May 29, 2019. Amended: Filed Nov. 21, 2018, effective July 30, 2019.*

**Original authority: 290.240, RSMo 1957, amended 1969, 2018.*

8 CSR 30-3.050 Posting of Prevailing Wage Rates

PURPOSE: This rule sets forth the requirements for the posting of prevailing wage rates on public works projects subject to the Prevailing Wage Law.

(1) Contractors and subcontractors engaged in public works projects shall post the applicable hourly rate of wages (the prevailing wage or the public works contracting minimum wage as provided in section 290.257, excluding rates on projects for which the engineer's estimate or the bid accepted by the public body for the total project cost is less than seventy-five thousand dollars ($75,000)) in a dry, accessible place within the field office at the site of the building or construction job. On public works projects for which no field office is needed or established, such as road construction, sewer lines, pipelines, and the like, a contractor/subcontractor may post the applicable hourly rates of wages at the contractor/subcontractor's local office or batch plant, so long as the contractor/subcontractor provides a copy of the prevailing hourly wage rates to any worker upon request. Applicable hourly wage rates must be posted and maintained in a clearly legible condition for the duration of the public works project as provided by law.

AUTHORITY: section 290.240, RSMo Supp. 2018. Original rule filed Aug. 24, 1990, effective April 29, 1991. Emergency amendment filed Nov. 21, 2018, effective Dec. 1, 2018, expired May 29, 2019. Amended: Filed Nov. 21, 2018, effective July 30, 2019.*

**Original authority: 290.240, RSMo 1957, amended 1969, 2018.*

8 CSR 30-3.060 Occupational Titles of Work Descriptions

PURPOSE: The Department of Labor and Industrial Relations is required to determine the prevailing hourly rate of wages to be paid to each worker engaged in construction on a public works project, relative to the type of work performed by each worker. This rule describes by occupational title the type of work performed in the construction of a public works project in Missouri and sets forth the procedures to be followed in identifying each occupational title utilized on a public works project.

(1) Each occupational title defines by name the type of work performed in the construction of a public works project. The description of work designated for a particular occupational title is not intended to be jurisdictional in scope or nature, and is not to be construed as limiting or prohibiting workers from engaging in construction work falling within

several occupational titles.

(2) Each occupational title of work description shall be based upon the particular nature of the work performed, with consideration given to those trades, occupations or work generally considered within the construction industry as constituting a distinct classification of work. In determining occupational titles and scope of work definitions, the department shall consider the following:

(A) Collective bargaining agreements;

(B) *Dictionary of Occupational Titles*, as published by the United States Department of Labor; and

(C) Opinions of experts from organized labor and the opinions of contractors and contractor associations as they relate to the custom and usage applicable to the construction industry in Missouri.

(3) Interested parties who wish to submit wage information to be used in establishing the prevailing hourly rate of wages for a particular class or type of work are required to identify the work according to the applicable occupational title of work description set forth in this rule. Hours of work reported by a contractor or subcontractor to the department shall not be used to establish the prevailing hourly rate of wages if the party submitting the hours of work fails to identify the work under one of the occupational titles included in section 290.257.

(4) Any question as to the proper classification of work should be resolved before the work in question is commenced. Interested parties are encouraged to contact the Prevailing Wage Section of the Division of Labor Standards for an interpretation of these rules and for a determination of the appropriate occupational title of work description, relative to the class or type of work to be performed.

(5) The occupational titles and work descriptions for each type or class of work contained herein are valid throughout the entire state of Missouri. Through an objection to a wage order, an interested party may assert that any given description of work, as stated within this rule, does not apply to a specific occupational title(s) and that a different work description should apply to that occupational title(s). The interested party shall have the burden of proving by a preponderance of the evidence the inapplicability of the description of work within that particular occupational title, but shall be afforded the opportunity to do so in a hearing on an objection to the wage order before the Labor and Industrial Relations Commission.

(6) Occupational titles of work descriptions may be obtained from the department by written request to the director of the Division of Labor Standards, PO Box 449, Jefferson City, MO 65102 or by visiting the following website: https://labor.mo.gov/DLS/PrevailingWage/pwContractors.

(7) The occupational titles of work descriptions set forth here are as follows:

(A) Asbestos Worker—Applies to workers who apply insulation materials to mechanical systems to reduce loss or absorption of heat, prevent moisture condensation, and to deaden sound and prevent vibration. The workers remove all insulation materials from mechanical systems unless the mechanical system is being scrapped. The work falling within this occupational title of work description includes:

1. The preparation, including the building of enclosures and hanging polyurethane, and physical distribution on the job site of asbestos, cork, plastic, magnesia or similar materials, or other materials used as a substitute, and used as thermal insulation. The manufacture, fabrication, assembling, molding, handling, erection, spraying, pouring, making, hanging, application, adjusting, alteration, repairing, dismantling, reconditioning, corrosion control, and testing of heat or frost insulation, such as asbestos, cork, mineral wall, infusorial earth, mercerized silk, flax, fiber, fire felt, asbestos paper, asbestos curtain, asbestos millboard, fibrous glass, foam glass, styrofoam, polyurethane, polystyrene, metals, plastics, fibrous matter, roving, and resins, and the erection of scaffolding up to fourteen feet (14'), working platform;

2. The covering, including encapsulation, of boilers, tanks, refrigeration units, evaporators, turbines, fittings, valves, ducts, flues, vats, equipment, hot and cold pipes, or any other hot or cold surfaces with the insulation materials listed in this rule, used for the purpose of thermal insulation, fire stoppage, fireproofing, radiator protection, sound deadeners, and the lagging (covering) on piping; and

3. The removal of all insulation materials from mechanical systems, unless the mechanical system is being scrapped, whether they contain asbestos or not (pipes, boilers, ducts, flues, breechings). All cleanup required in connection with this work, shall include the sealing, labeling, and dropping of scrap material into the appropriate containers. (After drop, final disposal is considered to be the class or type of work falling within the occupational title of work description for second semiskilled laborer.);

(B) Boilermaker—Applies to workers who assemble, erect, and repair boilers, tanks, vats, and pressure vessels according to blueprint specifications, using handtools, portable power tools, and equipment. The work falling within this occupational title of work description includes:

1. Locating and marking of reference points for columns on plates or foundations, using master straightedge, squares, transit, and measuring tape;

2. Using rigging or cranes to lift parts to specified positions;

3. Aligning structures or plate sections, using plumb bobs, levels, wedges, dogs, or turnbuckles;

4. Drilling, reaming, chipping, caulking, and grinding of structures and sections and bolting or welding them together;

5. Setting of drums and headers and installation of tubes;

6. Cleaning up as necessary in connection with this work; and

7. Riveting, acetylene burning, rigging, fitting-up, impact machine operating, unloading and handling of material and equipment where power equipment and rigging are required;

(C) Bricklayers—Applies to workers who prepare, lay, set, bed, point, patch, grout, caulk, cut, fit, plumb, align, level, anchor, bolt, or weld brick, stone masonry, precast aggregate panels, and all types of artificial or imitation masonry. Also, the workers install expansion joint materials in brick, stone masonry, precast aggregate panels, and all types of artificial or imitation masonry. The work falling within this occupational title of work description includes:

1. The unloading of brick, stone masonry, precast aggregate panels, and all types of artificial or imitation masonry where power equipment and rigging are required;

2. The masonry paving and rip-rapping of all types, with or without mortar;

3. The reinforcing of masonry, including placing, tying, and setting of rods;

4. The application of insulation systems and materials, and air and/or vapor barrier systems and materials, by spray, trowel, roller, adhesive, or mechanically fastened in or to all masonry walls;

5. The caulking of abutting masonry openings in masonry walls, expansion joints, and false joints in all types of masonry;

6. The waterproofing of all types of masonry, which shall include installation and application of air and/or vapor barrier systems and materials by spray, trowel, roller, adhesive, or mechanically fastened; and

7. The cleaning, tuckpointing, sandblasting, steam cleaning, and Gunite work on all types of masonry;

(D) Carpenter (which shall include pile driver, millwright, lather, and linoleum layer)—Applies to workers who construct,

erect, install, and repair structures, structural members and fixtures made of wood, plywood, wallboard, and materials that take the place of wood, such as plastic, metals, composites, fiberglass, and Transit sheeting and Cemesto Board, using carpenter hand tools and power tools. The work falling within this occupational title of work description includes:

1. General Carpenter.

A. The layout of buildings or structures on the site or plot. The installation of aluminum expansion joints for buildings and bridge structure as well as concrete strike-off machines.

B. The making and setting of all concrete forms (except curb forms on heavy construction), including establishment of building lines or flow lines (box culverts, bridges) including footing forms. The making of all forms used in tilt-up construction. The layout, installation, and construction for wall forms and footing forms, all block-outs, wood or steel, layout, and installation of all embedded items.

C. The building and handling of scaffolds used by carpenters to work from. All scaffolding, constructed or assembled, fourteen feet six inches (14'6") and higher for normal or specialty use—regardless of purpose.

D. The building of rough wooden structures, such as concrete forms, scaffolds, wooden bridges, trestles, coffer dams, tunnel and sewer support, welding and burning.

E. The selection of specified type of lumber or other materials. Prepare layout, using rule, framing square, and calipers. Mark cutting and assembling lines on materials, using pencil, chalk, and marking gauge. Shape materials to prescribed measurements, using saws, chisels, and planes. Assemble, cut, and shape materials and fasten them together with nails, dowel pins, or glue. Erect framework for structures. Verify trueness of structure with plumb bob and carpenter's level. Apply decorative paneling to walls.

F. The installation of ladders, handrails, walkways, platforms, and gangways made of wood as well as shoring and lagging. Install doors and wood and metal windows and bucks, including hardware (bucks are rough frames in which finished frames are inserted) in building framework and brace them with boards nailed to framework. Install pallet racks and metal shelving. Install subflooring in buildings. Install insulation such as batt, board, safing, thermal, styrofoam, sound attenuation, fiberglass when the installation of the insulation material is not being applied as an integral part of the roofing system. Nail plaster grounds (wood or metal strips) to studding. Fit and nail sheathing on outer walls and roofs on buildings. Install beams and trusses of wood laminate.

G. The making, handling, and setting of all frames, sash, blinds, trim, and other fixtures (for example, cabinets, bookcases, and benches), when made of wood or any wood substitute. The handling and assembly of chairs, seats, bleachers, and benches and other furniture in theaters, halls, schools, and other places of assemblage on floors of any kind. Install protection screens, chalk boards, toilet partitions (plastic laminate, solid plastic). Caulking of fixtures and countertops including Corian tub and shower enclosures.

H. The installation of wood and metal studs and exterior panels.

I. The handling, cutting, sawing, fitting of drywall (sheetrock), and lead-lined drywall whether for walls, ceilings, floors, soffits, or any use, no matter how installed—nailed, screwed, glued, or otherwise (interior, exterior). Lead-lined drywall is used in X rays to avoid radiation exposure. Install corner guards and wooden and plastic column covers.

J. The handling and installation of acoustical and egg crate ceiling systems in its entirety (hanger wire, grid, molding, tile) whether vertically or horizontally installed.

K. The installation of all builders hardware, including door tracks of every description. The installation of all weather strips. The making, fitting, and hanging of fly screens for doors, windows, and other openings.

L. Installation of wood and hollow metal doors, rollup garage doors, overhead doors or rolling fire doors, automatic doors, channel iron door bucks, glass sliding, and bi-fold doors.

M. The installation of access flooring, computer floors, and raised or elevated floors. Install modular headwall units and laboratory casework and fume hoods;

2. Pile Driver—The work falling within the occupational title of work description for pile driver includes:

A. The handling, layout, driving, cutting, and splicing of wood, metal, or concrete piling regardless of purpose (for example, sheets, I-beams, pile caps, and welding to piling);

B. The assembly, disassembly, and rigging of the pile driving equipment; and

C. The conduct of underwater diving that is incidental to pile driving work;

3. Millwright—Applies to workers who design, build, or repair mills or mill machinery; hoist, dismantle, erect, assemble, line, and adjust all machines used in the transmission of power in buildings, factories or elsewhere; unload machines used in the transmission of power in buildings, factories, or elsewhere, where power equipment and rigging are required. The work falling within this occupational title of work description includes: the setting of all classes of engines, direct drive motors, dynamos, turbines, generators, and air compressors and pumps. The assembling, setting, and packing of all compressors and pumps. The placing of all pulleys, sheaves, and fly wheels on the listed equipment. The making and setting of all templates and bolts for all machinery requiring same. Drypacking for sole plates. Installation of truck and railroad scales. Installation of trash compactors. Installation of all types of conveyors. The cutting and threading of all bolts. The handling and operating of all acetylene and devices for heating, welding, and cutting when used in connection with millwright work;

4. Lather—Applies to workers who erect horizontal metal framework to which laths are fastened, using nails, bolts, studgun, or a combination of these, drills holes in floor and ceiling, and drives ends of wooden or metal studs into holes to provide anchor for furring or rockboard laths. The occupational title of lather applies to workers who nail, clip, or fasten, all types of wood, wire, and metal laths, plasterboard, wallboard, rockboard, gypsum, sheetrock, and acoustical materials which take the place of same to walls, ceilings, and partitions of buildings to provide supporting base for plaster, fireproofing, or acoustical material. The occupational title of work description for lather applies to workers who erect all metal plastering accessories which are covered or serve as ground, or both, guard, stock, or screed for plaster materials, including wire mesh. The work falling within the occupational title of work description includes:

A. The installing of carrying bars and purlins (pieces of horizontal timber), light iron, and metal furring (thin strips of wood or metal to create air space) of all descriptions, such as rods, channels, flat iron, T-bar, H-bar, and other ceiling bars or systems for the receipt of lath and board;

B. The wiring of plasterer channels to overhead structural framework to provide support for plaster or acoustical ceiling tile; and

C. The nailing of plaster grounds (wood or metal strips) to studding to provide a guide for those workers performing work falling within the occupational title of work description for plasterer;

5. Linoleum Layer—Applies to workers who measure, cut, sew, make-up and seam, tape, fit, lay, and install and seal and wax materials to be cemented, tacked, or otherwise applied to its base, wherever it may be. These materials may be used as shock-absorbing, sound-absorbing, or decorative coverings. With the exception of terrazzo,

magnesite, and latex built-up floors, the materials include oil cloth, matting, linen, carpet, synthetic turf, linoleum, vinyl, plastic, rubber, cork, mastic, asphalt, mastipave, tile, wood tile, interlocking and magnetic tile, chalk and bulletin board, nonslip or abrasive materials, resilient, decorative seamless surface coatings, monolithic coverings (monolithic shall mean all resilient seamless material such as epoxy, polyethylene, plastics and their derivatives, components and systems), and all other resilient coverings on floors, walls, counters, table tops, and ceilings. The work falling within the occupational title of work description includes:

A. The handling of materials at the point of installation;

B. The performing of all necessary preparation and finish work, such as sweeping, scraping, sanding, or chipping dirt and irregularities from base surfaces and filling cracks with putty, plaster, or cement grout to form smooth, clean foundations, drilling holes for sockets and pins;

C. The installing of underlayment, sanding and filling, fitting of metal edgings, metal corners, and caps and fitting devices for attachment of these materials;

D. The spreading of adhesive cement over floor to cement foundation material to the floor;

E. The laying of covering on cement; and

F. The rolling of finished floor to smooth it out and press cement into base and covering;

(E) Cement Mason (which shall include plasterer)—The work falling within this occupational title of work description includes:

1. Cement Mason - Applies to workers who perform work on concrete where finishing tools are used.

A. The setting of screeds, the rodding (buildings), shaping, smoothing, and finishing of the surfaces of freshly poured concrete floors, walls, sidewalks, curbs, steps, and stairways, the finishing of extruded barrier rails or any other concrete surface requiring finishing, using hand tools or power tools, including floats, trowels, screeds, and straightedge.

B. The removing of rough or defective spots from concrete surfaces, using grinder or chisel and hammer and patching holes with fresh concrete or epoxy compound preparatory to sacking.

C. The molding of expansion joints and edges, using edging tools, jointers, and straightedge.

D. The application of penetrating sealer and primer protective coatings to concrete floors and steps when part of the finishing process.

E. The installation of seamless composition floors and the installation and finishing of epoxy-based coatings or polyester-based linings to all surfaces, when the coatings or linings are applied by spraying or troweling.

F. The sandblasting or water blasting for architectural finish or preparatory to patching.

G. The cutting of joints with concrete saw for the control of cracks in buildings and sidewalks, driveways, and curbs and gutters contiguous to buildings.

H. The setting of concrete curb, gutter, and sidewalk forms one (1) board high up to twelve inches (12");

2. Plasterer – Applies to workers who apply gypsum, Portland cement, stucco, imitation stone, and kindred materials and products to interior walls, ceilings, and partitions and to exterior walls of buildings, and finish those materials and products.

A. The spreading of plaster over laths, masonry, or any other base, using trowel, and smoothing the plaster with darby and float for uniform thickness;

B. The application of the various manufacturers' brand names of thin coat or plaster veneer;

C. The application of all bonding agents and mastical;

D. The roughing of undercoat with wire or metal scraper to provide bond for succeeding coat of plaster;

E. The application of all malleable plastic materials and epoxy materials;

F. The setting in place of plasterboard, insulation board, styrofoam and beadboard, ground, locks, patent dots, cork plates, brownstone and acoustical tile, fiberglass reinforcement and finished products;

G. The plastering of joints, nail holes, and bruises on wallboard;

H. The grouting and filling of door bucks, runners, and similar installations, in conjunction with plastering operations;

I. The application of scratchcoat, browncoat, and finish coat of plaster to wood, metal or board laths successively to all ceilings and walls when finished with terrazzo or tile, and the application of any plastic material to same;

J. The fireproofing of all building assemblies with plaster materials, sprayed fiberglass or similar materials, whether applied to gypsum, metal lath, or directly;

K. The application of crushed stone, marble, or ceramic chips and broken glass where embedded in plaster, or similar materials;

L. The placing of acoustic blocks with any plastic material, regardless of thickness;

M. The placing, by any method, of plaster or composition caps and ornaments;

N. The creating of decorative textures in finish coat by marking surface of coat with brush and trowel or by spattering it with small stones (stucco) where plastering equipment or materials, or both, are used; and

O. The operation and control of all types of plastering machines, including power trowels and floats;

(F) Communications Technician—Applies to workers who install, inspect, repair, and service electronic and telecommunication systems. The work falling within the occupational title of Communication (Electronic/Telecommunication) Technician includes:

1. Installing, repairing, and servicing of radio, television, and recording systems and devices; systems for paging, intercommunication, public address, wired music, clocks, security and surveillance systems, and mobile radio systems; fire alarm and burglar alarm systems;

2. Wiring of low-voltage surface wiring and wiring in nonmetallic conduits and incidental shielded metallic conduit runs of no longer than ten feet (10') nor larger than one inch (1") when required in conjunction with the work listed in this rule;

3. Installing, repairing, servicing, or a combination of these, of the Main Distribution Frame (MDF) where the permanent outside lines entering a building terminate and where the subscriber's line multiple cabling and trunk multiple cabling originate. It is usually located on the ground floor of a building;

4. Installing, repairing, servicing, or a combination of these, of the Intermediate Distribution Frames (IDF), which provides flexibility in allocating the subscriber's number to the line unit or equipment in the office that is to be associated with the particular line. These frames are located on each floor of a building;

5. Installing, repairing, servicing, or a combination of these, of the subpanels (blocks). The subpanels are connecting devices where large feed cables terminate at the distribution frames;

6. Installing, repairing common equipment or key service unit, or a combination of these. This equipment consists of a backboard assembly and an equipment mounting frame, which are utilized for connecting external telephones;

7. Installing, repairing, servicing of the instruments, terminals, and sets, or a combination of these. This equipment is at either end of a circuit, or at a subscriber's or user's terminal;

8. Installing, repairing, servicing, or a combination of these, of the ancillary or add-on equipment such as bells, buzzers,

speakerphones, headsets, automatic dialers, recorders; and

9. Installing, repairing, servicing of the telephone cable, or a combination of these. Telephone cable includes: network channel service cable; riser cables between floors of a building; distribution cables installed on each floor of a building in the floor or the ceiling, and inside wires between the telephone and the connection to the distribution cable;

(G) Electrician—Applies to workers who are responsible for installation, assembly, construction, inspection, operation, and repair of all electrical work within the property lines of any given property (manufacturing plants, commercial buildings, schools, hospitals, power plants, parking lots). This scope of work shall begin at the secondary site of the transformer when the transformer is furnished by the local utility and the service conductors are installed underground. When service conductors are installed overhead in open air from wooden poles, this scope of work shall start immediately after the first point of attachment to the buildings or structures. The work falling within this occupational title of work description includes:

1. Planning and layout of electrical systems that provide power and lighting in all structures. This includes cathodic protection systems utilized to protect structural steel in buildings and parking structures;

2. All handling, moving, loading, and unloading of any electrical materials, materials used in association with an electrical system, electrical equipment, and electrical apparatus on the job site, whether by hand or where power equipment and rigging are required;

3. Welding, burning, brazing, bending, drilling, and shaping of all copper, silver, aluminum, angle iron, and brackets to be used in connection with the installation and erection of electrical wiring and equipment;

4. Measuring, cutting, bending, threading, forming, assembling, and installing of all electrical raceways (conduit, wireways, cable trays), using tools, such as hacksaw, pipe threader, power saw, and conduit bender;

5. Installing wire in raceways (conduit, wireways, troughs, cable trays). This wire may be service conductors, feeder wiring, subfeeder wiring, branch circuit wiring;

6. Chasing and channeling necessary to complete any electrical work, including the fabrication and installation of duct banks and manholes incidental to electrical, electronic, data, fiber optic, and telecommunication installation;

7. Splicing wires by stripping insulation from terminal leads with knife or pliers, twisting or soldering wires together, and applying tape or terminal caps;

8. Installing and modifying of lighting fixtures. This includes athletic field lighting when installed on stadium structures or supports other than wooden poles, or both;

9. Installing and modifying of all electrical/fiber optic equipment (AC-DC motors, variable frequency drives, transformers, reactors, capacitors, motor generators, emergency generators, UPS equipment, data processing systems, and annunciator systems where sound is not a part thereof);

10. Installing of raceway systems utilizing conduit, conduit bodies, junction boxes, and device boxes for switches and receptacles. This also may include wiring systems utilizing other methods and materials approved by the *National Electrical Code* (MC cable, AC cable, BX, or flexible metal tubing or electrical nonmetallic tubing);

11. Installing of main service equipment, distribution panels, subpanels, branch circuit panels, motor starters, disconnect switches, and all other related items;

12. Installing and wiring of instrumentation and control devices as they pertain to heating, ventilating, air conditioning (HVAC) temperature control and energy management systems, building automation systems, and electrically or fiber optic operated fire/smoke detection systems where other building functions or systems are controlled;

13. Installing conduit or other raceway greater than ten feet (10') when used for the following: fire alarm systems, security systems, sound systems, closed circuit television systems or cable television systems, or any system requiring mechanical protection or metallic shielding (telephone systems);

14. Testing continuity of circuit to insure electrical compatibility and safety of components. This includes installation, inspecting, and testing of all grounding systems including those systems designed for lighting protection; and

15. Removing electrical systems, fixtures, conduit, wiring, equipment, equipment supports, or materials involved in the transmission and distribution of electricity within the parameters of the building property line if reuse of any of the existing electrical system is required. This may include the demolition and removal and disposal of the electrical system;

(H) Elevator Constructor—Applies to workers who assemble and install electric and hydraulic freight and passenger elevators, escalators, dumbwaiters, and moving walks. The work falling within this occupational title of work description includes:

1. The handling, unloading, and hoisting of all equipment to be assembled or installed by workers performing work within this occupational title of work description, from the time that equipment arrives at, or near the building site;

2. The wrecking or dismantling of elevator plants, to include elevators, escalators, dumbwaiters, moving walks, and all other equipment to be reused and assembled or installed by workers performing work within this occupational title of work description;

3. The sinking, drilling, boring, digging cylinder wells, or backfilling for hydraulic lifts, hydraulic elevators, or screw lifts;

4. The layout, erecting and assembling of all elevator equipment (for example, electric, hydraulic, steam, belt, compressed air, and hand-powered elevators; dumbwaiters, residence elevators, parking garage elevators), and the assembly of all escalators, moving walks and link belt carriers;

5. The erecting and assembly of all theater stage and curtain equipment and guides and rigging to them, organ consoles, and orchestra elevators;

6. The installing of all wiring, conduit, and raceways from the first point of attachment of main feeder terminals on the controller to other apparatus and operating circuits;

7. The operating of temporary cars; and

8. The installing of all elevator enclosures, fronts, fascias, sills, frames, and bucks;

(I) Glazier—Applies to workers who select, cut, prepare, handle, install, or remove all window glass, plate, and all other types of glass, including structural glass, mirror glass, tempered and laminated glass, safety or protection glass, all types of insulating glass units, all plastics or other similar materials when used in place of glass and when set or glazed with putty, moulding rubber, cement, lead, and all types of mastic, or other materials used in place of same. The workers performing work within this occupational title of work description install these materials in windows, louvers, doors, partitions, skylights, and on building fronts, walls, ceilings and tables, whether the materials are set in wood, stone, cement, or metal of all types. The work falling within the occupational title of work description includes:

1. The installing of mirrors of all types;

2. The marking of an outline or pattern on glass and cut glass with a glasscutter;

3. The breaking off of excess glass by hand or with a notched tool;

4. The fastening of glass panes into wood sash with glazier's points, and the spreading smooth of putty around the edge of panes with a knife to seal joints;

5. The installing of metal window and door frames into which glass panels are to be fitted or sliding windows. The bolting of metal hinges, handles, locks, and other hardware to prefabricated glass doors;

6. The installing of mirror or structural glass on building fronts, walls, ceilings or tables, using mastic, screws, or decorative moulding;

7. The installing of metal-framed glass enclosures for showers, bathtubs, and skylights; and

8. The installing, cutting, and removal of all window glass, plate, and all other types of glass, including structural glass, mirror glass, tempered and laminated glass, safety or protection glass, all types of insulating glass units, all plastics or other similar materials when used in place of glass and when set or glazed with putty, molding rubber, cement, lead, and all types of mastic, or other materials used in place of same;

(J) Ironworker—Applies to workers who perform work in connection with field fabrication, erection, or both, installation, removal, wrecking, and dismantling of structural, architectural, and reinforcing iron and steel, ornamental lead, bronze, brass, copper, and aluminum, and plastics or other materials when used in place of them. The work falling within the occupational title of work description includes:

1. Structural. The unloading, erecting, bolting-up, plumbing-up, welding, and installing of structural steel, including any field fabrication;

2. Reinforcing. The unloading, carrying, placing, and tying of all concrete reinforcing, such as re-bar, wire mesh, expanded metal or post tensioning cable (including the tension process) or prestress cables when installed on the job site;

3. Rigging. The unloading, moving, handling, placing, and setting of electrical machinery and equipment when rigging or power equipment, or both, is used (with the exception of setting of electric motors). The assembly and erection of radio and television and other structural steel towers (with the exception of electrical transmission towers). The unloading, handling, moving, and placing of machinery to be assembled or dismantled, erected, or installed to its approximate position (over the anchor bolts);

4. Windows. The installation of metal windows (with the exception of store fronts display windows), curtain walls, and metal panels. The caulking of metal-to-metal joints and metal-to-brick;

5. Doors. The erection of curtain type doors (overhead rolling-type doors), heavy industrial doors when made of metal, fire doors, and exterior metal hinged doors that carry a fire underwriters label are erected by iron workers;

6. Sheeting and decking. The installation of sheeting which is attached to metal framework including metal floor decking;

7. Metal buildings. The erection and installation of structural steel and sheet metal packaged buildings when they come in a package unit, such as Butler, Delta, Varco Prudent, or other name brand packaged buildings. The installation of all doors, windows, and insulation (when installed in conjunction with sheeting) in the packaged buildings. The installation of metal siding and metal roof decking, regardless of the fastening method or the object to which it is fastened;

8. Elevators. The installation of elevator doors for gates manually operated and all elevator enclosures, fronts, fascias, sills, frames, and bucks;

9. Precast. The unloading and installation/erection of precast bridge girders, single T's, double T's, top panels, and tilt-up slabs; and

10. Other. The installation of all catwalks, stairways, and hand rails made of aluminum, bronze, or any type of metal, glass or plastic. The installation of ornamental iron, such as revolving doors, gates, handrails, window grills, jail and cell work, and chain link fences. The installation of dry storage bins, hoppers, chutes, and conveyors where sand ore, coal, or any dry component is stored or transferred. The erection, installation, removal, wrecking, and dismantling of bridges, viaducts, cableways, tramway, monorail transportation systems. The erection, installation, removal, wrecking, and dismantling of locks, gates, metal forms, railings (including pipe). The erection, installation, removal, wrecking, and dismantling of frames in support of boilers. The installation of metal siding and metal roof decking, regardless of the fastening method, or the object to which it is fastened. The handling, burning, welding, and tying of all materials used to reinforce concrete structures. The installation and erection of TV and microwave towers, self-supporting towers, or guy towers. The installation of metal guardrails with metal posts and highway signage;

(K) General Laborer (including first semiskilled laborer and second semi-skilled laborer)—Consists of providing routine manual labor. This work encompasses several subclassifications, with the title and work description considered in light of whether the public works project pertains to building construction or heavy/highway construction.

1. Building construction. The subtitles falling within the occupational title of work description for laborer, as applicable to building construction, are as follows:

A. Laborer. The work falling within this subtitle of work description includes:

(I) Being included in one (1) of the following categories: flagmen, heaters, material plant man, carpenter tender, landscaper, signalman, wrecker (old/new structures), form handler, or posthole digger;

(II) Cleaning and clearing of all debris for all crafts, loading and unloading, conveying, distributing, construction material by hand and collecting and hoisting debris, backfilling, grading, and landscaping by hand;

(III) Covering of tanks, structures, and material piles with tarpaulins or other materials. Cleaning of masonry and other type walls and windows. Signaling and hoisting concrete buckets and for all other material handled by workers falling within the occupational title of work description for laborer;

(IV) Providing drinking water. Handling and cleaning of concrete chutes. Cleaning of concrete spills and chipping where hand tools are required. Performance of work necessary in remedying defects in concrete caused by leakage, bulging, sagging, or shifting of forms when finishing tools are not used. Jackhammer and paving breaker, air compressors, motor buggies, pumps (removal of water), except set-up men and nozzle men, chipping tool operator, concrete mixer operator (up to and including two- (2-) bag capacity); and

(V) Laying nonpressurized pipe for downspout drain lines, header lines, or laying of nonpressurized conduit, or a combination of these, for the carrying of storm water, waste, sewage, gravity flow lines, catch basins and manholes, effluent lines, originating outside the building and all those lines originating inside the building at the first Y, T, or connection outside the building;

B. First semiskill laborer. The work falling within this subtitle of work description includes: hod-carriers, plasterers, and cement mason tenders (who assist bricklayers, plasterers, and cement masons). The mixing, packing, wheeling, and tempering of mortar and fire clay. The mixing, handling and conveying of all other materials used by bricklayers, plasterers, and cement masons (for example, brick, tile, stone and cast stone), whether done by hand or using a forklift (walk behind or similar types). Building of scaffolds, trestles, boxes, and swinging staging for bricklayers, plasterers, and cement masons; and

C. Second semiskill laborer. The work falling within this subtitle of work description includes: concrete pump set-up men and nozzle men, tile layers and bottom men, on sewers and drains, cutting torch, and burning bar (demolition), trench, or pier holes twelve feet (12') or over, wagon drill, air track or any mechanical drill, powder man, tamper, one hundred pounds (100 lbs.) or over, laborers working for mechanical and electric contractors (including but not limited to digging of all trenches, ditches, holes, paving of concrete, and cleaning of all trash),

paving breaker, jackhammer and vibrator, laser beam man for sewer, grade checker for roads and railroads, asbestos removal (except mechanical systems that are not being scrapped and any type of roofing where the roof is to be relaid), hazardous waste removal, disposal work, or any combination of these.

2. Heavy/highway construction. The subtitle falling within the occupational title of work description for general laborer, as applicable to heavy/highway construction, are as follows:

A. Laborer. The work falling within this subtitle of work description includes: carpenters tenders, salamander tenders, dump man, ticket takers, flagman, loading trucks under bins, hoppers and conveyors, track men, cement handler, dump man on earth fill, Georgia buggie man, material batch hopper man, spreader on asphalt machine, material mixer man (except on man holes), coffer dams, riprap pavers—rock, block, or brick, signal man for materials handled by laborers, scaffolds over ten feet (10') not self-supported from ground up, skipman on concrete paving, wire mesh setters on concrete paving, work in connection with nonpressurized pipelines, such as nonpressured sewer, water, gas, gasoline, oil, drainage pipe, conduit pipe, tile, and duct lines and other nonpressurized pipelines; power tool operator; work performed by hand in connection with hydraulic or general dredging operations, form setters (curb and gutter), puddlers (paving only), straw blower nozzleman, asphalt plant platform man, chuck tender, crusher feeder, men handling creosote ties or creosote materials, men working with and handling epoxy material(s), topper of standing trees, feeder man on wood pulverizers, board and willow mat weavers and cable tiers on river work, deck hands, guardrail and temporary signs, pile dike and revetment work, all laborers working on underground tunnels less than twenty-five feet (25') where compressed air is not used, abutment and pier hole men working six feet (6') or more below ground, men working in coffer dams for bridge piers and footings in the river, Barca tamper, Jackson or any other similar tamp, cutting torch man, liners, curb, gutters, ditchliners, hot mastic kettleman, hot tar applicator, hand blade operators and mortar men on brick or block manholes, rubbing concrete, air tool operator under sixty-five pounds (65 lbs.), caulker and led man, chain or concrete saw under fifteen horsepower (15 HP). The unloading, handling, and carrying of concrete reinforcing bars, by hand, to the areas in which they are used, wrecking, stripping, dismantling, cleaning, moving, and oiling of all concrete forms; digging and laying sewer tile; and

B. Skilled laborer. The work falling within this subtitle of work description includes: vibrator man, asphalt raker, head pipe layer on sewer work, batterboard man on pipe and ditch work, cliff scalers working from Bosun's chairs, scaffolds, or platforms on dams or power plants over ten feet (10') high, air tool operator over sixty-five pounds (65 lbs.), stringline man on concrete paving and the like, sandblast man, laser beam man, wagon drill, churn drill, air track drill, and all other similar type drills, jackhammers, and other pneumatic hammers and tampers, Gunite nozzle man, pressure grout man, screed man on asphalt, concrete saw fifteen (15) HP and over, grade checker, stringline man on electronic grade control, manhole builder, dynamite man, powder man, welder, tunnel man waterblaster—one thousand pounds per square inch (1000 psi) over, asbestos (except mechanical systems that are not being scrapped), hazardous waste removal, disposal, or any combination of these;

(L) Mason (which shall include marble mason, marble finisher, terrazzo worker, terrazzo finisher, tile setter, and tile finisher).

1. Marble Mason-Terazzo Worker—The work falling within the occupational title of work description for Marble Mason-Terazzo Worker includes:

A. The installing of marble, mosaic, venetian enamel, and terrazzo; the cutting and assembling of mosaics and art ceramics; the casting of all terrazzo on the job site; all rolling of terrazzo work;

B. The preparing, cutting, layering, or setting of metal, composition, or wooden strips and grounds on all bedding above concrete floors or walls; and the laying and cutting of metal, strips, lath, or other reinforcement, where used in terrazzo work;

C. The installing of cement terrazzo, magnesite terrazzo, dex-o-tex terrazzo, epoxy matrix terrazzo, exposed aggregate. Rustic or rough wash of exterior or interior of buildings. The mixturing or applying of any other kind of mixtures of plastics composed of chips or granules of marble, granite, blue stone, enamel, mother of pearl, quartz ceramic colored quartz, and all other kinds of chips or granules when mixed with cement, rubber, neoprene, vinyl, magnesium chloride, or any other resinous or chemical substances used for seamless flooring systems. The applying of binding materials when used on walls, floors, ceilings, stairs, saddles, or any other part of the interior or exterior of the building, or other work not considered a part of the building such as fountains, swimming pools;

D. The finishing of cement floors where additional aggregate of stone is added by spreading or sprinkling on top of the finished base and troweled or rolled into the finish and then the surface ground by grinding machines (When no additional stone aggregate is added to the finished mixture, even though the surface may be ground, the work falls within the occupational title of work description for cement masons.); and

E. The carving, cutting, and setting of all marble, slate, including slate backboards, stone, albereen, carrara, sanionyx, vitrolite, and similar opaque glass, scaglioa, marbleithic, and all artificial, imitation, or case marble of whatever thickness or dimension. This shall apply to all interior work, such as sanitary, decorative, and other purposes inside of buildings of every description wherever required, including all polish, honed, or sand finish.

2. Marble Finisher—The work falling within the occupational title of work description for Marble Finisher includes:

A. The preparation of floors and/or walls by scraping, sweeping, grinding, and related methods to prepare surface for Marble Mason installation of construction materials on floor and/or walls; the movement of marble installation materials, tools, machines, and work devices to work areas; the erection of scaffolding and related installation structures;

B. The movement of marble slabs for installation; the drilling of holes and the chiseling of channels in edges of marble slabs to install wall anchors, using power drill and chisel; the securing of marble anchors to studding, using and covering ends of anchors with plaster to secure anchors in place;

C. The supply and mixture of construction materials for Marble Mason; the mixture of grout, as required, following standard formulas and using manual or machine mixing methods; the application of grout to installed marble; the movement of mixed mortar or plaster to installation area, manually or using wheelbarrow;

D. The removal of excess grout, using wet sponge; the cleaning of installed marble surfaces, work and storage areas, installation tools, machinery, and work aids, using water and cleaning agents;

E. The modification of mixing, material moving, grouting, polishing, and cleaning metal pieces, using a torch, spatula, and heat sensitive adhesive and filler;

F. The removal of marble installation materials and related debris from immediate work area; the storing of marble, installation material tools, machines, and related items; and

G. The provision of assistance to Marble Mason with the following tasks: bending or forming of wire to form metal anchors, using pliers; inserting anchors into holes of marble slab; securing anchors in

place with wooden stakes and plaster; selecting marble slab for installation following numbered sequences or drawings; grinding and polishing marble, using abrasives, chemical and/or manual, in machine grinding and/or polishing techniques, under Marble Mason's direction; the moving and positioning of marble.

3. Terrazzo Finisher—The work falling within the occupational title of work description for Terrazzo Finisher includes:

A. The preparation of floors and/or walls by scraping, sweeping, grinding, and related methods to prepare surface for Terrazzo Worker installation of construction materials on floors, base, and/or walls; the moving of terrazzo installation materials, tools, machines, and work devices to area, manually or using wheelbarrow;

B. The supply and mixture of construction materials for Terrazzo Worker; the preparation, mixture by hand, mixture by mixing machine, or transportation of premixed materials and the distribution with shovel, rake, hoe, or pail, of all kinds of concrete foundations necessary for mosaic and terrazzo work; the dumping of mixed materials that form base or top surface of terrazzo into prepared installation site, using wheelbarrow; the measuring of designated amounts of ingredients for terrazzo or grout, using graduated containers and scale, following standard formulas and specifications, and the loading of portable mixer using proper means of transport; the mixture of materials according to experience and requests from Terrazzo Worker;

C. The spreading of marble chips or other material over fresh terrazzo surface and the pressing of the material into terrazzo by use of a roller; the application of grout finishes to surfaces of installed terrazzo; the spreading of grout across terrazzo to finish surface imperfections, using trowel; the installation of grinding stones in power grinders, using hand tools; the fine grinding and polishing of the surface of terrazzo, when grout has set, using power grinders; the application of curing agent to installed terrazzo to promote even curing, using brush or sprayer; the cutting of grooves in terrazzo stairs, using power grinder, and the filling of grooves with nonskid material;

D. The modification of mixing, grouting, grinding, and cleaning position and the securing of moisture membrane and wire mesh prior to pouring base materials for terrazzo installation;

E. The washing of the surface of polished terrazzo, using cleaner and water, and the application of sealer, according to manufacturer specifications, using brush; the cleaning of the installation site, and storage areas, tools, machines, and equipment; the removal of Terrazzo Worker materials and related debris from immediate work area; and

F. The provision of assistance to Terrazzo Worker with the following tasks: grinding surfaces of cured terrazzo; using power grinders.

4. Tile Setter—The work falling within the occupational title of work description for Tile Setter includes:

A. The application of tile to floors, walls, ceilings, stair treads, promenade roof decks, garden walks, swimming pools, and all places where tiles may be used to form a finished surface for practical use, sanitary finish, or decorative purpose. (Tile includes all burned clay products, as used in the tile industry, either glazed or unglazed, all composition materials; all substitute materials in single units up to and including, fifteen inches by twenty inches by two inches (15" × 20" × 2") (except quarry tiles larger than nine inches by eleven inches (9" × 11")) and all mixtures in the form of cement, plastics, and metals that are used as a finished surface.);

B. The cutting and shaping of tile with saws, tile cutters, and biters; and

C. The positioning of tile and tapping it with a trowel handle to affix tile to plaster or adhesive base.

5. Tile Finisher—The work falling within the occupational title of work description for Tile Finisher includes:

A. The preparation of floors and/or walls by scraping, sweeping, grinding, and related methods for Tile Setter to install construction materials on floors and walls; the movement of tiles, tile setting tools, and work devices from storage area to installation site manually or using wheelbarrow;

B. The supply and mixture of materials for Tile Setter; the supply and mixture of construction materials for Tile Setter; the mixture of mortar and grout accordingly to standard formulas and request from Tile Setter using bucket, water hose, spatulas, and portable mixer; the modification of mixing, grouting, grinding, and cleaning procedures according to type of installation or material used; the supply to Tile Setter of mortar, using wheelbarrow and shovel; the application of grout between joints of installed tile, using grouting trowel; the application of grout; the cutting of installed tile;

C. The removal of excess grout from tile joints with a sponge and scraping of corners and crevices with a trowel; the application of caulk, sealers, acid, steam, or related agents to caulk, seal, or clean installed tile, using various application devices and equipment;

D. The wiping of surfaces of tile after grouting to remove grout residue and polish tile, using non-abrasive materials; the removal of Tile Setter materials and related debris from immediate work area; the cleaning of installation site, mixing and storage tools, and equipment, using water and various cleaning tools; the storing of tile setting material machines, tools, and equipment; and

E. The provision of assistance to Tile Setter to secure position of metal lath, wire mesh, felt paper, Dur/rock or wonderboard prior to installation of tile;

(M) Operating Engineer (which shall include operating engineer group I, operating engineer group II, operating engineer group III, operating engineer group III-A, operating engineer group IV, and operating engineer group V)—Applies to workers who perform work falling within the occupational title of work description for operating engineer/portable and hoisting operator, monitor, and control, repair, modify, assemble, erect, oil, service each or all electrically or electronically, hydraulically, or any power-operated equipment. This occupational title encompasses several subclassifications, with the title and work description considered in light of whether the public works project pertains to building construction or heavy/highway construction.

1. Building construction. The subtitles falling within the occupational title of work description for operating engineer, as applicable to building construction, are as follows:

A. Group I—This subtitle applies to workers who operate, monitor, and control, repair, modify, assemble, erect, oil, service each or all electrically or electronically, hydraulically, or any power-operated equipment set forth as follows: crane (for example, crawler or truck); dragline—clam shell—gradall; Derrick (all types); kimmer scoop; power shovel or backhoe over one (1) cubic yard; pile driver (for example, land or floating); Whirley; mechanic and welder; hydraulic, self-propelled crane; stinger or cherry picker crane; switch boat; concrete portable plant/concrete mixer paver; cableways;

B. Group II—This subtitle applies to workers who operate, monitor, and control, repair, modify, assemble, erect, oil, service each or all electrically or electronically, hydraulically, or any power-operated equipment set forth as follows: asphalt paver and spreader/concrete spreader; asphalt plant mixer operators; asphalt plant operator; backfillers; back hoe (under one (1) cubic yard); Barber-Green loader (similar type); blade—power, all types; boats—power; boilers; boring machine (all types, including tunnel boring); brooms—power operated (all types); concrete saw (self-propelled); chip spreader (front man); clef plane operators; combination concrete hoist and mixer such as mix or mobile; crab—power operated; crusher rock; ditching machine; dozer/dredges;

finishing machine; firemen on rigs; flex plane; floating machine; form grader; greaser; hoist operator (all types); hopper—power operated; hydra hammer (all types); Lad-A-Vator—similar type; loaders—all types, including skid-steer (for example, Bobcat); locomotives (all types); curb finishing machine; mucking machine; orange peels; pumps (all types); push cats; rollers (all types); scoops (all types except skimmer scoop); self-propelled rotary drill; air compressors (all types); side boom; siphons, jets, and jennies; welding machine; subgrader; testhole machine; throttle man tractors over fifty (50) HP; air tugger with air compressor; anchor placing barge; Ahoy force feeder loader (self-propelled); bull float; pipe cleaning/wrapping machine; conveyor; heaters, fuel fired with forced air; quadtrack; tie tamper; vibrating machine; well drilling machine; forklift (except masonry forklift);

C. Group III—This subtitle applies to workers who operate, monitor, and control, repair, modify, assemble, erect, oil, service each or all electrically or electronically, hydraulically, or any power-operated equipment set forth as follows: tractors (under fifty (50) HP); distributor (bituminous); scissor lift; small machine (operator); mud jack; wench truck operator; pug mill operator; elevator-push button; A-frame truck; mixers; oilers;

D. Group III-A—This subtitle applies to workers who operate, monitor, and control, repair, modify, assemble, erect, oil, service each or all electrically or electronically, hydraulically, or any power-operated equipment set forth as a masonry forklift;

E. Group IV—This subtitle applies to workers who operate, monitor, and control, repair, modify, assemble, erect, oil, service each or all electrically or electronically, hydraulically, or any power-operated equipment set forth as a self-propelled floor sweeper; and

F. Group V—This subtitle applies to workers who operate, monitor, and control, repair, modify, assemble, erect, oil, service each or all electrically or electronically, hydraulically, or any power-operated equipment set forth as follows: elevator—auto; air pressure oiler; air pressure engineer.

2. Heavy/highway construction. The subtitles falling within the occupational title of work description for operating engineer, as applicable to heavy/highway construction, are as follows:

A. Group I—This subtitle applies to workers who operate, monitor, and control, repair, modify, assemble, erect, oil, service each or all electrically or electronically, hydraulically, or any power-operated equipment set forth as follows: asphalt finishing machine and trench; widening spreader; asphalt plant console operator; autograder; automatic slipform paver; backhoe; blade operator (all types); boat operator (all types); boilers—two (2); central mix concrete plant operator; clamshell operator; concrete mixer paver; crane operator; Derrick or Derrick trucks; ditching machine; dozer operator; dragline operator; dredge booster pump; dredge engineman; dredge operator; drill cat with compressor mounted on cat; drilling or boring machine rotary self-propelled; high-loader including skid steer (for example, Bobcat); hoisting engine—two (2) active drums; launchhammer wheel; locomotive operator—standard gauge; mechanics and welders; mucking machine; piledriver operator; Pitman crane operator; push cat operator; quadtrack; scoop operator—all types; shovel operator; sideboom cats; skimmer scoop operator; trenching machine operator; truck crane;

B. Group II—This subtitle applies to workers who operate, monitor, and control, repair, modify, assemble, erect, oil, service each or all electrically or electronically, hydraulically, or any power-operated equipment set forth as follows: A-frame truck; asphalt hot mix silo; asphalt plant fireman, drum or boiler; asphalt plant mixer operator; asphalt plant man; asphalt roller operator; backfiller operator; Barber-Greene loader; chip spreader; concrete mixer operator, skip loader; concrete plant operator; concrete pump operator; crusher operator; dredge oiler; elevating grader operator; forklift; greaser—fleet; hoisting engine—one (1); locomotive operator—narrow gauge; multiple compactor; pavement breaker; power-broom—self-propelled; power shield; rooter; side discharge concrete spreader; slip form finishing machine; stumpcutter machine; throttle man; tractor operator—over fifty (50) HP; winch truck;

C. Group III—This subtitle applies to workers who operate, monitor, and control, repair, modify, assemble, erect, oil, service each or all electrically or electronically, hydraulically, or any power-operated equipment set forth as follows: boilers—one (1); chip spreader (front man); churn drill operator; clef plane operator; concrete saw operator self-propelled; curb finishing machine; distributor operator; finishing machine operator; flex plane operator; float operator; form grader operator; pugmill operator; roller operator, other than high-type asphalt; screening and washing plant operator; siphons and jets; subgrading machine operator; spreader box operator, self-propelled (not asphalt); tank car heater operator—combination boiler and booster; tractor operator fifty (50) HP or less; Ulmac, Ulric, or similar spreader; vibrating machine operator, not hand;

D. Group IV—This subtitle applies to workers who operate, monitor, and control, repair, modify, assemble, erect, oil, service each or all electrically or electronically, hydraulically, or any power-operated equipment set forth as an oiler or oiler-driver (fireman—rig; maintenance operator);

(N) Outside- lineman, lineman operator, groundman, lineman tree trimmer, groundman tree trimmer, and any combination thereof.

1. Outside-lineman—Applies to workers who erect and repair transmission poles (whether built of wood, metal, or other material), fabricated metal transmission towers, outdoor substations, switch racks, or similar electrical structures, electric cables, and related auxiliary equipment for high-voltage transmission and distribution powerlines used to conduct energy between generating stations, substations, and consumers. The work (overhead and underground) falling within this occupational title of work description includes:

A. Construction, repair, or dismantling of all overhead and underground electrical installations. The handling and operation of all equipment used to transport men, tools, and materials to and from the job site. The framing, trenching, digging, and backfilling of vaults, holes and poles, and anchors (by hand or mechanical equipment), guying, fastening to the stub-in on concrete footings or pads, assembling of the grillage, grounding of all structures, stringing overhead wire, installing underground wire, splicing, and installation of transformers;

B. Construction and repair of highway and street lighting and traffic signal systems, cathodic protection systems, and ball field lighting systems;

2. Lineman operator—Operates equipment used on the outside line portion of a project. The lineman operator assists linemen in the performance of their work but does not climb or work out of any type of aerial lift equipment. The lineman operator does not perform any work that requires the use of hand tools;

3. Groundman—Work performed on the ground to assist the journeymen outside line construction/lineman on work not energized. Groundmen use jack hammers, air drills, shovels, picks, tamps, trenching equipment, and other such tools for excavating and/or compacting dirt or rock on the outside line portion of a project but do not use hand tools;

4. Lineman tree trimmer—Trimming and removal of trees, stumps, limbs, brush, and other related tasks in and around electrical systems by use of chainsaws, pruners, pole saws, and hand saws only when specifically required to provide clearance and right-of-way preparation for installation of overhead or underground high-voltage electric

utility lines, and excluding the clearance of right-of-ways related to heavy-highway construction or other public projects not directly related to the installation of electrical utility lines. Lineman tree trimmer work may be performed on the ground and in the air; and

5. Groundman tree trimmer—Assists the lineman tree trimmer in the performance of their work using rakes, chainsaws, chippers, and industrial mowers in and around electrical systems only when specifically required to provide clearance and right-of-way preparation for installation of overhead or underground high-voltage electric utility lines, and excluding the clearance of right-of-ways related to heavy-highway construction or other public projects not directly related to the installation of electrical utility lines. Groundman tree trimmer work is only performed on the ground;

(O) Painter—The work falling within the occupational title of work description for painter includes:

1. Preparation of surfaces. The washing, cleaning, pointing, and taping of drywall, regardless of material used, and smoothing of surfaces, using sandpaper, brushes, or steel wool. The removal of old paint or other coatings from surfaces, using paint remover, scraper, wire brushing, sandblasting, water blasting, liquid steam, or by any other similar process. The filling of nail holes, cracks, and joints with putty, plaster, or other fillers;

2. Color matching and mixing. The application of paint, varnish, stain, enamel, lacquer, vinyl, wallpaper, and other materials of whatever kind of quality applied to walls or ceilings with paste or adhesive, using brushes, spray gun (spray painter), or paint rollers. The application of polyurethane elastomers, vinyl plastics, neoprene, resin, polyester, and epoxy as waterproofing or protective coatings to any kind of surface (except roofs) when applied with brushes, spray guns, or rollers;

3. Texturing and decorating. The erecting of scaffolding or setting up of ladders to perform the work above ground level. The paperhanging of walls and ceilings with decorative wall coverings made of fabric, vinyl, or paper. The preparing of the surface to be covered by applying sizing, which seals the surface and makes the covering stick better. The removal of the old covering by soaking, steaming, or applying solvents. The patching of holes and other imperfections before applying the new wall covering. The measuring of the area to be covered; the cutting of the covering into strips of the proper size, the checking of the covering for flaws and the examination of the pattern so it can be matched when the strips are hung. The preparation of paste or other adhesives according to manufacturers' directions, and the brushing or rolling it on the covering. The placing of the strips on the wall or ceiling, to match adjacent patterns. The smoothing of the strips to remove bubbles and wrinkles; the trimming of the top and bottom with a razor blade; and the painting or taping of highway striping, or both; and

4. Cleanup. The cleanup of tools and equipment required in connection with work falling within this occupational title;

(P) Plumber (which shall include pipe fitter).

1. General Plumber—Applies to workers who install and repair domestic potable water lines, gravity waste disposal systems inside the curb or fence lines, plumbing fixtures such as: bathtubs, sinks, and toilets—and appliances such as, dishwashers and water heaters. The work falling within the occupational title of work description for plumber includes:

A. Assembling and installing piping systems, fixtures and equipment for the transportation of domestic water and sewage. Piping systems installed in structures (for example, buildings, industrial plants) to the first Y, T, or connection located outside the building;

B. Cutting, threading, and bending pipe. Joining pipes by use of screws, bolts, fittings, solder, welding brazing, and caulking or any other method of making joints in the plumbing industry;

C. Assembling, installing, and repairing valves, pipe fittings, and pumps. Testing the piping system. Installing and repairing plumbing fixtures, such as sinks, bathtubs, water heaters, and water softeners; and

D. Cutting holes in floors and walls for pipes with point and hammer, core drill, or both.

2. Pipe Fitter—Applies to workers who fabricate, install, and repair piping systems to include: water and waste processing systems; heating and air-conditioning systems, pneumatic controls, and pneumatic delivery systems; powerhouse and all pressurized piping systems; gas, oxygen systems; gasoline systems not for public sale. The work falling within this occupational title of work description includes:

A. Piping systems installed in structures (for example, buildings, industrial plants, and the like);

B. Cutting, threading, and bending pipe. Joining pipes by use of screws, bolts, fittings, solder, welding, and caulking, or any other method of making joints in the pipefitting industry;

C. Assembling, installing, and repairing valves, pipe fittings, and pumps. Testing the piping system. Cutting holes in floors and walls for pipes with point and hammer, core-drill, or both;

D. Installing of distribution lines (for example, water mains, sewer mains, oil and gas lines);

E. Welding of steel pipe joints and joining pipes with screws, bolts, fittings, solder, caulking, or any other method for making joints in the industry; and

F. Joining ductile iron and plastic pipes by using any method for making joints in the industry, when the pipe will be under pressure;

(Q) Roofer—Applies to workers who apply and install any and all types of roofing materials, other than sheet metal. The work falling within this occupational title of work description includes:

1. The installation of slate and tile and all substitute materials taking the place of slate and tile used for roofing including flat or promenade slate, with necessary metal flashing to make water-tight;

2. The cementing in, on, or around slate and tile roofs. The laying of felt or paper beneath the slate and tile. The dressing, punching, and cutting of all roof slate or tile either by hand or machinery;

3. The installation of all forms of plastic, slate, slag, gravel; asphalt and composition roofing; rock asphalt mastic when used for damp and waterproofing; prepared paper; compressed paper and chemically prepared paper, and burlap with or without coating. The installation of all damp resisting preparations regardless of the method of application in or outside of building. The installation of damp courses, sheeting, or coating on foundation work and tarred roofs. The laying of the tile or brick, when laid in asphalt or pitch tar;

4. The installation and application of new materials used in roofing, water-proofing, encapsulation, and containment process including all forms of elastomeric or plastic (elastoplastic), or both, roofing systems, both sheet and liquid applied, whether single-ply or multi-ply. The installation of aggregates or stone, used as a ballast for inverted roofing membrane assembly, or roof of similar construction where insulation is laid over the roofing membrane. The sealing and caulking of seams and joints on these elastoplastic systems to insure water-tightness. The applying of liquid-type elastoplastic preparation for roofing, damp, or waterproofing when applied with a squeegee, trowel, roller, or spray equipment whether applied inside or outside of a building. The priming of surfaces to be roofed, damp, or waterproofed, whether done by roller, mop, swab, three- (3-) knot brush, or spray systems. The waterproofing of all types of preformed panels;

5. The application of all types of spray-in-place such as urethane or polyurethane, and the coatings that are

applied over them;

6. The application of roof insulation, when the insulation material is applied as an integral part of the roofing system, whether the insulation material is applied as the first, last, or any other layer in between;

7. The operation and servicing of all kettles, bulk tankers, stationary heating tankers, and other types of equipment and tools used to accomplish this work (including heating systems for the operation of the equipment); and compressors for applying roofing material components, roof and mop carts, hydraulics, tools and equipment, be it hand or power, needed to apply waterproofing, insulated, and roofing materials;

8. The handling, hoisting, and storing of all roofing, damp, and waterproofing materials; and

9. The tear-off, removal, or both, of any type of roofing, all spudding, sweeping, vacuuming, cleanup, or a combination of these, of any areas of any type where a roof is to be relayed;

(R) Sheet Metal Worker—The work falling within the occupational title of sheet metal worker includes:

1. The handling, conditioning, assembling, installing, servicing, repairing, altering, and dismantling of the duct work for the heating, ventilation, and air-conditioning systems regardless of the materials used and the setting of all equipment and all supports and reinforcements in connection with the system;

2. The installation of expansion and discharge valves, air filters, and water filters in heating, ventilation, and air-conditioning systems;

3. The testing and balancing of air-handling equipment and duct work;

4. The forming, rolling, drawing, stamping, or pressing of sheet metal shingles, sheet metal tile, sheet metal brick, sheet metal stone, and sheet metal lumber, when specified for use as roofing, siding, waterproofing, weather proofing, fire proofing, or for ornamental or any other purpose;

5. The performing of sheet metal work specified for use in connection with or incidental to steeples, domes, minarets, look outs, dormers, louvers, ridges, copings, roofing, decking, hips, valleys, gutters, outlets, roof flanges, flashings, gravel stops, leader heads, down spouts, mansards, balustrades, skylights, cornice moulding, columns, capitals, panels, pilasters, mullions, spandrils, and any and all other shapes, forms and design of sheet metal work specified for use for waterproofing, weatherproofing, fire proofing, ornamental, decorative, or display purposes, or as trim on exterior of the buildings;

6. The installing of sheet metal ceilings with cornices and mouldings of plain, ornamental, enameled, glazed, or acoustic type;

7. The installing of side walls, wainscoting of plain, ornamental, enameled, or glazed types, including sheet metal tile;

8. The application of all necessary wood or metal furring, plastic, or other materials, to which they are directly applied;

9. The performing of sheet-metal work specified for use in connection with or incidental to direct, indirect, or other types of heating, ventilating, air-conditioning, and cooling systems (including risers, stacks, ducts, S strips, fittings, dampers, casings, recess boxes, outlets, radiator enclosures, exhausts, ventilators, frames, grisses, louvers, registers, cabinets, fans, and motors);

10. The air washers, filters, air brushes, housings, air-conditioning chambers;

11. The setting and hanging of air-conditioning units, unit heaters or air-veyor systems, and air handling systems regardless of material used;

12. The assembling and setting up of all cast iron parts, warm air furnace, all stoker, gas, and oil burner equipment used in connection with warm air heating, all sheet metal hoods, casings, wall stacks, smoke pipes, truck lines, cold air intake, air chambers, vent pipes, frames, registers, dampers, and regulation devices;

13. The installing of equipment utilized in the operation of kitchens including ranges, canopies, steam tables, work tables, dishwashers, coffee urns, soda fountains, warming closets, sinks, drainboards, garbage chutes, incinerators, and refrigerators;

14. The installing of tubing, pipes, and fittings, used in connection with or incidental to coppersmithing work. The installation of fume hoods, metal toilet partitions, metal lockers, plain metal shelving; and

15. The handling, moving, hoisting, and storing of all sheet metal materials on the job site, where power equipment and rigging are required;

(S) Sprinkler Fitter—Applies to workers who perform the installation, adjustments, and corrections, repair, and dismantling of all fire protection and fire control systems and the installation of all fire piping for tubing, appurtenances, and equipment. The work falling within the occupational title includes: The handling and installation of all piping and appurtenances pertaining to sprinkler equipment, including both overhead and underground water mains, fire hydrants and hydrant mains, standpipes, and hose connections to the sprinkler systems, sprinkler tank heaters, air lines and thermal systems used in connection with sprinkler and alarm systems, tank and pump connections, and fire protection systems using mulsifyre, spray, water, fog, carbon dioxide (CO_2), gas and foam and dry chemical systems; and

(T) Truck Driver (which shall include truck control service driver, truck driver group I, truck driver group II, truck driver group III, and truck driver group IV)—The workers who perform work falling within the occupational title of work description for truck driver includes the operation, repair, and servicing of the following mechanical equipment. This occupational title encompasses several subclassifications, with the title and work description considered in light of whether the public works project pertains to building construction or heavy/highway construction.

1. Building construction. The subtitles falling within the occupational title of work description for truck driver, as applicable to building construction, are as follows:

A. Truck control service driver – Applies to workers who perform work including:

(I) The delivery, installation, and pickup of traffic control devices;

(II) The unloading and installation of barricades, plastic channelizer drums, safety cones, and temporary flashing lights not to exceed one hundred fifteen (115) volts;

(III) Regular periodic inspections to assure that traffic control devices are clean, clearly visible, and properly positioned. Inspection and maintenance includes replacing batteries and bulbs in lights, cleaning reflective material and lenses, and repairing or replacing damaged or missing devices when incidental to and part of a public works construction project; and

(IV) Removal of all traffic control devices by loading them on a truck and driving them to a storage yard where they are unloaded;

B. Group I—This subtitle applies to workers who operate, monitor, control, repair, modify, assemble, erect, oil, and service the following equipment: flat bed trucks single axle, station wagons, pick-up trucks, material trucks single axle, tank wagon single axle;

C. Group II—This subtitle applies to workers who operate, monitor, control, repair, modify, assemble, erect, oil, and service the following equipment: agitator and transit mix-trucks;

D. Group III—This subtitle applies to workers who operate, monitor, control, repair, modify, assemble, erect, oil, and service the following equipment: flat bed trucks tandem axle, articulated dump trucks, material trucks tandem axle, tank wagon tandem axle; and

E. Group IV—This subtitle applies to workers who operate, monitor, control, repair, modify, assemble, erect, oil, and service the

following equipment: semi and/or pole trailers, winch, fork and steel trucks, distributor drivers and operators, tank wagon semi-trailer, Insley wagons, dumpsters, halftracks, speedace, euclids, and other similar equipment, A-frame and Derrick trucks, float or low boy, and boom truck.

2. Heavy/highway construction. The subtitles falling within the occupational title work description for truck driver, as applicable to heavy/highway construction, are as follows:

A. Truck control service driver – Applies to workers who perform work including:

(I) The delivery, installation, and pickup of traffic control devices;

(II) The unloading and installation of barricades, plastic channelizer drums, safety cones, and temporary flashing lights not to exceed one hundred fifteen (115) volts;

(III) Regular periodic inspections to assure that traffic control devices are clean, clearly visible, and properly positioned. Inspection and maintenance includes replacing batteries and bulbs in lights, cleaning reflective material and lenses, and repairing or replacing damaged or missing devices when incidental to and part of a public works construction project; and

(IV) Removal of all traffic control devices by loading them on a truck and driving them to a storage yard where they are unloaded;

B. Group I—This subtitle applies to workers who operate, monitor, control, repair, modify, assemble, erect, oil, and service the following equipment: flat bed trucks single axle, station wagons, pick-up trucks, material trucks single axle, tank wagon single axle;

C. Group II—This subtitle applies to workers who operate, monitor, control, repair, modify, assemble, erect, oil, and service the following equipment: agitator and transit mix-trucks;

D. Group III—This subtitle applies to workers who operate, monitor, control, repair, modify, assemble, erect, oil, and service the following equipment: flat bed trucks tandem axle, articulated dump trucks, material trucks tandem axle, tank wagon tandem axle; and

E. Group IV—This subtitle applies to workers who operate, monitor, control, repair, modify, assemble, erect, oil, and service the following equipment: semi-and/or pole trailers, winch, fork and steel trucks, distributor drivers and operators, tank wagon semi-trailer, Insley wagons, dumpsters, halftracks, speedace, euclids, and other similar equipment, A-frame and Derrick trucks, float or low boy, and boom truck.

AUTHORITY: section 290.240.2., RSMo Supp. 2018. Original rule filed Sept. 15, 1992, effective May 6, 1993. Emergency amendment filed April 30, 1993, effective May 10, 1993, expired Aug. 28, 1993. Amended: Filed Aug. 13, 1996, effective Feb. 28, 1997. Amended: Filed Jan. 22, 1997, effective Sept. 30, 1997. Amended: Filed June 17, 2004, effective Dec. 30, 2004. Amended: Filed Aug. 19, 2010, effective Feb. 28, 2011. Amended: Filed Aug. 9, 2012, effective Feb. 28, 2013. Emergency amendment filed Nov. 7, 2014, effective Nov. 17, 2014, expired May 15, 2015. Amended: Filed Nov. 7, 2014, effective April 30, 2015. Emergency amendment filed Nov. 21, 2018, effective Dec. 1, 2018, expired May 29, 2019. Amended: Filed Nov. 21, 2018, effective July 30, 2019.*

**Original authority: 290.240, RSMo 1957, amended 1969, 2018.*

DIVISION OF LABOR STANDARDS

MISSOURI DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS

PREVAILING WAGE PROJECT NOTIFICATION – CONTRACTOR INFORMATION

☐ New ☐ Update

The information below is requested pursuant to Sections 290.210 through 290.340, RSMo.

1. Date of Notification		2. Annual Wage Order Number Included in Bid Specifications
3. Popular or Descriptive Name of Project		
4. Estimated Project Cost of Completion *(total construction contracts to be awarded)* $		
5. Exact Location of Project County	City	
6. Official Name of Public Body or Agency		
7. Name of Contact Person		8. Phone Number *(include area code)*
9. Address		
10. Email Address	Website	
11. Contract Award Date	12. Estimated Date of Project Completion	13. Will There Be Any Federal Funds Used in this Contract? ☐ Yes ☐ No

14. Contractor Information Notification

General Contractor:

Name _____

Address _____

City _____ State _____ ZIP _____

Phone Number _____ Email Address _____

Type of Craftsmen Needed by Project _____

Scope of Work _____

List all Subcontractors:

1. Name _____

Address _____

City _____ State _____ ZIP _____

Phone Number _____ Email Address _____

Type of Craftsmen Needed by Project _____

Scope of Work _____

2. Name _____

Address _____

City _____ State _____ ZIP _____

Phone Number _____ Email Address _____

Type of Craftsmen Needed by Project _____

Scope of Work _____

3. Name _____

Address _____

City _____ State _____ ZIP _____

Phone Number _____ Email Address _____

Type of Craftsmen Needed by Project _____

Scope of Work _____

(Subcontractors continued)

4. Name _____
   Address _____
   City _____ State _____ ZIP _____
   Phone Number _____ Email Address _____
   Type of Craftsmen Needed by Project _____
   Scope of Work _____

5. Name _____
   Address _____
   City _____ State _____ ZIP _____
   Phone Number _____ Email Address _____
   Type of Craftsmen Needed by Project _____
   Scope of Work _____

6. Name _____
   Address _____
   City _____ State _____ ZIP _____
   Phone Number _____ Email Address _____
   Type of Craftsmen Needed by Project _____
   Scope of Work _____

7. Name _____
   Address _____
   City _____ State _____ ZIP _____
   Phone Number _____ Email Address _____
   Type of Craftsmen Needed by Project _____
   Scope of Work _____

8. Name _____
   Address _____
   City _____ State _____ ZIP _____
   Phone Number _____ Email Address _____
   Type of Craftsmen Needed by Project _____
   Scope of Work _____

9. Name _____
   Address _____
   City _____ State _____ ZIP _____
   Phone Number _____ Email Address _____
   Type of Craftsmen Needed by Project _____
   Scope of Work _____

The state of Missouri requires workers on public works projects be paid the prevailing wage. Public bodies have duties as required under Section 290.210 - 290.340, RSMo.

Mail, Fax, or Email completed form to: DIVISION OF LABOR STANDARDS
Attn: Prevailing Wage Section
P.O. Box 449, Jefferson City, MO 65102-0449
Phone: 573-751-3403 Fax: 573-751-3721
Email: prevailingwage@labor.mo.gov
Website: www.labor.mo.gov/DLS

SUBMIT

Missouri Department of Labor and Industrial Relations is an equal opportunity employer/program.
TDD/TTY: 800-735-2966 Relay Missouri: 711

DIVISION OF LABOR STANDARDS

MISSOURI DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS

AFFIDAVIT
COMPLIANCE WITH THE PREVAILING WAGE LAW

I, _____, upon being duly sworn upon my oath state that: (1) I am the
(Name)

_____ of _____; (2) all requirements of
(Title) *(Name of Company)*

§§ 290.210 to 290.340, RSMo, pertaining to the payment of wages to workers employed on public works projects have been fully satisfied with regard to this company's work on _____;
(Name of Project)

(3) I have reviewed and am familiar with the prevailing wage rules in 8 CSR 30-3.010 to 8 CSR 30-3.060; (4) based upon my knowledge of these rules, including the occupational titles set out in 8 CSR 30-3.060, I have completed full and accurate records clearly indicating (a) the names, occupations, and crafts of every worker employed by this company in connection with this project together with an accurate record of the number of hours worked by each worker and the actual wages paid for each class or type of work performed, (b) the payroll deductions that have been made for each worker, and (c) the amounts paid to provide fringe benefits, if any, for each worker; (5) the amounts paid to provide fringe benefits, if any, were irrevocably made to a fund, plan, or program on behalf of the workers; (6) these payroll records are kept and have been provided for inspection to the authorized representative of the contracting public body and will be available, as often as may be necessary, to such body and the Missouri Department of Labor and Industrial Relations; (7) such records shall not be destroyed or removed from the state for one year following the completion of this company's work on this project; and (8) there has been no exception to the full and complete compliance with the provisions and requirements of Annual Wage Order No. _____ Section _____ issued by the Missouri Division of Labor Standards and applicable to this project located in _____ County, Missouri, and completed on the ____ day of _____, _____.

The matters stated herein are true to the best of my information, knowledge, and belief. I acknowledge that the falsification of any information set out above may subject me to criminal prosecution pursuant to §§290.340, 570.090, 575.040, 575.050, or 575.060, RSMo.

_____
Signature

Subscribed and sworn to me this ____ day of _____, _____.

My commission expires _____, _____.

_____
Notary Public

_____
Receipt by Authorized Public Representative

Missouri Department of Labor and Industrial Relations is an equal opportunity employer/program.

Revisor of Statutes

State of Missouri
Constitution Committee Publications

About Help & FAQ Other Links & Info

Words | 1st search term | And | 2nd search term

290.010. What constitutes a day's labor. — From and after the first day of May, in the year eighteen hundred and sixty-seven, the period of eight hours shall be and constitute a legal day's work; but nothing in this section shall be so construed as to prevent parties to any contract for work, services or labor from agreeing upon a longer or shorter time. This section shall not apply to persons hired or employed by the month, nor to laborers or farm hands in the service of farmers or others engaged in agriculture.

(RSMo 1939 § 10166)

Prior revisions: 1929 § 13205; 1919 § 6766; 1909 § 7812

CROSS REFERENCE:

Election, employees allowed three hours to vote, 115.639

8/28/1939

290.020. Limitation of working hours in certain industries, exception by consent of worker. — It is hereby declared to be unlawful for any person, company or corporation engaged in carrying on any kind of mining, mechanical, chemical manufacturing or smelting business, to work their employees in any mill or mills, or plants, while engaged in crushing rocks and mine products, containing mineral or ores, or engaged in separating the minerals or ores from rock and such combination with which the mineral or ores are mixed, or reducing or roasting, or refining or smelting minerals or ores, from and after the time such rocks, or combination of rocks and mine products, or minerals or ores are taken out of the mines, at such labor or industry, for a period of time longer than eight hours in a day of twenty-four hours, without their consent, and it is hereby declared that eight hours shall constitute a day of employment, for all laborers, or employees, engaged in the kind of labor or industry aforesaid.

(RSMo 1939 § 10167, A.L. 1981 H.B. 748)

Prior revisions: 1929 § 13206; 1919 § 6767; 1909 § 7813

8/28/1981

290.030. Penalty. — Any person or persons, company or corporation who shall violate any of the provisions of section 290.020 shall, on conviction, be fined in a sum not less than twenty-five dollars nor more than five hundred dollars.

(RSMo 1939 § 10168)

Prior revisions: 1929 § 13207; 1919 § 6768; 1909 § 7814

8/28/1939

290.080. Employees paid semimonthly, exception — statement of deductions — violation, misdemeanor. — All corporations doing business in this state, and all persons operating railroads or railroad shops in this state, shall pay the wages and salaries of their employees as often as semimonthly, within sixteen days of the close of each payroll period; provided, however, that executive, administrative and professional employees, and sales people and other employees compensated in whole or in part on a commission basis, at the option of such employers, may be paid their salaries or commissions monthly. Such corporations and persons either as a part of the check, draft or other voucher paying the wages or separately, shall furnish the employee at least once a month a statement showing the total amount of deductions for the period. Any corporation or person violating this section shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined in any sum not less than fifty dollars, nor more than five hundred dollars, for each offense.

(RSMo 1939 §§ 5080, 5081, 10176, A. 1949 S.B. 1105, A.L. 1955 p. 596)

Prior revisions: 1929 §§ 4608, 4609, 13215; 1919 §§ 9802, 9803, 6778; 1909 § 7820

CROSS REFERENCE:

Wages, when to be paid, interest, priority, 430.360

8/28/1955

290.090. Factory employees paid semimonthly — amount withheld — penalty. — The employees of the operators of all manufactories, including plate glass manufactories, operated within this state shall be regularly paid in full of all wages due them at least once in every fifteen days, in lawful money, and at no pay day shall there be withheld from the earnings of any employee any sum to exceed the amount due him for his labor for five days next preceding any such pay day. Any such operator who fails and refuses to pay his employees, their agents, assigns or anyone duly authorized to collect such wages, as in this section provided, shall become immediately liable to any such employee, his agents or assigns for an amount double

the sum due such employee at the time of such failure to pay the wages due, to be recovered by civil action in any court of competent jurisdiction within this state, and no employee, within the meaning of this section, shall be deemed to have waived any right accruing to him under this section by any contract he may make contrary to the provisions hereof.

(RSMo 1939 § 10175)

Prior revisions: 1929 § 13214; 1919 § 6775; 1909 § 7817

8/28/1939

290.095. Wage subsidies, bid supplements, and rebates for employment prohibited, when — violation, penalty. — 1. No contractor or subcontractor may directly or indirectly receive a wage subsidy, bid supplement, or rebate for employment on a public works project if such wage subsidy, bid supplement, or rebate has the effect of reducing the wage rate paid by the employer on a given occupational title below the wage rate required to be paid for such project pursuant to sections 290.210 to 290.340.

2. In the event a wage subsidy, bid supplement, or rebate is lawfully provided or received under subsection 1 of this section, the entity receiving such subsidy, supplement, or rebate shall report the date and amount of such subsidy, supplement, or rebate to the public body within thirty days of receipt of payment. This disclosure report shall be a matter of public record under chapter 610.

3. Any employer in violation of this section shall owe to the public body double the dollar amount per hour that the wage subsidy, bid supplement, or rebate has reduced the wage rate paid by the employer below the wage rate required to be paid for such project pursuant to sections 290.210 to 290.340 for each hour that work was performed. It shall be the duty of the department to calculate the dollar amount owed to the public body under this section.

(L. 2007 S.B. 339, A.L. 2018 H.B. 1729, et al.)

8/28/2018

290.100. Thirty days' notice of reduction of wages, how. — Any railway, mining, express, telegraph, manufacturing or other company or corporation doing business in this state, and desiring to reduce the wages of its employees, or any of them, shall give to the employees to be affected thereby thirty days' notice thereof. Such notice may be given by posting a written or printed handbill, specifying the class of employees whose

wages are to be reduced and the amount of the reduction, in a conspicuous place in or about the shops, station, office, depot or other place where said employees may be at work, or by mailing each employee a copy of said notice or handbill, and such company or corporation violating any of the provisions of this section shall forfeit and pay each party affected thereby the sum of fifty dollars, to be recovered by civil action in the name of the injured party, with costs, before any court of competent jurisdiction.

(RSMo 1939 §§ 5066, 5067, A.L. 1943 p. 410 § 75)

Prior revisions: 1929 §§ 4590, 4591; 1919 §§ 9782, 9783; 1909 §§ 3022, 3023

8/28/1943

290.110. Payment due discharged employee — exceptions — penalty for delay. — Whenever any person, firm or corporation doing business in this state shall discharge, with or without cause, or refuse to further employ any servant or employee thereof, the unpaid wages of the servant or employee then earned at the contract rate, without abatement or deduction, shall be and become due and payable on the day of the discharge or refusal to longer employ and the servant or employee may request in writing of his foreman or the keeper of his time to have the money due him, or a valid check therefor, sent to any station or office where a regular agent is kept; and if the money or a valid check therefor, does not reach the station or office within seven days from the date it is so requested, then as a penalty for such nonpayment the wages of the servant or employee shall continue from the date of the discharge or refusal to further employ, at the same rate until paid; provided, such wages shall not continue more than sixty days. This section shall not apply in the case of an employee whose remuneration for work is based primarily on commissions and whose duties include collection of accounts, care of a stock or merchandise and similar activities and where an audit is necessary or customary in order to determine the net amount due.

(RSMo 1939 § 5082, A.L. 1943 p. 410 § 76, A.L. 1963 p. 414, A.L. 1972 H.B. 1203)

Prior revisions: 1929 § 4610; 1919 § 9804

8/28/1972

290.120. Employee not entitled to benefits, when. — No such servant or employee who secretes or absents himself to avoid payment to him, or refuses to receive the same when fully tendered, shall be entitled to any benefit under sections 290.110 and 290.120 for such time as he so avoids payment.

(RSMo 1939 § 5083, A.L. 1943 p. 410 § 77)

Prior revisions: 1929 § 4611; 1919 § 9805

8/28/1943

290.130. Action by employees for breach of employment contract. — Any such servant or employee whose employment is for a definite period of time, and who is discharged without cause before the expiration of such time, may, in addition to the penalty prescribed by this law, have an action against any such employer for any damages he may have sustained by reason of such wrongful discharge, and such action may be joined with an action for unpaid wages and penalty.

(RSMo 1939 § 5084, A.L. 1943 p. 410 § 78)

Prior revisions: 1929 § 4612; 1919 § 9806

8/28/1943

290.140. Letter of dismissal, when — failure to issue, damages — punitive damages, limitations. — 1. Whenever any employee of any corporation doing business in this state and which employs seven or more employees, who shall have been in the service of said corporation for a period of at least ninety days, shall be discharged or voluntarily quit the service of such corporation and who thereafter within a reasonable period of time, but not later than one year following the date the employee was discharged or voluntarily quit, requests in writing by certified mail to the superintendent, manager or registered agent of said corporation, with specific reference to the statute, it shall be the duty of the superintendent or manager of said corporation to issue to such employee, within forty-five days after the receipt of such request, a letter, duly signed by such superintendent or manager, setting forth the nature and character of service rendered by such employee to such corporation and the duration thereof, and truly stating for what cause, if any, such employee was discharged or voluntarily quit such service.

2. Any corporation which violates the provisions of subsection 1 of this section shall be liable for compensatory but not punitive damages but in the event that the evidence establishes that the employer did not issue the requested letter, said employer may be liable for nominal and punitive damages; but no award of punitive damages under this section shall be based upon the content of any such letter.

(RSMo 1939 § 5064, A.L. 1941 p. 330, A.L. 1982 S.B. 747)

Prior revisions: 1929 § 4588; 1919 § 9780; 1909 § 3020

CROSS REFERENCE:

Employee dismissal rights, damage action, time limitation, 516.140

(1985) Actual damages in a "service letter" case are proven by showing that the plaintiff was refused employment or hindered in obtaining employment, due to the absence or inadequacy of a service letter, that the position plaintiff was refused or hindered in obtaining was actually open, and the rate of pay of that position. Gibson v. Hummel (Mo. App. E.D.), 688 S.W.2d 4.

(1985) An award of punitive damages based on the failure to provide a service letter is improper except upon a showing of actual or legal malice. Comerio v. Beatrice Foods Co., 616 F.Supp. 1423 (D.C.Mo.).

(1986) An employer which fails to issue the service letter within forty-five days of it being requested may be liable for punitive damages. Talbert v. Safeway Stores, Inc. 651 F.Supp. 1563 (W.D. Mo.).

1986) A statement that termination is due to "unsatisfactory work performance" is insufficient as a matter of law under this section. Gloria v. University of Health Sciences, 713 S.W.2d 32 (Mo. App. W.D.).

(1987) Legal malice must be proven in order to recover punitive damages pursuant to this section and such malice must be averred generally in the petition. Willett v. Slay Warehouse Co., Inc., 735 S.W.2d 60 (Mo. App. E.D.).

(1987) Legal malice or the deliberate failure to provide a service letter knowing that an individual has requested one perhaps may be shown in order to recover punitive damages by proving that this section was cited in the request for a service letter. Fink v. Revco Discount Drug Centers, Inc., 666 F.Supp. 1325 (W.D. Mo.).

(1990) Letter requesting statement of reasons for employee's discharge signed only by the employee's attorney and not by the employee is not a valid request for a service letter. Zeman v. V.F. Factory Outlet, Inc., 911 F.2d 107 (8th Cir.).

(1990) Discharged employee not entitled to actual damages for an employer's violation of service letter statute for false statements unless employee can show evidence that prospective employer saw letter and held it against employee. Employee could seek nominal damages. Prewitt v. Factory Motor Parts, Inc., 747 F.Supp. 560 (W.D. Mo.).

8/28/1982

290.145. Discrimination, refusal to hire or discharge employee for alcohol or tobacco use not during working hours, prohibited, exception — not cause for legal actions. — It shall be an improper employment practice for an employer to refuse to hire, or to discharge, any individual, or to otherwise disadvantage any individual, with respect to compensation, terms or conditions of employment because the individual

uses lawful alcohol or tobacco products off the premises of the employer during hours such individual is not working for the employer, unless such use interferes with the duties and performance of the employee, the employee's coworkers, or the overall operation of the employer's business; except that, nothing in this section shall prohibit an employer from providing or contracting for health insurance benefits at a reduced premium rate or at a reduced deductible level for employees who do not smoke or use tobacco products. Religious organizations and church-operated institutions, and not-for-profit organizations whose principal business is health care promotion shall be exempt from the provisions of this section. The provisions of this section shall not be deemed to create a cause of action for injunctive relief, damages or other relief.

(L. 1992 S.B. 509, et al. § 6, A.L. 2005 H.B. 596, A.L. 2006 S.B. 567 & 792)

8/28/2006

290.152. Employer response to request for information about current or former employee, contents, requirements, civil immunity, when. — 1. As used in this section, the following terms shall mean:

(1) "**Employer**", any individual, organization, partnership, political subdivision, corporation or other legal entity which has or had in the entity's employ one or more individuals performing services for the entity within this state;

(2) "**Prospective employer**", any employer, as defined in this subsection, to which an individual has made application for employment, either oral or written, or forwarded a resume or other correspondence expressing an interest in employment.

2. An employer may:

(1) Respond in writing to a written request concerning a current or former employee from an entity or person which the employer reasonably believes to be a prospective employer of such employee; and

(2) Disclose the nature and character of service rendered by such employee to such employer and the duration thereof; and

(3) Truly state for what cause, if any, such employee was discharged or voluntarily quit such service. The provisions of this section shall apply regardless of whether the employee becomes employed by the prospective employer prior to receipt of the former employer's written response. The information provided pursuant to this section shall be consistent with the content of any service letter provided pursuant to section 290.140 for the same employee.

3. The employer shall send a copy of any letter provided pursuant to subsection 2 of this section to the current employee or former employee at the employee's last known address. The current or former employee may request from the employer a copy of the letter provided pursuant to subsection 2 of this section for up to one year following the date of such letter.

4. For purposes of this section, an employer shall be immune from civil liability for any response made pursuant to this section or for any consequences of such response, unless such response was false and made with knowledge that it was false or with reckless disregard for whether such response was true or false.

5. Any employer who violates the provisions of subsection 2 of this section shall be liable for compensatory damages but not punitive damages.

6. Any letter issued pursuant to this section shall not be admitted as evidence in an unemployment compensation claim.

(L. 1999 S.B. 32)

8/28/1999

290.210. Definitions. — As used in sections 290.210 to 290.340, unless the context indicates otherwise, the following terms shall mean:

(1) "**Collective bargaining agreement**", any written agreement or understanding between an employer or employer association and a labor organization or union which is the exclusive bargaining representative of the employer's or employer association's employees pursuant to the terms of the National Labor Relations Act and which agreement or understanding or predecessor agreement or understanding has been used to determine an occupational title wage rate;

(2) "**Construction**", construction, reconstruction, improvement, enlargement, alteration, painting and decorating, or major repair;

(3) "**Department**", the department of labor and industrial relations;

(4) "**Labor organization**" or "**union**", any entity which has been designated pursuant to the terms of the National Labor Relations Act as the exclusive bargaining representative of employees of employers engaged in the construction industry, which entity or affiliated entity has ever had a collective bargaining agreement which determined an occupational title wage rate;

(5) "**Locality**", the county where the physical work upon public works is performed;

(6) "**Maintenance work**", the repair, but not the replacement, of existing facilities when the size, type or extent of the existing facilities is not thereby changed or increased;

(7) "**Prevailing hourly rate of wages**" or "**prevailing wage rate**", the wages paid generally, to workers engaged in work of a similar character in the locality in which the public works is being performed, including the basic hourly rate of pay and the amount of the rate of contributions irrevocably made to a fund, plan or program, and the amount of the rate of costs to the contractor or subcontractor which may be reasonably anticipated in providing benefits to workers and mechanics pursuant to an enforceable commitment to carry out a financially responsible plan or program which was communicated in writing to the workmen affected, for medical or hospital care, pensions on retirement or death, compensation for injuries or illness resulting from occupational activity, or insurance to provide any of the foregoing, for unemployment benefits, life insurance, disability and sickness insurance, accident insurance, for vacation and holiday pay, for defraying costs of apprenticeship or other similar programs, or for other bona fide fringe benefits, but only where the contractor or subcontractor is not required by other federal or state law to provide any of the benefits; provided, that the obligation of a contractor or subcontractor to make payment in accordance with the prevailing wage determinations of the department, insofar as sections 290.210 to 290.340 are concerned, may be discharged by the making of payments in cash, by the making of irrevocable contributions by the assumption of an enforceable commitment to bear the costs of a plan or program as provided herein, or any combination thereof, where the aggregate of such payments, contributions and costs is not less than the rate of pay plus the other amounts as provided herein;

(8) "**Public body**", the state of Missouri or any officer, official, authority, board or commission of the state, or other political subdivision thereof, or any institution supported in whole or in part by public funds;

(9) "**Public works**", all fixed works constructed for public use or benefit or paid for wholly or in part out of public funds. It also includes any work done directly by any public utility company when performed by it pursuant to the order of the public service commission or other public authority whether or not it be done under public supervision or direction or paid for wholly or in part out of public funds when let to contract by said utility. It does not include any work done for or by any drainage or levee district;

(10) "**Public works contracting minimum wage**", the wage rate determined by the department pursuant to section 290.257;

(11) "**Workers**", laborers and mechanics.

(L. 1957 p. 574 § 1, A.L. 1965 p. 438, A.L. 1969 S.B. 142, A.L. 2013 H.B. 34, A.L. 2018 H.B. 1729, et al.)

(1981) Industrial development projects are not subject to the Prevailing Wage Act unless the projects constitute "public works" and involve workmen employed by or on behalf of a public body engaged in public works. State ex rel. Ashcroft v. City of Sedalia (Mo. App. W.D.), 629 S.W.2d 578.

8/28/2018

290.220. Policy declared. — It is hereby declared to be the policy of the state of Missouri that a wage of no less than the prevailing hourly rate of wages for work of a similar character in the locality in which the work is performed or the public works contracting minimum wage, whichever is applicable, shall be paid to all workers employed by or on behalf of any public body engaged in public works, exclusive of maintenance work.

(L. 1957 p. 574 § 2, A.L. 2018 H.B. 1729, et al.)

8/28/2018

290.230. Prevailing wage rates required on construction of public works — who is deemed employed upon public works — inapplicability of prevailing wage, when. — 1. (1) Except as otherwise provided in this section, not less than the prevailing hourly rate of wages for work of a similar character in the locality in which the work is performed or the public works contracting minimum wage, whichever is applicable, shall be paid to all workers employed by or on behalf of any public body engaged in the construction of public works, exclusive of maintenance work.

(2) For all work performed on a Sunday or a holiday, not less than twice the prevailing hourly rate of wages for work of a similar character in the locality in which the work is performed or the public works contracting minimum wage, whichever is applicable, shall be paid to all workers employed by or on behalf of any public body engaged in the construction of public works, exclusive of maintenance work. For purposes of this subdivision, "**holiday**" shall include each of the following:

(a) January first;

(b) The last Monday in May;

(c) July fourth;

(d) The first Monday in September;

(e) November eleventh;

(f) The fourth Thursday in November; and

(g) December twenty-fifth;

If any holiday falls on a Sunday, the following Monday shall be considered a holiday.

(3) For all overtime work performed, not less than one and one-half the prevailing hourly rate of wages for work of a similar character in the locality in which the work is performed or the public works contracting minimum wage, whichever is applicable, shall be paid to all workers employed by or on behalf of any public body engaged in the construction of public works, exclusive of maintenance work or contractual obligation. For purposes of this subdivision, "**overtime work**" shall include work that exceeds ten hours in one day and work in excess of forty hours in one calendar week; and

(4) A thirty-minute lunch period on each calendar day shall be allowed for each worker on a public works project, provided that such time shall not be considered as time worked.

2. Only workers that are directly employed by contractors or subcontractors in actual construction work on the site of the building or construction job shall be deemed to be employed upon public works.

3. Any worker who agrees in writing to volunteer his or her labor without pay shall not be deemed to be employed upon public works, and shall not be entitled to the wage rates required pursuant to sections 290.210 to 290.340. For the purposes of this section, the term "**worker who agrees in writing to volunteer his or her labor without pay**" shall mean a worker who volunteers his or her labor without any promise of benefit or remuneration for such voluntary activity, and who is not a prisoner in any jail or prison facility and who is not performing community service pursuant to disposition of a criminal case against him or her, and is not otherwise employed for compensation at any time in the construction or maintenance work on the same public works for which the worker is a volunteer. Under no circumstances may an employer or a public body force, compel or otherwise intimidate a worker into performing work otherwise paid at a prevailing wage rate or at a public works contracting minimum wage rate as a volunteer.

4. When the hauling of materials or equipment includes some phase of construction other than the mere transportation to the site of the construction, workers engaged in

this dual capacity shall be deemed employed directly on public works.

5. (1) The provisions of sections 290.210 to 290.340 shall not apply to the construction of public works for which either the engineer's estimate or the bid accepted by the public body for the total project cost is in the amount of seventy-five thousand dollars or less.

(2) The total project cost shall be based upon the entire project and not individual projects within a larger project.

(3) The total project cost shall include the value of work performed on the project by every person paid by a contractor or subcontractor for that person's work on the project. The total project cost shall additionally include all materials and supplies purchased for the project.

6. A public body shall not divide a project into multiple contracts for the purpose of lowering the total project cost below the threshold described in subsection 5 of this section.

7. For any public works project for which either the engineer's estimate or the bid accepted by the public body for the total project cost is in the amount of seventy-five thousand dollars or less that becomes subject to a change order that increases the total project cost in excess of seventy-five thousand dollars, the provisions of sections 290.210 to 290.340 shall apply only to that portion of the project that was in excess of seventy-five thousand dollars.

8. Notwithstanding any provision of law to the contrary, for the purposes of construction of public works for which either the engineer's estimate or the bid accepted by the public body for the total project cost is in the amount of ten thousand dollars or less for all occupational titles, public bodies shall be exempt from any law requiring the use of competitive bids.

(L. 1957 p. 574 § 3, A.L. 2014 H.B. 1594, A.L. 2018 H.B. 1729, et al.)

8/28/2018

290.235. On-the-job training periods, use of entry-level workers and apprentices — wages — aggregate limit. — 1. Employers may use entry-level workers and federally registered apprentices for on-the-job training periods. The wage rate for on-the-job training workers shall be equal to fifty percent of the applicable wage rate for a journeyman worker under the appropriate occupational title for a specific locality.

2. The combined total of entry-level workers and federally registered apprentices shall not exceed a one-to-one ratio with the number of journeyman workers in any

occupational title on a public works project subject to sections 290.210 to 290.340.

(L. 2018 H.B. 1729, et al.)

8/28/2018

290.240. Department inquiry into complaints — rulemaking authority. — 1. The department shall inquire diligently into complaints regarding any violation of sections 290.210 to 290.340, shall institute actions for penalties herein prescribed, and shall enforce generally the provisions of sections 290.210 to 290.340. Complaints regarding any violation of sections 290.210 to 290.340 shall be filed with the department. The following interested parties are the only parties allowed to file such complaints with the department:

(1) Any decision-making public servant for a public body for which a public works project is being performed, if the complaint is against the contractor or subcontractor for the project;

(2) Any contractor, if the complaint is against his or her subcontractor for work performed on behalf of a public body;

(3) Any subcontractor, if the complaint is against his or her contractor for work performed on behalf of a public body; and

(4) Any worker who alleges a violation of his or her rights under sections 290.210 to 290.340.

2. The department may establish rules and regulations for the purpose of carrying out the provisions of sections 290.210 to 290.340.

(L. 1957 p. 574 § 6, A.L. 1969 S.B. 142, A.L. 2018 H.B. 1729, et al.)

8/28/2018

290.250. Applicable wage rates, incorporation into contracts — failure to pay, penalty — complaints of violation, public body or prime contractor to withhold payment — determination of a violation, investigation required — employer's right to dispute — enforcement proceeding permitted, when. — 1. Every public body authorized to contract for or construct public works before advertising for bids or undertaking such construction shall request the department to determine the applicable wage rates in the locality where the work is to be performed. The department shall determine the applicable wage rates in the locality in which the work is to be performed as provided in section 290.257. Such determination or schedule of the wage rates shall be attached to and made a part of the specifications for the

work. The public body shall then specify in the resolution or ordinance and in the call for bids for the contract the wage rates in the locality needed to execute the contract. The contractor to whom the contract is awarded and any subcontractor under the contractor shall pay not less than the specified wage rates to all workers employed by them in the execution of the contract. The public body awarding the contract shall cause to be inserted in the contract a stipulation to the effect that not less than the specified wage rates shall be paid to all workers performing work under the contract. The contractor shall forfeit as a penalty to the public body on whose behalf the contract is made or awarded one hundred dollars for each worker employed, for each calendar day, or portion thereof, such worker is paid less than the specified wage rates for any work done under the contract, by the contractor or by any subcontractor under the contractor, and the public body awarding the contract shall cause to be inserted in the contract a stipulation to this effect. The public body awarding the contract, and its agents and officers, shall take cognizance of all complaints of all violations of the provisions of sections 290.210 to 290.340 committed in the course of the execution of the contract, and, when making payments to the contractor becoming due under the contract, shall withhold and retain therefrom all sums and amounts due and owing as a result of any violation of sections 290.210 to 290.340. Any contractor may withhold from any subcontractor sufficient sums to cover any penalties withheld by the awarding public body on account of the subcontractor's failure to comply with the terms of sections 290.210 to 290.340, and if payment has already been made, the contractor may recover from the subcontractor the amount of the penalty in a suit at law.

2. In determining whether a violation of sections 290.210 to 290.340 has occurred, and whether a penalty shall be imposed pursuant to subsection 1 of this section, the department shall investigate any complaint made by an interested party listed under section 290.240. Upon completing such investigation, the department shall notify the employer of its findings. If the department concludes that a violation of sections 290.210 to 290.340 has occurred and a penalty may be due, the department shall notify the employer of such finding by providing a notice of penalty to the employer. Such penalty shall not be due until forty-five days after the date of the notice of the penalty.

3. The employer shall have the right to dispute such notice of penalty in writing to the department within forty-five days of the date of the notice. Upon receipt of this written notice of dispute, the department shall notify the employer of the right to resolve such dispute through arbitration. The state and the employer shall submit to an arbitration process to be established by the department by rule, and in conformance with the guidelines and rules of the American Arbitration Association or other

arbitration process mutually agreed upon by the employer and the state. If at any time prior to the department pursuing an enforcement action to enforce the monetary penalty provisions of subsection 1 of this section against the employer, the employer pays the back wages as determined by either the department or the arbitrator, the department shall be precluded from initiating any enforcement action to impose the monetary penalty provisions of subsection 1 of this section.

4. If the employer fails to pay all wages due as determined by the arbitrator within forty-five days following the conclusion of the arbitration process, or if the employer fails to exercise the right to seek arbitration, the department may then pursue an enforcement action to enforce the monetary penalty provisions of subsection 1 of this section against the employer. If the court orders payment of the penalties as prescribed in subsection 1 of this section, the department shall be entitled to recover its actual cost of enforcement from such penalty amount.

5. Nothing in this section shall be interpreted as precluding an action for enforcement filed by an aggrieved employee as otherwise provided in law.

(L. 1957 p. 574 § 4, A.L. 1969 S.B. 142, A.L. 2007 S.B. 339, A.L. 2018 H.B. 1729, et al.)

8/28/2018

290.257. Determination of prevailing wage — annual calculation — final determination, when — occupational titles, applicability. — 1. (1) In determining the prevailing wage rate, the department shall accept and consider information submitted in either paper or electronic format regarding local wage rates for construction projects that occurred during the year preceding the annual wage order to be issued, provided that information regarding local wage rates for entry-level workers and federally registered apprentices shall not be considered.

(2) (a) The prevailing wage rate for each occupational title shall be equal to the weighted average wage for that occupational title.

(b) For purposes of this subdivision, the following terms shall mean:

a. "**Reported wage sum**", for each occupational title, the sum of every product of each reported wage rate, which shall include fringe benefits, multiplied by the total number of reportable hours at such wage rate; and

b. "**Weighted average wage**", the reported wage sum for each occupational title divided by the total number of reportable hours for that occupational title.

2. The department shall annually calculate the public works contracting minimum wage in each locality. The public works contracting minimum wage shall be equal to

one hundred twenty percent of the average hourly wage in a particular locality, as determined by the Missouri economic research and information center within the department of economic development, or any successor agency.

3. A final determination of the prevailing hourly rate of wages and the public works contracting minimum wage applicable to every locality to be contained in an annual wage order shall be made annually on or before July 1, 2019, and July first of each year thereafter. The wage order shall remain in effect until superseded by a new annual wage order. The department shall, by March 10, 2019, and March tenth of each year thereafter, make an initial determination of the prevailing wage rate for each occupational title within the locality as well as an initial determination as to the public works contracting minimum wage. Objections may be filed as to any initial determination as provided in section 290.262.

4. (1) If the total number of reportable hours that are paid pursuant to a collective bargaining agreement and the total number of reportable hours that are not paid pursuant to a collective bargaining agreement equal or exceed, in the aggregate, one thousand hours for any particular occupational title within a locality, workers engaged in that occupational title in such locality shall be paid the prevailing wage rate determined by the department pursuant to this section.

(2) If the total number of reportable hours that are paid pursuant to a collective bargaining agreement and the total number of reportable hours that are not paid pursuant to a collective bargaining agreement do not equal or exceed, in the aggregate, one thousand hours for any particular occupational title within a locality, workers engaged in that occupational title in such locality shall be paid the public works contracting minimum wage.

5. For purposes of this section, the term "**reportable hours**" shall mean hours reported by a contractor for work performed under such contractor in a particular occupational title within a particular locality.

6. (1) The different types of occupational titles to which sections 290.210 to 290.340 shall apply shall be limited to, and shall include, all of the following:

(a) Asbestos worker;

(b) Boilermaker;

(c) Bricklayer;

(d) Carpenter, which shall include pile driver, millwright, lather, and linoleum layer;

(e) Cement mason, which shall include plasterer;

(f) Communications technician;

(g) Electrician;

(h) Elevator constructor;

(i) Glazier;

(j) Ironworker;

(k) General laborer, including first semi-skilled laborer and second semi-skilled laborer;

(l) Mason, which shall include marble mason, marble finisher, terrazzo worker, terrazzo finisher, tile setter, and tile finisher;

(m) Operating engineer, which shall include operating engineer group one, operating engineer group two, operating engineer group three, operating engineer group three-A, operating engineer group four, and operating engineer group five;

(n) Outside lineman, lineman operator, groundman, lineman tree trimmer, groundman tree trimmer, and any combination thereof;

(o) Painter;

(p) Plumber, which shall include pipefitter;

(q) Roofer;

(r) Sheet metal worker;

(s) Sprinkler fitter; and

(t) Truck driver, which shall include truck control service driver, truck driver group one, truck driver group two, truck driver group three, and truck driver group four.

(2) Each occupational title listed in subdivision (1) of this subsection shall have the same meaning and description as given to such occupational title in 8 CSR 30-3.060.

(L. 2018 H.B. 1729, et al.)

8/28/2018

290.260. Determination of hourly rate for heavy and highway construction work, when made, where filed, objections, hearing, determination. — 1. The department, as it deems necessary, shall from time to time investigate and determine the prevailing hourly rate of wages for heavy and highway construction work in the localities. In doing so, the department shall accept and consider information regarding local wage

rates that is submitted in either paper or electronic formats. A determination applicable to every locality to be contained in a general wage order shall be made annually on or before July first of each year for the Missouri state highways and transportation commission and shall remain in effect until superseded by a new general wage order. In determining prevailing rates, the department shall ascertain and consider the applicable wage rates established by collective bargaining agreements, if any, and the rates that are paid generally within the locality.

2. A certified copy of the determination so made shall be filed immediately with the secretary of state and with the department in Jefferson City. Copies shall be supplied by the department to all persons requesting them within ten days after the filing.

3. At any time within thirty days after the certified copies of the determinations have been filed with the secretary of state and the department, any person who is affected thereby may object in writing to the determination or the part thereof that he deems objectionable by filing a written notice with the department, stating the specific grounds of the objection.

4. Within thirty days of the receipt of the objection, the department shall set a date for a hearing on the objection. The date for the hearing shall be within sixty days of the receipt of the objection. Written notice of the time and place of the hearing shall be given to the objectors at least ten days prior to the date set for the hearing.

5. The department at its discretion may hear each written objection separately or consolidate for hearing any two or more written objections. At the hearing the department shall first introduce in evidence the investigation it instituted and the other facts which were considered at the time of the original determination which formed the basis for its determination. The department, or the objector, or any interested party, thereafter may introduce any evidence that is material to the issues.

6. Within twenty days of the conclusion of the hearing, the department must rule on the written objection and make the final determination that it believes the evidence warrants. Immediately, the department shall file a certified copy of its final determination with the secretary of state and with the department and shall serve a copy of the final determination on all parties to the proceedings by personal service or by registered mail.

7. This final decision of the department of the prevailing wages in the locality is subject to review in accordance with the provisions of chapter 536. Any person affected, whether or not the person participated in the proceedings resulting in the final determination, may have the decision of the department reviewed. The filing of

the final determination with the secretary of state shall be considered a service of the final determination on persons not participating in the administrative proceedings resulting in the final determination.

8. At any time before trial any person affected by the final determination of the department may intervene in the proceedings to review under chapter 536 and be made a party to the proceedings.

9. All proceedings in any court affecting a determination of the department under the provisions of sections 290.210 to 290.340 shall have priority in hearing and determination over all other civil proceedings pending in the court, except election contests.

(L. 1957 p. 574 § 8, A.L. 1965 p. 95, A.L. 1969 S.B. 142, A.L. 2013 H.B. 34)

(1962) The function of the court in reviewing decision of industrial commission fixing hourly wage rate is to decide if the determination was authorized by law and supported by competent and substantial evidence upon the whole record. United Bro. of Carpenters, etc. v. Industrial Commission (A.), 363 S.W.2d 82.

8/28/2013

290.262. Determination of hourly rate, certification — objections, hearings — final determination — notice to department by public body, when. — 1. A certified copy of any initial wage determinations made pursuant to section 290.257 shall be filed immediately with the secretary of state and with the department in Jefferson City. Copies shall be supplied by the department to all persons requesting them within ten days after the filing.

2. At any time within thirty days after the certified copies of the determinations have been filed with the secretary of state and the department, any person who is affected thereby may object in writing to a determination or a part thereof that he or she deems objectionable by filing a written notice with the department, stating the specific grounds of the objection. If no objection is filed, the determination is final after thirty days.

3. After the receipt of the objection, the department shall set a date for a hearing on the objection. The date for the hearing shall be within sixty days of the receipt of the objection. Written notice of the time and place of the hearing shall be given to the objectors at least ten days prior to the date set for the hearing.

4. The department at its discretion may hear each written objection separately or consolidate for hearing any two or more written objections. At the hearing the department shall first introduce in evidence the investigation it instituted and the other facts which were considered at the time of the original determination which formed the basis for its determination. The department, or the objector, or any interested party, thereafter may introduce any evidence that is material to the issues.

5. Within twenty days of the conclusion of the hearing, the department shall rule on the written objection and make the final determination that it believes the evidence warrants. Immediately, the department shall file a certified copy of its final determination with the secretary of state and with the department and shall serve a copy of the final determination on all parties to the proceedings by personal service or by registered mail.

6. This final decision of the department of the prevailing wages in the locality for each occupational title is subject to review in accordance with the provisions of chapter 536. Any person affected, whether or not the person participated in the proceedings resulting in the final determination, may have the decision of the department reviewed. The filing of the final determination with the secretary of state shall be considered a service of the final determination on persons not participating in the administrative proceedings resulting in the final determination.

7. At any time before trial any person affected by the final determination of the department may intervene in the proceedings to review under chapter 536 and be made a party to the proceedings.

8. Any annual wage order made for a particular occupational title in a locality, that is based on the number of hours worked under a collective bargaining agreement, may be altered once each year, as provided in this subsection. The prevailing wage for each such occupational title may be adjusted on the anniversary date of any collective bargaining agreement which covers all persons in that particular occupational title in the locality in accordance with any annual incremental wage increases set in the collective bargaining agreement. If the prevailing wage for an occupational title is adjusted pursuant to this subsection, the employee's representative or employer in regard to such collective bargaining agreement shall notify the department of this adjustment, including the effective date of the adjustment. The adjusted prevailing wage shall be in effect until the next final annual wage order is issued pursuant to this section. The wage rates for any particular job, contracted and commenced within sixty days of the contract date, which were set as a result of the annual or revised wage order, shall remain in effect for the duration of that particular job.

9. In addition to all other reporting requirements of sections 290.210 to 290.340, each public body which is awarding a contract for a public works project shall, prior to beginning of any work on such public works project, notify the department, on a form prescribed by the department, of the scope of the work to be done, the various types of craftsmen who will be needed on the project, and the date work will commence on the project.

(L. 1993 H.B. 638, A.L. 2013 H.B. 34, A.L. 2018 H.B. 1729, et al.)

8/28/2018

290.263. Wage rates to equal or exceed federal minimum wage. — The wage rates required to be paid to workers upon public works pursuant to sections 290.210 to 290.340 shall not be less than the minimum wage specified under Section 6(a)(1) of the Fair Labor Standards Act of 1938, as amended.

(L. 1969 S.B. 142, A.L. 2018 H.B. 1729, et al.)

8/28/2018

290.265. Wage rates posted, where. — A clearly legible statement of all wage rates required to be paid to all workers employed in order to execute the contract and employed on the construction of the public works shall be kept posted in a prominent and easily accessible place at the site thereof by each contractor and subcontractor engaged in the public works projects under sections 290.210 to 290.340 and such notice shall remain posted during the full time that any such worker shall be employed on the public works.

(L. 1969 S.B. 142, A.L. 2018 H.B. 1729, et al.)

8/28/2018

290.270. Declaration as to wages final — maximum wages and hours not limited. — The finding of the department ascertaining and declaring the prevailing hourly rate of wages and the public works contracting minimum wage shall be final for the locality, unless reviewed under the provisions of sections 290.210 to 290.340. Nothing in sections 290.210 to 290.340, however, shall be construed to prohibit the payment to any worker employed on any public work of more than the prevailing hourly rate of wages or the public works contracting minimum wage. Nothing in sections 290.210 to 290.340 shall be construed to limit the hours of work which may be performed by any worker in any particular period of time.

(L. 1957 p. 574 § 7, A.L. 1969 S.B. 142, A.L. 2018 H.B. 1729, et al.)

8/28/2018

290.280. Administration of oaths — subpoenas — enforcement of subpoenas. — The authorized representative of the department may administer oaths, take or cause to be taken the depositions of witnesses, and require by subpoena the attendance and testimony of witnesses and the production of all books, records, and other evidence relative to any matter under investigation or hearing. The subpoena shall be signed and issued by the department's authorized representative. In case of failure of any person to comply with any subpoena lawfully issued under this section, or on the refusal of any witness to produce evidence or to testify to any matter regarding which he may be lawfully interrogated, the authorized representative of the department may proceed to enforce obedience to the subpoenas in the manner provided by section 536.077 for administrative agencies. The authorized representative of the department shall have the power to certify to official acts.

(L. 1957 p. 574 § 9, A.L. 1961 p. 438)

8/28/1961

290.290. Contractor's payroll records, contents — affidavit of compliance required — signs on motor vehicles and equipment, requirements — temporary stationary sign, when — exception. — 1. The contractor and each subcontractor engaged in any construction of public works shall keep full and accurate records clearly indicating the names, occupations and crafts of every worker employed by them in connection with the public work together with an accurate record of the number of hours worked by each worker and the actual wages paid therefor. The payroll records required to be so kept shall be open to inspection by any authorized representative of the contracting public body or of the department at any reasonable time and as often as may be necessary and such records shall not be destroyed or removed from the state for the period of one year following the completion of the public work in connection with which the records are made.

2. Each contractor and subcontractor shall file with the contracting public body upon completion of the public work and prior to final payment therefor an affidavit stating that he or she had fully complied with the provisions and requirements of sections 290.210 to 290.340, and no public body shall be authorized to make final payment until such affidavit is filed therewith in proper form and order.

3. Each contractor and subcontractor engaged in any construction of public works shall have its name, acceptable abbreviation or recognizable logo and the name of the city and state of the mailing address of the principal office of the company, on each

motor vehicle and motorized self-propelled piece of equipment which is used in connection with such public works project during the time the contractor or subcontractor is engaged on such project. The sign shall be legible from a distance of twenty feet but the size of the lettering need not be larger than two inches. In cases where equipment is leased or where affixing a legible sign to the equipment is impractical, the contractor may place a temporary stationary sign, with the information required pursuant to this subsection, at the main entrance of the construction project in place of affixing the required information on the equipment so long as such sign is not in violation of any state or federal statute, rule or regulation. Motor vehicles which are required to have similar information affixed thereto pursuant to requirements of a regulatory agency of the state or federal government are exempt from the provisions of this subsection.

4. The provisions of subsection 3 of this section shall not apply to construction of public works for which the contract awarded is in the amount of two hundred fifty thousand dollars or less.

(L. 1957 p. 574 § 5, A.L. 1969 S.B. 142, A.L. 1993 H.B. 416 & 417, A.L. 2018 H.B. 1729, et al.)

8/28/2018

290.300. Actions for wages by worker authorized. — Any worker employed by the contractor or by any subcontractor under the contractor who shall be paid for his or her services in a sum less than the stipulated rates for work done under the contract, shall have a right of action for double whatever difference there may be between the amount so paid and the rates provided by the contract together with a reasonable attorney's fee to be determined by the court, and an action brought to recover same shall be deemed to be a suit for wages, and any and all judgments entered therein shall have the same force and effect as other judgments for wages.

(L. 1957 p. 574 § 10, A.L. 1969 S.B. 142, A.L. 2018 H.B. 1729, et al.)

8/28/2018

290.305. Rebates by workers prohibited, exception. — No person, firm or corporation shall violate the wage provisions of any contract contemplated in sections 290.210 to 290.340 or suffer or require any employee to work for less than the rate of wages so fixed, or violate any of the provisions contained in sections 290.210 to 290.340. Where workers are employed and their rate of wages has been determined as provided in sections 290.210 to 290.340, no person, either on his or her behalf or for

any other person, shall request, demand or receive, either before or after such worker is engaged, that such worker pay back, return, donate, contribute, or give any part or all of said worker's wages, salary, or thing of value, to any person, upon the statement, representation, or understanding that failure to comply with such request or demand will prevent such worker from procuring or retaining employment, and no person shall, directly or indirectly, pay, request or authorize any other person to violate this section. This section shall not apply to any agent or representative of a duly constituted labor organization acting in the collection of dues or assessments of such organization.

(L. 1969 S.B. 142, A.L. 2018 H.B. 1729, et al.)

8/28/2018

290.315. Deductions from wages, agreement to be written, approval of public body required. — All contractors and subcontractors subject to sections 290.210 to 290.340 shall make full payment of the required wages in legal tender, without any deduction for food, sleeping accommodations, transportation, use of small tools, or any other thing of any kind or description. This section shall not apply where the employer and employee enter into an agreement in writing at the beginning of said term of employment covering deductions for food, sleeping accommodations, or other similar items, provided such agreement is submitted by the employer to the public body awarding the contract and the same is approved by such public body as fair and reasonable.

(L. 1969 S.B. 142, A.L. 2018 H.B. 1729, et al.)

8/28/2018

290.320. Advertising for bids before wage rates are determined prohibited. — No public body, officer, official, member, agent or representative authorized to contract for public works shall fail, before advertising for bids or contracting for such construction, to have the department determine the wage rates in the locality where the work is to be performed as provided in sections 290.210 to 290.340.

(L. 1969 S.B. 142, A.L. 2018 H.B. 1729, et al.)

8/28/2018

290.325. Awarding contract or payment without wage rate determination prohibited. — No public body, officer, official, member, agent or representative thereof authorized to contract for public works shall award a contract for the

construction of such improvement or disburse any funds on account of the construction of such public improvement, unless such public body has first had the department determine the rates of wages required to be paid in the locality where the work is to be performed and such determination has been made a part of the specifications and contract for such public works.

(L. 1969 S.B. 142, A.L. 2018 H.B. 1729, et al.)

8/28/2018

290.330. Convicted violators of sections 290.210 to 290.340 listed, effect of. — The department after investigation, upon complaint made by an interested party listed under section 290.240 or upon its own initiative, shall file with the secretary of state a list of the contractors and subcontractors who it finds have been prosecuted and convicted for violations of sections 290.210 to 290.340 and such contractor or subcontractor, or simulations thereof, shall be prohibited from contracting directly or indirectly with any public body for the construction of any public works or from performing any work on the same as a contractor or subcontractor for a period of one year from the date of the first conviction for such violation and for a period of three years from the date of each subsequent violation and conviction thereof. No public body shall award a contract for a public works to any contractor or subcontractor, or simulation thereof, during the time that its name appears on said list. The filing of the notice of conviction with the secretary of state shall be notice to all public bodies and their officers, officials, members, agents and representatives.

(L. 1969 S.B. 142, A.L. 2018 H.B. 1729, et al.)

8/28/2018

290.335. Notice of violation, failure to comply, attorney general shall sue, injunctive relief authorized. — If it is found that a public body, contractor or subcontractor has not complied with any of the terms of sections 290.210 to 290.340, the department shall give notice of the precise violation in writing to such public body, contractor or subcontractor. Sufficient time may be allowed for compliance therewith as the department deems necessary. After the expiration of the time prescribed in said notice, the department may in writing inform the attorney general of the fact that such notice has been given and that the public body, contractor or subcontractor or the authorized representative or agent thereof to whom it was directed has not complied with such notice. Upon receipt thereof, the attorney general shall at the earliest possible time bring suit in the name of the state in the circuit court of the county in

which such public body is located or where any such contractor or subcontractor is engaged in any public works to enjoin the award of such contract for a public works, or any further work or payments thereunder if the contract has been awarded, until the requirements of such notice are fully complied with. The court may issue a temporary restraining order with due notice to the defendant in such action. The plaintiff shall in any such injunctive action post an adequate bond to be set by the circuit judge. Upon final hearing thereof, if the court is satisfied that the requirements of the notice by the department to the defendant were not unreasonable or arbitrary, it shall issue an order enjoining the awarding of such contract for a public works, or any further work or payments thereunder if the contract has been awarded, until the notice is fully complied with. Such injunction shall continue operative until the court is satisfied that the requirements of such notice have been complied with and the court shall have and exercise with respect to the enforcement of such injunctions all the power in it in other similar cases. Both the plaintiff and defendant in such action have the same rights of appeal as are provided by law in other injunction proceedings.

(L. 1969 S.B. 142)

8/28/1969

290.340. Penalty for violation. — Any officer, official, member, agent or representative of any public body, contractor or subcontractor who willfully violates and omits to comply with any of the provisions and requirements of sections 290.210 to 290.340 shall be punished for each violation thereof by a fine not exceeding five hundred dollars, or by imprisonment not exceeding six months, or by both such fine and imprisonment. Each day such violation or omission continues shall constitute a separate offense as contemplated by this section.

(L. 1969 S.B. 142)

8/28/1969

290.350. Request for arbitration, when, how made — board to be appointed. — Whenever a dispute exists concerning wages, hours of labor, or conditions of employment of members of a paid fire department of any county, city, town, fire district, or other governmental unit having a population in excess of twenty thousand or located in a county of the first class, and a request for arbitration is made by either party to the dispute, a firemen's arbitration board shall be appointed as provided in sections 290.350 to 290.380. Request for arbitration may be made by written petition signed by at least fifty-one percent of the employees of the fire department or by

resolution of the county commission, council, board, or other governing body having direction and control over the fire department.

(L. 1963 p. 415 § 1)

(1968) As applied to constitutional charter cities, §§ 290.350 and 290.360 are unconstitutional and void as imposing duties upon a municipal officer. State ex rel. Burke v. Cervantes, 423 S.W.2d 791 (Mo.).

8/28/1963

290.360. Board members — selected, how — officers. — The board shall consist of five members, four of whom shall be appointed by the chief executive officer of the county, city, town, fire district, or other governmental unit involved, and shall be qualified voters of the county, city, town, fire district, or other governmental unit involved. Two of these appointments shall be made from a list of four or more, submitted by the employees. If the request for arbitration is initiated by petition of the employees, the petition shall be accompanied by a list of four or more persons. If the request for arbitration is initiated by the county commission, council, board or other governing body having direction and control over the fire department, the chief executive officer of the county, city, town, fire district, or other governmental unit shall mail a copy of the resolution, together with a request for the submission of a list of four or more prospective members of the firemen's arbitration board to representatives of the employees of the fire department. The four members appointed by the chief executive officer shall select the fifth member of the board, who may or may not be a registered voter of the county, city, town, fire district, or other governmental unit involved. The board shall meet and organize as soon as possible after its appointment. The board shall select from its membership a chairman and any other officers it considers necessary, and make rules of procedure governing its hearings.

(L. 1963 p. 415 § 2)

(1968) As applied to constitutional charter cities, §§ 290.350 and 290.360, RSMo, are unconstitutional and void as imposing duties upon a municipal officer. State ex rel. Burke v. Cervantes, 423 S.W.2d 791 (Mo.).

8/28/1963

290.370. Hearing and recommendations of board. — The board shall conduct hearings, with dispatch, for the purpose of hearing evidence relevant to the subject of the dispute, and shall, as soon as practicable, report its findings and recommendations in writing to the chief executive officer of the county, city, town, fire district, or other

governmental unit involved, and to any organization of firemen involved. The report shall be concurred in by at least three members of the board. The recommendation shall be advisory only and shall not be binding upon the county, city, town, fire district, or other governmental unit, or upon the members of the fire department involved.

(L. 1963 p. 415 § 3)

8/28/1963

290.380. Expenses of board members to be paid. — Members of the board shall serve without compensation. All necessary expenses of any hearing conducted by the board members, certified to by all the members of the board, shall be paid by the county, city, town, fire district, or other governmental unit involved.

(L. 1963 p. 415 § 4)

8/28/1963

290.400. Definitions. — As used in sections 290.400 to 290.450 the following words have the meanings indicated unless the context clearly requires otherwise:

(1) "**Commission**", the labor and industrial relations commission of Missouri;

(2) "**Employee**", every woman or man in receipt of or entitled to compensation for labor performed for any employer;

(3) "**Employer**", every person, firm, corporation, agent, manager, representative, contractor, subcontractor, principal or other person having control or direction of any woman or man employed at any labor, or responsible directly or indirectly for the wages of another;

(4) "**Female**", a woman of eighteen years or over;

(5) "**Wage rates**" or "**wages**", any compensation for labor measured by time, piece, or otherwise.

(L. 1963 p. 416 § 1)

8/28/1963

290.410. Employer not to pay female lower wage. — Notwithstanding any other provisions of the law, no employer shall pay any female in his employ at wage rates less than the wage rates paid to male employees in the same establishment for the same quantity and quality of the same classification of work, provided that nothing herein shall prohibit a variation of rates of pay for male and female employees

engaged in the same classification of work based upon a difference in seniority, length of service, ability, skill, difference in duties or services performed, difference in the shift or time of day worked, hours of work, or restrictions or prohibitions on lifting or moving objects in excess of specified weight, or other reasonable differentiation, or factors other than sex, when exercised in good faith.

(L. 1963 p. 416 § 2)

8/28/1963

290.420. Female may register complaint. — Any affected female employee may register with the commission a complaint that the wages paid to her are less than the wages to which she is entitled under sections 290.400 to 290.450.

(L. 1963 p. 416 § 4)

8/28/1963

290.430. Labor and industrial relations commission to mediate wage disputes. — The commission shall take all proceedings necessary to mediate the dispute concerning the payment of any sums alleged to be due and unpaid to the female employees. The commission shall have the power to issue such regulations not inconsistent with the purpose and provisions of sections 290.400 to 290.450, as it deems necessary or appropriate for the administration thereof.

(L. 1963 p. 416 § 5, A.L. 1965 p. 95)

8/28/1965

290.440. Female may recover wages, when — burden of proof. — 1. Any employer who violates section 290.410 is liable to the female employee affected in the amount of the wages of which the female employee is deprived by reason of the violation.

2. Any female employee receiving less than the wage to which she is entitled under sections 290.400 to 290.450 may recover in a civil action the balance of the wages, together with the costs of suit, notwithstanding any agreement to work for a lesser wage.

3. The burden of proof shall be upon the person bringing the claim to establish that the differentiation in rate of pay is based upon the factor of sex and not upon other differences or factors.

(L. 1963 p. 416 §§ 3, 6, 8)

8/28/1963

290.450. Actions to be instituted in circuit court — limitations. — Any action based upon or arising under sections 290.400 to 290.450 shall be instituted in the circuit court within six months after the date of the alleged violation, but in no event shall any employer be liable for any pay due under sections 290.400 to 290.450 for more than thirty days prior to receipt by the employer of written notice of claim thereof from the female employee.

(L. 1963 p. 416 § 7)

8/28/1963

290.460. Powers and duties of commission. — The commission shall carry on a continuing program of education, information, study, and community organization concerning the problems of female employees in seeking, obtaining and holding employment without discrimination on account of sex. The commission's power and duties shall include but not be limited to the following:

(1) Promote in cooperation with the federal government, state, local and private agencies and organizations, programs to eliminate discrimination in employment based solely on sex;

(2) Promote research with the view to reducing barriers based solely on sex in the hire, employment and retention of female employees;

(3) Sponsor and correlate in communities of the state, information and educational programs intended to reduce or abolish discrimination in employment based solely on sex;

(4) Recommend to the governor, from time to time, any specific proposals for legislation as may be deemed necessary and proper for the elimination in employment of discrimination based solely on sex.

(L. 1965 p. 439)

8/28/1965

290.500. Definitions. — As used in sections 290.500 to 290.530, the following words and phrases mean:

(1) "**Agriculture**", farming and all its branches including, but not limited to, the cultivation and tillage of the soil, dairying, the production, cultivation, growing and harvesting of any agricultural commodities, the raising of livestock, fish and other marine life, bees, fur-bearing animals or poultry and any practices performed by a farmer or on a farm as an incident to or in conjunction with farming operations,

including preparation for market, delivery to storage or to market or to carriers for transportation to market;

(2) "**Director**", the director of the department of labor and industrial relations or his authorized representative;

(3) "**Employee**", any individual employed by an employer, except that the term "employee" shall not include:

(a) Any individual employed in a bona fide executive, administrative, or professional capacity;

(b) Any individual engaged in the activities of an educational, charitable, religious, or nonprofit organization where the employer-employee relationship does not, in fact, exist or where the services rendered to the organization are on a voluntary basis;

(c) Any individual standing in loco parentis to foster children in their care;

(d) Any individual employed for less than four months in any year in a resident or day camp for children or youth, or any individual employed by an educational conference center operated by an educational, charitable or not-for-profit organization;

(e) Any individual engaged in the activities of an educational organization where employment by the organization is in lieu of the requirement that the individual pay the cost of tuition, housing or other educational fees of the organization or where earnings of the individual employed by the organization are credited toward the payment of the cost of tuition, housing or other educational fees of the organization;

(f) Any individual employed on or about a private residence on an occasional basis for six hours or less on each occasion;

(g) Any handicapped person employed in a sheltered workshop, certified by the department of elementary and secondary education;

(h) Any person employed on a casual basis to provide baby-sitting services;

(i) Any individual employed by an employer subject to the provisions of part A of subtitle IV of title 49, United States Code, 49 U.S.C. §§ 10101 et seq.;

(j) Any individual employed on a casual or intermittent basis as a golf caddy, newsboy, or in a similar occupation;

(k) Any individual whose earnings are derived in whole or in part from sales commissions and whose hours and places of employment are not substantially controlled by the employer;

(l) Any individual who is employed in any government position defined in 29 U.S.C. §§ 203(e)(2)(C)(i)-(ii);

(m) Any individual employed by a retail or service business whose annual gross volume sales made or business done is less than five hundred thousand dollars;

(n) Any individual who is an offender, as defined in section 217.010, who is incarcerated in any correctional facility operated by the department of corrections, including offenders who provide labor or services on the grounds of such correctional facility pursuant to section 217.550;

(o) Any individual described by the provisions of section 29 U.S.C. 213(a) (8);

(4) "**Employer**", any person acting directly or indirectly in the interest of an employer in relation to an employee;

(5) "**Learner and apprentice**", any individual under 20 years of age who has not completed the required training for a particular job. In no event shall the individual be deemed a learner or apprentice in the occupation after three months of training except where the director finds, after investigation, that for the particular occupation a minimum of proficiency cannot be acquired in three months. In no case shall a person be declared to be a learner or apprentice after six months of training for a particular employer or job. Employees of an amusement or recreation business that meets the criteria set out in 29 U.S.C. § 213(a) (3) may be deemed a learner or apprentice for ninety working days. No individual shall be deemed a learner or apprentice solely for the purpose of evading the provisions of sections 290.500 to 290.530;

(6) "**Occupation**", any occupation, service, trade, business, industry, or branch or group of industries or employment or class of employment in which individuals are gainfully employed;

(7) "**Wage**", compensation due to an employee by reason of his employment, payable in legal tender of the United States or checks on banks convertible into cash on demand at full face value;

(8) "**Person**", any individual, partnership, association, corporation, business, business trust, legal representative, or any organized group of persons;

(9) "**Man-day**", any day during which an employee performs any agricultural labor for not less than one hour.

(L. 1990 H.B. 1881 § 1, A.L. 2006 Adopted by Initiative, Proposition B, November 7, 2006)

290.502. Minimum wage rate — increase or decrease, when. — 1. Except as may be otherwise provided pursuant to sections 290.500 to 290.530, effective January 1, 2007, every employer shall pay to each employee wages at the rate of $6.50 per hour, or wages at the same rate or rates set under the provisions of federal law as the prevailing federal minimum wage applicable to those covered jobs in interstate commerce, whichever rate per hour is higher.

2. The minimum wage shall be increased or decreased on January 1, 2008, and on January 1 of successive years, by the increase or decrease in the cost of living. On September 30, 2007, and on each September 30 of each successive year, the director shall measure the increase or decrease in the cost of living by the percentage increase or decrease as of the preceding July over the level as of July of the immediately preceding year of the Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W) or successor index as published by the U.S. Department of Labor or its successor agency, with the amount of the minimum wage increase or decrease rounded to the nearest five cents.

3. Except as may be otherwise provided pursuant to sections 290.500 to 290.530, and notwithstanding subsection 1* of this section, effective January 1, 2019, every employer shall pay to each employee wages at the rate of not less than $8.60 per hour, or wages at the same rate or rates set under the provisions of federal law as the prevailing federal minimum wage applicable to those covered jobs in interstate commerce, whichever rate per hour is higher. Thereafter, the minimum wage established by this subsection shall be increased each year by $.85 per hour, effective January 1 of each of the next four years, until it reaches $12.00 per hour, effective January 1, 2023. Thereafter, the minimum wage established by this subsection shall be increased or decreased on January 1, 2024, and on January 1 of successive years, per the method set forth in subsection 2** of this section. If at any time the federal minimum wage rate is above or is thereafter increased above the minimum wage then in effect under this subsection, the minimum wage required by this subsection shall continue to be increased pursuant to this subsection ***, but the higher federal rate shall immediately become the minimum wage required by this subsection and shall be increased or decreased per the method set forth in subsection 2** for so long as it remains higher than the state minimum wage required and increased pursuant to this subsection.

4. For purposes of this section, the term "**public employer**" means an employer that is the state or a political subdivision of the state, including a department, agency, officer, bureau, division, board, commission, or instrumentality of the state, or a city,

county, town, village, school district, or other political subdivision of the state. Subsection 3**** of this section shall not apply to a public employer with respect to its employees. Any public employer that is subject to subsections 1* and 2** of this section shall continue to be subject to those subsections.

(L. 1990 H.B. 1881 § 2, A.L. 2006 Adopted by Initiative, Proposition B, November 7, 2006, A.L. 2018 Adopted by Initiative, Proposition B, November 6, 2018)

Effective 11-06-18

*Words "subsection (1)" appear in original rolls.

**Words "subsection (2)" appear in original rolls.

***Number "(3)" appears here in original rolls.

****Words "subsection (3)" appear in original rolls.

11/6/2018

290.505. Overtime compensation, applicable number of hours, exceptions. — 1. No employer shall employ any of his employees for a workweek longer than forty hours unless such employee receives compensation for his employment in excess of the hours above specified at a rate not less than one and one-half times the regular rate at which he is employed.

2. Employees of an amusement or recreation business that meets the criteria set out in 29 U.S.C. 213(a)(3) must be paid one and one-half times their regular compensation for any hours worked in excess of fifty-two hours in any one-week period.

3. With the exception of employees described in subsection (2), the overtime requirements of subsection (1) shall not apply to employees who are exempt from federal minimum wage or overtime requirements including, but not limited to, the exemptions or hour calculation formulas specified in 29 U.S.C. Sections 207 and 213, and any regulations promulgated thereunder.

4. Except as may be otherwise provided under sections 290.500 to 290.530, this section shall be interpreted in accordance with the Fair Labor Standards Act, 29 U.S.C. Section 201, et seq., as amended, and the Portal to Portal Act, 29 U.S.C. Section 251, et seq., as amended, and any regulations promulgated thereunder.

(L. 1990 H.B. 1881 § 3, A.L. 2006 Adopted by Initiative, Proposition B, November 7, 2006, A.L. 2008 H.B. 1883 merged with H.B. 2041)

Effective 6-25-08 (H.B. 2041); 8-28-08 (H.B. 1883)

8/28/2008

290.507. Agriculture, law not applicable. — Sections 290.500 to 290.530 shall not apply to any employee or employer engaged in agriculture, as defined in section 290.500 (A) if such employee is employed by an employer who did not, during any calendar quarter during the preceding calendar year, use more than five hundred man-days of agriculture labor, (B) if such employee is the parent, spouse, child, or other member of his employer's immediate family, (C) if such employee (i) is employed as a hand harvest laborer and is paid on a piece rate basis in an operation which has been, and is customarily and generally recognized as having been, paid on a piece rate basis in the region of employment, (ii) commutes daily from his permanent residence to the farm on which he is so employed, and (iii) has been employed in agriculture less than thirteen weeks during the preceding calendar year, (D) if such employee (other than an employee described in clause (C) of this subsection) (i) is sixteen years of age or under and is employed as a hand harvest laborer, is paid on a piece rate basis in an operation which has been, and is customarily and generally recognized as having been, paid on a piece rate basis in the region of employment, (ii) is employed on the same farm as his parent or person standing in the place of his parent, and (iii) is paid at the same piece rate as employees over age sixteen are paid on the same farm, or (E) if such employee is principally engaged in the range production of livestock.

(L. 1990 H.B. 1881 § 4, A.L. 2006 Adopted by Initiative, Proposition B, November 7, 2006)

12/7/2006

290.510. Director may investigate to prove compliance. — The director shall have authority to investigate and ascertain the wages of persons employed in any occupation included within the meaning of sections 290.500 to 290.530.

(L. 1990 H.B. 1881 § 5, A.L. 2006 Adopted by Initiative, Proposition B, November 7, 2006)

12/7/2006

290.512. Gratuities, goods or services as part of wages, effect on minimum wage requirements. — 1. No employer of any employee who receives and retains compensation in the form of gratuities in addition to wages is required to pay wages in excess of fifty percent of the minimum wage rate specified in sections 290.500 to 290.530, however, total compensation for such employee shall total at least the minimum wage specified in sections 290.500 to 290.530, the difference being made up by the employer.

2. If an employee receives and retains compensation in the form of goods or services as an incident of his employment and if he is not required to exercise any discretion in order to receive the goods or services, the employer is required to pay only the difference between the fair market value of the goods and services and the minimum wage otherwise required to be paid by sections 290.500 to 290.530. The fair market value of the goods and services shall be computed on a weekly basis. The director shall provide by regulation a method of valuing the goods and services received by any employee in lieu of the wages otherwise required to be paid under the provisions of sections 290.500 to 290.530. He shall also provide by regulation a method of determining those types of goods and services that are an incident of employment the receipt of which does not require any discretion on the part of the employee.

(L. 1990 H.B. 1881 § 6, A.L. 2006 Adopted by Initiative, Proposition B, November 7, 2006)

12/7/2006

290.515. Physical or mental deficiency of employee, wage rate, determined by director, how. — After a public hearing at which any person may be heard, the director shall provide by regulation for the employment in any occupation of individuals whose earning capacity is impaired by physical or mental deficiency at wages lower than the wage rate applicable under sections 290.500 to 290.530. The individuals shall be employed as the director finds appropriate to prevent curtailment of opportunities for employment, to avoid undue hardship, and to safeguard the wage rate applicable under sections 290.500 to 290.530, except that no individual who maintains a production level within the limits required of other employees shall be paid less than the wage rate applicable under sections 290.500 to 290.530. Employees affected or their guardians shall be given reasonable notice of this hearing.

(L. 1990 H.B. 1881 § 7, A.L. 2006 Adopted by Initiative, Proposition B, November 7, 2006)

12/7/2006

290.517. Learners and apprentices, wage rate, determined by director, how. — After a public hearing of which individual employees affected must be given reasonable notice, the director shall provide by regulation for the employment in any occupation, at wages lower than the wage rate applicable under sections 290.500 to 290.530, of such learners and apprentices as he finds appropriate to prevent curtailment of opportunities for employment. Such wage rate for learners and apprentices shall be not less than 90 cents less than the minimum wage established by

sections 290.500 to 290.530. At no time may this provision be used for the purpose of evading the spirit and meaning of sections 290.500 to 290.530.

(L. 1990 H.B. 1881 § 8, A.L. 2006 Adopted by Initiative, Proposition B, November 7, 2006)

12/7/2006

290.520. Employer to keep records — director may inspect, records to be confidential. — Every employer subject to any provision of sections 290.500 to 290.530 or any regulation issued under sections 290.500 to 290.530 shall make and keep for a period of not less than three years on or about the premises wherein any employee is employed or at some other premises which is suitable to the employer, a record of the name, address and occupation of each of his employees, the rate of pay, the amount paid each pay period to each employee, the hours worked each day and each workweek by the employee and any goods or services provided by the employer to the employee as provided in section 290.512. The records shall be open for inspection by the director by appointment. Where the records required under this section are kept outside the state, the records shall be made available to the director upon demand. Every such employer shall furnish to the director on demand a sworn statement of time records and information upon forms prescribed or approved by the director. All the records and information obtained by the department of labor and industrial relations are confidential and shall be disclosed only on order of a court of competent jurisdiction.

(L. 1990 H.B. 1881 § 9, A.L. 2006 Adopted by Initiative, Proposition B, November 7, 2006)

12/7/2006

290.522. Summary of law and wage rate, employer to post, how. — Every employer subject to any provision of sections 290.500 to 290.530 or of any regulations issued under sections 290.500 to 290.530 shall keep a summary of sections 290.500 to 290.530, approved by the director, and copies of any applicable wage regulations issued under sections 290.500 to 290.530, or a summary of the wage regulations posted in a conspicuous and accessible place in or about the premises wherein any person subject thereto is employed. Employers shall be furnished copies of the summaries and regulations by the state on request without charge.

(L. 1990 H.B. 1881 § 10, A.L. 2006 Adopted by Initiative, Proposition B, November 7, 2006)

12/7/2006

290.523. Rulemaking authority. — The department may, in accordance with chapter 536, promulgate such rules and regulations as are necessary for the enforcement and administration of sections 290.500 to 290.530. Any rule or portion of a rule, as that term is defined in section 536.010, that is created under the authority delegated in this section shall become effective only if it complies with and is subject to all of the provisions of chapter 536 and, if applicable, section 536.028. This section and chapter 536 are nonseverable and if any of the powers vested with the general assembly pursuant to chapter 536 to review, to delay the effective date, or to disapprove and annul* a rule are subsequently held unconstitutional, then the grant of rulemaking authority and any rule proposed or adopted after August 28, 2008, shall be invalid and void.

(L. 2008 H.B. 1883 merged with H.B. 2041)

*Word "annual" appears in original rolls of H.B. 1883, 2008.

8/28/2008

290.525. Violations — penalty. — Any employer who hinders the director in the performance of his duties in the enforcement of sections 290.500 to 290.530 by any of the following acts is guilty of a class C misdemeanor:

(1) Refusing to admit the director to any place of employment;

(2) Failing to make, keep and preserve any records as required under the provisions of sections 290.500 to 290.530;

(3) Falsifying any record required under the provisions of sections 290.500 to 290.530;

(4) Refusing to make any record required under the provisions of sections 290.500 to 290.530 accessible to the director;

(5) Refusing to furnish a sworn statement of any record required under the provisions of sections 290.500 to 290.530 or any other information required for the proper enforcement of sections 290.500 to 290.530 to the director upon demand;

(6) Failing to post a summary of sections 290.500 to 290.530 or a copy of any applicable regulation as required;

(7) Discharging or in any other manner discriminating against any employee who has notified the director that he has not been paid wages in accordance with the provisions of sections 290.500 to 290.530, or who has caused to be instituted any proceeding under or related to sections 290.500 to 290.530, or who has testified or is about to testify in any such proceeding;

(8) Paying or agreeing to pay wages at a rate less than the rate applicable under sections 290.500 to 290.530. Payment at such rate for any week or portion of a week constitutes a separate offense as to each employee;

(9) Otherwise violating any provisions of sections 290.500 to 290.530.

Each day of violation constitutes a separate offense.

(L. 1990 H.B. 1881 § 11, A.L. 2006 Adopted by Initiative, Proposition B, November 7, 2006)

12/7/2006

290.527. Action for underpayment of wages, employee may bring — limitation. — Any employer who pays any employee less wages than the wages to which the employee is entitled under or by virtue of sections 290.500 to 290.530 shall be liable to the employee affected for the full amount of the wage rate and an additional amount equal to twice the unpaid wages as liquidated damages, less any amount actually paid to the employee by the employer and for costs and such reasonable attorney fees as may be allowed by the court or jury. The employee may bring any legal action necessary to collect the claim. Any agreement between the employee and the employer to work for less than the wage rate shall be no defense to the action. All actions for the collection of any deficiency in wages shall be commenced within three years of the accrual of the cause of action.

(L. 1990 H.B. 1881 § 12, A.L. 2006 Adopted by Initiative, Proposition B, November 7, 2006, A.L. 2018 Adopted by Initiative, Proposition B, November 6, 2018)

Effective 11-06-18

11/6/2018

290.528. Minimum wage and employment benefits, limitations on political subdivisions. — 1. As used in this section, the following terms shall mean:

(1) "**Employee**", an individual employed in this state by an employer;

(2) "**Employer**", any individual, sole proprietorship, partnership, limited liability company, corporation, or any other entity that is legally doing business in this state;

except that, the term "employer" shall not include any public employer, as defined in section 285.525;

(3) "**Employment benefits**", anything of value that an employee may receive from an employer in addition to wages and salary. The term includes, but is not limited to, health, disability, retirement, profit-sharing, and death benefits; group accidental death and dismemberment benefits; paid or unpaid days off from work for holidays, sick leave, vacation, and personal necessity; and terms of employment, attendance, or leave policies;

(4) "**Political subdivision**", any municipality, special district, local governmental body, county, city, town, or village.

2. Notwithstanding any other provisions of law to the contrary, no political subdivision shall establish, mandate, or otherwise require an employer to provide to an employee:

(1) A minimum or living wage rate; or

(2) Employment benefits;

that exceed state laws, rules, or regulations. Sections 290.500 to 290.530 shall preempt and nullify all political subdivision ordinances, rules, and regulations currently in effect or later enacted relating to the establishment or enforcement of a minimum or living wage or the provision of employment benefits that exceed state laws, rules, or regulations.

(L. 1990 H.B. 1881 § 13, A.L. 2006 Adopted by Initiative, Proposition B, November 7, 2006, A.L. 2017 H.B. 1194 & 1193)

8/28/2017

290.529. Severability clause. — Except in the circumstances set forth in section 290.523, all the provisions of sections 290.500 to 290.530 are severable. If any provision, including any section, subsection, subdivision, paragraph, sentence, or clause, of sections 290.500 to 290.530, or the application thereof to any person or circumstance, is found by a court of competent jurisdiction to be invalid, unconstitutional, or unconstitutionally enacted, such decision shall not affect other provisions or applications of sections 290.500 to 290.530 that can be given effect without the invalid, unconstitutional, or unconstitutionally enacted provision or application.

(L. 2018 Adopted by Initiative, Proposition B, November 6, 2018)

Effective 11-06-18

11/6/2018

290.530. Law not to interfere with collective bargaining rights. — Nothing in sections 290.500 to 290.530 shall be deemed to interfere with, impede, or in any way diminish the right of employees to bargain collectively with their employers through representatives of their own choosing in order to establish wages or other conditions of work in excess of the applicable minimum under the provisions of sections 290.500 to 290.530.

(L. 1990 H.B. 1881 § 14, A.L. 2006 Adopted by Initiative, Proposition B, November 7, 2006)

12/7/2006

290.550. Definitions. — As used in sections 290.550 to 290.580, the following terms mean:

(1) "**Laborers from nonrestrictive states**", persons who are residents of a state which has not enacted state laws restricting Missouri laborers from working on public works projects in that state, as determined by the labor and industrial relations commission;

(2) "**Missouri laborer**", any person who has resided in Missouri for at least thirty days and intends to become or remain a Missouri resident;

(3) "**A period of excessive unemployment**", any month immediately following two consecutive calendar months during which the level of unemployment in the state has exceeded five percent as measured by the United States Bureau of Labor Statistics in its monthly publication of employment and unemployment figures;

(4) "**Public works**", projects defined as public works pursuant to section 290.210.

(L. 1993 H.B. 416 & 417 § 1)

8/28/1993

290.555. Law to apply to certain projects. — Sections 290.550 to 290.580 apply to all labor on public works projects or improvements, whether skilled, semiskilled or unskilled, and whether manual or nonmanual except work done directly by any public utility company and not let to contract.

(L. 1993 H.B. 416 & 417 § 2)

8/28/1993

290.560. Certain laborers to be used on public works projects, when — contract provisions — exceptions. — Whenever there is a period of excessive unemployment in this state, every person who is charged with the duty, either by law or contract, of constructing or building any public works project or improvement for the state or any political subdivision, municipal corporation or other governmental unit thereof shall employ only Missouri laborers and laborers from nonrestrictive states on such project or improvement, and every contract let by any such person shall contain a provision requiring that such labor be used, except that other laborers may be used when Missouri laborers or laborers from nonrestrictive states are not available, or are incapable of performing the particular type of work involved, if so certified by the contractor and approved by the contracting officer.

(L. 1993 H.B. 416 & 417 § 3)

8/28/1993

290.565. Law not to apply to certain personnel. — The provisions of sections 290.550 to 290.580 shall not apply to regularly employed nonresident executive, supervisory or technical personnel.

(L. 1993 H.B. 416 & 417 § 4)

8/28/1993

290.570. Federal projects, statutes not enforced, when. — In all contracts involving the expenditure of federal aid funds, sections 290.550 to 290.580 shall not be enforced in such manner as to conflict with any federal statutes or rules and regulations.

(L. 1993 H.B. 416 & 417 § 5)

8/28/1993

290.575. Penalties for failure to use certain laborers, when. — Any person who knowingly fails to use Missouri laborers or laborers from nonrestrictive states as required in section 290.560 shall be guilty of an infraction. Each separate case of failure to use Missouri laborers or laborers from nonrestrictive states on such public works projects or improvements shall constitute a separate offense.

(L. 1993 H.B. 416 & 417 § 6)

8/28/1993

290.580. Department to enforce law — injunctive relief, when. — Sections 290.550 to 290.580 shall be enforced by the department of labor and industrial relations, which, as represented by the attorney general, is empowered to sue for injunctive relief

against the awarding of any contract or the continuation of any work under any contract for public works or improvements at a time when the provisions of sections 290.550 to 290.580 are not being met.

(L. 1993 H.B. 416 & 417 § 7)

8/28/1993

***290.590. Labor organization membership, dues, and fees not required as condition of employment — definitions — violations, penalty — investigation of complaints — inapplicability, when.** — 1. As used in this section, the following terms shall mean:

(1) "**Employer**", any individual, organization, partnership, state agency, political subdivision, corporation, or other legal entity which employs or has employed one or more individuals performing services for the entity within this state; and

(2) "**Labor organization**", any organization of any kind or agency, or employee representation committee or union which exists for the purpose in whole or in part of dealing with employers concerning wages, rates of pay, hours of work, other conditions of employment, or other forms of compensation.

2. No person shall be required as a condition or continuation of employment to:

(1) Become, remain, or refrain from becoming a member of a labor organization;

(2) Pay any dues, fees, assessments, or other similar charges however denominated of any kind or amount to a labor organization; or

(3) In lieu of the payments listed under subdivision (2) of this subsection, pay to any charity or other third party any amount equivalent to, or on a pro rata basis, any dues, fees, assessments, or other charges required of members of a labor organization.

3. Any agreement, understanding, or practice, written or oral, implied or expressed, between any labor organization and employer that violates the rights of employees as guaranteed under this section is unlawful, null and void, and of no legal effect.

4. Any person who violates or directs another to violate any provision of this section shall be guilty of a class C misdemeanor.

5. (1) Any person injured as a result of any violation or threatened violation of this section shall be entitled to injunctive relief against any and all violators or persons threatening violations.

(2) Any person injured as a result of any violation or threatened violation of this section may recover any and all damages of any character resulting from such

violation or threatened violation including costs and reasonable attorney fees. Such remedies shall be independent of and in addition to the other penalties and remedies prescribed under this section.

6. The prosecuting attorney or circuit attorney with jurisdiction over the location where a violation or threatened violation of this section occurs or the attorney general of this state shall investigate complaints of violation or threatened violation of this section, prosecute any person violating this section, and use all means at their command to ensure the effective enforcement of this section.

7. This section shall not apply:

(1) To employers and employees covered by the federal Railway Labor Act;

(2) To federal employers and employees;

(3) To employers and employees on exclusive federal enclaves;

(4) Where this section conflicts with or is preempted by federal law; or

(5) To any agreement between an employer and a labor organization entered into before August 28, 2017, but shall apply to any such agreement upon its renewal, extension, amendment, or modification in any respect after August 28, 2017.

(L. 2017 S.B. 19, Rejected by Referendum, Proposition A, August 7, 2018)

*Revisor's Note: On February 21, 2017, a petition for referendum (Chapter 116, RSMo) on Senate Substitute No. 2 for Senate Bill No. 19 was received by the Secretary of State's Office. On March 28, 2017, the official ballot title was certified by the Secretary of State (Section 116.180, RSMo) and approved for circulation in accordance with Article III, Section 52(a). On August 18, 2017, the Secretary of State's Office received 163 boxes of referendum petitions for Senate Substitute No. 2 for Senate Bill No. 19. On November 22, 2017, the Secretary of State issued a certificate of sufficiency certifying the referendum petition. The referendum petition was to be placed on the November 6, 2018, ballot unless a different date was designated by the General Assembly. The General Assembly, in SCR 49 enacted on May 24, 2018, designated the referendum vote to be held on August 7, 2018. The measure was rejected by referendum, Proposition A, on August 7, 2018.

8/28/2017

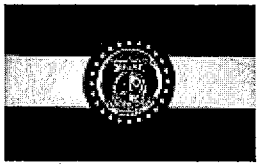
In accordance with Section **3.090**, the language of statutory sections enacted during a legislative session are updated and available on this website **on the effective date** of such enacted statutory section.

- **Other Links**
- **Other Information**

Missouri Senate **MO.gov** **Missouri House**

© Missouri Legislature, all rights reserved.

Site errors / suggestions - webmaster@LR.mo.gov



Our flag's story

Over 41M page views.

360

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

REQUEST FOR INTERPRETATION

Project Number _____

Project Title _____

Contractor _____

RFI Number _____ Date _____

From: _____

To: _____

Re: _____

Spec. Sec. Ref: Paragraph: Drawing Ref: Detail:

Signed: _____

Response:

❑ Attachments

Response From: To: Date Transmitted:_____ Date Rec'd:_____

Signed:_____ Signed:_____

Design Professional Owner's Representative

Distribution:
- ❑ Owner
- ❑ Contractor
- ❑ Construction Manager
- ❑ Design Professional
- ❑ Consultant _____
- ❑ Other _____

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

REQUEST FOR INTERPRETATION LOG

Project Number _____

Project Title _____

CONTRACTOR _____

OWNER _____

RFI No.	Issue Date	Brief Description of issue and response	Respond Date

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

SUPPLEMENTAL DESIGN INSTRUCTION

Project Number _____

Project Title _____

To Contractor _____

From: _____ SDI No _____ Issue Date: _____

The Work shall be carried out in accordance with the following supplemental instructions issued in accordance with the Contract Documents without change in Contract Price or Contract Times. Proceeding with the Work in accordance with these instructions indicates your acknowledgement that there will be no change in the Contract Price or Contract Times.

Description:

❑ Attachments *(List)*

(Signature) Design Professional Date

Distribution:
- ❑ Owner
- ❑ Contractor
- ❑ Construction Manager
- ❑ Design Professional
- ❑ Consultant _____
- ❑ Other _____

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

REQUEST FOR PROPOSAL

Project Number _____

Project Title _____

To Contractor _____

From: _____ RFP No _____ Issue Date: _____

Please submit an itemized proposal for changes in the Contract Price and Contract Times for proposed modifications to the Contract Documents described herein. Submit proposal within _____ days, or notify the Owner in writing of the date on which you anticipate submitting your proposal.

This is NOT a Change Order, a Work Change Directive or a direction to proceed with the work described in the proposed modifications.

Description:

❑ Attachments

Prepared by Design Professional

Prepared by Construction Manager

REQUESTED by OWNER'S Representative

Distribution:
- ❑ Owner
- ❑ Contractor
- ❑ Construction Manager
- ❑ Design Professional
- ❑ Consultant _____
- ❑ Other _____

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

REQUEST FOR PROPOSAL LOG

Project Number _____

Project Title _____

CONTRACTOR _____

OWNER _____

RFP No.	Issue Date	Brief Description of Request	Respond Date	Amount	CO No.

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

CHANGE ORDER

Project Number _____

Project Title _____

Change Order No: _____ Date of Issuance: _____

Ordinance No: _____ Ordinance Effective Date: _____

Contract Notice To Proceed Date: _____

To CONTRACTOR:

The Contract is changed as follows: _____

This Change Order constitutes compensation in full on behalf of the Contractor and its subcontractors and suppliers for all costs, including impact costs and extended general conditions, and markups directly and indirectly attributable to the Work changes ordered herein, for all delays related thereto and for performance of the changes within the time stated. Contractor hereby releases all claims for delay, interruption, extended general conditions, impact and cumulative impact claims for this Work.

[**Note**: Identify the specific attachments; example:"Attachment A, Additional Scope of Services." Delete **all** notes before printing final]

☐ See Attached Document(s).

[**Note:** If the CO does not change the Contract Price, use "Director" instead of "Director of Finance"]

Not valid until signed by the Director of Finance.

The original Contract Price was	$0.00
Net change by previously authorized Change Orders	$0.00
The Contract Price prior to this Change Order was	$0.00
The Contract Price will be (☐ increased by) (☐ decreased by) (☐ unchanged)	$0.00
The new Contract Price including this Change Order will be	$0.00
[Note: If revised, establish and enter new dates. If unchanged, enter current contract dates.	
If you are only changing the Final Completion date, add the following reference:	
"The Contract Time for Final Completion will be . . ."]	
The Contract Time will be (☐ increased by) (☐ decreased by) (☐ unchanged)	( ) calendar days
The date of Substantial Completion as of the date of this Change Order therefore is	Enter Date
The date of Final Completion as of the date of this Change Order therefore is	Enter Date

Project No. & Title
Change Order No.
[**Note:** Include any required additional signatures.]

DESIGN PROFESSIONAL:	**By:** **Title:**	**Date:**
CONTRACTOR:	**By:** **Title:**	**Date:**
CITY:	**By** **Title:**	**Date:**

Approved as to form: _____
Assistant City Attorney

[**Note:** If this CO does not change the Contract Price, delete the cert. of funds by Finance Director but send signed copy to Finance.]

I certify there is a balance otherwise unencumbered to the credit of the appropriation to which the above amount is chargeable, and a cash balance otherwise unencumbered in the treasury to the credit of the fund from which payment is to be made, each sufficient to meet the above obligation.

By: _____
Director of Finance Date

Distribution:
- ❑ CITY
- ❑ CONTRACTOR
- ❑ DESIGN PROFESSIONAL

REMINDER: CONTRACTOR is responsible for considering the effect this Change Order may have on its ability to meet or exceed the D/M/WBE participation amounts in its Contractor Utilization Plan (CUP) as amended by any previously approved Request for Modification/Substitution. If CONTRACTOR will not be able to achieve the approved participation amounts in performing the work included within this Change Order, or if CONTRACTOR needs to retain the services of additional D/M/WBEs not previously listed in its CUP, CONTRACTOR is advised to submit a Request for Modification/Substitution.

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

WORK CHANGE DIRECTIVE

Project Number _____

Project Title _____

No.: _____ Date of Issuance: _____

TO:
(CONTRACTOR)

You are directed to proceed promptly with the following work:

Description:

Purpose of Work Change Directive:

Attachments: *(List documents supporting change)*

If the above work results on a change in the Contract Price or Contract Times, any request for a Change Order based thereon will involve one or more of the following methods of determining the effect of the change(s).

Method of determining change in Contract Price:	Method of determining change in Contract Times:
❑ Unit Prices	❑ CONTRACTOR's Records
❑ Lump Sum	❑ DESIGN PROFESSIONAL's Records
❑ As Stipulated in General Conditions	❑ City's Records
❑ Other _____	❑ Other _____
Estimated increase (decrease) in Contract Price:	Estimated increase (decrease) in Contract Times:
$ _____	Substantial Completion: _____ days;
If the change involves an increase, the estimated Amount is not to be exceeded without further authorization.	Final Completion: _____ days.
	If the change involves an increase, the estimated times are not to be exceeded without further authorization.

Recommended:	Recommended:	Recommended:
DESIGN PROFESSIONAL	Construction Manager	City
By (Authorized Signature)	By (Authorized Signature)	By (Authorized Signature)

Distribution:
❑ City
❑ Contractor
❑ Construction Manager
❑ Design Professional
❑ Consultant
❑ Other

WORK CHANGE DIRECTIVE ("WCD") INSTRUCTIONS

[Note: Do not attach these instructions to the WCD Form]

A. GENERAL INFORMATION

This document was developed for use in situations involving changes in the Work which, if not processed expeditiously, might delay the Project. These changes are often initiated in the field and may affect the Contract Price or the Contract Times. This is not a Change Order, but only a directive to proceed with Work that may be included in a subsequent Change Order. If the WCD may result in an increase in the Contract Price, a contract impact cost analysis must be performed prior to issuing the WCD. Availability of funds and authorization to expend funds must be part of the analysis.

For supplemental instructions and minor changes not involving a possible change in the Contract Price or the Contract Times a Supplemental Design Instruction may be used.

B. COMPLETING THE WORK CHANGE DIRECTIVE FORM

Based on conversations between Design Professional, City's Representative and CONTRACTOR, Design Professional must complete the following:

DESCRIPTION: shall include a summary of the Work included in the WCD. Additional information may be attached to the WCD to further define the scope.

PURPOSE OF WORK CHANGE DIRECTIVE: will identify clearly if the Work included in the WCD is an addition, deletion, revision, or some combination.

ATTACHMENTS: shall identify all attachments included in and made a part of the WCD. Be certain that attachments are clearly labeled.

METHOD OF DETERMINING CHANGE, IF ANY, IN CONTRACT PRICE: Mark the method to be used in determining the final cost of Work involved and the estimated net effect on the Contract Price. If the change involves an increase in the Contract Price and the estimated amount is approached before the additional or changed Work is completed, another WCD must be issued to change the estimated price. Do not leave blank spaces or write "To be determined" (or "TBD"). An estimated dollar figure must be assigned to the Work. If the WCD is not likely to change the Contract Price, the space for estimated increase (decrease) should be marked "No Change in Price".

METHOD OF DETERMINING CHANGE, IF ANY, IN CONTRACT TIMES: Mark the method to be used in determining the change in Contract Times and the estimated increase or decrease in Contract Times. If the change involves an increase in the Contract Times and the estimated times are approached before the additional or changed Work is completed, another WCD must be issued to change the times or CONTRACTOR may stop the changed Work when the estimated times are reached. Do not leave blank spaces or write "To be determined" (or "TBD"). If the WCD is not likely to change the Contract Times, the space for estimated increase (decrease) should be marked "No Change in Times".

Once Design Professional has completed and signed the form, all copies should be sent to CITY for authorization because Design Professional does not have authority to authorize changes in Price or Times. Once authorized by CITY, a copy must be sent by Design Professional to CONTRACTOR. Price and Times may only be changed by Change Order signed by CITY, Design Professional, and CONTRACTOR. If the value of the work included in the WCD exceeds the contingency or budget available for the contract, staff must obtain written approval from the Director or his or her designee before the WCD is issued. A Director or his or her designee may not approve a WCD that will exceed City Council authorization. If the work included in the WCD is needed as a result of an emergency, staff may proceed with the issuance of the WCD without

prior written approval even if the value of the work added is expected to exceed the contract contingency balance.

Once the Work covered by this directive is completed or final cost and times are determined. CONTRACTOR must submit proper documentation for inclusion in a Change Order.

IF THIS IS A DIRECTIVE TO PROCEED WITH A CHANGE THAT MAY AFFECT THE CONTRACT PRICE OR THE CONTRACT TIMES A CHANGE ORDER, IF ANY, MUST BE PROCESSED PROMPTLY.

- ☐ Executed Contract File
- ☐ Contractor
- ☐ Finance
- ☐ City Clerk
- ☐ Surety
- ☐ Granting Agency
- ☐ Project Manager
- ☐ CM/Inspector
- ☐ Design Professional
- ☐ _____

City of Kansas City, Missouri
Water Services Department
Kenneth C. Morgan P.E., Director

Project Manual

PROJECT/CONTRACT NO. 81000999/1751

PART 2

BLUE RIVER WWTP GRIT REMOVAL AND FINE SCREENS PROJECT

BIDDER/ADDRESS

Company	Goodwin Brothers Construction Co.
Contact	Doug Wachsnicht
Address	6455 Universal Avenue Kansas City, MO 64120
Phone	636-931-6084
Fax	636-931-6085
Email	dougw@goodwinbros.com

Project Manager: Kevin White
Telephone: 816-513-0213
Email: kevin.wite@kcmo.org

Docusign Envelope ID: BBC8E49D-85B7-45C8-A206-B34E6BD11F2A

KC WATER
OFFICE OF THE DIRECTOR

4800 E. 63rd Street
Kansas City, Missouri 64130
www.kcwater.us

816-513-0504
Fax: 816-513-0185

April 10, 2025

Doug Wachsnicht
Goodwin Brothers construction Co.
6455 Universal Avenue
Kansas City, MO 64120

Re: Notice to Proceed for Contract No. 81000999/1751 Blue River WWTP Grit Removal and Fine Screens Project

Dear Mr. Wachsnicht:

The Contract Times for the subject Project shall begin **April 11, 2025**. This letter is your official Notice to Proceed to begin the Work at the Site at that time. In accordance with the Contract the Work shall be substantially complete within 12 Months for GMP-1 and within 30 Months for GMP-2. Work shall be complete and ready for final Payment within 90 calendar days after the date of substantial completion. The Missouri Tax Exemption Certificate for this Project is enclosed.

This Notice to Proceed is issued with the understanding that the City will not make any payment under this Contract until you furnish to OWNER sufficient proof from the City's Commissioner of Revenue that shows your compliance with the City's earnings and profits tax and occupational license tax ordinances. If any of your Subcontractors cannot obtain a taxpayer clearance letter, you must inform the City when the substitution of these Subcontractors is made.

KC Water is now requiring management of all construction contracts within Trimble Unity Construct Project Management Software. These include, but are not limited to, electronic invoice submission, document management, and submission of change orders.

Please direct all project-related questions to kevin.white@kcmo.org, City's Representative, at 816-513-0213 and all e-Builder-related questions to Alvina Kweh, Planning Engineer, at 816-513-0444.

Sincerely,

DocuSigned by:
Jeff Martin
31E8ECD407AB411...

Jeff Martin, P.E., Deputy Director, Chief Engineering Officer

Form **5060**

Missouri Department of Revenue
Project Exemption Certificate

This form is to be completed and given to your contractor.

Exempt Entity and Project Information

Name of Exempt Entity Issuing the Certificate			Missouri Tax Exemption Number
City of Kansas City, Missouri			1 2 4 9 0 4 6 6
Address	**City**	**State**	**ZIP Code**
414 East 12th Street, 3rd Floor	Kansas City	MO	64106
E-mail Address			
Kevin.White@kcmo.org			
Project Number	**Project Begin Date (MM/DD/YYYY)**		**Estimated Project End Date (MM/DD/YYYY)**
81000999	04/11/2025		12/31/2027

Description of Project
Blue River WWTP Grit Removal and Fine Screens Project

Project Location	Certificate Expiration Date (MM/DD/YYYY)
Blue River WWTP, Kansas City, Missouri	04/11/2026

Provide a signed copy of this certificate, along with a copy of the exempt entity's Missouri Sales and Use Tax Exemption Letter to each contractor or subcontractor who will be purchasing tangible personal property for use in this project. It is the responsibility of the exempt entity to ensure the validity of the information on the certificate. The exempt entity must issue a new certificate if any of the information changes.

Signature of Authorized Exempt Entity	Printed Name of Authorized Exempt Entity	Date (MM/DD/YYYY)
Kevin White	Kevin White	04/10/2025

Contractor

The Missouri exempt entity named above hereby authorizes the purchase, without sales tax, of tangible personal property to be incorporated or consumed in the construction project identified herein and no other, pursuant to **Section 144.062, RSMo.** Under penalties of perjury, I declare that the above information and any attached supplement is true, complete, and correct.

Name of Purchasing Contractor	Signature of Contractor	Date (MM/DD/YYYY)
		/ /
Address	**City**	**State** / **ZIP Code**

Subcontractor

Contractors - Present this to your supplier in order to purchase the necessary materials tax exempt. Complete the Subcontractor portion if extending the certificate to your subcontractor. The contractor must sign the form in the space provided below.

Name of Purchasing Subcontractor			
Address	**City**	**State**	**ZIP Code**
Signature of Contractor	**Contractor's Printed Name**	**Date (MM/DD/YYYY)**	
		/ /	

Form 5060 (Revised 08-2015)

Taxation Division
P.O Box 358
Jefferson City, MO 65105-0358

Phone: (573) 751-2836
Fax: (573) 522-1271
E-mail: salestaxexemptions@dor.mo.gov

Visit http://dor.mo.gov/business/sales/sales-use-exemptions.php for additional information.

Docusign Envelope ID: BBC8E49D-85B7-45C8-A206-B34E6BD11F2A

Enclosure

cc: Kevin White, PM
Blake Anderson, PE
Raed Asfan, Project Engineer
Contract File
e-Builder File

SECTION 01019 – CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including other Division 1 Specification Sections, apply to this Section.
B. Related Sections include the following:
    1. Section 01020 – Record Documents.
    2. Section 01021 – Operation and Maintenance Data.
    3. Section 01140 – Work Restrictions.
    4. Section 01290 – Payment Procedures and Change Management.
    5. Section 01300 – Submittals.
    6. Section 01320 – Construction Progress Documentation.
    7. Section 01335 – Document Management.
    8. Section 01340 – Project BIM Coordination.
    9. Section 01352 – Selective Alterations and Demolition.
    10. Section 01433 – Manufacturers' Field Services.
    11. Section 01600 – Product Delivery Storage and Handling.
    12. Section 01664 – Training.
    13. Section 01757 – Commissioning.

1.02 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
    1. Inspection procedures.
    2. Submittals.
    3. Final cleaning.

1.03 SUBMITTALS

A. All Acceptance documents shall be submitted at least 14 calendar days prior to Acceptance inspection request.
    1. Specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
    2. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
    3. Prepare and submit Project Record Documents, final operation and maintenance manuals, Record Documents, damage or settlement surveys, property surveys, and similar final record information.
    4. Submit specific warranties, workmanship bonds, maintenance service agreements, and similar documents in accordance with this Section.
    5. Submit all manufacturers' certificates in accordance with Section – 01433 Manufacturers' Field Services.
    6. Submit completed Asset Maintenance Summary Forms for retired assets in Accordance with Section 01021 – Operation and Maintenance Data for assets retired as a part of this Work.
    7. Submit Final Original Equipment Manufacturer Operations & Maintenance (OEM O&M) Manuals for all equipment and materials furnished as part of the Work of the Project.

8. Prepare and submit draft Facility O&M Data and the draft Electronic O&M Manual in accordance with the requirements of this Section.
9. Submit draft as-built BIM developed in accordance with Section 01340 – Building Information Modeling Requirements and updated to include as-built conditions.
10. Submit training materials and recordings of training sessions as described in Section – 01757 Commissioning.
11. Submit Acceptance Test Report for Owner review and approval and receive notice of successful Acceptance Testing from the Owner in accordance with Section – 01757 Commissioning and with this Section.
12. Deliver tools, spare parts, extra material, and maintenance products in accordance with Section – 01600 Product Delivery Storage and Handling.
13. Submit changeover information related to Owner's use, operation, and maintenance.
14. Prepare and submit draft Project Record Documents prepared in accordance with Section 01020 – Record Documents and submitted in accordance with the requirements of this Section.

B. All Final Completion documents shall be submitted at least 14 calendar days prior to Final Completion inspection request. Before requesting a final inspection to determine the date of Final Completion, complete the following:
   1. Submit a certified copy of the City's Acceptance inspection list of items to be completed or corrected (punch list), endorsed and dated by the Engineer-of-Record and Owner. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
   2. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
   3. Submit changeover information related to Owner's use, operation, and maintenance.
   4. Submit Final O&M Data, including the final Electronic O&M Manual in accordance with the requirements of this Section and Section 01021 – Operation and Maintenance Data.
   5. Submit Final BIM incorporating all as-built information in accordance with Section 01340 – Project BIM Coordination.
   6. Submit written notification to Owner that all Project signs have been removed.
   7. Submit evidence of completion of final cleaning and waste removal activities in accordance with Part 3 of this Section.

1.04 WARRANTIES AND BONDS

A. Warranties and Bonds shall be obtained in accordance with the General Conditions and with applicable equipment Specifications and shall be compiled and submitted as described in this Section as a condition of achieving Acceptance.
B. Submit all written warranties and bonds, including those previously submitted, in a compiled document, in accordance with the requirements of this Section, prior to making a request for inspection for Acceptance.
C. Submit warranties and bonds on request of Owner for designated portions of the Work where commencement of warranties and bonds other than Acceptance Date is indicated.
D. Partial Use: Submit properly executed warranties and bonds within 15 days of completion of designated portions of the Work that are completed and used by Owner during construction period by separate agreement with Design-Builder.

E. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
    1. Bind warranties and bonds in heavy-duty, 3-D-side ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
    2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of manufacturer, supplier, and installer, as applicable.
    3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES and BONDS," Project name or Title, and name, address and telephone number of Design-Builder.
F. Include each required warranty and bond in proper form, with full information, are certified manufacturer as required, and are properly executed by Design-Builder, or subcontractor, supplier, or manufacturer.
G. Provide additional copies of each warranty to include in operation and maintenance manuals.
H. Provide additional copies of each warranty as a separate pdf file.
I. Warranty submittal format:
    1. Submit two (2) hardcopies.
    2. Submit one (1) electronic copy in PDF format.

1.05 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting a Substantial Completion inspection for determining the Substantial Completion Date, the Design-Builder shall comply with all conditions in General Conditions and complete the following. List items below that are incomplete in request.
    1. Prepare a list of items to be completed and corrected (punch list) per Paragraph 1.07, the value of items on the list, and reasons why the Work is not complete.
    2. Deliver salvaged material and similar items in accordance with Section 01352 – Selective Alterations and Demolition to location designated by the Owner. Label with manufacturer's name and model number where applicable.
    3. Complete Acceptance Testing in accordance with Section 01757 – Commissioning.
    4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems in accordance with Section 01757 – Commissioning.
    5. Clean the project area of construction debris and other construction effects.
    6. Terminate and remove temporary facilities from the Project site, along with mockups, construction tools, and similar elements.
    7. Complete final cleaning requirements, including touchup painting.
    8. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
    9. Prepare and submit all required Submittals as specified herein.
B. Inspection: Submit a written request for inspection for Acceptance. On receipt of request, the Owner will either proceed with inspection or notify Design-Builder of unfulfilled requirements. The Owner will prepare the Certificate of Acceptance after inspection or will notify Design-Builder of items, either on Design-Builder's list or additional items identified by Owner, that must be completed or corrected before certificate will be issued.
    1. Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

2. Results of completed inspection will form the basis of requirements for Substantial Completion.
3. The Design-Builder shall pay for any re-inspection other than the first re-inspection. The costs of all extra re-inspections, including the cost of the Owner's Representative, will be deducted from the Design-Builder's payments.
4. Following completion of all items above and all requirements for Substantial Completion included in the Agreement, the Owner will complete Certificate of Substantial Completion (Section 01290.12) and distribute to the Design-Builder.

1.06 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining the Final Completion Date, complete the following:
    1. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Final operations and maintenance manuals must be provided for the training sessions.
    2. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects. Surfaces which cannot be touched-up or repaired satisfactorily, shall be refinished or replaced.
    3. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects. Surfaces which cannot be touched-up or repaired satisfactorily, shall be refinished or replaced.
    4. Prepare and submit all required Submittals as specified herein.
B. A written request for final inspection for acceptance must be provided to the Owner. Upon receipt of request, Owner will either proceed with inspection or notify Design-Builder of unfulfilled requirements. Owner will prepare a final Certificate of Final Completion after inspection or will notify Design-Builder of construction that must be completed or corrected before certificate will be issued.
    1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected. The Design-Builder shall pay for any re-inspection other than the first re-inspection. The costs of all extra re-inspections, including the cost of the Owner's Representative deducted from the Design-Builder's payments.
    2. Submit a final Application for Payment according to Section 01290 – Payment Procedures and Change Management.

1.07 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Design-Builder shall prepare and submit three copies of punch list prepared using form provided as Section 01290.13 – Punch List or Owner-approved form. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Design-Builder that are outside the limits of construction. Design-Builder shall use the standard Water Services form for all items.
    1. Organize a list of spaces in sequential order,
    2. Organize items applying to each space by major element, including category equipment, and building systems.
    3. Include the following information at the top of each page:
        a. Project Number
        b. Project name.

c. Date.
d. Name of Design-Builder.
e. Page number.

PART 2 - PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with the manufacturer's written instructions.
C. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
D. Complete the following cleaning operations before requesting inspection for certification of Final Completion for entire Project or for a portion of Project:
    1. Clean Project site and grounds, in areas disturbed by construction activities, of rubbish, waste material, litter, and other foreign substances.
    2. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    3. Remove tools, construction equipment, machinery, and surplus material from the Project site.
    4. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, and similar spaces.
    5. Sweep concrete floors broom clean in unoccupied spaces.
    6. Remove labels that are not permanent.
    7. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already shows evidence of repair or restoration.
E. Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
    1. Wipe surfaces of mechanical and electrical equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
    2. Clean ducts and blowers if units were operated without filters during construction.
    3. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
    4. Leave Project clean and ready for use.
F. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from the Project site and dispose of lawfully.

END OF SECTION

SECTION 01020 – RECORD DOCUMENTS

PART 1 - GENERAL

1.01 SUMMARY

A. Record Documents include Record Drawings, Record Specifications, and Record Product Data as described in this Section.
B. The Record Documents shall be an integral part of the work guaranteed by the Design-Builder's Performance and Maintenance Bond. If during the Project Warranties Term the Owner determines that further revisions or corrections are necessary to make the Record Documents accurate, the Design-Builder shall make or cause the revisions or corrections to be made at no additional cost to the Owner.
C. Design-Builder shall maintain, in a safe place at the Site, one updated copy of all Drawings, Standards and Specifications, Addenda, Shop Drawings, Requests for Interpretation (RFIs), Requests for Proposal (RFPs), Work Change Directives (WCDs), Change Orders, other written interpretations or clarifications of the contract documents, written reports of any material testing and inspection, survey information (including approved cut sheets) and all other documents relevant to the Work.
D. All such documents shall be kept in order, good condition and shall be continuously updated to indicate all work installed and all changes made during construction. Post changes and modifications to Record Documents as they occur; do not wait until the end of Project.
E. No work shall be allowed in the absence of these Record Documents.
F. This document also outlines electronic data requirements and defines the survey requirements for the development of Record Documents.

1.02 RELATED SECTIONS

A. Section 01019 – Closeout Procedures.
B. Section 01020 – Record Documents.
C. Section 01021 – Operation and Maintenance Data.
D. Section 01140 – Work Restrictions.
E. Section 01300 – Submittals.
F. Section 01320 – Construction Progress Documentation.
G. Section 01322 – Photographic and Video Documentation.
H. Section 01335 – Document Management.
I. Section 01340 – Project BIM Coordination
J. Section 01664 – Training.
K. Section 01757 – Commissioning.

1.03 CODES AND STANDARDS

A. CAD Standards – KC Water CAD Standards.

1.04 SUBMITTALS

A. Submit as specified in Section 01300 – Submittals and in accordance with Section 01019 – Closeout Procedures.
B. Warranties and Bonds.
C. For each item of material or equipment furnished under the Contract.
D. Submittals include, but are not limited to, the following:

1. Warranties, as specified herein.
2. Record Documents.
3. Electronic Submittals:
    a. All electronic deliverables (drawings, coordinates table, etc.) shall be made through the approved document management system. See Section 01335 – Document Management.
    b. Maintain one copy of each submittal during the construction period for Project Record Document purposes.
4. Record Drawings:
    a. One signed, sealed and certified hard copy on Mylar or Vellum.
    b. One signed, sealed and certified hard copy on paper.
    c. One signed, sealed and certified electronic copy in PDF format.
    d. One signed, sealed and certified electronic copy in the latest version of AutoCAD® .dwg format.
5. All Record Documents including those listed in the referenced Sections:
    a. Submit Record documents in accordance with Section 01019 – Closeout Procedures.
    b. The following shall be submitted for Record Documents:
        i. One hard copy on paper.
        ii. One electronic copy in PDF format.
        iii. As specified in other sections.
        iv. Electronic PDF Documents:
        v. Documents shall be full scale.
        vi. Markups shall be noted in RED.
        vii. Minimum resolution shall be 600 dpi.
6. Design-Builder shall deliver draft Record Documents in accordance with the following requirements to the Owner for review prior to Completion or as noted in this Section. Final Completion will not be granted until all final Record Documents have been submitted to and accepted by the Owner.
    a. Submittal Timeline:
        i. Draft Record Drawings, Specifications, and Product Data shall be submitted to the Owner a minimum of 60 calendar days prior to the Scheduled Acceptance Date for review by the Owner.
        ii. Final Record Drawings, Specifications, and Product Data shall be submitted to the Owner within 30 calendar days following Acceptance and prior to Final Completion.
    b. Submittal Requirements:
        i. Record Drawings and Specifications shall be prepared in accordance with this Section.
        ii. Record Drawings:
            a. Submit one complete electronic set (pdf) of marked-up Record Drawings, with all changes captured throughout construction shown as markups.
            b. Submit one electronic version of drawings with all modifications incorporated into the native format as described in Section 01320 Construction Progress Documentation.
            c. All Record Drawings of that are non-schematic shall be section cuts of a BIM model. Schematic drawings include P&IDs and one-lines.
            d. Submit two electronic versions (pdf and tiff) of Record Drawings with all modifications incorporated and sized for printing at 24" x 36".
        iii. Record Specifications:
            a. Submit one complete electronic set (pdf) of marked-up Record Specifications, with all changes captured throughout construction shown as redlines.
            b. Submit one complete hard copy set and one electronic copy (pdf) of clean Project Specifications with all changes incorporated.
        iv. Record Product Data:

a. Submit two hard copies and one electronic copy (PDF) of each Product Data submittal.
b. Where Record Product Data is required as part of operation and maintenance manuals, submit marked up Product Data as an insert in the manual instead of submittal as Record Product Data.
c. Accompany each submittal with a transmittal letter containing:
i. Date.
ii. Project title and number.
iii. Design-Builder's name and address.
iv. Title and number of each Record Document.
v. Signature of Design-Builder or Design-Builder Representative.

1.05 WARRANTIES AND BONDS

A. Warranties and Bond are Record Documents.
B. Owner has the right to reject warranties.
C. Owner reserves the right to reject Work for the Project if the required warranties have not been provided.
D. Submit form of manufacturer's warranty prior to fabrication and shipment of the item from the manufacturer's facility.
E. Submit form of manufacturer's special warranty when specified.
F. Provide consolidated warranties and bonds in accordance with Section 01019 – Closeout Procedures.

1.06 QUALITY ASSURANCE

A. Design-Builder is responsible for the quality assurance and quality control of the Work.

PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION

3.01 SURVEY REQUIREMENTS

A. All field books, notes, videotapes and other data developed by Design-Builder in performing required surveys as part of the Work shall be available to the Owner for examination throughout the construction period. All such data shall be submitted to the Owner with the other documentation required for Final Completion of the Work.
B. General Requirements:
1. Design-Builder shall provide survey grade information for the locations and elevations of the Work as described herein. Surveys shall be conducted by a Professional Land Surveyor, licensed in the State of Missouri.
2. Vertical Datum – All elevations shall be indicated in North American Vertical Datum of 1988 (NAVD 88) in feet and decimals of a foot.
3. Horizontal Control – Coordinates shall be referenced to the North American Datum of 1983 (NAD 83), State Plane Missouri West Zone FIPS 2403 US Feet coordinate system, Kansas City Metro Control. Statewide Missouri Geographical Reference System monuments, Project monuments and Certified Land corners shall be used as references to determine State Plane coordinates. All control monuments used in the survey work shall be listed with reference ties and shown on the Record Drawings.
4. Water Systems:
a. Fire Hydrant Assemblies – Provide survey point (location and elevation) at the top of the operating nut for each fire hydrant.

b. Fittings – Provide survey point (location and elevation) at the center of each fitting (i.e. bends, tees, valves, etc.). Survey shall be taken at the top of the fitting. Provide the elevation of finished grade or improvements at the top of the fitting.
c. Pipe Profile – Provide survey points (location and elevation) at the center point of all piping at a maximum spacing of 50 feet. Survey shall be taken on the top of the pipe. At the same location, provide the elevation of finished grade.
d. Valves, Valve Vaults, Meter pits and Other Structures – A survey is required to verify the location of all new valves, valve vaults, meter pits or other structures. The survey shall include, but is not limited to, the following:
(i) Location of the Structure – Provide coordinates for the center of the access cover.
(ii) Top elevation – Provide the top elevation of the structure at the center of the access cover.

5. Wastewater Systems:
a. Location – Verify the "Locating Point" shown on the Contract Drawings or standard detail. Verify all coordinate data shown on the Contract Drawings. If no such information is provided, the Locating Point shall be the center of the manhole cover.
b. Top Elevation. – Provide the elevation of the top of the structure at the Locating Point.
c. Pipe Inverts – Provide the invert elevation and flow direction of all pipes that penetrate the structure (flowline in - FL IN) and exit the structure (flowline out - FL OUT).
d. Manhole Invert – Provide the elevation of the invert at the center of the manhole if different than the pipe inverts.

6. Existing Manholes – A survey is required to verify the location of all existing manholes that are modified as part of the Work. The survey shall include, but is not limited to, the following:
a. Location of the Structure – Verify the "Locating Point" shown on the Contract Drawings or standard detail. Verify all coordinate data shown on the Contract Drawings. If no such information is provided, the Location Point shall be the center of the manhole cover.
b. Top Elevation – Provide the elevation of the top of the structure at the Locating Point.
c. Pipe Inverts – Provide the invert elevation and flow direction of all pipes that penetrate the structure (flowline in - FL IN) and exit the structure (flowline out - FL OUT).
d. Manhole Invert – Provide the elevation of the invert at the center of the manhole if different from the pipe inverts.

7. Storm Water and Green Infrastructure Systems
a. A survey is required to verify the location of all new Green Infrastructure, Storm Water Structures, Junction Boxes, Manholes, Inlets and all other related structures. The survey shall include, but is not limited to, the following:
b. Location of the Structure – Verify the Locating Point shown on the Contract Drawings or standard detail. Verify all coordinate data shown on the Contract Drawings. The locating point for curb inlets is center of inside face of inlet wall. If no other locating information is provided for other structures, the Locating Point shall be the center of the access cover.
c. Top Elevation – Provide the elevation of the top of the structure at the Locating Point.
d. Pipe Inverts – Provide the invert elevation and flow direction of all pipes that penetrate the structure (flowline in - FL IN) and exit the structure (flowline out - FL OUT).
e. Manhole or Structure Invert – Provide the elevation of the invert at the center of the manhole or structure if different than the pipe inverts.

8. Culvert - A survey is required to verify the location of new culverts. The survey shall include, but is not limited to, the following:
a. Location – The Locating Points shall be the center line of each culvert barrel at the upstream and downstream end of each. The location of each culvert barrel is to be provided.

b. Invert – Provide the upstream and downstream invert elevation of each culvert barrel.

9. Channels and Ditches:
   a. Profile – Provide survey points (location and elevation) at the upstream and downstream end of the channel and along the channel at a maximum 50-foot intervals and at all bends and changes in alignment.
   b. Survey points shall be taken at finished grade at the centerline, toes of side slopes or walls and top elevation of the high flow channel on both sides of the channel. If water is present in the channel or ditch, provide water surface elevation on both sides of the channel.
10. Detention Areas:
   a. For any surface feature designed to detain or retain storm water runoff (i.e., detention basins, rain gardens, bio-retention cells, etc.) an as-built survey of the feature is required.
   b. Enough survey points shall be taken to generate 1-foot contours of the detention or retention area and any containment berms.
   c. Provide survey points (location and elevation) for both ends of weirs, all weir high and low points (if top of weir is not level) and other flow control structures, inlets and outlets.
   d. Provide survey points (location and elevation) for both ends of weirs and all weir high and low points (if top of weir is not level) of the principal spillway structure.
11. Facility Site Assets:
   a. Site Assets shall be documented to the same level of detail as other assets (water, wastewater etc.).
   b. Assets include all buried infrastructure in the project including but not limited to ductbanks, conduit, chemical piping, casings, gravity sewers, process piping, etc.

3.02 MAINTENANCE OF RECORD DOCUMENTS

A. Record Documents: Maintain one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings.

B. Design-Builder shall continuously maintain a set of Record Documents which details all work completed and shows all changes or deviations made by the Design-Builder, Installer, Subcontractor, or similar entity, from the Contract Documents. Where the Contract Documents are not detailed and allow for flexibility during construction, Design-Builder shall be responsible for confirming that the detailed information on how the Work was constructed is provided by the individual or entity responsible for making the change. These adjustments shall include, but are not limited to, field adjustments and change orders.

   1. Mark record sets in red. Use other colors to distinguish between changes for different categories of the Work at the same location. Hard copy and electronic (PDF) deliverables shall be provided in color.
   2. Mark new information that is not shown on Contract Drawings or Shop Drawings. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
   3. Information shall be clearly distinguishable on hard copy mark-ups and in the electronic files. Accurately record information in an understandable drawing technique.
   4. Include the following:
      a. Field changes of dimension and detail.
      b. Change Order or Work Change Directive (WCD) modification. Note related Change Order or WCD numbers where applicable.
      c. RFI modification. Note related RFI numbers where applicable.
      d. Details not on original Drawings.

e. Horizontal and vertical location of all underground utilities and all other concealed elements that would be difficult or costly to maintain the installed asset long term.
f. Revision to routing of piping and conduits.
g. Actual equipment locations.
h. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
i. Record information on the Work that is shown only schematically.

5. Precision of Measurement:
   a. Where survey measurements are not required (sketching connection details) – elevations, stationing, distances and measurements shall be expressed to the nearest 0.10 foot.
   b. All other Work requires survey information – elevations, station, distances and measurements shall be expressed to the nearest 0.01 foot.

3.03 RECORD DRAWINGS

A. Upon completion of the Work and before the Application for Final Payment, Design-Builder shall prepare the As-Built Drawings by completing annotations to the Record Drawings and adding the required certification statements.
   1. Surveyor's Certification:
      a. Each drawing shall be modified to include a certification statement and signature block as described below.
         i. Water Systems

         Each sheet of these Record Drawings and attached Survey Cut Sheets for the Work have been reviewed and approved by the Professional Land Surveyor whose seal is affixed to this Record. The horizontal control, coordinates and elevations shown on these Records are accurate and are based on the Missouri Coordinate System of 1983, West Zone and NAVD88 datum, with the date of adjustment. These Records have been revised, as required in Section 01000, 1.20 of the Standards and Specifications for Water Main Extensions and Relocations, under my personal supervision to show the true and accurate measurements of the work as it was actually constructed.

         ii. Wastewater, Storm Water and Green Infrastructure Systems

         Each sheet of these Record Drawings, Record Models and attached Survey Cut Sheets for the Work have been reviewed and approved by the Professional Land Surveyor whose seal is affixed to this Record. The horizontal control coordinates and elevations shown on these Records are accurate and are based on the Missouri Coordinate System of 1983, West Zone and NAVD88 Datum. These Records have been revised under my personal supervision to show the true and accurate measurements of the work as it was actually constructed.

   2. Every sheet of the Record Drawings must be reviewed, signed and sealed by a Professional Land Surveyor, licensed in the State of Missouri and must include the following statement on the title block inside the box marked "for WSD use" and near the Surveyor's professional license seal.
   3. Design-Builder's Certification:
      a. Each drawing shall be modified to include a certification statement and signature block as described below:
         i. Water Systems

         I hereby certify that this Record correctly depicts the Work constructed as to size, material, horizontal location, vertical location and finished grade as shown on the

approved construction drawings or their revision. The Work was done in accordance with these Records and the current version of the Standards and Specifications for Water Main Extensions and Relocations.

Design-Builder: _____ *Date:* _____

Name (print): _____ *Title:* _____

Signature: _____

ii. Wastewater, Storm Water and Green Infrastructure Systems

I hereby certify that this Record correctly depicts the Work constructed as to size, material, horizontal location, vertical location, grade of installed piping systems and finished grade as shown on the approved construction drawings or their revision. The Work was done in accordance with these Records.

Design-Builder: _____ *Date:* _____

Name (print): _____ *Title:* _____

Signature: _____

b. Design-Builder shall provide certification that the Record Drawings reflect the conditions that were constructed.
c. Design-Builder shall review the Record Drawings and verify all information is accurate. Design-Builder shall verify that all changes to the Work have been documented. Design-Builder shall sign each sheet of the Record Drawings with the following certification(s):

1. Record Drawings shall be prepared using survey grade information to show the horizontal and vertical location of the Work after completion of construction. Connection details may be sketched using field run measurements.
    1. Newly Prepared Record Drawings: Prepare new Drawings instead of preparing As-Built Drawings where Owner determines that neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.
        a. New Drawings may be required when a Change Order is issued as a result of accepting a substitution, or other modification.

B. If Design-Builder observes inaccurate information pertaining to existing conditions, the correct information shall be noted in the Record Drawings.

C. Submittals – Submit As-Built Drawings in accordance with Paragraph 1.04 of this Section. As-Built and Record Drawings must be approved by the Owner before Design-Builder submits the Application for Final Payment.

1. Mark each document "AS-BUILT DRAWINGS" in neat, large print letters.
2. The cover sheet of the project shall be included. The cover sheet shall include all required As-Built certifications and shall clearly show that the drawings are As-Built.

3.03 RECORD MODEL

A. BIM model of the structure constructed or modified during this project.
B. Record Model should be per KC BIM standards with Record documents and drawings linked. Design-Builder and Owner shall coordinate on the details promptly after Notice to Proceed.
C. All BIM files and associated files shall be tagged according to Record File Standard.

3.04 RECORD DRAWINGS

A. Record Drawings shall be submitted and accepted by the Owner before Design-Builder may submit the Application for Final Payment.
B. Design-Builder shall edit the CAD drawings to reflect the changes shown on the As-Built Drawings. All line work and text shall be revised and edited to accurately reflect the information provided in the As-Built Drawings. Line work shall be drawn to scale in the coordinate system and datum specified herein.
C. Version – CAD drawings shall be developed and submitted in the latest version of AutoCAD® .dwg format or AutoCAD® Civil 3D.
D. CAD Standards – Comply with KC Water CAD Standards.
E. GIS Standards – Comply with KC Water GIS Standards.
F. The cover sheet of the project shall be included. The cover sheet shall include all required as-built certifications and shall clearly show that the drawings are as-built.
G. Record Drawings shall have a "PROJECT RECORD DRAWINGS" label clearly and prominently shown on each sheet, preferably in the lower right-hand corner of the drawing.
H. Record Drawings shall be labeled with the following information:
    1. Project Name.
    2. WSD Project Number.
    3. WSD Work Order Number.
    4. WSD Drawing Number.
    5. CMMS Assets.
    6. Date of publication.

3.05 OTHER RECORD DOCUMENTS

A. As defined by Section 01021 – Operation and Maintenance Data, Section 01300 –Submittals, Section 01320 – Construction Progress Documentation, Section 01322 – Photographic and Video Documentation, Section 01664 – Training, and Section 01757 – Commissioning.
B. Record Specifications:
    1. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
    2. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
    3. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
    4. Record the name of the manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
    5. Note related Change Orders, Record Drawings, and Product Data where applicable.
    6. Maintain a slit of final submittals per assets.
C. Record Project Data:
    1. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
    2. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
    3. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
    4. Note related Change Orders, Record Drawings, and Product Data where applicable.

D. GIS Data of Site Piping.
E. Coordinates Table – Provide a Microsoft Excel spreadsheet that contains the coordinates of every asset installed or adjusted as part of the Work.
F. Survey Cut Sheets.
    a. Record permanent benchmark locations with horizontal and vertical data on Record Documents in accordance with this Section.
G. Written report of each test and inspection; one copy each to Owner, Design-Builder, and one copy to file of Record Documents.
H. Submit final Record Documents incorporating comments from the Owner on draft Record Documents and any modifications made during commissioning.

END OF SECTION

SECTION 01021 – OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes administrative and procedural requirements for the preparation, submission, and Owner's Representative's review of Operation and Maintenance (O&M) Data.

1. Design-Builder shall furnish all labor, materials, equipment, and incidentals as necessary to comply with these requirements.

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract; including General Conditions, all applicable Division 1 Sections, and all applicable Division Sections; apply to this Section.

B. Related Sections include the following:
1. Section 01019 – Closeout Procedures.
2. Section 01020 – Record Documents.
3. Section 01140 – Work Restrictions.
4. Section 01020 – Record Documents.
5. Section 01300 – Submittals.
6. Section 01320 – Construction Progress Documentation.
7. Section 01335 – Document Management.
8. Section 01340 – Project BIM Coordination.
9. Section 01664 – Training.
10. Section 01757 – Commissioning.

1.03 REQUIREMENTS

A. Design-Builder shall prepare and provide data and materials, and provide instruction and services, as specified in this Section.

B. Compile product data and related information appropriate for Owner's maintenance and operation of products and systems furnished under this Contract. Include information on all motors supplied with equipment.

C. Prepare O&M Data as specified in this Section and as referenced in other pertinent sections of the Specifications.

D. Instruct Owner's personnel in maintenance of products and in operation of equipment and systems, including electrical and instrumentation.

1.04 DEFINITIONS

A. O&M Data includes but is not limited to:
1. Original Equipment Manufacturer (OEM) O&M manuals.
2. Electronic O&M (E-O&M) Manual for the entire project.
3. PLC, VFD, and SCADA Server Programs.
4. Standard Operation Procedures (SOPs)

5. Standard Instructions (SIs)

B. Preliminary Data: Initial and subsequent submissions for the Owner's Representative's review.

C. Final Data: Owner's Representative accepted data, submitted as specified herein.

D. Maintenance Operation: As used on Asset Maintenance Summary Form is defined to mean any routine operation required to ensure satisfactory performance and longevity of equipment. Examples of typical maintenance operations are lubrication, belt tensioning, adjustment of pump packing glands, and routine adjustments.

1.05 SUBMITTALS

A. Informational:

1. Data Outline: Submit two copies of a detailed outline of proposed organization and contents of Final Data prior to the preparation of the Preliminary Data.

2. Preliminary Data:
   a. Submit three copies for Owner's Representative's review.
   b. If Data meets the conditions of the Contract:
      (1) One copy will be returned to Design-Builder.
      (2) One copy will be forwarded to Owner's Construction Manager or Resident Project Representative.
      (3) One copy will be retained in Owner's Representative's file.
   c. If Data does not meet the condition of the Contract:
      (1) All copies will be returned to Design-Builder with Owner's Representative's comments (on separate document) for revision.
      (2) Owner's Representatives comments will be retained in Owner's Representative's file.
      (3) Resubmit two copies revised in accordance with Owner's Representative's comments.

1.06 SEQUENCING AND SCHEDULING

A. Equipment and System Data:
1. Preliminary Data:
   a. Do not submit until Shop Drawings for equipment or system has been reviewed and approved by Owner's Representative.
   b. Submit prior to shipment.

2. Final Data: Submit Instructional Manual Formatted in accordance with Paragraph 2.01.B. Data not less than 30 days prior to equipment or system field functional testing. Submit Compilation Formatted in accordance with Paragraph 2.01.C, and Electronic Media Formatted in accordance with Paragraph 2.01.D Data prior to Completion of Project.

B. Materials and Finish Data:

1. Preliminary Data: Submit at least 15 days prior to request for final inspection.

2. Final Data: Submit within ten calendar days after final inspection.

PART 2 - PRODUCTS

2.01 DATA FORMAT (for OEM O&M Manuals)

A. An OEM O&M Manual shall be prepared for every piece of equipment provided as part of the Work on this project and for each material or finish requiring regular maintenance. Design-Builder shall not request payment for more than 90 percent of the value of a specific piece of equipment, based on the schedule of values, until a draft OEM O&M Manual for that equipment has been submitted.

B. Prepare Preliminary and Final Data in the form of an Instructional Manual. Prepare Final Data on both electronic media and hardcopy.

C. Instructional Manual Format:

1. Binder: Commercial quality, permanent, three ring or three post binder with durable plastic cover.
2. Size: 8 ½ inches by 11 inches minimum.
3. Cover: Identify manual with typed or printed title, "(relevant area) OPERATION AND MAINTENANCE MANUAL" and list.
   a. Project title.
   b. Designate applicable system, equipment, material, or finish.
   c. Identify the assets covered in this O&M Manual.
   d. Identify separate structure as applicable.
   e. Identify volume number if more than one volume.
   f. Identify general subject matter covered in manual. Identity equipment number and Specification section.
4. Spine:
   a. Project Title.
   b. Volume number (if more than one volume).
5. Title Page:
   a. Design-Builder name, address, and telephone number.
   b. Subcontractor, supplier, installer, or maintenance Design-Builder's name, address, and telephone number, as appropriate.
      (1) Identify area of responsibility of each.
      (2) Provide name and telephone number of local source of supply of parts and replacement.
6. Table of Contents:
   a. Neatly typewritten and arranged in systematic order with consecutive page numbers.
   b. Identify each product by product name and other identifying numbers or symbols as set forth in Contract Documents.
7. Paper: 20 pound minimum, white for typed pages.
8. Text: Manufacturer's printed data, or neatly typewritten.
9. Three-hole punch data for binding and composition.

10. Material shall be suitable for reproduction, with quality equal to original. Photocopying of material will be acceptable, except for material containing photographs.

D. Data Compilation Format:

1. Compile all Owner's Representative's accepted preliminary O&M Data into a hardcopy, hard bound set.

2. Each set shall consist of the following:
   a. Binder: Commercial quality, permanent, three ring or three post binders with durable plastic covers.
   b. Cover: Identify each volume with typed and printed title "OPERATION AND MAINTENANCE DATA, VOLUME NO. _____ OF _____", and list:
      (1) Project Title
      (2) Design-Builder's name, address, and telephone number.
      (3) If entire volume covers equipment or system provided by one supplier include the following:
         (a) Identity of general subject matter covered in manual.
         (b) Identity of equipment number and Specification section.
   c. Provide each volume with title page and typed table of contents with consecutive page numbers. Place contents of entire set, identified by volume number, in each binder.
   d. Table of contents neatly typewritten, arranged in a systematic order:
      (1) Include list of each product, indexed to content of each volume.
      (2) Designate system or equipment for which it is intended.
      (3) Identify each product by product name and other identifying numbers or symbols as set forth in Contract Documents.
   e. Section Dividers:
      (1) Heavy, 80 pound cover weight, tabbed with numbered plastic index tabs.
      (2) Fly leaf:
         (a) For each separate product, or each piece of operating equipment, with typed description of product and major component parts of equipment.
         (b) List with each product:
            (i) Name, address, and telephone number of Subcontractor, Supplier, Installer, and Design-Builder, as appropriate.
            (ii) Identify area of responsibility of each.
            (iii) Provide local source of supply for parts and replacement.
   f. Assemble and bind material, as much as possible, in same order as specified in the Contract Documents.

E. Electronic Media Data:
   1. Portable Document Format (PDF):
      a. After all preliminary data has been found to be acceptable to Owner's Representative, submit O&M Data in PDF format on e-Builder.
      b. Files to be exact duplicates of Owner's Representative's accepted preliminary data. Arrange by specification number, asset, and name.
      c. Files to be fully functional and viewable in most recent version of Adobe Acrobat.
      d. PDFs shall be bookmarked as appropriate with appropriate hyperlinks.

e. All files shall be tagged per the Owner's Record File Standard tagging system.

F. DATA FOR EQUIPMENT SYSTEMS (OEM O&M manuals):

1. Content for each Unit (or Common Units) and System:

a. Product Data:

(1) Include only those sheets that are pertinent to specific product.

(2) Clearly annotate each sheet to:

(a) Identify specific product or part installed.

(b) Identify data applicable to installation.

(c) Delete references to inapplicable information.

(3) Function, normal operating characteristics, and limiting conditions.

(4) Performance curves, engineering data, nameplate data, and tests.

(5) Complete nomenclature and commercial number of replaceable parts.

(6) Original manufacturer's parts list, illustrations, detailed assembly drawings showing each part with part numbers and sequentially numbered parts list, and diagrams required for maintenance.

(7) Spare parts ordering instructions.

(8) Where applicable, identify installed spares and other provisions for future work (e.g., reserved panel space, unused components, wiring, terminals).

b. As installed, color coded piping diagrams.

c. Charts of valve tag numbers, with the location and function of each valve.

2. Drawings: Supplement product data with drawings as necessary to clearly illustrate:

a. Format:

(1) Provide reinforced, punched, binder tab; bind in with text.

(2) Reduced to 8 ½ inches by 11 inches, or 11 inches by 17 inches folded to 8 ½ inches by 11 inches.

(3) Where reduction is impractical, fold and place in 8 ½ inch by 11 inch envelopes bound in text.

(4) Identify Specification section and product on drawings and envelopes.

b. Relations of component parts of equipment and systems.

c. Control and flow diagrams.

d. Coordinate drawings with Project record documents to assure correct illustration of completed installation.

3. Instructions and Procedures: Within text, as required to supplement product data.

a. Format:

(1) Organize in consistent format under separate heading for each different procedure.

(2) Provide logical sequence of instructions for each procedure.

(3) Provide information sheet for Owner's personnel, including:

(a) Proper procedures in event of failure.

(b) Instances that might affect validity of guarantee or Bond.

b. Installation Instructions: Including alignment, adjusting, calibrating, and checking.

c. Operating Procedures:
   (1) Startup, break-in, routine, and normal operating instructions.
   (2) Test procedures and results of factory tests where required.
   (3) Regulation, control, stopping, and emergency instructions.
   (4) Description of operation sequence by control manufacturer.
   (5) Shutdown instructions for both short and extended duration.
   (6) Summer and winter operating instructions, as applicable.
   (7) Safety precautions.
   (8) Special operating instructions.

d. Maintenance and Overhaul Procedure:
   (1) Routine maintenance.
   (2) Guide to troubleshooting.
   (3) Disassembly, removal, repair, reinstallation, and re-assembly.
   (4) Recommended work orders for preventative maintenance.

4. Guarantee, Bond, and Service Agreement: In accordance with Section 01019 – Closeout Procedures.

5. Standard Operating Procedures and Standard Instructions for each unit process in KCMO Water Services Format approved by the KCMO Owner's Representative and created by the Design Consultant.

6. Assets covered in this document.

G. Content for each Electric or Electronic Item or System:

1. Description of Unit and Component Parts:
   a. Function, normal operating characteristics, and limiting conditions.
   b. Performance curves, engineering data, nameplate data, and tests.
   c. Complete nomenclature and commercial number of replaceable parts.
   d. Interconnection wiring diagrams, including control and lighting systems.
   e. Piping and Instrumentation Diagram of the unit.

2. Circuit Directories of Panelboards.

3. Electrical service.

4. Control requirements and interface.

5. Communication requirements and interfaces.

6. List of electrical relay settings, and control and alarm contact settings.

7. Electrical interconnection wiring diagram, including as applicable, single line, three line, schematic and internal wiring, tags per KCMO tagging standard and external interconnection wiring.

8. As installed control diagrams by control manufacturer.

9. Operating Procedures:
   a. Routine and normal operating instructions.
   b. Startup and shutdown sequences, normal, and emergency.

c. Safety precautions.
d. Special operating instructions.

10. Maintenance Procedures:
    a. Routine maintenance.
    b. Guide to troubleshooting.
    c. Adjustment and checking.
    d. List of relay settings, control, and alarm contact settings.
    e. Preventative Maintenance.

11. Manufacturer's printed operating and maintenance instructions.

12. List or original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.

H. Maintenance Summary:
1. Complete individual Asset Maintenance Summary Form for each applicable equipment item, respective unit or system, and for components or sub-units.

2. The Asset Maintenance Summary Form shall be updated to incorporate the final recommendations established through the Maintenance Workshops described in Section 01320 – Construction Progress Documentation.

3. Format:
    a. Use Asset Maintenance Summary Form provided as Supplement to this section or electronic facsimile of such.
    b. Each Asset Maintenance Summary Form may take as many pages as required.
    c. Use only 8 ½ inch by 11 inch size paper.
    d. Complete using typewritten or electronic printing.

4. Include detailed lubrication instructions and diagrams showing points to be greased or oiled; recommended type, grade, and temperature range of lubricants and frequency of lubrication.

5. Recommended Spare Parts:
    a. Data to be consistent with manufacturer's Bill of Materials/Parts List furnished in O&M manuals.
    b. "Unit" is the unit of measure for ordering the part.
    c. "Quantity" is the number of units recommended.
    d. "Unit Cost" is the current purchase price.

I. The type and quantity of spare parts provided shall be consistent with Criticality Workshops and failure mode and effects analysis (FMEA) process as described in Section 01320 Construction Progress Documentation.

2.02 DATA FOR MATERIALS AND FINISHES

A. Content for Architectural Products, Applied Materials, and Finishes:
1. Manufacturer's data, giving full information on products:
    a. Catalog number, size, and composition.
    b. Color and texture designations.
    c. Information required for reordering special manufactured products.

2. Instructions for Care and Maintenance:
   a. Manufacturer's recommendation for types of cleaning agents and methods.
   b. Cautions against cleaning agents and methods that are detrimental to product.
   c. Recommended schedule for cleaning and maintenance.

B. Content for Moisture and Weather Exposed Products:
   1. Manufacturer's data, giving full information on products:
      a. Applicable standards.
      b. Chemical composition.
      c. Details of installation.
   2. Instructions for inspection, maintenance, and repair.

2.03 ELECTRONIC O&M (E-O&M) MANUAL

A. Design-Builder shall provide a project-specific Electronic O&M (e-O&M) Manual, which shall supplement the OEM O&M Manuals. E-O&M Manual shall contain the following information and functionalities:
   1. Images (photographic or digitally rendered) of the facility shall be provided in a "main screen" location, with specific facilities and systems labeled with all relevant names including but not limited to common names, Computerized Maintenance Management System (CMMS) tag and P&ID tags.
   2. Overall and Major system descriptions.
   3. Control narratives for the overall project and individual systems/subsystems.
   4. SOPs and SIs created by the Engineer of Record.
   5. Record Photographs providing documentation of the final visible assets as well as buried/hidden piping, conduits, foundations, and other infrastructure not readily located after construction work at the facilities is complete.
   6. Final and accepted shop drawings and submittals and OEM O&M manuals, each as a single, complete document.
   7. BIM of the assets.
   8. Arc Flash Study.
   9. Load Study.
   10. Test results as identified in other Sections.
   11. GIS records for the project.
   12. Record Documents developed in accordance with Section 01019 Closeout Procedures.
   13. Final training materials, including video recorded training sessions, organized by asset.
   14. All Warranty and Bond information for equipment, materials, and finishes.

B. All system-specific information shall be organized into accessible files tied to each system. Access shall be through a written and/or graphic interface at the main screen.

C. All files submitted as part of the e-O&M Manual shall be tagged per the Record File Standard.

D. PDF shall be bookmarked and hyperlinked.

E. E-O&M Manual will operate through Adobe Acrobat software unless Design-Builder provides an alternative application that is accepted in writing by Owner.

F. A draft version of the e-O&M Manual will be provided to Owner for review and comment at approximately 70% completion of the Project to provide time for Owner to update the CMMS with the O&M Data to enable sufficient maintenance during Acceptance Testing. Final e-O&M shall be submitted prior to Final Completion.

G. E-O&M Manual will be installed at/on the project facility server or workstation(s) as appropriate, and a copy will be provided to the Owner.

H. Design-Builder will provide training on the use and update of the e-O&M Manual to Owner. One training session lasting no longer than two (2) hours will be provided at the project location, Water Services offices, or Design-Builder's office, as agreed-upon by the Owner.

I. All source files to the e-O&M Manual will be linked to the as-built BIM model by relevant asset. Items relevant to multiple assets will have multiple links.

J. Complete a short-circuit device coordination and arc flash study computer model developed in SKM, by SKM Systems Analysis, Inc.

K. Update SKM load study provided by the Owner.

L. Complete Asset/CMMS data:

1. Owner will provide a template for machine reading assets and maintenance activities into the Owner's CMMS.

2. Access database template will be blank with fields for assets information such as asset additions, asset updates, asset retirements including a rough estimated value, maintenance activities for the assets, P&ID tags within the asset, and asset categorization.

3. Design-Builder shall fill out the template documenting changes in the CMMS; insert asset additions including value, updates and retired assets including estimated value when taken out of service; work order updates; new PMs; PMs to be retired; non-destructive testing updates; and other asset fields. Assets shall be coordinated and categorized with the applicable CMMS takes for entry into Owner's CMMS and Financial Software.

2.04 PROGRAMS

A. PLC, VFD, and SCADA Programs: Provide current native format copies of all software programs used to control assets.

B. Files should be named per asset equipment IDs, systems, or sub systems as appropriate.

1. VFD and PLC programs:

a. Original programs for VFDs and PLCs shall be submitted to the Owner following acceptance of the equipment submittal.

b. Final program files shall be submitted with final OEM O&M Manuals prior to Final Completion.

2. SCADA program:

a. A draft SCADA program shall be submitted following completion of major programming work and prior to Substantial Completion.

b. Final SCADA program shall be submitted prior to Final Completion.

PART 3 - EXECUTION

3.01 SUPPLEMENTS

A. The supplements listed below, following "End of Section", are part of this Specification.

1. Forms: Asset Maintenance Summary.
2. Forms: Maintenance Requirements.
3. Forms: Lubricants.
4. Forms: Recommended Spare Parts for Owner's Inventory.

END OF SECTION

ASSET MAINTENANCE SUMMARY FORM

PROJECT _____ CONTRACT NO _____

KCMO CMMS TAG _____

EQUIPMENT ITEM _____

MANUFACTURER _____

PID/TAG NUMBERS _____

WEIGHT OF INDIVIDUAL COMPONENTS (OVER 100 POUNDS) _____

NAMEPLATE DATA (hp, voltage, speed, etc.) _____

MANUFACTURER'S LOCAL REPRESENTATIVE _____

Name _____ Telephone Number _____

Address _____

MAINTENANCE REQUIREMENTS

PROJECT _____ CONTRACT NO _____

KCMO CMMS TAG _____

EQUIPMENT ITEM _____

PID/TAG NUMBERS _____

Maintenance Operation Comments	Frequency	Lubricant (if applicable)
List briefly each maintenance operation required and refer to specific information in manufacturer's standard maintenance manual, if applicable. (Reference to manufacturer's catalog or sales literature is not acceptable)	List required frequency of each maintenance operation	Refer by symbol to lubricant required

LUBRICANTS

PROJECT _____ CONTRACT NO _____

KCMO CMMS TAG _____

EQUIPMENT ITEM _____

PID/TAG NUMBERS _____

Reference Symbol	Shell	Exxon Mobil	Chevron Texaco	BP Amoco	or Equal

RECOMMENDED SPARE PARTS FOR OWNER'S INVENTORY

PROJECT _____ CONTRACT NO _____

KCMO CMMS TAG _____

EQUIPMENT ITEM _____

PID/TAG NUMBERS _____

Part Number	Description	Unit	Quantity	Unit Cost
Note: Identify parts provided by this contract with two asterisks				

SECTION 01110 SUMMARY OF WORK

PART 1 GENERAL

1.01 LOCATION OF WORK

A. The work of this Contract is located at Blue River WWTP at 7300 Hawthorne Road, Kansas City, Missouri 64120.

1.02 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required to construct the Blue River WWTP Grit Removal and Fine Screens Project in its entirety in accordance with the Contract Documents.

B. The Work includes, but is not necessarily limited to, the following:

1. Advancement and completion of design for required permits and construction.
2. Mobilization and General Conditions.
3. Erosion control.
4. Excavation and grading of the site.
5. Site dewatering.
6. Structural excavation.
7. Equipment procurement.
8. Construction and demolition of facilities, utilities, etc.
9. Power distribution and electrical system.
10. Instrumentation and control.
11. Final grading, paving, and landscaping.
12. Security infrastructure installation, testing, and startup.
13. Programming of control system.
14. Demobilization.
15. Commissioning, startup, and training and associated manual development.
16. Record documents.
17. Project closeout.

1.03 DESIGN-BUILDER'S USE OF PREMISES

A. Design-Builder shall limit the use of the premises for the Work and for storage to allow for:

1. Work by other agencies.

2. Owner occupancy.

B. Continuous operation of Blue River WWTP by Owner. Coordinate use of premises with Owner.

C. Design-Builder shall assume full responsibility for security of all Design-Builder staff and Subcontractors' materials and equipment stored on the site.

D. If directed by the Owner, move any stored items which interfere with operations of Owner or other contractors.

E. Obtain and pay for use of additional storage or work areas if needed to perform the Work.

1.04 OWNER OCCUPANCY

A. Owner will occupy premises during performance of the Work for the conduct of Design-Builder staff normal operations. Coordinate all construction operations with Owner to minimize conflict and to facilitate Owner usage.

1.05 CONSTRUCTION COORDINATION

A. Unless indicated otherwise, provide a minimum 4-week notice to Owner for any coordination required with Others. Activities by Others which may affect performance of the Work:

1. Blue River Screen House Improvements Project
   a. Design-Builder shall coordinate with the construction and sequencing activities on the Blue River Screens House Project, by Others, regarding any work related to the Blue River Screens House and influent pumping, including space or access requirements in areas occupied prior to Design-Builder's Notice to Proceed.

2. Blue River Biosolids Facility Project
   a. Design-Builder shall coordinate with the construction and sequencing activities on the Biosolids Facility, by Others, regarding any work related to utilities that also go to the Biosolids Facility, as well as any space or access requirements in areas occupied prior to Design-Builder's Notice to Proceed.

3. Blue River Biogas Project.
   a. Design-Builder shall coordinate with the construction and sequencing activities on the Blue River Biogas Project, by Others, regarding any work related to the Blue River Biogas Project, or space or access requirements in areas occupied prior to Design-Builder's Notice to Proceed.

4. Blue River Power Pen Project.
   a. Design-Builder shall coordinate with the construction and sequencing activities on the Blue River Power Pen Project, by Others, regarding any work related to the Blue

River Power Pen including power supply, space or access requirements in areas occupied prior to Design-Builder's Notice to Proceed.

B. Design-Builder shall coordinate scheduling and sequence of Work in accordance with Section 01140 – Work Restrictions.

C. Design-Builder shall coordinate with Owner on status of Activities by Others to identify scheduling constraints or requirements for schedules in accordance with Section 01320 – Construction Progress Documentation.

D. Maintain overall coordination of the Work.

1. Utilize description of critical events in work sequence in Section 01140 – Work Restrictions as a guideline for scheduling and undertaking the Work.

2. Obtain construction schedules from Subcontractors and Suppliers and assume responsibility for correctness.

3. Incorporate schedules from Subcontractors and Suppliers into Progress Schedule to plan for and comply with sequencing constraints.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 EMERGENCIES

A. Design-Builder shall at all times before and after regular working hours, including weekends and holidays, maintain a telephone number where Design-Builder can be reached on an emergency basis.

B. Design-Builder shall provide three contacts that are available 24/7 for notification. Contact information for emergency contacts shall be provided at Preconstruction Conference in accordance with Section 01320 – Construction Progress Documentation.

C. Design-Builder shall be prepared to act to correct conditions on-site that are deemed to constitute an emergency by the Owner or Owner's Representative and is obligated to act to prevent threatened damage, injury or loss without special instructions from the Owner or Owner's Advisor.

D. Design-Builder shall give the Owner prompt written notice of all significant changes in the work or deviations from the Contract Documents caused thereby.

E. If a condition on the site requires attention after hours, either the Owner or Owner's Representative shall call Design-Builder at the emergency telephone number. Design-Builder is expected to respond within one hour. If for any reason Design-Builder cannot be reached at the emergency number after a reasonable amount of time (not exceeding 30 minutes) the Owner reserves the right to institute corrective measures, and the costs shall be deducted from payments due to Design-Builder.

F. In the event Design-Builder fails to maintain safe job conditions, including but not limited to trench settlement and storage of hazardous backfill or construction materials, the Owner, after failure of Design-Builder to commence substantial steps at the job site to rectify the situation within two hours of the time Design-Builder has been notified of the unsafe condition, may take such precautions, make such repairs, and take any other steps which the Owner in the Owner's discretion considers necessary to protect the property, persons, or Owner. The costs for such actions shall be deducted from payments due to Design-Builder.

END OF SECTION

SECTION 01140 – WORK RESTRICTIONS

PART 1 GENERAL

1.01 SUMMARY

A. Section includes: Requirements for sequencing and scheduling the Work affected by existing site and facility; work restrictions; and coordination between construction operations and plant operations.

1.02 SUBMITTALS

A. Baseline Schedule with Operational Change Control Plan (OCCP) tasks.

B. OCCP Form as provided in Section 01140.02.

C. Progress Schedule with OCCP tasks.

1.03 DESIGN-BUILDER'S USE OF SITE AND PREMISES

A. Limit use of site and premises to allow:
   1. Continuous operation by Owner of the Blue River Wastewater Treatment Plant (WWTP) through performance of the Work.
   2. Other firms to perform their Work as indicated in "Activities by Others" in Section 01110 – Summary of Work.

B. Access to project site: . Through the northeast security gate on Rochester Avenue south of Hawthorne Road.

C. Unfavorable Construction Conditions: During unfavorable weather, wet ground, or other unsuitable construction conditions, Design-Builder shall confine their operations to Work that is not adversely affected by such conditions. No portion of the Work shall be constructed under conditions that adversely affect the quality thereof, unless special means or precautions are taken by Design-Builder to protect and properly perform the Work. Design-Builder shall maintain suitable all-weather access to all portions of the Project Site.

D. Provide security for all products, materials, and equipment stored on the site, including those of subcontractors.

E. Design-Builder shall utilize only areas for construction staging and/or storage as shown on the Contract Drawings unless locations are approved by Owner.

1.04 GENERAL CONSTRAINTS ON SEQUENCE AND SCHEDULING OF WORK

A. The Blue River WWTP must remain in operation during construction. Impairing the operational capabilities of this treatment plant will result in serious environmental damage and monetary fines.

B. Conduct Work in a manner that will not impair the operational capabilities of essential elements of the treatment process or reduce the capacity of the entire treatment plant below

levels sufficient to treat the quality of raw wastewater to the water quality limitations specified in the National Pollutant Discharge Elimination System (NPDES) permit.

C. Proposed bypasses and outages will be subject to Owner approval and must be requested with an OCCP as described in this Section. Owner will be responsible for ensuring adequate treatment during approved bypasses and outages.

D. Conduct commissioning and process start-up activities as specified in Section 01757 – Commissioning in a manner that will not impair the operational capabilities of essential elements of the treatment process or reduce the capacity of the entire treatment plant below levels sufficient to treat the quality of raw wastewater to the water quality limitations specified in the NPDES permit.

E. The status of the Project shall be defined as "operational" when the facility can reliably remove grit in full compliance with performance standards for the full range of flow conditions.

F. Work sequence and constraints:
   1. Utilize description of critical events in work sequence in this Section as a guideline for scheduling and undertaking the Work.
   2. Work sequence and constraints presented do not include all items affecting completion of the Work, but are intended to describe critical events necessary to minimize disruption of the existing facilities and to ensure compliance with NPDES permit requirements.

G. Instrumentation and controls process performance testing:
   1. After the Process Operational Period, test PCIS system as specified in Section 01757 - Commissioning.

H. Road and Facility Access:
   1. The project site is congested. Conduct operations to minimize interference with plant operation and others. Provide Owner 14 days advance written notice before any road outage and coordinate road outages with Owner.
   2. Means of access to adjacent properties shall be maintained at all times.
   3. Chemical truck access to operational facilities shall be maintained at all times.
   4. Site access requires multiple railroad track crossings. Design-Builder shall recognize railroad track crossings may be inaccessible at times due to circumstances outside of Owner's control and take such considerations when planning delivery and other hauling activities.

1.05 SHUTDOWN AND CONSTRUCTION CONSTRAINTS

A. Normal working hours:
   1. Design-Builder shall perform Work onsite during normal working hours as defined herein, unless otherwise stipulated for after-hours activities, or unless otherwise stipulated in these Specifications:
      a. 7AM to 6PM Monday through Friday.
      b. Work will be prohibited on all Owner-recognized holidays of New Year's Day, Martin Luther King, Jr. Day, President's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, Day after Thanksgiving, and Christmas Day.

c. Design-Builder may request extended work hours in writing. Extended work hours must be pre-approved by Owner.
d. Emergency work may be performed without prior permission, but Owner must be immediately notified. Contact information for onsite Operations Staff to contact during emergencies will be provided at the Preconstruction Conference as described in Section 01320 – Construction Progress Documentation.

B. General shutdown constraints:
1. Execute the Work while the existing facility is in operation.
2. Some activities may be accomplished without a shutdown.
3. Apply to activities of construction regardless of process or work area.
4. Activities that disrupt plant or utilities operations must comply with these shutdown constraints.
5. Organize work to be completed in a minimum number of shutdowns.
6. Provide thorough advanced planning, including having required equipment, materials, and labor on hand at time of shutdown.
7. Notify Owner at least 30 days in advance of any tasks that will require dewatering and cleaning to allow Staff the appropriate amount of time to conduct the work.
8. Where required to minimize treatment process interruptions while complying with specified sequencing constraints, provide temporary pumping, power, lighting, controls, instrumentation, and safety devices.
9. Final determination of the permitting of shutdowns will be the sole judgment of Owner.
10. Owner maintains the ability to abort on the day of the scheduled shutdown or to hold at any hold point.
11. Activities that disrupt plant operations are prohibited during the following conditions, unless otherwise approved in writing by the Owner.
a. Activities that reduce the capacity of the plant's liquid and solids treatment capacity will not be allowed without an OCCP.
b. All work that reduces liquid treatment capacity during dry weather shall be performed at low flow conditions at night.
c. All work that reduces solids treatment shall be during periods of low solids inventory and first shift.
d. Design-Builder will need WWTD approval to remove all access to active unit processes via car or on foot.
e. Flows greater than 80 mgd in combined Blue River Sewer and Northeast Industrial District (NEID).
12. When shutdowns are required to perform work, install temporary power or controls, install temporary systems for bypasses, or other shutdowns:
a. Perform the Work in one approved shut down in accordance with approved OCCP.
b. Shutdowns that cannot be completed during the restrictions of this Section and in accordance with the approved OCCP must be identified by Design-Builder during planning of the work and an acceptable schedule and sequence worked out with Owner and documented in writing by Design-Builder.

C. Unit process availability work limitations:
1. Shutdowns and tie-ins or other activities that disrupt plant operations shall not occur if the following conditions exist unless approved by Owner in writing:
a. Rainfall has occurred in the 2 days preceding the shutdown.

b. Rainfall is forecast for more than 3 of the first 14 days of the shutdown period.

D. Shutdown activities:
   1. Scheduling:
      a. Perform between the hours of 9 a.m. – 4 p.m. unless otherwise specified herein or as approved by Owner.
   2. Unplanned shutdowns due to emergencies are not defined in this Section.

E. Dewatering of existing process and disposal of residue:
   1. When Owner has turned the process unit over to Design-Builder for modification or temporary use, Design-Builder is responsible for costs and procedures required to dewater and dispose of liquid, solids, etc. in the process unit unless Owner has made prior arrangements.
      a. Drainage and disposal of process unit liquids, solids, etc. into another treatment process unit on the plant site may be allowed if approved in advance by Owner and is conducted in accordance with Owner's requirements Design-Builder shall notify onsite Owner staff immediately of any accidental solids being directed to the return line and or storm sewers.
      b. Costs for dewatering, disposal of solids and residuals, and preparation of surfaces for the Work are Design-Builder's responsibility.
         (1) Includes tipping fees for the removal and disposal of the grit/debris.
      c. Dewatering of grit/debris to meet landfill requirements is the responsibility of the Design-Builder.
      d. Design-Builder shall provide adequate time in schedules for draining and cleanup of basins and channels.

1.06 OPERATIONAL CHANGE CONTROL PLAN (OCCP)

A. Refer to Section 01140.02 - Operational Change Control Plan (OCCP) Documents for additional requirements.

B. Submit Baseline Schedule, as specified in Section 01320 Construction Progress Documentation with preparation and submittal of OCCPs included as activities.

C. No consideration will be given to claims of additional time and costs associated with preparing OCCPs required by Owner to complete this work in a manner that facilitates proper operation of the facility and compliance with effluent discharge criteria.

D. Where required to minimize treatment process interruptions while complying with specified sequencing constraints, provide temporary pumping, power, lighting, controls, instrumentation, constant and continuous on-site supervision of all out-of-service unit processes and safety devices.

E. OCCPs are required whenever an existing asset or a new asset that could affect treatment or conveyance are modified including but not limited to set points and operational modes.

F. Design-Builder shall schedule OCCP Coordination Meeting with Owner one-week prior to implementation of approved OCCP. However, Design-Builder may request earlier meetings to discuss preparation of OCCPs with Owner prior to submitting the Draft OCCP. OCCP

Coordination Meeting is discussed in Section 01320 – Construction Progress Documentation.

1.07 COMPLIANCE WITH NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT

A. The existing facility is operating under the terms of a NPDES permit issued by the State of Missouri. This permit specifies the water quality limits that the plant must meet prior to discharge of effluent. A copy of the existing permit (Missouri State Operating Permit No. MO-0024911) is on file for review at the Administration Building at the Blue River WWTP.

B. Perform work in a manner that will not prevent the existing facility from achieving the finished water quality requirements established by regulations.

C. Bear the cost of penalties imposed on Owner for discharge violations caused by actions of the Design-Builder.

1.08 REQUIREMENTS FOR OPERATION OF PLANT AND MAINTAINING CONTINUOUS OPERATION OF EXISTING FACILITIES

A. Facilities or conditions required to keep the existing plant operational include, but are not limited to, the following:
   1. All process units, buildings and equipment.
   2. Electrical power including transformers, distribution wiring, and motor control centers.
   3. Plant and potable water.
   4. Plant air.
   5. Dewatering capacity.
   6. Laboratory facilities.
   7. Office, toilets, and washrooms.
   8. Fencing and gates.
   9. Lighting.
   10. Heating, ventilation, and air conditioning.
   11. Instrumentation, meters, controls, and telemetry equipment.
   12. Safety equipment and features.
   13. Parking for City employees and vehicles required for operation and maintenance of the treatment facilities.
   14. Telephone system.
   15. Storm drainage.
   16. Natural gas service.
   17. Access for Owner operations of unit processes.

B. Conduct the Work and provide temporary facilities required to keep the existing plant continuously operational.

C. Design-Builder shall protect existing grating with steel traffic plate for superimposed loads when moving equipment or supplies over grating. Design-Builder is responsible for any damage incurred to existing facilities as a results of its construction activities.

D. Maximum allowable superimposed live load on any existing grating or walkway shall be 50 psf. If higher loads are proposed, provide detailed calculations demonstrating adequacy of grating or walkway system for higher loads. The calculations shall be sealed and signed by a registered professional engineer and submitted to the Design-Builder for review and acceptance.

E. Do not remove or demolish existing facilities required to keep the existing plant operational at the current capacities until the existing facilities are replaced by temporary, new or upgraded facilities or equipment. The replacement facilities shall have been tested and demonstrated to be operational prior to removing or demolishing existing facilities. Design-Builder shall perform any alteration or Do not remove or demolish existing facilities required to keep the existing plant operational at the current capacities until the existing facilities are replaced by temporary, new or upgraded facilities or equipment. The replacement facilities shall have been tested and demonstrated to be operational prior to removing or demolition in accordance with Section 01352 – Selective Alterations and Demolition.

F. Design-Builder shall not demolish equipment, conduit, or piping without notifying the City in the presence of objects being demolished in accordance with Section 01352 – Selective Alterations and Demolition.

1.09 OPERATION AND MAINTENANCE ACCESS

A. Provide safe, continuous access to process control equipment for plant operations personnel.

1.10 WORK BY OTHERS

A. Where proper execution of the Work depends upon work by others, inspect and promptly report discrepancies and defects.

1.11 UTILITIES

A. Provide advance notice to request and utilize services of the Missouri One Call System (www.mo1call.com or 1-800-344-7483 (DIG-RITE)) for location and marking of underground utilities operated by utility agencies other than Owner.

B. Maintain electrical, telephone, water, gas, sanitary facilities, communications, stormwater, compressed air, and other utilities within existing facilities in service. Provide temporary utilities when necessary.

C. New yard utilities in Representative Project, if any, were designed using existing facility drawings.
   1. Field verification of utilities locations was not performed during design of Representative Project.
   2. Services crossed or located nearby new yard utilities may require relocation and possible shutdowns.

1.12 WORK SEQUENCE REQUIREMENTS

A. Design-Builder shall execute the Work in accordance with the Baseline Schedule in the executed Contract.

B. During performance of the Work, Design-Builder shall update the Baseline Schedule as specified in Section 01320 – Construction Progress Documentation.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

End of Section

KC WATER

WASTEWATER TREATMENT DIVISION
7300 Hawthorne Road • Kansas City, MO 64120
P: 816-513-7200 • F: 816-513-7271 • www.kcwater.us

Operational Change Control Plan (OCCP) Version 8

OCCP Number & Title (The OCCP number will be provided by the Division OCCP Coordinator)

OCCPs ARE REQUIRED TWO WEEKS IN ADVANCE OF THE ANTICIPATED WORK

This version is being provided as a Word document to enable editing within the document.

Do not delete any sections. Note if a section is not applicable to the proposed work.

Instructions are provided at the beginning of each section. READ THESE CAREFULLY. Provide the information requested. The submitted document is to include this title page.

Table of Contents

1. Date Page 1
2. Version Page 1
3. OCCP Number Page 1
4. Facility Name/ Facility ID Page 1
5. Project Execution Start Date Page 1
6. Description of Works Page 1
7. Key Plan Information Page 1
8. Significant Project and Meeting Dates Page 2
9. Project Milestones/ Execution Steps Page 2
10. Works to be completed prior start of OCCP Page 5
11. Contingency Actions Page 5
12. Job Hazard Analyses Page 5
13. Affected Monitoring Points and Impact Page 6
14. Water Quality Impacts Page 7
15. Notifications Page 7
16. Contractor OCCP Development and Sign Off Page 8
17. Notification to Stakeholders Page 9
18. Final Authorization/Approval Date Page 10

1. Date	
2. Version (use modifier starting with A at end of OCCP number when document changes substantially)	
3. OCCP Number	
4. Facility Name/ Facility ID	
5. Project Execution Start Date	

6. Description of Works (provide a summary of the work to be performed)

7. Key Plan information (hold points are those points at which work will be halted and operations returned to usual and customary conditions and is not a description of the work to be performed)

Description of Hold Point 1	
Description of Hold Point 2	
Description of Hold Point 3	
Description of Hold Point 4	
Description of Hold Point 5	
Description of Hold Point 6	
Description of Hold Point 7	
Description of Hold Point 8	

8. **Significant Dates (this section keys around the OCCP development to include a meeting with WTD staff to define operational collaboration)**

Project is scheduled to start no earlier than (02/15/24)	
Action	**Date**
OCCP Initial Development no later than:	
OCCP Final no later than:	
OCCP Coordination Meeting no later than:	
Other as needed:	
Other as needed:	

9. **Project Milestones/ExecutionSteps (define the major work steps and attach a schedule for the work if so developed specifically for this OCCP project)**

Step	Action and Date (may include start date + X if start is unknown at the time of OCCP development

Step	Action and Date (may include start date + X if start is unknown at the time of OCCP development

10. Works to be completed prior start of OCCP (this will result from the initial OCCP meeting)

Operational Condition	Contingency Action
1)	

11. Contingency Actions (these actions result from plans in the event of adverse project impacts)

Mode of Failure/Incident	Contingency Action
1)	1)

12. Job Hazard Analysis (define any hazards to be encountered that are not usual and customary)

Hazard	Mitigation

13. **Affected monitoring points and impact**

a. **Usual sample locations affected by this operation (this will result from the initial OCCP meeting)**

Description of Element	How is it Affected

b. **Special location(s) established for this operation (this will result from the initial OCCP meeting)**

Description of Location	Describe Revised Procedure

c. **Treatment Process Affected (define which process will be impacted and how any alternate or interim operation will be implemented)**

Process Description	Describe Alternate or Interim Operation

d. Alarm Modifications

Alarm name	Alarm Value	Replacement	How Does it Operate?

e. Environmental Spill Risks

Description of Spill Risks	Mitigating Controls

14. Wastewater Quality Impacts

Description of Impact	How It Will Be Managed

15. External Stakeholders to Be Notified (these include neighboring residential and businesses)

Individual or Entity	Name and Phone Number

16. Contractor OCCP Development and Sign Off (these include the prime and any subs performing the work and to ensure all contractor teams are aware of the work plan)

Name and Title	Signature

17. WWTD OCCP Final Authorization and Approval (to include the WTD chain of command from the CPO to the Division Manager and a senior representative from each contractor team)

Name	Title	Signature	Date

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

ALLOWANCE AUTHORIZATION

Project/Contract Numbers: 81000999/1751

Project Title: Blue River WWTP Grit Removal and Fine Screens Project

To: _____

_____

Re: _____

_____

Authorization Number: _____
From: _____
Date: _____
Contract For: _____

You are authorized to perform the following item(s) of work and to adjust the Allowance Sum accordingly:

This is NOT a CHANGE ORDER and does NOT INCREASE OR DECREASE the CONTRACT AMOUNT.

Original Allowance	$_____
Allowance Expenditures prior to this Authorization	$_____
Allowance Balance prior to this Authorization	$_____
Allowance will be [❑ increased] [❑ decreased] by this Authorization	$_____
New Allowance Balance	$_____

APPROVAL RECOMMENDED

_____
Design Professional Date

_____
Construction Manager Date

CITY APPROVAL

_____
City's Representative Date

CONTRACTOR ACCEPTANCE

_____
Contractor Date

❑ Attachments:

Distribution:
- ❑ City
- ❑ Contractor
- ❑ Construction Manager
- ❑ Design Professional
- ❑ Consultant
- ❑ Other

SECTION 01290 PAYMENT PROCEDURES AND CHANGE MANAGEMENT

PART 1 - GENERAL

1.01 SUMMARY

A. This Section specifies administrative and procedural requirements necessary for payment and change management including:
   1. Schedule of Values.
   2. Application for payment.
   3. Change procedures.
   4. Defect assessment.
   5. Allowances.

1.02 SUBMITTALS

A. In accordance with Section 01300 – Submittals.

1.03 PHASE 2 SCHEDULE OF VALUES

A. Design-Builder shall prepare Proposed Phase 2 Schedule of Values for Phase 2 Work based on the Contract Price and submit in accordance with Article 2 of the General Conditions. Design-Builder shall prepare the Phase 2 Schedule of Values with preparation of Baseline Schedule as defined in Section 01320 – Construction Progress Documentation and submit in accordance with Section 01300 – Submittals. The Proposed Phase 2 Schedule of Values will be developed in reference to the project schedule work break-down structure (WBS) but the level of detail and number of line items will be mutually agreed to by the Owner and Design-Builder prior to the initial Application for Payment (bonds and insurance payment is excluded from this requirement).

B. Design-Builder shall incorporate in the Proposed Phase 2 Schedule of Values the review comments from Owner and finalize the Phase 2 Schedule of Values for approval by Owner. Submittal of the finalized Phase 2 Schedule of Values is a condition precedent to the issuance of the first payment for Phase 2 Work. No changes shall be made to the Phase 2 Schedule of Values without Owner's prior approval.

C. Whenever the scope is changed or revised to include approved Change Orders that change the Work or Allowance authorizations, the Phase 2 Schedule of Values shall also be revised such that the sum total shall be equal to the total current Contract Price plus changes. Scope additions shall be added to the Phase 2 Schedule of Values as new line item(s) equaling the value of the change.

D. The Phase 2 Schedule of Values shall show the estimated total number of construction units for each kind of work and the value of each unit.

E. The Owner and Design-Builder will agree to the rules of credit for each unit of the Phase 2 Schedule of Values that are considered lump sum items. Rules of credit identify the method for determining completion and value of Work completed for lump sum items. Examples of rules of credit include physical percent complete, pre-defined value, and level of effort.

F. The total estimated value of the items of work listed in the Phase 2 Schedule of Values shall equal the Contract Price.

1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:
   a. Owner's "Application for Payment' forms.
   b. Baseline Schedule.
2. Updated Phase 2 Schedule of Values to be submitted with each Application for Payment as required in this Section and will be a condition of recommendation for payment by the Owner's Representative.
3. Updated Phase 2 Schedule of Values will include the Design-Builder's estimated percent completion of each line-item included in the Phase 2 Schedule of Values. The amount requested for each line item will equal the item's percent complete multiplied by the estimated value for that item.

G. Format and Content: Prepare Phase 2 Schedule of Values from submitted and accepted Baseline Schedule per Section 01320 – Construction Progress Documentation. Provide a minimum of one line-item for each Specification Division.
   1. Prepare and submit the Phase 2 Schedule of Values using Section 01290.02 – Schedule of Values.
   2. Phase 2 Schedule of Values shall be a listing of all work, listed in numerical order, showing that the sum total of all items equals the Contract Price.
   3. Phase 2 Schedule of Values shall include Allowances in accordance with the following:
      a. The initial Phase 2 Schedule of Values will identify on separate lines each allowance item and allowance value defined in the Contract Price.
      b. As allowance items are authorized for use, a new sub line item to the authorized allowance item will be added with the allowance value equal to the amount authorized.
      c. At no time will the sum of the allowance value sub line-item budgets exceed the initial allowance value unless revised by a Change Order.
   4. Phase 2 Schedule of Values shall include line item for premiums for Bonds and insurance.
   5. Phase 2 Schedule of Values shall include line item for general conditions.
   6. Design-Builder shall include design activities and deliverables on the Phase 2 Schedule of Values, organized by discipline. Design-Builder shall distinguish between design completion activities and design services during construction.
   7. Round amounts to nearest whole dollar; total shall equal the value of the Contract Price.
   8. Assign prices to Major Items of Work which aggregate the Contract Price. Base prices on costs associated with scheduled activities based on the approved Baseline Schedule for each Major Item of Work.
   9. Provide a separate line item in the Phase 2 Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored.
   10. Provide separate line items in the Phase 2 Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
   11. Provide separate lines for Major Items of Work, mobilization, demolition, general earthwork and grading, miscellaneous yard piping, general electrical work not included on Major Items of Work, general instrumentation not included on Major Items of Work, demobilization, Manufacturers' Field Services, Operation and Maintenance Data, Warranty Documents, equipment startup, commissioning, Project Record Documents, contract closeout (Refer to Section 01019 – Closeout Procedures

for contract closeout details), and miscellaneous work items and other prices not included in previous items and necessary to complete the Work.

12. Each item in the Phase 2 Schedule of Values and Applications for Payment shall be complete.
13. Whenever the schedule is changed or revised to include approved change orders that add or delete work, the Phase 2 Schedule of Values shall also be revised such that the sum total of all items shall sum to the total current contract amount.
14. Upon request, support prices with data that will substantiate their correctness.
15. Submit corrected Phase 2 Schedule of Values in accordance with Article 2 of the General Conditions.
16. In accordance with the rules of credit, provide separate line items in the Phase 2 Schedule of Values for lump sum items such as initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.

1.04 APPLICATION FOR PAYMENT

A. Payment Application Times: The date for each progress payment is indicated in the Contract for Progressive Design-Build Services. The period of Work covered by each Application for Payment is the period indicated in Article 6 of the General Conditions.

B. Payment Application Forms: Use Section 01290.01 – Application for Payment and follow Owner's payment procedure, described in Article 6 of the General Conditions and in this Section.

C. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Design-Builder. Owner will return incomplete applications without action.
   1. Base Application for Payment on the direct breakdown of costs for each item in the Phase 2 Schedule of Values. Percent Complete and related monetary value will be entered on the Owner's "Application for Payment." Identify each item on the Phase 2 Schedule of Values, the value of each item, the actual physical percent complete for each item, and the value of work completed for both the payment period and job to date.
   2. Include amounts of Change Orders and Work Change Directives issued before last day of construction period covered by application.
   3. For stored materials:
      a. Design-Builder shall be paid, in accordance with Article 6.2.2 of the General Conditions, the invoice amount for suitably stored materials (less retainage) when incurred. Submit invoice with the Application for Payment. Any additional amount for procurement of the material (including delivery, storage, preparation, installation, transport to the site, etc.) listed or calculated from the Phase 2 Schedule of Values shall be paid after installation.
      b. Stored materials can be properly stored onsite in a location approved by the Owner or offsite in an appropriate bonded and insured warehouse according to storage specifications contained in the Specifications and manufacturer's instructions and recommendations. If used, the offsite warehouse shall be within 20 miles of the Project Site.
      c. Complete Owner's Stored Materials Form with application for payment. Form provided as a Supplement to this Section.
      d. Design-Builder will be required to provide secure and proper storage of materials and equipment including adequate insurance against loss or damage. This shall include notification of location of stored material, submittal of manufacturer's

instructions for storage (if provided), and photographs of stored materials indicating the proper protection and showing the amount of materials stored at that particular location.

e. Design-Builder shall provide appropriate stored material and equipment, lubrication, maintenance, electrification, storage area temperature and moisture control and warranties.

f. After payment for stored materials or equipment is made, ownership of the material is transferred to the Owner and any or all of the materials may not be sold, traded, or confiscated without written approval by the Owner.

g. Owner must be allowed access to visually inspect stored equipment and materials at their request. Payment for stored materials shall not become due unless the Owner's Representative has been provided access to inspect those stored materials.

4. All invoiced Work shall be documented to the Owner's satisfaction and include the following:

a. Bond and Insurance premium reimbursement requests shall be documented with receipts.

D. Provide updated progress schedules matching the progress reported in the Phase 2 Schedule of Values and associated schedule narrative with the Monthly Project Status Report that accompanies each payment application, identifying accomplishments for the reporting period, a forecast of anticipated work in the next period, issues/risks affecting the project, an updated change log, including approved and potential change orders, contingency usage, and Allowances. Design-Builder shall include an updated Five-Week Schedule, and edits to the previous month's Five-Week Schedule reflecting actual work completed.

E. Provide the most recently submitted version of the following CREO Forms, located in Division 00 specifications, with each payment request. Each form shall have already been submitted to Civil Rights and Equal Opportunity Department:

1. 00485.01 M/WBE Monthly Utilization Report.
2. 00485.02 Project Workforce Monthly Report.
3. 00485.03 Company-Wide Workforce Monthly Report.
4. 01290.11 Daily Labor Force Report, in accordance with Section 01320 – Construction Progress Documentation.

F. Maintain an updated set of Drawings and Specifications to be used as Record Drawings in accordance with Section 01020 – Record Documents. As a prerequisite for monthly progress payments, exhibit, or make available, the updated Record Drawings for review by Owner.

G. Payroll Certification: Design-Builder shall keep and require each of its Subcontractors engaged in performance of the Contract to keep full and accurate records on Certified Payroll Report Form provided as a Supplement to this Section.

1. Design-Builder shall follow Section 00485 - CREO KC Monthly Reporting Instructions and Section 01290.03 – Certified Payroll Report Instructions.
2. Design-Builder shall prepare and shall require each Subcontractor to prepare a Payroll Certification Form (Section 01290.07 – Payroll Certification) to accompany the Certified Payroll Report (Section 01290.05 – Certified Payroll Report Form). The Payroll Certification must be signed by the employee or agent who pays or supervises the payment of the workers employed under the Contract and each Subcontractor.

H. The Application for Payment shall include the following documents in accordance with Division 00 and 01 specifications and the General Conditions to the Contract for Progressive Design-Build Services:
   1. Waivers of lien and similar attachments from Subcontractors and vendors, as required.
   2. Approved Baseline Schedule, as appropriate.
   3. Monthly Progress Status Report submitted as defined above.
   4. Schedule Reports.
   5. Monthly Quality Report.
   6. Copies of Certified Payroll Reports submitted to Civil Rights and Equal Opportunity Department for payroll period covered by Application for Payment.
   7. Affidavits attesting to offsite stored products and insurance coverage for offsite stored products. All stored materials must clearly be labeled "Property of Kansas City Water Services Department, Project 81000999/1751".
   8. An affidavit of Design-Builder stating that all previous progress payments received for the Work have been applied to discharge Design-Builder's legitimate obligations associated with prior Applications for Payment.
   9. Any submission to the Owner pursuant to this Paragraph shall contain the following statement:
      I certify under penalty of law that the document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted, and that the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

I. Submit one signed and notarized original copies of each Application for Payment in accordance with Section 01300 – Submittals.

J. Owner has the right to review all design services and construction services, performed at the Site or elsewhere, to determine whether the quantity and quality of labor, services, equipment, and materials are as required by the Contract Documents and as represented in the Application for Payment.

K. Acceptance of progress schedules and Phase 2 Schedule of Values are a condition precedent to making payments.

1.05 FINAL APPLICATION FOR PAYMENT

A. Upon meeting requirements set forth by Section 01019 – Closeout Procedures and the General Conditions, Design-Builder shall submit the final Application for Payment in accordance with procedures and requirements stated in Article 6.6 of the General Conditions.

B. With the final Application for Payment, DESIGN-BUILDER shall complete and submit Contractor Affidavit for Final Payment (Section 01290.14) provided as supplement to this Section.

C. Prior to final payment, Design-Builder shall submit affidavits from each of its Subcontractors and Sub-subcontractors (regardless of tier) stating that each has fully complied with the provisions and requirements of the Missouri Prevailing Wage Law. Owner shall not make final payment until the affidavits, in proper form and order, from

Design-Builder and each of its Subcontractors, are filed by Design-Builder. Subcontractor Affidavit of Final Payment is provided as Section 01290.15.

1.06 CHANGE PROCEDURES

A. The Owner may add or delete any quantity of work to the Project by Work Change Directive in accordance with Section 00945 – Work Change Directive and/or Change Order in accordance with Section 00940 – Construction Change Order. Minor changes or supplemental instructions that do not involve a possible change to Contract Price or Time may be issued using a Supplemental Design in accordance with Section 00931 – Supplemental Design Instruction.

B. Owner may submit notice of a proposed Owner change to Design-Builder in the form of a Request for Proposal as provided in Section 00932 – Request for Proposal. Design-Builder shall respond to Owner's Request for Proposal in accordance with Article 9 of the General Conditions. Design-Builder shall maintain a log of Owner's Requests for Proposal that includes the following fields:
   1. Request for Proposal number.
   2. Date of issuance as indicated on Section 00932 – Request for Proposal.
   3. Brief description of Owner's request.
   4. Date response was provided to Owner.
   5. Amount of change.
   6. Resulting Change Order number.

C. Work Change Directive (WCD):
   1. When it is necessary for Work to be performed before an adjustment to Contract Price and Contract Times can be agreed upon, Owner will issue a WCD in accordance with Article 9 of the General Conditions which will authorize and direct Design-Builder to proceed with the Work that may be included in a subsequent Change Order.
   2. If the WCD may result in an increase to Contract Price, however, a contract impact cost analysis must be performed.
   3. Instructions for Design-Builder's completion of Section 00945 Work Change Directive are included with the form. Design-Builder shall include an estimate of change to Contract Price and/or Contract Time.
   4. Proceed with such Work in accordance with Article 9 of the General Conditions. When changes in Contract Price and Contract Time are to be based upon the cost of the Work, maintain and submit cost records in accordance with Article 9 of the General Conditions.
   5. When a WCD is to be used that increases Contract Price and/or Contract Time, Design-Builder must submit proper documentation for inclusion in a Change Order. Design-Builder's documentation to include but not limited to:
      a. Appropriately detailed records of Work performed to enable determination of value of the Work.
      b. Full information required to substantiate resulting change in Contract Times and Contract Price for Work. On request of Owner, provide additional data necessary to support documentation.
      c. Support data for Work performed on a unit price or Cost of the Work basis with additional information such as:
         1) Dates Work was performed, and by whom.
         2) Time records, wage rates paid, and equipment rental rates.
      d. Invoices and receipts for materials, equipment, and subcontracts, all similarly documented.

e. Effective Date of WCD: Date of signature by Owner, unless otherwise indicated thereon.

D. Change Order (CO):
1. Owner will issue COs as needed which will authorize and direct Design-Builder to proceed with the Work included in one or more WCDs, Owner's Request for Proposal, and/or Design-Builder Proposed Change Order in accordance with Article 9 of the General Conditions. for which the change in Contract Price and Contract Times have been determined. Proceed with such Work in accordance with Article 9 of the General Conditions. Proposed changes for which a WCD has been issued will be included in a Change Order after the Contract Price and Contract Times have been determined.
   a. Upon receipt of Owner-executed Change Order, Design-Builder shall:
      1) Perform Work covered by Change Order.
      2) Revise Phase 2 Schedule of Values to adjust Contract Price and submit with next Application for Payment.
      3) Revise Baseline Schedule to reflect changes in Contract Times, if any, and to adjust times for other items of Work affected by change.
      4) Enter changes in Project record documents after completion of change related Work.
   b. In signing a Change Order, Owner and Design-Builder acknowledge and agree that:
      1) Stipulated compensation (Contract Price or Contract Times, or both) set forth includes payment for (i) the Cost of the Work covered by the Change Order; (ii) Design-Builder's fee for overhead and profit; (iii) interruption of Baseline Schedule; (iv) delay and impact, including cumulative impact, on other Work under the Contract Documents; and (v) extended overheads.
      2) Change Order constitutes full mutual accord and satisfaction for the change to the Work.
      3) Unless otherwise stated in the Change Order, all requirements of the original Contract Documents apply to the Work covered by the Change Order.

1.07 DEFECT ASSESSMENT

A. Replace the Work, or portions of the Work, not conforming to specified requirements in accordance with Article 2.9 of the General Conditions.

1.08 ALLOWANCES

A. Allowance Payment Values are as indicated in Phase 2 Contract Price Amendment and payment is in accordance with Article 4.2 of the General Conditions.

B. Costs included in allowances for furnishing and installing products:
1. Net cost of product.
2. Delivery and unloading at site.
3. Applicable taxes.
4. Handling at site, including uncrating and storage.
5. Protection from elements and from damage.
6. Labor, installation, testing, and finishing.
7. Other expenses required to complete installation.

C. Obtain proposals from suppliers, including:
   1. Quantity.
   2. Complete description of product and services provided under allowance.
   3. Unit cost.
   4. Total amount of purchase.
   5. Taxes and delivery charges.

D. Prior to entering into a purchase agreement with designated supplier, Design-Builder shall complete and submit to Owner the Allowance Authorization Form in accordance with Section 01210.01 – Allowance Authorization and in accordance with Section 01300 - Submittals.

E. On notification of selection, enter into purchase agreement with designated supplier.

F. Arrange for delivery and unloading.

G. Install products in accordance with Contract Documents.

H. If Allowance items are not executed, or are only partially executed, or the allowance for any item is not expended or partially expended, then a deductive Change Order shall be issued reducing the Allowance Payment Value and applicable Contract Price by the amount that is not expended. If, however, these items are over expended (with Owner's prior approval), then an appropriate Change Order shall be executed in accordance with the provisions of the Contract for Progressive Design-Build Services.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01 SUPPLEMENTS

A. The supplements listed below, following "End of Section," are a part of this Specification. Owner will provide Design-Builder an electronic form for their use.
   1. Stored Materials and Equipment Form.

END OF SECTION

SECTION 01290 - SUPPLEMENT 1

STORED MATERIALS AND EQUIPMENT FORM

CITY OF FOUNTAINS
HEART OF THE NATION
KANSAS CITY
MISSOURI

STORED MATERIALS AND EQUIPMENT

Project Number 81000999

Project Title Blue River WWTP Grit Removal and Fine Screens Project

Payment Application No. _____

Submittal Date: _____

Period From: _____ to _____

ITEM NO.	ITEM CODE	MATERIAL DESCRIPTION (may be referenced and attached)	VENDOR	INVENTORY NUMBER	TOTAL MATERIAL VALUE
		TOTALS	—	—	**$**

I certify that the above-listed materials and equipment have been delivered and properly stored as indicated, that Design-Builder has submitted invoices and other documentation required by Owner, and that it is appropriate to include the above-listed materials and equipment on the Application for Payment indicated above.

_____
Design-Builder

_____
Owner's Representative

CITY OF FOUNTAINS
HEART OF THE NATION
KANSAS CITY
MISSOURI

APPLICATION FOR PAYMENT

Project Number 81000999

Project Title Blue River WWTP Grit Removal and Fine Screens Project

Final Payment[5] ☐

Design-Builder

Address

Application Number[2]:
Date:
Ordinance/Resolution Number:
Effective:
PO Number
Vendor Number

Application for Work Accomplished from _____ to _____

Original Contract Price		[1]		$	-
Net by Change Orders___through___			[2]	$	-
Current Contract Price (1+2)			[3]	$	-
Completed Work		[4]			
Disputed Amounts[3]	[-]	[4a]	$ -		
Stored Material[4]		[5]	$ -		
Disputed Amounts[3]	[-]	[5a]	$ -		
Total Completed and Stored to Date (4+5)			[6]	$	-
Previous Payments		[7]			
Previous Retainage		[8]			
Total Previous Applications (7+8)			[9]	$	-
Amount This Application (6-9)			[10]	$	-
Less Retainage This Application (5%)			[-] [11]	$	-
Release of Retainage			[12]	$	-
Total Due This Application (10-11+12)			[13]	$	-
Liquidated Damages					
Completion of Work		[14]	$ -	[-] $	-
Prevailing Wage[7]		[15]	$ -	[-] $	-
MBE/WBE Program[7]		[16]	$ -	[-] $	-
Workforce Program[7]		[17]	$ -	[-] $	-
Total Amount Due Contractor (13 - 14 through 17)			[18]	$	-

Accompanying Documentation: [1, 2, 3, 4, 5, & 6] and any other information as necessary.

NOTE: Initial all figures on this Application and on the Schedule of Values that are changed to correct errors or conform to the amount recommended. Attach explanation of changes that have been made.

Design-Builder's Certification:

The undersigned Design-Builder certifies that (a) all previous progress payments received from Owner on account of Work done under this Contract have been applied on account to discharge Design-Builder's legitimate obligations incurred in connection with Work covered by all prior Applications for Payment; (b) at time of payment, title of all Work, materials and equipment incorporated into said Work or otherwise listed in or covered by this Application for Payment will pass to Owner free and clear of all Liens, security interests and encumbrances (except such as are covered by a Bond acceptable to Owner indemnifying Owner against any such Lien, security interest or encumbrance); and (c) all Work covered by this Application for Payment is in accordance with the Contract Documents and not defective; and (d) all manufactured goods or commodities used or supplied for this Project are in compliance with Kansas City's Buy America ordinance.

_____ By _____ _____

Design-Builder | Authorized Representative (Print) | Signature

Date_____

State of)
)SS
County of)

Subscribed and Sworn to before me this _____ day of _____, _____.

My commission expires:

_____ Notary Public: _____

Construction/Program Manager's Recommendation of Payment: (if applicable)

In accordance with the Contract Documents, based on onsite observations and the data comprising this application, the Construction/Program Manager recommends to the Owner that to the best of the Construction/Program Manager's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Design-Builder is entitled to payment of the Amount above listed in this application.

Construction/Program Manager firm (Print)	Authorized Representative (Print)	(Signature)

Date: _____

City's Representative's Agreement with Recommendation of Payment

City's Representative(print)	(Signature)	(Date)

City's Approval

The amount previously recommended is approved for payment.

Director or Designee (Print)	(Signature)	(Date)

[1]See General Conditions Article 6.2.
[2]Proof of tax compliance if 1st payment and if Contract amount exceeds $150,000.00
[3]Schedule of Values–Denote any amounts currently disputed in this application. Attach additional dispute documentation if required.
[4]If requesting payment for stored materials, see General Conditions Article 6.2.2.
[5]If final payment, current proof of tax compliance if Contract is longer than 1 year and amount exceeds $150,000.00.
[6] Per HRD Form 05 attach a copy of the most recent 00485.01 M/WBE Monthly Utilization Report, 00485.02 Project Workforce Monthly Report and 00485.03 Company-Wide Workforce Monthly Report Design-Builder has submitted to the City's Civil Rights and Equal Opportunity Department
[7]Applicable only if final payment

REMINDER: Design-Builder is responsible for meeting or exceeding the the D/M/WBE participation amounts in its Design-Builder Utilization Plan as amended by any previously approved Request for Modification/Substitution. Any Change Orders or amendements modifying the amount Design-Builder is to be compensated will have correspondingly impacted the amount of compensation due D/M/WBEs for purposes of meeting or exceeding the Bidder/Proposer participation. Design-Builder is again reminded to consider the effect of any Change Order or amendment, and to submit a Request for Modification/Substitution if appropriate.

Distribution: Owner, Design-Builder, Construction Manager, Project Manager, Design Consultant

CITY OF FOUNTAINS
HEART OF THE MAKOS
KANSAS CITY
MISSOURI

PHASE 2 SCHEDULE OF VALUES

Project Number 81000999

Project Title Blue River WWTP Grit Removal and Fine Screens Project

HRD APPROVED CUP		
MBE	WBE	DBE
$0.00	$0.00	$0.00
%	%	%

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
SPEC SECTION	UNIT PRICE CONTRACTS			DESCRIPTION OF WORK UNIT ITEM DESCRIPTION	$ UNIT PRICE	NO. OF UNITS	$ TOTAL OR LUMP SUM	UNITS COMPLETE	$ COMPLETED WORK	$ STORED MATERIAL	$ TOTAL COMPLETED AND STORED TO DATE		TOTALS TO DATE			% AT BOTTOM	$ TOTAL PREVIOUS APPLICATIONS	$ AMOUNT THIS APPLICATION L-R
	UNIT ITEM NO.	UNIT	ESTIMATED QUANTITY								$ J+K	% J/H	$ MBE	$ WBE	$ DBE			
																P/L		
																O/L		
																N/L		

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

City Of Kansas City, Missouri

Certified Payroll Report Instructions

GENERAL INSTRUCTIONS:

Each space on the attached Certified Payroll Report requiring information is numbered. The numbers below correspond to those spaces. When completing the Certified Payroll Report, insert the required information in each space. The Certified Payroll Report **must be complete, clear and legible** and be accompanied by a completed Payroll Certification including **original signature**. All payrolls are to be submitted within two (2) weeks after the ending date of the payroll week.

The payroll form is available on line.

INSTRUCTION FOR PAYROLL SHEETS

1. **PAYROLL NUMBER**: Insert the number of the payroll. Payrolls start with number 1 (one) for the first week of work by each contractor or subcontractor. The numbers are then continuous until the last payroll. During weeks when no work takes place a payroll for that week showing no work is to be turned in. Revised payrolls must be designated with a letter "R" following the number. Check (✓) the box by the word "FINAL" after the number to indicate that no further work will be done by the contractor or subcontractor.

2. **WEEK ENDING**: On each sheet, insert the date of the last day of this payroll.

3. **SHEET OF**: On each sheet, insert the number of each sheet and the total number of sheets submitted.

4. **GRANT AGENCY PROJECT NO:** Insert the Grant Agency Project Grant Number if this is a grant funded project.

5. **CONTRACTOR**: Insert the contractor's company name and address.

6. **SUBCONTRACTOR**: If this is a payroll for a subcontractor, insert subcontractor's name and address. For the remainder of these instructions, the word "contractor" shall apply to both contractor and subcontractor.

7. **DEPARTMENT PROJECT or CONTRACT NO**: Insert Department's Project or Contract Number.

8. **LOCATION**: Insert location of work, including address, and county.

9. **DESCRIPTION**: Insert name of the project or contract from the Agreement.

10. **FEDERAL I.D. NUMBER**: Insert the contractor (10a) and subcontractor's (10b) Federal I.D. Number.

11. **EMPLOYEE NAME**: Insert employee's full legal name and complete home address. Make sure to include Apartment #'s and zip code.

12. **SOCIAL SECURITY NO.**: Insert employee's social security number (xxx-xx-xxxx).

13. **DATE**: Insert date for each day of the payroll week for each employee (mm/dd/yyyy).

14. **REGULAR HOURS***: Insert the regular hours worked each day.

15. **OVERTIME HOURS***: Insert the overtime hours worked each day.

16. **DOUBLE OVERTIME HOURS*:** Insert the double overtime hours worked each day.

    ***Note:** Numbers 14, 15, and 16: Make sure these **hours are equal to or greater than the hours turned in on the "Daily Labor Force Report" form.** Refer to the wage order for applicable overtime schedule.

    If allowed by occupational title's applicable overtime rate, Contractor may make a permanent schedule transfer to an eight (8) or ten (10) hour day work week. **Advance written notification to and approval** from the Owner's Representative **is required.**

    If allowed by the occupational title's applicable overtime rate, any change in the work week schedule due to inclement weather **must** be documented on the certified payroll.

17. **TOTAL HOURS**: Insert total of *regular hours* worked for the week on this project. (The total hours will calculate automatically if you are using the electronic form.)

18. **TOTAL HOURS**: Insert total of *overtime hours* worked for the week on this project. (The total hours will calculate automatically if you are using the electronic form.)

19. **TOTAL HOURS:** Insert total of *double overtime* hours worked for the week on this project. (The total hours will calculate automatically if you are using the electronic form.)

20. **TOTAL FRINGE HOURS**: Insert total Fringe Hours (by adding the amounts in 17, 18, and 19). (The total hours will calculate automatically if you are using the electronic form.)

21. **BASE RATE***: Insert basic hourly rate of pay. Check the contract's "Annual Wage Order" or the "Federal General Wage Decision" section for basic hourly rate.

22. **OVERTIME RATE***: Insert overtime rate of pay. Check the contract's "Annual Wage Order" or the "Federal General Wage Decision" section for the overtime rate.

23. **DOUBLE OVERTIME RATE***: Insert double overtime rate of pay. Check the contract's "Annual Wage Order" or the "Federal General Wage Decision" section for the double overtime rate.

24. **FRINGE RATE***: Insert fringe benefit rate for this project. Check the contract's "Annual Wage Order" or the "Federal General Wage Decision" section for the fringe benefit rate.

    ***Note**: *The total of the basic hourly rate plus the fringe benefit rate must be equal to or greater than the total of the basic hourly rate plus the fringe benefit rate found in the contract's "Annual Wage Order" or the "Federal General Wage Decision" section. If the contract contains both of the above, the higher rate will prevail.*

25. **TOTAL**: Multiply the amounts in 17 by 21 and insert here. (The total hours will calculate automatically if you are using the electronic form.)

26. **TOTAL**: Multiply the amounts in 18 by 22 and insert here. (The total hours will calculate automatically if you are using the electronic form.)

27. **TOTAL**: Multiple the amounts in 19 by 23 and insert here. (The total hours will calculate automatically if you are using the electronic form.)

28. **TOTAL**: Multiply the amounts in 20 by 24 and insert here. (The total hours will calculate automatically if you are using the electronic form.)

29. Check (✓) the box (☐) for the "*APPROVED PLAN*", "*EMPLOYEE*", or both indicating the Plan or manner in which the fringe benefit is paid. If fringe benefit is paid to both a Plan and the employee, then insert each amount that is paid to the Plan and/or the employee. If paid to a Plan, list the name(s) of Plan Programs on Payroll Certification page.

    ***Note:** 29a plus 29b **must equal** 28.

30. **OCCUPATIONAL TITLE/CLASSIFICATION**: Insert occupational title/classification of worker for each employee. Examples: Carpenter, laborer, electrician.

31. **GROUP**: Insert the group if, applicable for the occupational title/classification. Example: Operating Engineers Group I, II, III, IV or V.

32. **SKILL GROUP**: Insert skill group, if applicable. Example: general laborer, skilled laborer, first semi-skilled, second semi-skilled etc. or any of the listings under the federal classification such as painters.

33. **HOURS**: Insert total hours worked for all jobs for each employee during each payroll period.

34. **GROSS EARNINGS**: Insert employee's gross earnings for each payroll period.

35. **FEDERAL**: Insert the amount of the deduction from each employee's check stub.

36. **FICA**: Insert the amount of the deduction from each employee's check stub.

37. **STATE**: Insert the amount of the deduction from each employee's check stub.

38. **LOCAL E-TAX**: Insert the amount of the deduction from each employee's check stub.

39. **MISCELLANEOUS**: Insert the amount of the deduction from each employee's check stub.

40. **NET PAY**: Insert the employee's net pay for each week.

41. **EARNINGS FOR THIS JOB**: Add the amounts in 25, 26, 27, and 29b and insert here.

    ***Note**: If fringe benefit is paid to Approved Plan, do not add the amount in 29a to this total.

42. **KANSAS CITY EARNINGS TAX THIS JOB**: Insert Kansas City Earnings tax deducted from employee's check for this job.

Steps 11 through 42 are to be repeated for each employee working on the project site, or for the same employee working any additional Occupational Title/Classification.

CITY OF FOUNTAINS
HEART OF THE NATION
KANSAS CITY
MISSOURI

CERTIFIED PAYROLL REPORT

Project Number:

Project Title:

Payroll Number: (1) ☐ **Final**

WEEK ENDING: (2) SHEET (3) of

GRANT AGENCY PROJECT NO.: (4)

CONTRACTOR: (5)
ADDRESS:
CITY, STATE ZIP:
FEDERAL I.D. NUMBER: (10a)

SUBCONTRACTOR: (6)
ADDRESS:
CITY, STATE ZIP:
FEDERAL I.D. NUMBER: (10b)

DEPT PROJECT OR CONTRACT NO.: (7)
LOCATION: (8)
DESCRIPTION: (9)

First Name	Last Name	DATE:	MON	TUES	WED	THUR	FRI	SAT	SUN	TOTAL HRS.	BASE RATE	O.T. RATE	FRINGE RATE	TOTAL
EMPLOYEE NAME: (11)														
ADDRESS:		REG. HRS. (14)								(17) 0.00	$ (21) -			$ (25) -
CITY, STATE ZIP:		O.T. HRS. (15)								(18) 0.00		$ (22) -		$ (26) -
SOCIAL SECURITY NO.: (12)		D.O.T. HRS. (16)								(19) 0.00		$ (23) -		$ (27) -
OCCUPATIONAL TITLE / CLASSIFICATION:							TOTAL FRINGE HOURS (20)			0.00			$ (24) -	$ (28) -
(30)													FRINGE PAID TO: ☐ APPROVED PLAN (29a)	-
		GROUP: (31)		SKILL GROUP: (32)									☐ EMPLOYEE (29)	$ (29b) -

WEEK ALL JOBS:	HOURS:	GROSS EARNINGS:	FEDERAL:	FICA:	STATE:	LOCAL E-TAX:	MISC:	NET PAY:	EARNINGS FOR THIS JOB:	$ (41) -
	(33)	$ (34) -	$ (35) -	$ (36) -	$ (37) -	$ (38) -	$ (39) -	$ (40) -	KANSAS CITY EARNINGS TAX THIS JOB	$ (42) -

First Name	Last Name	DATE:	MON	TUES	WED	THUR	FRI	SAT	SUN	TOTAL HRS.	BASE RATE	O.T. RATE	FRINGE RATE	TOTAL
EMPLOYEE NAME:														
ADDRESS:		REG. HRS.								0.00	$ -			$ -
CITY, STATE ZIP:		O.T. HRS.								0.00		$ -		$ -
SOCIAL SECURITY NO.:		D.O.T. HRS.								0.00		$ -		$ -
OCCUPATIONAL TITLE / CLASSIFICATION:							TOTAL FRINGE HOURS			0.00			$ -	$ -
													FRINGE PAID TO: ☐ APPROVED PLAN	$ -
		GROUP:		SKILL GROUP:									☐ EMPLOYEE	$ -

WEEK ALL JOBS:	HOURS:	GROSS EARNINGS:	FEDERAL:	FICA:	STATE:	LOCAL E-TAX:	MISC:	NET PAY:	EARNINGS FOR THIS JOB:	$ -
		$ -	$ -	$ -	$ -	$ -	$ -	$ -	KANSAS CITY EARNINGS TAX THIS JOB	$ -

First Name	Last Name	DATE:	MON	TUES	WED	THUR	FRI	SAT	SUN	TOTAL HRS.	BASE RATE	O.T. RATE	FRINGE RATE	TOTAL
EMPLOYEE NAME:														
ADDRESS:		REG. HRS.								0.00	$ -			$ -
CITY, STATE ZIP:		O.T. HRS.								0.00		$ -		$ -
SOCIAL SECURITY NO.:		D.O.T. HRS.								0.00		$ -		$ -
OCCUPATIONAL TITLE / CLASSIFICATION:							TOTAL FRINGE HOURS			0.00			$ -	$ -
													FRINGE PAID TO: ☐ APPROVED PLAN	$ -
		GROUP:		SKILL GROUP:									☐ EMPLOYEE	$ -

WEEK ALL JOBS:	HOURS:	GROSS EARNINGS:	FEDERAL:	FICA:	STATE:	LOCAL E-TAX:	MISC:	NET PAY:	EARNINGS FOR THIS JOB:	$ -
		$ -	$ -	$ -	$ -	$ -	$ -	$ -	KANSAS CITY EARNINGS TAX THIS JOB	$ -

First Name	Last Name	DATE:	MON	TUES	WED	THUR	FRI	SAT	SUN	TOTAL HRS.	BASE RATE	O.T. RATE	FRINGE RATE	TOTAL
EMPLOYEE NAME:														
ADDRESS:		REG. HRS.								0.00	$ -			$ -
CITY, STATE ZIP:		O.T. HRS.								0.00		$ -		$ -
SOCIAL SECURITY NO.:		D.O.T. HRS.								0.00		$ -		$ -
OCCUPATIONAL TITLE / CLASSIFICATION:							TOTAL FRINGE HOURS			0.00			$ -	$ -
													FRINGE PAID TO: ☐ APPROVED PLAN	$ -
		GROUP:		SKILL GROUP:									☐ EMPLOYEE	$ -

WEEK ALL JOBS:	HOURS:	GROSS EARNINGS:	FEDERAL:	FICA:	STATE:	LOCAL E-TAX:	MISC:	NET PAY:	EARNINGS FOR THIS JOB:	$ -
		$ -	$ -	$ -	$ -	$ -	$ -	$ -	KANSAS CITY EARNINGS TAX THIS JOB	$ -

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

CERTIFIED PAYROLL REPORT

Project Number: 81000999

Project Title: Blue River WWTP Grit Removal and Fine Screens Project

Payroll Number: _____ ☐ **Final**

			WEEK ENDING:			SHEET		of		GRANT AGENCY PROJECT NO.:					
CONTRACTOR:			SUBCONTRACTOR:							DEPT PROJECT OR CONTRACT NO.:					
ADDRESS:			ADDRESS:							LOCATION:					
CITY, STATE ZIP:			CITY, STATE ZIP:							DESCRIPTION:					
FEDERAL I.D. NUMBER:			FEDERAL I.D. NUMBER:												
	First Name	Last Name	DATE:												
EMPLOYEE NAME:				MON	TUES	WED	THUR	FRI	SAT	SUN	TOTAL HRS.	BASE RATE	O.T. RATE	FRINGE RATE	TOTAL
ADDRESS:			REG. HRS.								0.00	$ -			$ -
CITY, STATE ZIP:			O.T. HRS.								0.00		$ -		$ -
SOCIAL SECURITY NO.:			D.O.T. HRS.								0.00		$ -		$ -
OCCUPATIONAL TITLE / CLASSIFICATION:								TOTAL FRINGE HOURS			0.00			$ -	$ -
													FRINGE PAID TO:	☑ APPROVED PLAN	$ -
			GROUP:		SKILL GROUP:									☐ EMPLOYEE	$ -
WEEK ALL JOBS:	HOURS:	GROSS EARNINGS:	FEDERAL:		FICA:		STATE:		LOCAL E-TAX:		MISC:	NET PAY:	EARNINGS FOR THIS JOB:		$ -
		$ -	$ -		$ -		$ -		$ -		$ -	$ -	KANSAS CITY EARNINGS TAX THIS JOB		$ -
	First Name	Last Name	DATE:												
EMPLOYEE NAME:				MON	TUES	WED	THUR	FRI	SAT	SUN	TOTAL HRS.	BASE RATE	O.T. RATE	FRINGE RATE	TOTAL
ADDRESS:			REG. HRS.								0.00	$ -			$ -
CITY, STATE ZIP:			O.T. HRS.								0.00		$ -		$ -
SOCIAL SECURITY NO.:			D.O.T. HRS.								0.00		$ -		$ -
OCCUPATIONAL TITLE / CLASSIFICATION:								TOTAL FRINGE HOURS			0.00			$ -	$ -
													FRINGE PAID TO:	☐ APPROVED PLAN	$ -
			GROUP:		SKILL GROUP:									☐ EMPLOYEE	$ -
WEEK ALL JOBS:	HOURS:	GROSS EARNINGS:	FEDERAL:		FICA:		STATE:		LOCAL E-TAX:		MISC:	NET PAY:	EARNINGS FOR THIS JOB:		$ -
		$ -	$ -		$ -		$ -		$ -		$ -	$ -	KANSAS CITY EARNINGS TAX THIS JOB		$ -
	First Name	Last Name	DATE:												
EMPLOYEE NAME:				MON	TUES	WED	THUR	FRI	SAT	SUN	TOTAL HRS.	BASE RATE	O.T. RATE	FRINGE RATE	TOTAL
ADDRESS:			REG. HRS.								0.00	$ -			$ -
CITY, STATE ZIP:			O.T. HRS.								0.00		$ -		$ -
SOCIAL SECURITY NO.:			D.O.T. HRS.								0.00		$ -		$ -
OCCUPATIONAL TITLE / CLASSIFICATION:								TOTAL FRINGE HOURS			0.00			$ -	$ -
													FRINGE PAID TO:	☐ APPROVED PLAN	$ -
			GROUP:		SKILL GROUP:									☐ EMPLOYEE	$ -
WEEK ALL JOBS:	HOURS:	GROSS EARNINGS:	FEDERAL:		FICA:		STATE:		LOCAL E-TAX:		MISC:	NET PAY:	EARNINGS FOR THIS JOB:		$ -
		$ -	$ -		$ -		$ -		$ -		$ -	$ -	KANSAS CITY EARNINGS TAX THIS JOB		$ -
	First Name	Last Name	DATE:												
EMPLOYEE NAME:				MON	TUES	WED	THUR	FRI	SAT	SUN	TOTAL HRS.	BASE RATE	O.T. RATE	FRINGE RATE	TOTAL
ADDRESS:			REG. HRS.								0.00	$ -			$ -
CITY, STATE ZIP:			O.T. HRS.								0.00		$ -		$ -
SOCIAL SECURITY NO.:			D.O.T. HRS.								0.00		$ -		$ -
OCCUPATIONAL TITLE / CLASSIFICATION:								TOTAL FRINGE HOURS			0.00			$ -	$ -
													FRINGE PAID TO:	☐ APPROVED PLAN	$ -
			GROUP:		SKILL GROUP:									☐ EMPLOYEE	$ -
WEEK ALL JOBS:	HOURS:	GROSS EARNINGS:	FEDERAL:		FICA:		STATE:		LOCAL E-TAX:		MISC:	NET PAY:	EARNINGS FOR THIS JOB:		$ -
		$ -	$ -		$ -		$ -		$ -		$ -	$ -	KANSAS CITY EARNINGS TAX THIS JOB		$ -

Date _____

I, _____, _____
(Name of Signatory Party) (Title)
do hereby state:

(1) That I pay or supervise the payment of the persons employed by (Design-Builder or Subcontractor)_____ on the (Building or work)_____: that during the payroll period commencing on the _____ day of _____, 20___, and ending the _____ day of _____, 20___, all said persons employed on said project have been paid the full weekly wages earned, that no rebates have been or will be made either directly or indirectly to or on behalf of said (Design-Builder or Subcontractor) _____from the full weekly wages earned by any person and that no deductions have been made either directly or indirectly from the full wages earned by any person, other than permissible deductions as defined in Regulations, Part 3 (29 CFR Subtitle A), issued by the Secretary of Labor under the Copeland Act, as amended (48 Stat. 948.63 Stat. 108, 72 Stat. 967; 76 Stat. 357; 40 U.S.C. 276c), and described below:

_____

_____

_____

_____

(2) That any payrolls otherwise required under this contract to be submitted for the above period are correct and complete; that the wage rates for laborers or mechanics contained herein are not less than the applicable wage rates contained in any wage determination incorporated into this contract; that the classifications set forth herein for each laborer or mechanic conform to the work he performed.

(3) That any apprentices employed in the above period are duly registered in a bona fide apprenticeship program registered with a State apprenticeship agency recognized by the Bureau of Apprenticeship and Training, United States Department of Labor, or if no such recognized agency exists in a State, are registered with the Bureau of Apprenticeship and Training, United States Department of Labor.

(4) That:

(a) WHERE BENEFITS ARE PAID TO APPROVED PLANS, FUNDS, OR PROGRAMS

❑ In addition to the basic hourly wage rates paid to each laborer or mechanic listed in the above referenced payroll, consisting of _____ pages, payments of fringe benefits as listed in the contract have been or will be made to appropriate programs for the benefit of such employees, exceptions noted in 4 (c) below.

(b) WHERE BENEFITS ARE PAID IN CASH

❑ Each laborer or mechanic listed in the above referenced payroll, consisting of _____ pages, has been paid, as indicated on the payroll, in an amount not less than the sum of the basic hourly wage rate plus the amount of the required fringe benefits as listed in the contract, except as noted in Section 4 (c) below.

(c) EXCEPTIONS

EXCEPTION (CRAFT)	EXPLANATION

REMARKS

NAME AND TITLE	SIGNATURE

The willful falsification of any of the above statements may subject the Design-Builder or Subcontractor to civil or criminal prosecution. See Section 1001 of Title 18 Section 231 of Title 31 of the United States Code.

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

SUBCONTRACTORS AND MAJOR MATERIAL SUPPLIERS LIST

Project Number 81000999 Project Title Blue River WWTP Grit Removal and Fine Screens Project

From Contractor _____ To _____ Date _____

Spec. No.	Section Title	4	Firm, Address (Check box if Supplier)	Phone, FAX and e-mail	Contact
			Environmental Advisors & Engineers 19211 W 64th Terr Shawnee, KS 66218	913.599.4326	Douglas Swift
			TREKK Design Group 1411 East 104th St Kansas City, MO 64131	816.874.4655	Justin Likes
			TSi Geotechnical, Inc 8248 NW 101st Terr, Ste 5 Kansas City, MO 64133	816.839.5505	Andrew DeClue

❑ Attachments:

Signed by: _____ Date February 13, 2025

Distribution: ❑ Owner ❑ Contractor ❑ Construction Manager ❑ Design Professional ❑ Consultant ❑ Other

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

SUBCONTRACTORS AND MAJOR MATERIAL SUPPLIERS LIST

Project Number 81000999 Project Title Blue River WWTP Grit Removal and Fine Screens Project

From Contractor _____ To _____ Date February 13, 2025

Spec. No.	Section Title	4	Firm, Address (Check box if Supplier)	Phone, FAX and e-mail	Contact
			Richardson Hauling 14800 E Kentucky Rd Independence, MO 64050	816.252.0664	Dianna Richardson
			Genesis 8422 S 7th Hwy Blue Springs, MO 64104	816.229.5900	Shaun Thomas
			CJ Industries 610 S 78th St, Ste 1 Kansas City, KS 66111	913.788.1104	Mindy Rocha
			Whatever It Takes Electrical Contractors (WITEC) 9709 East 56th St Raytown, MO 64133	816.743.0770	John Rolls
			Custom Engineering 12760 East US Highway 40 Independence, MO 64055	816.350.1473	Joseph Davis
			DuBois Consultants 7611 State Line Road, Ste 103 Kansas City, MO 64114	816.333.7700	Cervente Sudduth

❑ Attachments:

Signed by: _____ Date February 13, 2025

Distribution: ❑ Owner ❑ Contractor ❑ Construction Manager ❑ Design Professional ❑ Consultant ❑ Other

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

SUBCONTRACTORS AND MAJOR MATERIAL SUPPLIERS LIST

Project Number 81000999 Project Title Blue River WWTP Grit Removal and Fine Screens Project

From Contractor _____ To _____ Date _____

Spec. No.	Section Title	4	Firm, Address (Check box if Supplier)	Phone, FAX and e-mail	Contact

❑ Attachments:

Signed by: _____ Date _____

Distribution: ❑ Owner ❑ Contractor ❑ Construction Manager ❑ Design Professional ❑ Consultant ❑ Other

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

DAILY LABOR FORCE REPORT

Project Number 81000999 Day _____ Date _____
Project Title Blue River WWTP Grit Removal and Fine Screens Project
Contractor or Design-Builder _____
Subcontractor _____

Weather: (Indicate if weather prevented work and why) _____

Shift: (circle) 5–8 hr Days 4–10 hr Days Other _____

* This report *MUST be completed and turned in* for EACH DAY until FINAL COMPLETION.

Worker's Full Legal Name	**Occupational Title or Classification Group & Skill**	**Hours Worked & Time (i.e. 10AM – 4PM)**	**Race & Gender**

I CERTIFY THAT ALL OF THE INFORMATION PROVIDED ABOVE IS TRUE AND COMPLETE.
Contractor/Subcontractor Representative:

Complete Name: (print) _____ Title: (print) _____

Signature: _____ Page ____ of ____

Distribution: ❑ City Department ❑ Contractor ❑ Subcontractor ❑ Other

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

CERTIFICATE OF SUBSTANTIAL COMPLETION

Project Number 81000999

Project Title Blue River WWTP Grit Removal and Fine Screens Project

CONTRACT FOR: _____

CONTRACTOR: _____

DATE OF ISSUANCE: _____

PROJECT OR DESIGNATED PORTION SHALL INCLUDE:

The Work performed under this Contract has been reviewed and found, to the Design Professional's and/or Construction Manager's best knowledge, information and belief, to be substantially complete. Substantial Completion is the state in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the Work for its intended use. The date of Substantial Completion of Project or portion thereof designated above is hereby established as _____ which is also the date of commencement of applicable warranties required by the Contract Documents, except as stated below:

A list of items to be completed or corrected is attached hereto. The failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

CONSTRUCTION MANAGER	BY	DATE
DESIGN PROFESSIONAL	BY	DATE

The Contractor will complete or correct the Work on the list of items attached hereto within _____ days from the above date of Substantial Completion.

CONSTRUCTION MANAGER	BY	DATE
DESIGN PROFESSIONAL	BY	DATE

The Owner accepts the Work or designated portion thereof as substantially complete and will assume full possession thereof at _____ (time) on _____(date).

OWNER'S REPRESENTATIVE	BY	DATE

Distribution:
- ❑ Owner
- ❑ Contractor
- ❑ Construction Manager
- ❑ Design Professional
- ❑ Consultant _____
- ❑ Other _____

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

PUNCH LIST

Project Number 81000999

Project Title Blue River WWTP Grit Removal and Fine Screens Project

CONTRACTOR _____

From _____ Site Visit Date _____

The following items require the attention of the CONTRACTOR for completion or correction. This list may not be all-inclusive, and the failure to include any items on this list does not alter the responsibility of the CONTRACTOR to complete all Work in accordance with the Contract Documents.

Item No.	Location (Area)	Description	Correction/ Completion Date	Verification Check

❑ Attachments

Signed by: _____ Date: _____

DESIGN PROFESSIONAL (Firm/In House)

Distribution:
- ❑ OWNER
- ❑ CONTRACTOR
- ❑ DESIGN PROFESSIONAL
- ❑ Consultant _____
- ❑ Other _____

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

CONTRACTOR AFFIDAVIT FOR FINAL PAYMENT

Project Number 81000999

Project Title Blue River WWTP Grit Removal and Fine Screens Project

STATE OF _____)
)SS
COUNTY OF _____)

The Undersigned, _____ of lawful
(Name)
age, being first duly sworn, states under oath as follows:

1. I am the _____ of _____who is the general
(Title) (CONTRACTOR)
CONTRACTOR for the CITY on Project No. _____ and Project Title _____.

2. All payrolls, material bills, use of equipment and other indebtedness connected with the Work for this Project have been paid and all Claims of whatever nature have been satisfied, as required by the Contract.

3 (✓) ____Prevailing wage does not apply; or

(✓) ____All provisions and requirements set forth in Chapter 290, Section 290.210 through and including 290.340, Missouri Revised Statutes, pertaining to the payment of wages to workmen employed on public works projects have been fully satisfied and there has been no exception to the full and complete compliance with these provisions and requirements and the Annual Wage Order contained in the Contract in carrying out the Contract and Work. CONTRACTOR has fully complied with the requirements of the prevailing wage law as required in the Contract and has attached affidavits from all Subcontractors on this Project, regardless of tier, affirming compliance with the prevailing wage law as stipulated in the Contract.

4. I hereby certify that (a) at project completion and pursuant to contractor's final request for payment, contractor achieved (_____%) Minority Business Enterprise (MBE) participation and (_____%) Women Business Enterprise (WBE) participation on this contract, and (b) listed herein are the names of all certified M/WBE subcontractors, regardless of tier, with whom I, or my subcontractors contracted.

1. Name of MBE/WBE Firm _____
Address _____
_____
Telephone Number (_____) _____
IRS Number _____
Area/Scope*of Work _____
Subcontract Final Amount _____

2. Name of MBE/WBE Firm _____
Address _____
_____
Telephone Number (_____) _____
IRS Number _____
Area/Scope*of Work _____
Subcontract Final Amount _____

List additional subcontractors, if any, on a similar form and attach to the bid.

Supplier** Final Amount: _____

*Reference to specification sections or bid item number.

(✓) ____ Met or exceeded the Contract utilization goals; or
(✓) ____ Failed to meet the Contract utilization goals (attach waiver, substitution or modification); or
(✓) ____ No goals applied to this Project.

5. CONTRACTOR certifies that each Subcontractor has received full payment for its respective work in connection with the Contract.

6. If applicable, I hereby certify that (a) at project completion and pursuant to contractor's final request for payment, contractor achieved, company-wide, at least ten percent (10%) minority workforce participation and two percent (2%) women workforce participation and (2) a true and accurate copy of my final project workforce monthly report (HRD Form 00485.02 and final company-wide workforce monthly report (HRD Form 00485.03) are attached. **NOTE: This paragraph is only applicable if you completed a construction contract that was estimated by the City, prior to solicitation, as requiring more than 800 construction labor hours and costing in excess of $324,000.01. If applicable you MUST attach copies of your final monthly workforce reports.**

7. This affidavit is made in behalf of the CONTRACTOR for the purpose of securing from Kansas City, Missouri, the certification of completion of the Project and receiving payment therefore.

8. If the Contract amount exceeded $150,000, CONTRACTOR has submitted proof of compliance with the City tax ordinances administered by the City's Commissioner of Revenue and has on file proof of tax compliance from all Subcontractors. If the Contract term exceeded one (1) year, CONTRACTOR has provided proof of compliance with the City tax ordinances administered by the City's Commissioner of Revenue prior to receiving final payment and has on file proof of tax compliance from all Subcontractors prior to the Subcontractor receiving final payment from CONTRACTOR.

CONTRACTOR_____

By _____
(Authorized Signature)

Title _____

On this _____ day of _____, _____, before me

appeared _____, to me personally known to be the

_____of the_____,

and who executed the foregoing instrument and acknowledged that (s)he executed the same on behalf of

_____ as its free act and deed.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal on the day and year first above written.

My commission expires:

_____ _____
Notary Public

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

SUBCONTRACTOR AFFIDAVIT FOR FINAL PAYMENT

Project Number 81000999

Project Title Blue River WWTP Grit Removal and Fine Screens Project

STATE OF MISSOURI)

) ss:

COUNTY OF _____)

After being duly sworn the person whose name and signature appears below hereby states under penalty of perjury that:

1. I am the duly authorized officer of the business indicated below (hereinafter Subcontractor) and I make this affidavit on behalf of Subcontractor in accordance with the requirements set forth in Section 290.290, RSMo. Subcontractor has completed all of the Work required under the terms and conditions of a subcontract as follows:

Subcontract with: _____, Contractor

Work Performed: _____

Total Dollar Amount of Subcontract and all Change Orders: $_____

City Certified ☐MBE ☐ WBE ☐ DBE ☐ NA
List certifications: _____

2. Subcontractor fully complied with the provisions and requirements of the Missouri Prevailing Wage Law set forth in Sections 290.210, RSMo through 290.340, RSMo.

Business Entity Type:
(___) Missouri Corporation
(___) Foreign Corporation
(___) Fictitious Name Corporation
(___) Sole Proprietor
(___) Limited Liability Company
(___) Partnership
(___) Joint Venture
(___) Other (Specify)

Subcontractor's Legal Name and Address

_____

_____

Phone No. _____
Fax: _____
E:mail: _____
Federal ID No. _____

I hereby certify that I have the authority to execute this affidavit on behalf of Subcontractor.

By: _____ _____
(Signature) (Print Name)

_____ _____
(Title) (Date)

NOTARY

Subscribed and sworn to before me this _____ day of _____, 20_____.

My Commission Expires:_____ By_____

_____ _____
Print Name Title

SECTION 01300 – SUBMITTALS

PART 1 - GENERAL

1.01 SUMMARY

A. This section provides for the submittals required by Owner prior to the start of Work and, as required, for the duration of the Work.

B. All submittals shall be clearly identified by reference to a specification section and/or detail drawing. Submittals shall be clear and legible and shall include sufficient presentation of the data.

C. No portion of the Work requiring a shop drawing, product data or sample shall be started nor shall any materials be fabricated or installed prior to the completion of the submittal process described herein. Fabrication performed, purchased materials or onsite construction accomplished prior to completing the submittal process as defined herein shall be at the Design-Builder's sole risk. Owner shall not be liable for any expense or delay to complete the submittal process.

1.02 RELATED SECTIONS

A. Section 01019 – Closeout Procedures.
B. Section 01020 – Record Documents.
C. Section 01021 – Operation and Maintenance Data.
D. Section 01140 – Work Restrictions.
E. Section 01320 – Construction Progress Documentation.
F. Section 01322 – Photographic and Video Documentation.
G. Section 01335 – Document Management.
H. Section 01340 – Project BIM Coordination.
I. Section 01352 – Selective Alterations and Demolition
J. Section 01354 – Hazardous Material Procedures.
K. Section 01400 – Quality Control.
L. Section 01433 – Manufacturer's Field Services.
M. Section 01480 – Water Tightness.
N. Section 01500 – Temporary Facilities.
O. Section 01566 – Cleanup Operations.
P. Section 01570 – Temporary Erosion & Sediment Control.
Q. Section 01580 – Project Signs.
R. Section 01581 – Public Communications.
S. Section 01600 – Product Delivery Storage and Handling.
T. Section 01664 – Training.
U. Section 01757 – Commissioning.

1.03 GENERAL INFORMATION

A. Definitions:
   1. Administrative Submittals are those nontechnical Submittals required by the Contract Documents or deemed necessary for administrative records. These Submittals include maintenance agreements, Bonds, Project photographs, physical work records, statements of applicability, copies of industry standards, Project record data, schedules, security/protection/safety data, and similar type Submittals.
   2. Certificates: Describe certificates that document affirmations by the Design-Builder or other entity that the quality of workers' certifications and work is in accordance with the

Contract Documents. Certificates and guarantees are those Submittals on Equipment and Materials where a written certificate or guarantee from the manufacturer or Supplier is called for in the Specifications.

3. Extra stock materials: Describe extra stock materials to be provided for the Owner's use in facility operation and maintenance.
4. Informational Submittals are those technical reports, administrative Submittals, certificates, and guarantees not defined as Shop Drawings, product data, or Samples. Technical reports include laboratory reports, tests, technical procedures, technical records, and Design-Builder's design analysis.
5. Manufacturer's Instructions: Instructions, stipulations, directions, and recommendations issued in printed form by the manufacturer of a product addressing handling, installation, erection, and application of the product; manufacturers' instructions are not prepared especially for the Work.
6. Maintenance material submittals: Use this article to categorize maintenance materials submittals requiring no action other than confirmation of receipt under an explanatory heading.
7. Product data: Product data usually consists of manufacturers' printed data sheets or catalog pages illustrating the products to be incorporated into the project. Illustrations, standard schedules, performance charts, brochures, diagrams and other information to illustrate materials or equipment for some portion of the Work. Product data includes standard printed information on materials, products, and systems; not custom-prepared for this Project, other than the designation of selections from available choices. It includes such items as the manufacturer's product specification and installation instructions, availability of colors and patterns, manufacturer's printed statements of compliances and applicability, roughing-in diagrams and templates, catalog cuts, product photographs, standard wiring diagrams, printed performance curves and operational-range diagrams, production or quality control inspection and test reports and certifications, mill reports, product operating and maintenance instructions and recommended spare-parts listing and printed product warranties, as applicable to the Work.
8. Samples: Samples specified in individual Sections, include, but are not necessarily limited to, physical examples of the work such as sections of manufactured or fabricated work, small cuts or containers of materials, complete units of repetitively-used products, color/texture/pattern swatches and range sets, specimens for coordination of visual effect, graphic symbols and units of work to be used by the Design-Builder or Owner for independent inspection and testing, as applicable to the Work. They are physical examples which illustrate materials, equipment, or workmanship and establish standards by which the Work will be judged. Samples are full-size actual products intended to illustrate the products to be incorporated into the project. Sample submittals are often necessary for such characteristics as colors, textures, and other appearance issues. Samples include both fabricated and physical examples of materials, products, and Work; both as complete units and as smaller portions of units of Work; either for limited visual inspection or (where indicated) for more detailed testing and analysis. Mock-ups are a special form of Samples which are too large to be handled in the specified manner for transmittal of Sample Submittals.
9. Shop drawings: Shop drawings are prepared specifically for the project to illustrate details, dimensions, and other data necessary for satisfactory fabrication or construction that are not shown in the contract documents. Shop drawings could include graphic line-type drawings, single-line diagrams, or schedules and lists of products and their application. Shop Drawings include custom-prepared data of all types including

drawings, diagrams, performance curves, material schedules, templates, instructions, and similar information not in standard printed form applicable to other projects.

10. Spare parts: Describe spare parts necessary for the Owner's use in facility. operation and maintenance; identify the type and quantity here, but include the actual characteristics of the spare parts in Product as part of the specification of the product.
11. Tools: Tools are generally defined as items such as special wrenches, gauges, circuit setters, and other similar devices required for the proper operation or maintenance of a system that would not normally be in the Owner's tool kit.

B. Quality Requirements:
   1. Design-Builder shall submit Shop Drawings and Samples in accordance with Contract Documents.
   2. Submittals such as Shop Drawings and product data shall be of suitable quality for legibility and reproduction purposes. Every line, character and letter shall be clearly legible. Drawings shall be useable for further reproduction to yield legible hard copies.
   3. All submittals by subcontractors shall be sent directly to Design-Builder for checking. Design-Builder shall be responsible for their submission at the proper time to prevent delays.
   4. Design-Builder shall check all Subcontractors' submittals regarding measurements, sizes, materials and details to determine and verify that they meet the requirements of the Contract Documents. Submittals found to be inaccurate or otherwise in error shall be returned to the Subcontractors for correction before submission to Owner.
   5. Certificates of Compliance: Where indicated in these specifications, each submittal shall include a certificate of compliance prepared by the manufacturer or Supplier of the submitted data, certifying that the item covered complies with Contract Documents. The certificate of compliance shall be a separate document and shall include identification of all deviations, if any, from the Contract Documents.

C. Submittal Completeness:
   1. Design-Builder shall accept full responsibility for the completeness of each submission. When an item consists of components from several sources, Design-Builder's initial submittal on the item shall include all components.
   2. Submittals shall be complete with respect to dimensions, design criteria, materials of construction and other information specified to enable the Owner or Designee to review the information effectively.
   3. Partial submittals will not be reviewed. Owner will be the sole judge as to the completeness of a submittal. Incomplete submittals will be returned to Design-Builder without review and will be considered "Rejected" until resubmitted with adequate and complete information. Owner may at his option provide a list of the areas that are incomplete.
   4. Where standard drawings are furnished which cover several variations of the general class of Equipment, each drawing shall be annotated to indicate exactly which parts of the drawing apply to the Equipment being furnished. Use hatch marks to indicate variations that do not apply to the Submittal. The use of "highlighting markers" will not be an acceptable means of annotating Submittals. Annotation shall also include proper identification of the Submittal permanently attached to the drawing. Edit all submittals so that the submittal specifically applies to only the equipment furnished. Neatly cross out all extraneous text, options, models, etc. that do not apply to the equipment being furnished, so that the information remaining is only applicable to the equipment being furnished. Pages containing all extraneous information should not be include in the submittal.

D. Form of Submittals:

1. Unless specifically required in this Section, by Owner, or elsewhere in the Contract Documents, each submittal shall be made in an electronic format. Design-Builder shall provide read rights and download capability for Owner to access Design-Builder's web-based document management system. Design-Builder shall provide capabilities for hard copies of all submittals to be available to Owner at end of Project.
2. Samples shall be submitted via hard copy as described in this Section and using the Owner's Transmittal Letter provided as Section 01330.01 – Letter of Transmittal. Other submittals that include large format drawings or very lengthy documents may be considered by the Owner for hard copy distribution. Hard copy submittals, except for material samples, will not be accepted by the Owner without prior approval.
3. Each electronic file shall include a copy of the Owner's standard Transmittal Letter provided as Section 01330.01 – Letter of Transmittal. Hard copy files, if required by Specifications, shall also include Owner's standard Transmittal Letter which shall be scanned and submitted electronically for record of transmittal of submittal and disposition.
4. Owner will reject any submittal that is not electronically submitted, unless otherwise permitted by the Owner.
5. Design-Builder shall provide the Owner with the authorization to reproduce and/or redistribute each file as many times as necessary for the project.
6. Design-Builder shall include all costs for preparation of electronic copies of the submittal in its pricing, including all re-submittals, record copies, and final copies.
7. Where multiple submittals are required, provide a separate submittal for each specification section.
8. In order to expedite construction, Design-Builder may make more than 1 submittal per specification section, but a single submittal may not cover more than 1 specification section:
   (a) The only exception to this requirement is when one specification section covers the requirements for a component of equipment specified in another section.
9. Design-Builder shall provide a Schedule of Submittals that is suitable for upload to the Owner's Document Management program.
10. Electronic Format:
    (a) Transmit Submittals and Project documents utilizing:
        (i) Adobe ".pdf" files created directly from native electronic format or Owner - approved equal file type and format. Use the latest Adobe version available at the time of execution of the Contract for Progressive Design-Build Services.
        (ii) General information shall be added to each PDF file, including Title, Subject, Author, and Keywords
        (iii) Electronic submittal ".pdf" files are not to be combined files or collections of files/drawings. Each drawing document must stand alone.
        (iv) Each file will be right reading and oriented the same for all consecutive resubmissions.
        (v) For any given Submittal, the filename and format shall be consistent for initial submission and subsequent revisions of the same. Use consistent naming convention throughout. Reference to revision or dates shall not be included in a filename.
        (vi) Files greater than 5 pages shall have table of contents with bookmarks for each section. The Sections shall have easily understood names.
        (vii) Submittals not meeting the above criteria are subject to rejection.

(viii) Provide Record Documents, equipment instruction books and operating and maintenance manuals and any other documents, as required, in a file type and format approved by Owner.
(ix) PDF files shall be unsecured, unencrypted, and not password protected.
(x) The following actions within Adobe Acrobat shall be allowed: printing, content copying or extraction, extraction for access, commenting, fitting for form fields, signing, and creation of duplicate information.
(xi) The PDF files shall be set up to print legibly at either 8-1/2-inch by 11-inch, 11-inch by 17-inch, or 22-inch by 34-inch paper sizes. No other paper sizes will be accepted.
(xii) New electronic files shall be required for each re-submittal.

11. Non-electronic Format:
    (a) Selected Submittals may be provided in paper (hard copy), as well, only with advance approval of Owner and using procedures specified herein.
    (b) Equipment instruction books and operating manuals shall be provided in hard copies in addition to the specified electronic format.
12. Attachments:
    (a) Specification section: Include with each submittal reference to the relevant specification section, including relevant addenda updates.
        (i) Provide a list of all numbered deviations with a clear explanation and reason for the deviation.
    (b) Drawings: Include with each submittal a reference to the relevant Drawing, including relevant addenda updates.
        (i) Provide a list of all numbered deviations with a clear explanation and reason for the deviation.
        (ii) Provide field dimensions and relationship to adjacent or critical features of the Work or materials.

E. Design-Builder shall prepare submittal information in sufficient detail to show compliance with specified requirements.
    1. Determine and verify quantities, field dimensions, product dimensions, specified design and performance criteria, materials, catalog numbers, and similar data.
    2. Show dimensions, construction details, wiring diagrams, controls, manufacturers, catalog numbers, and all other pertinent details.
    3. Coordinate submittal with other submittals and with the requirements of the Contract Documents.
    4. Indicate project designated equipment tag numbers from P&IDs for submittal of devices, equipment, and assemblies.
        (a) Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
    5. Check, verify, and revise submittals as necessary to bring them into conformance with Contract Documents and actual field conditions.
F. Prepare submittals in the English language. Do not include information in other languages.
G. Present measurements in customary American units (feet, inches, pounds, etc.).
H. Submittals such as Shop Drawings and Product Data shall be of suitable quality for legibility and reproduction purposes. Every line, character, and letter shall be clearly legible. Drawings shall be useable for further reproduction to yield legible hard copy.
I. Transmittal of Submittals:
    1. Submittal register shall be uploaded prior the transmission of the first submittal.
    2. All submittals, regardless of origin, shall be stamped with the approval of Design-Builder and identified with the name and number of this Contract, Design-Builder's name,

references to applicable specification paragraphs and Contract Drawings and version of the submittal. Submittals can be named for their specification if the submittals cover the full scope of work in said specification.

3. Indicate on Transmittal Letter if submittals are a "Priority".
4. Each submittal shall indicate the intended use of the item in the Work. When catalog pages are submitted, applicable items shall be clearly identified and inapplicable data crossed out. The current revision, issue number and date shall be indicated on all drawings and other descriptive data. Design-Builder's stamp of approval is a representation to Owner that the Design-Builder accepts full responsibility for determining and verifying all quantities, dimensions, field construction criteria, materials, catalog numbers and similar data, and Design-Builder has reviewed and coordinated each submittal with the requirements of the Work and the Contract Documents.
   (a) Electronic Submittals –Design-Builder shall utilize Owner's document management system as specified in Section 01335 – Document Management for managing, tracking and storing documents associated with the Project. If an internet-based document management system is to be used, additional requirements are provided in Section 01335 – Document Management. Design-Builder shall comply with the file protocols and procedures for the document management system.
   (b) Approved submittals shall be tagged per Owner's metadata tagging standard and provided to Owner as part of the Electronic O&M Manual in accordance with Section 01021 – Operation and Maintenance Data.
   (c) Document Management can be found in Section 01335 – Document Management.

J. In order to allow for expedited review submittals Design-Builder shall conduct Expedited Submittal Review Meetings in accordance with Section 01320 – Construction Progress Documentation.

1.04 CONSTRUCTION SUBMITTALS

A. For Submittals subject to Owner's review, submit to Owner for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.
B. Project work, materials, fabrication, and installation shall conform to approved shop drawings, applicable samples, and product data.
C. Shop Drawings:
   1. All shop drawings submitted by Subcontractors for approval shall be sent directly to Design-Builder for checking. Design-Builder shall be responsible for their submission at the proper time to prevent delays in delivery of materials.
   2. The data shall include drawings, descriptive information, sufficient detail to show the kind, size, arrangement and operation of component materials and devices; the external connections, anchorages and supports required; performance characteristics; and dimensions needed for installation and correlation with other materials and equipment.
   3. All deviations from the Contract Documents shall be identified on each submittal and shall be tabulated in Design-Builder's letter of transmittal. A Letter of Transmittal is provided in Section 01330.01 – Letter of Transmittal. Such submittals shall, as pertinent to the deviation, indicate essential details of all changes proposed by Design-Builder (including modifications to other facilities that may be a result of the deviation) and all required piping and wiring diagrams.
   4. Design-Builder to field verify elevation, coordinates, and pipe material for pipe tie-in prior to the preparation of shop drawings.
   5. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

6. Details:
   (a) Fabrication drawings: drawn to scale and dimensioned.
   (b) Front, side, and, rear elevations, and top and bottom views, showing all dimensions.
   (c) Locations of conduit entrances and access plates.
   (d) Component layout and identification.
   (e) Weight.
   (f) Finish.
   (g) Temperature limitations, as applicable.
   (h) Nameplate information.

D. Product Data and Manufacturer's Instructions:
   1. Product data as specified in individual Sections, include, but are not necessarily limited to, standard prepared data for manufactured products (sometimes referred to as catalog data), such as the manufacturer's product specification and installation instructions, availability of colors and patterns, manufacturer's printed statements of compliances and applicability, roughing-in diagrams and templates, catalog cuts, product photographs, standard wiring diagrams, printed performance curves and operational-range diagrams, production or quality control inspection and test reports and certifications, mill reports, product operating and maintenance instructions and recommended spare-parts listing and printed product warranties, as applicable to the Work.
   2. Manufacturer's Instructions, when made available by manufacturers, and installation, erection, or application in accordance with manufacturer's instructions are required, prior to installation, erection, or application of equipment and other project components.
   3. Submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, to Owner in quantities specified for Product Data.
   4. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.
   5. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
   6. If applicable, submittals for equipment shall include a listing of all installations where identical or similar equipment has been installed and been in operation for a period of at least one year.
   7. Indicate product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
   8. Excise or cross out non-applicable information and clearly mark applicable information with citations to and terminology consistent with Contract Documents.
   9. Details:
      (a) Supplier name and address.
      (b) Subcontractor name and address.
   10. Include:
      (a) Catalog cuts.
      (b) Bulletins.
      (c) Brochures.
      (d) Manufacturer's Certificate of Compliance: signed by product manufacturer along with supporting reference data, affidavits, and tests, as appropriate.
         (i) Manufacturer's printed recommendations for installation of equipment.
      (e) Quality photocopies of applicable pages from manufacturer's documents.
   11. Completely fill out a Motor Data Sheet, for every motor furnished:
      (a) Submit one copy of the Motor Data Sheet to the Owner for review as part of the asset management data.

E. Samples:

1. Samples specified in individual Sections, include, but are not necessarily limited to, physical examples of the work such as sections of manufactured or fabricated work, small cuts or containers of materials, complete units of repetitively used products, color/texture/pattern swatches and range sets, specimens for coordination of visual effect, graphic symbols and units of work to be used by Owner or Designee for independent inspection and testing, as applicable to the Work.
2. Samples for selection as specified in product sections:
   (a) Submit to Owner for aesthetic, color, or finish selection.
   (b) Submit samples of finishes, textures, and patterns for Owner selection.
3. Submit samples to illustrate functional and aesthetic characteristics of products, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
4. Include identification on each sample, with full Project information.
   (a) Clearly label samples to indicate any that represent non-standard colors, materials, products, or equipment lines and that if selected, will require an increase in Contract Time or Contract Price.
5. Submit number of samples specified in individual specification sections; Owner will retain two samples.
6. Reviewed samples which may be used in the Work are indicated in individual specification sections.
7. Samples will not be used for testing purposes unless specifically stated in specification section.

F. Design Data:
1. Submit for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.
2. Defined in technical sections.
3. Calculations must bear the original seal and signature of a Professional Engineer licensed in the State of Missouri and who provided responsible charge for the design.

G. Operation and Maintenance Manuals:
1. Design-Builder shall submit all Operation and Maintenance Data and Manuals as required by Section 01019 – Closeout Procedures and Section 01021 – Operation and Maintenance Data.
2. Equipment instruction books and operating manuals shall be provided in hard copies in addition to specified electronic format.

H. Survey Data:
1. All field books, notes, videotapes, and other data developed by Design-Builder in performing surveys required as part of the Work and in accordance with Section 01020 – Record Documents shall be available to Owner for examination throughout the construction period.
2. All such data shall be submitted to Owner with the other documentation required for final acceptance of the Work.

I. Certificates:
1. Certificates are statements printed on the manufacturer's or supplier's letterhead and signed by responsible officials of manufacturer of product, system or material. Certifications shall provide a clear statement that the product, system or material meets the specified requirements of Contract Documents. All certificates shall be dated after the Effective Date of the contract and shall clearly indicate the project name and project number.
2. When specified in individual specification sections, submit certification by manufacturer, installation/application subcontractor, or Design-Builder to Owner, in quantities specified for Product Data.

3. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
4. Certificates may be recent or previous test results on material or product, but must be acceptable to Owner.

J. Test Reports:
1. Submit test reports for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.
2. Include the following information:
(a) A description of the test.
(b) List of equipment used.
(c) Name of the person conducting the test.
(d) Date and time the test was conducted.
(e) Ambient temperature and weather conditions.
(f) All raw data collected.
(g) Calculated results.
(h) Clear statement if the test passed or failed the requirements stated in Contract Documents.
(i) Signature of the person responsible for the test.

K. Manufacturer's Field Reports:
1. Provide and submit Manufacturer's Field Reports in accordance with Section 01433 – Manufacturer's Field Services.
2. Provide access to Owner in Design-Builder's document control system.
3. Submit reports electronically on a monthly basis to Owner for information.
4. Submit for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

L. Qualifications and Qualification Statements:
1. As required in Division 01 sections and Technical Sections.
2. Licensing documentation.
3. Certification documentation.
4. Education documentation.

M. Operational Control Change Plans (OCCPs):
1. Design-Builder shall prepare OCCPs as required in Section 01140 – Work Restrictions for any required temporary shutdown, bypass, etc.
2. Design-Builder shall schedule submittal of OCCPs to:
(a) Provide minimum of two-week duration between approved OCCP and required implementation. This provides Owner sufficient time for preparation.
(b) Provide Owner sufficient time to review each submitted draft OCCP per Section 01140.02 – Operational Change Control Plan Documents.

N. Record Documents
1. Per Section 01020 – Record Documents.

O. Survey Data
1. All field books, notes, videotapes, and other data developed by Design-Builder in performing surveys required as part of the Work shall be available to Owner for examination throughout the construction period.
2. All such data shall be submitted to Owner with the other documentation required for final acceptance of the Work.

1.05 ADMINISTRATIVE SUBMITTALS

A. As required in other Division 01 Sections.
B. Submittals include, but are not limited to, the following:

1. Daily Field Observation Report (Section 01320.01).
2. Periodic Field Observation Report (Section 01320.02).
3. Weekly Report of Working Days (Section 01320.03).
4. Daily Labor Force Report (Section 01290.11).
5. Subcontractors and Major Suppliers List (Section 01290.09).
6. Operational Change Control Plans (Section 01140.02).
7. Material Location Reports.
8. Field Condition Reports.
9. Special Reports.
10. Stormwater Pollution Prevention Plan in accordance with Section 01570 – Temporary Erosion and Sediment Control and other compliance or regulatory-required submittals.
11. Civil Rights and Equal Employment Opportunity (CREO) forms.

C. Design-Builder shall upload reports to Owner's web-based document management system as required by the specifications and Section 01335 – Document Management.

1.06 SCHEDULES

A. Provide all schedules and schedule reports required by the General Conditions and as specified in Section 01290 – Payment Procedures and Change Management and Section 01320 – Construction Progress Documentation.

1.07 COMMISSIONING SUBMITTALS

A. Provide commissioning and training Submittals as specified in Section 01757 – Commissioning.

1.08 CONSTRUCTION PROGRESS PHOTOGRAPHS AND VIDEOS

A. Design-Builder shall submit photographs and videos documenting site conditions before construction and progress photographs through construction in accordance with Section 01322 – Photographic and Video Documentation.

B. Each month submit photographs prior to Monthly Progress Meeting (see Section 01320 – Construction Progress Documentation for more information about meetings).

C. Design-Builder shall identify construction progress photographs and videos for incorporation in the final BIM and Electronic O&M Manual as described in Section 01020 – Record Documents and Section 01021 – Operation and Maintenance Data. Photos will be tagged per asset (Parent and Child).

D. Photos and Videos documenting assets that will not be visible during the Acceptance inspection shall have their record photos taken prior to be obscured by backfill, equipment installation, gypsum board installation, etc. Record photos shall have metadata tags per KC Water standards.

1.09 WARRANTY and BONDS and CLOSEOUT SUBMITTALS

A. Provide warranties and bonds as specified in Section 01019 – Closeout Procedures. Warranties and bonds are considered Administrative Submittals and Product Data.

1.10 PHASE 2 SCHEDULE OF VALUES

A. Design-Builder shall prepare and submit to Owner for approval by the Preconstruction Conference, a proposed Phase 2 Schedule of Values in accordance with Article 2 of the General Conditions and Section 01290 – Change Management and Payment Procedures.

B. An unbalanced schedule of values providing for overpayment of Design-Builder on items of Work which would be performed first will not be approved. The Phase 2 Schedule of Values shall be revised and resubmitted until acceptable to Owner. Final acceptance by Owner shall

indicate only consent to the Phase 2 Schedule of Values as a basis for preparation of applications for progress payments and shall not constitute an agreement as to the value of each indicated item.

1.11 REQUESTS FOR INTERPRETATION

A. Requests for Interpretation (RFIs): Design-Builder may issue RFIs to request clarifications. If an RFI requires Owner input, use Owner's RFI form available as Section 00930 – Request for Interpretation, within the Owner's document management system; number RFIs consecutively and add a consecutive letter to RFI number on modified submittals of the same item (i.e., RFI-4A); Owner will respond on the same form. For each RFI, allow 21 calendar days excluding delivery time to and from Design-Builder for Owner to respond. In the event that Design-Builder identifies an RFI as critical to the progress of the Project, Owner will make every effort to reduce the review time of the RFI.

B. Design-Builder shall maintain an RFI log on the document management system and assign numbers. Log shall be available to Owner to review at any time and include the following fields:
   1. RFI Number.
   2. Issue date.
   3. Description of issue and response.
   4. Response date

1.12 SUPPLEMENTAL DESIGN INSTRUCTION

A. Owner may request minor changes in Work that do not change Contract Price or Contract Time using Section 00931 – Supplemental Design Instruction in accordance with Article 9 of the General Conditions.

1.13 OWNER'S REVIEW OF SUBMITTALS

A. Design-Builder will need to provide the Owner with certain electronic submittals for their review as determined in Phase 1 Services. Submittals that are not identified for Owner review will be reviewed and processed by Design-Builder. Design-Builder may request concurrent Owner review of time-sensitive submittals, but approval of request is at the discretion of the Owner.

B. Owner's review of drawings and data submitted by Design-Builder will cover only general conformity to the Contract Documents. Owner's review does not indicate a thorough review of all dimensions, quantities and details of the material, equipment, device or item shown or Design-Builder's means, methods, techniques, sequences, or procedures except when specified, indicated on Contract Drawings, or required by Contract Documents. Safety precautions or programs related to safety which shall remain the sole responsibility of Design-Builder. Owner's review shall not relieve Design-Builder of Design-Builder's responsibility for errors, omissions or deviations in the drawings and data, nor of sole responsibility for compliance with the Contract Documents. Neither shall Owner's review release Design-Builder fulfilling purpose of installation nor from Design-Builder's liability to replace defective work.

C. Owner will be entitled to rely upon the accuracy or completeness of designs, calculations, or certifications made by licensed professionals accompanying a particular submittal whether or not a stamp or seal is required by Contract Documents or Laws and Regulations.

D. Owner's submittal review period shall be 21 consecutive calendar days in length and shall commence on the first calendar day immediately following the date of arrival of the submittal or resubmittal in the Owner's office. The time required to mail the submittal or resubmittal back to Design-Builder shall not be considered a part of the submittal review period.

E. Design-Builder may request an expedited review of a limited number of submittals. Owner may elect to require a workshop to facilitate this expedited review. A maximum of one workshop per week will be allowed. Expedited Submittal Review Meetings are discussed in Section 01320 – Construction Progress Documentation.

F. Submittals shall be returned to Design-Builder under one of the following assignments:
   1. Reviewed: No corrections noted.
      (a) Design-Builder may release the equipment and/or material for production.
   2. Resubmittal not required: See list of consolidated Owner review comments and make corrections noted.
      (a) Design-Builder shall incorporate all review comments into the work, but resubmittal of an amended submittal package is not required.
      (b) Resubmit only the portion of package necessary to respond to Owner's comments.
      (c) Design-Builder may release the equipment or material for manufacture; however, all notations and comments must be incorporated into the final product.
   3. Correct and Resubmit: See comments and make corrections noted.
      (a) Design-Builder shall incorporate the review comments into a complete revised package, and resubmit it for review.
      (b) Also assigned when notations and comments are extensive enough to require a resubmittal of the package.
   4. Rejected: See comments.
      (a) Design-Builder shall develop a new submittal package with materials, equipment, methods, etc. that meet the requirements of the Contract Documents.
      (b) Design-Builder must resubmit the entire package revised to bring the submittal into compliance with Contract Documents. It may be necessary to resubmit using a different manufacturer/vendor to meet the Contract Documents or provide a change request to the Owner for a Substitution in accordance with Section 1600 – Product Requirements.
   5. Receipt acknowledged: Filed for record.
      (a) Contractor has no further action required.
      (b) Submittal is for supplementary information only; pamphlets, general information sheets, catalog cuts, standard sheets, test reports, manufacturer's or supplier's letters included with submittal data, unmarked catalog data, bulletins and similar data, all of which are useful to Owner in design, operation, or maintenance, but which by their nature does not constitute a basis for determining that items represented thereby conform with the design concept or comply with the intent of the Contract Documents. It is not subject to Owner's review and acceptance, and is being filed for Record Copy purposes only. This is generally used in acknowledging receipt of means and methods of construction work plans, filed conformance test reports, health and safety plans, or structural design by Design-Builder.

G. When a submittal cannot be returned within the specified period, Owner will, within a reasonable time after receipt of the submittal, give notice of the date by which that submittal will be returned.

H. Schedule delays:
   1. No adjustment of Contract Times or Contract Price will be allowed due to Owner's review of submittals, unless all of the following criteria are met:
      (a) Owner has failed to review and return first submission within the agreed upon time frame.
      (b) Design-Builder demonstrates that delay in progress of Work is directly attributable to Owner's failure to return submittal within time indicated and accepted by Owner.

I. If Design-Builder considers any correction indicated on the shop drawings to constitute a change to the Contract Documents, Design-Builder shall give written notice thereof to the Owner within 10 calendar days following return of submittal. Such notice does not need to include pricing.

J. Resubmittal of Drawings and Data:
   1. Design-Builder shall accept full responsibility for the completeness of each resubmittal. Design-Builder shall clearly identify each correction or change made and shall verify that all corrected data and additional information previously requested by Owner are provided on the resubmittal.
   2. Design-Builder shall in writing direct specific attention to all revisions and shall list separately any revisions made other than those called for by Owner on previous submissions.
   3. Requirements specified for initial submittals shall also apply to resubmittals. Resubmittals shall bear the number of the first submittal followed by a letter (A, B, etc.) to indicate the sequence of the resubmittal.
   4. Resubmittals shall be made within 30 days of the date of the letter returning the material to be modified or corrected; unless, within 14 days, Design-Builder submits an acceptable request for an extension of the stipulated period, listing the reasons the resubmittal cannot be completed within that time.

K. Resubmittal of Drawings and Data:
   1. Design-Builder shall accept full responsibility for the completeness of each resubmittal. Design-Builder clearly identify each correction or change made and shall verify that all corrected data and additional information previously requested by Owner are provided on the resubmittal.
   2. Design-Builder shall in writing direct specific attention to all revisions and shall list separately any revisions made other than those called for by Owner on previous submissions.
   3. Requirements specified for initial submittals shall also apply to resubmittals. Resubmittals shall bear the number of the first submittal followed by a letter (A, B, etc.) to indicate the sequence of the resubmittal.
   4. Resubmittals shall be made within 30 days of the date of the letter returning the material to be modified or corrected, unless within 14 days Design-Builder submits an acceptable request for an extension of the stipulated period, listing the reasons the resubmittal cannot be completed within that time.
   5. Include a response in writing to each of the Owner's comments or questions for submittal packages that are resubmitted in the order that the comments or questions were presented throughout the submittal.
      (a) Acceptable responses to Owner's comments are listed below:
         (i) "Incorporated" Owner's comment or change is accepted and appropriate changes are made.
         (ii) "Response" Owner's comment not incorporated. Explain why comment is not accepted or requested change is not made. Explain how requirement will be satisfied in lieu of comment or change requested by Owner.
      (b) Reviews and re-submittals:
         (i) Design-Builder shall provide re-submittals which include responses to all submittal review comments separately and at a level of detail commensurate with each comment.
         (ii) Design-Builder responses shall indicate how the issue is resolved pertaining to each review comment. Responses such as "acknowledged" or "noted" are not acceptable.

(iii) Resubmittals which do not comply with this requirement may be rejected and returned without review.
(iv) Design-Builder shall be allowed no extensions of any kind to any part of their contract due to the rejection of non-compliant submittals.
(v) Submittal review comments not addressed by Design-Builder in resubmittals shall continue to apply whether restated or not in subsequent reviews until adequately addressed by Design-Builder to the satisfaction of the reviewing and approving authority.

6. Any re-submittal that does not contain responses to the Owner's previous comments shall be returned for Correct and Resubmit. No further review by the Owner will be performed until a response for previous comments has been received.
7. Any need for more than one resubmission or any other delay in obtaining Owner's review of submittals, will not entitle Design-Builder to an extension of the Contract Times, unless the delay of the Work is directly caused by a change in the Work authorized by a Change Order or by failure of Owner to review the submittals within the submittal review period specified herein and to return the submittal to Design-Builder.
8. Any need for more than one resubmission, or any other delay in obtaining Owner's review of submittals, will not entitle Design-Builder to extension of the Contract Times unless delay of the Work is directly caused by a change in the Work authorized by a Change Order or by failure of Owner to review any submittal within the submittal review period specified herein.
9. Shop drawings and other submittals will be reviewed no more than twice at the Owner's expense. Costs incurred by Owner as a result of additional reviews of a particular submittal after the second time it has been reviewed shall be borne by Contractor or Design-Builder unless review comments change Contract Requirements. Reimbursement to Owner will be made by deducting such costs from Design-Builder's subsequent progress payments.
10. Submittals are required until approved.
11. Design-Builder assumes risk of expense and delays when proceeding with work related to required submittals without review and approval.
12. When minor deviations from Contract Documents are accepted, modify Contract Documents in accordance with the General Conditions.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

3.01 SUBMITTAL PROCEDURES

A. Design-Builder shall prepare and transmit each submittal sufficiently in advance of performing the related work or other applicable activities, or within the time specified in the individual work sections, of the Specifications, so that the installation will not be delayed by processing times including disapproval and resubmittal (if required), coordination with other submittals, testing, purchasing, fabrication, delivery and similar sequenced activities. No extension of time will be authorized because of Design-Builder's failure to transmit submittals sufficiently in advance of the Work.
B. Design-Builder shall utilize a three-character submittal identification numbering system in the following manner:
   1. The six-digit specification section should be listed.

2. The next four digits shall be the numbers 0001 to 9999 to sequentially number each separate item or drawing submitted.
3. The last character shall be a letter, A to Z, indicating the submission or resubmission of the same submittal, i.e., A = 1st submission, B = 2nd submission, C = 3rd submission, etc.
4. A typical submittal number would be as follows:
   (a) 033000 = Section for Concrete.
   (b) 0008 = The eighth initial submittal under this Section.
   (c) B = The second submission (first resubmission) of that particular shop drawing.

C. Included within the Transmittal Letter provided in Section 01330.01 Letter of Transmittal, each Shop Drawing, Sample and Product Data submitted by Design-Builder shall have affixed to it following Certification Statement including Design-Builder's Company name and signed by Design-Builder:

Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other applicable Accepted shop drawings and all Contract requirements.

D. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report inability to comply with requirements.
E. Documents submitted to Owner that do not conform to specified requirements shall be subject to rejection by Owner, and upon request by Owner, Design-Builder shall resubmit conforming documents. If conforming Submittals cannot be obtained, such documents shall be retraced, redrawn, or photographically restored as may be necessary to meet such requirements. Design-Builder's failure to initially satisfy the legibility quality requirements will not relieve Design-Builder from meeting the required Schedule for Submittals.
F. Any need for more than two reviews, or any other delay in obtaining Owner's review of submittals, will not entitle Design-Builder to extension of the Contract Time or provide justification of a claim for impeding Design-Builder's early completion.
G. When the shop drawings have been completed to the satisfaction of the Owner, Design-Builder shall carry out the construction in accordance therewith and shall make no further changes therein except upon written acceptance by the Owner.
H. If shop drawing will not be submitted electronically, submit a minimum of three hard copies, unless otherwise specified. Three copies will be returned to Design-Builder with reviewer's comments, as applicable.
   1. The following is a list documents that are to be submitted in electronic and hard copy formats:
      (a) Project Baseline Schedule, submit one copy.
      (b) Baseline Schedule Updates, submit one copy.
      (c) Each Project Recovery Schedules (as applicable), submit one copy.
      (d) O&M Deliverables two copies.

Q. Reproductions or copies of Contract Drawings or portions thereof will not be accepted as complete fabrication or erection drawings. Design-Builder may use a reproduction of Contract Drawings for erection drawings to indicate information on erection or to identify detail drawing references. Whenever the Drawings are revised to show this additional information, the Engineer-of-Record's title block and professional seal shall be removed from the drawing. Design-Builder shall revise these erection drawings for subsequent Engineer-of-

Record revisions to the Contract Drawings in accordance with project record document requirements in Section 01020 – Record Documents.

END OF SECTION

SECTION 01320 – CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.01 SUMMARY

A. It is Design-Builder's responsibility for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of Design-Builder's Work. This includes coordinating site visits of all manufacturers and Subcontractors necessary to effectively install and startup unit processes.

1.02 RELATED SECTIONS

A. Drawings and general provisions of the Contract; including General Conditions, all applicable Division 01 Sections, and all applicable Technical Sections; apply to this Section.

B. Section 01020 – Record Documents.

C. Section 01021 – Operation and Maintenance Data.

D. Section 01140 – Work Restrictions.

E. Section 01019 – Closeout Procedures.

F. Section 01290 – Change Management and Payment Procedures.

G. Section 01300 – Submittals.

H. Section 01322 – Photographic and Video Documentation.

I. Section 01600 – Product Delivery Storage and Handling.

J. Section 01664 – Training.

K. Section 01757 – Commissioning.

1.03 CODES AND STANDARDS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

B. American Association of Cost Engineers (AACE):
   1. Comply with recommended practices.

1.04 DEFINITIONS

A. Activity:

1. A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
2. Critical activities are activities on the critical path. They must start and finish on the planned start and finish times.
3. Predecessor activity is an activity that must start or complete before a given activity can be started. No negative lag is allowed.
4. Successor activity is an activity that can not start until the predecessor activity allows it. No negative lag is allowed.

B. Baseline Schedule: Has the meaning set forth in Article 1.2 of the General Conditions. Developed from the Proposed Baseline Schedule and updated monthly at a minimum.

C. CPM (Critical Path Method): A schedule network analysis technique used to determine the amount of scheduling flexibility (the amount of float) on various logical network paths in the project schedule network, and to determine the minimum total project duration. Start and finish dates are calculated by means of a forward pass, using a specified start date. Late start and finish dates are calculated by means of a backward pass, starting from a specified completion date, which sometimes is the project early finish date determined during the forward pass.

D. Critical Path: Generally, but not always, the sequence of schedule activities determining the duration of the project. Generally, it is the longest path through the project. However, a critical path can end, as an example, on a schedule milestone that is in the middle of the schedule model and that has a finish-on-or-before imposed date schedule constraint.

E. Event: The starting or ending point of an activity.

F. Float: The measure of leeway in starting and completing an activity. Float time is not for the exclusive use or benefit of either Owner or Design-Builder, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the following activity. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

G. Fragnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.

H. Gantt Chart: A graphic display of schedule-related information. In the typical Gantt chart, schedule activities or work breakdown structure components are listed down the left side of the chart, dates are shown across the top and activity durations are shown as date-placed horizontal bars. Also known as a Bar chart.

I. Lag: An offset or delay from an activity to its successor. It is based on the calendar of the successor activity.

J. Major Area: A significant construction element.

K. Milestone: A key or critical point in time for reference or measurement.

L. Network Diagram: A graphic diagram of a network schedule, showing activities and activity relationships.

M. Progress Schedules: General categorization of schedules to be produced, maintained, and submitted routinely to convey construction and payment progress through Project. Progress schedules include: Proposed Baseline Schedule, , Baseline Schedule, Critical Path Schedule, and schedule updates.

N. Proposed Phase 2 Baseline Schedule: Has the meaning set forth in Article 1.2 of the General Conditions. Schedule submitted with Technical Proposal.

O. Proposed Phase 2 Schedule of Values: Has the meaning set forth in Article 1.2 of the General Conditions.

P. Schedule of Monthly Payments: Estimated monthly progress payments based on Baseline Schedule and Phase 2 Schedule of Values for each month for the duration of the project.

Q. Phase 2 Schedule of Values: Has the meaning set forth in Article 1.2 of the General Conditions. Developed from the Baseline Schedule.

R. WBS (Work Breakdown Structure): A deliverable-oriented hierarchical decomposition of the work to be executed by the project team to accomplish the project objectives and create the required deliverables. It organizes and defines the total scope of the project. Each descending level represents an increasingly detailed definition of the project work. The WBS is decomposed into work packages. The deliverable orientation of the hierarchy includes both internal and external deliverables.

S. Work Package: A deliverable or project work component at the lowest level of each branch of the WBS. The work package includes the schedule activities and schedule milestones required to complete the work package deliverable or project work component.

1.05 SUBMITTALS

A. Scheduler Qualifications
   1. Five years verifiable experience in preparation of complex construction schedules for projects of similar value, size, and complexity.
   2. Knowledge of CPM scheduling utilizing Primavera P6 Professional.
   3. Submit qualifications in accordance with Section 01300 – Submittal Procedures in advance of Preconstruction Conference to demonstrate capabilities and experience. Include lists of completed projects with the following information:
      (a) Project name.
      (b) Project location.

(c) Name and address of engineer, architect or Design-Builder for which schedules were prepared.
(d) Name and address of client.
(e) Project Duration at Bid & Project Duration.
(f) Other information and pertinent.

B. Coding Structure: Design-Builder shall submit proposed coding structure, identifying the code fields and the associated code values it intends to use in the project schedule. The coding structure shall, at a minimum, include code fields for Project Segment or Phase, Facility Number, asset, Type of Work, Submittal/Procurement/Construction and responsibility/Subcontractor, and Structure. WBS shall align to Design-Builder cost accounting approaches.
1. Submit proposed WBS, identifying Phase, Area of Work, asset, Type of Work.

C. Schedule of Submittals – Arrange Submittals List developed in Phase 1 Services in a tabular format or a format that is compatible with entry into Owner's document management system with the following information:
1. Scheduled date for each first submittal.
2. Specification Section number and title.
3. Submittal category (action or informational).
4. Name of subcontractor.
5. Description of the Work covered.
6. If a Pre-Submittal Workshop (per Section 01300 – Submittals) is required.
7. If Design-Builder will request expedited review per Section 01300 – Submittals.
8. Scheduled date for Owner's final approval.

D. Progress Schedules – Submit in native electronic format and PDF format. PDF sheet size shall sufficiently large enough to legibly show entire schedule for entire construction period.
1. Include:
(a) Activity report
(1) A list of all activities sorted by activity number and early start date, or actual start date, if known.
(b) Logic Report
(1) A list of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
(c) Total Float Report
(1) A list of all activities sorted in ascending order of total float.
(d) Daily Labor Force Report
(e) Material Location Report
(f) Field Condition Report
(g) Owner may request a cost and resource loaded schedule if the project has insufficient float or multiple overlapping critical paths.

E. Commissioning Schedule in accordance with Section 01757 – Commissioning

F. Special Reports – Submit special reports within one day of an occurrence.

G. Daily Field Observation Reports – Submit at weekly intervals.

1.06 PROJECT SCHEDULER

A. Designate, in writing person responsible for preparation, maintenance, updating, and revision of all Progress Schedules.

B. Scheduler shall be dedicated primarily to Project. Owner may request the scheduler be located onsite; however, scheduler should be based a minimum of 50% in the Kansas City Metropolitan Statistical Area.

C. All scheduling software and hardware shall be located on Design-Builder corporate servers. Scheduler shall attend all project meetings, in-person or remotely, called for in this Section with the Baseline Schedule as an agenda item. Owner may request the Scheduler attend meetings in-person rather than remotely.

D. Owner reserves the right to disapprove scheduler when submitted by Design-Builder if not qualified. Owner reserves the right to remove scheduler from the Project if found to be inadequate.

1.07 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities including the scheduling and reporting of separate Subcontractors performing construction activities related to Project.

B. Coordinate Progress Schedules with the Phase 2 Schedule of Values, to estimate a Schedule of Monthly Payments, list of Subcontractors, Schedule of Submittals, progress reports, Application for Payment, and other required schedules and reports.

C. Secure time commitments for performing critical elements of the Work from parties involved. Time commitments should be captured within the schedule.

1.08 SCHEDULING SOFTWARE AND FILING

A. Progress Schedule format: Utilize CPM format unless indicated otherwise.

B. Prepare computerized schedules utilizing Oracle Primavera P6 Project Management, most current version, unless indicated otherwise.

C. Naming convention: Name schedule files with the year, month, and day of the data date, revision identifier, and a description of the schedule.
   1. Example 1: 2020_07_30 rev 1 draft baseline schedule.xer.
   2. Example 2: 2020_09_30 rev 2 sep final update.xer.

D. Filing: Post submitted files to the web-based construction document management system in accordance with Section 01300 – Submittals.

E. Standard Schedule Format: Layout for all schedules and reports shall follow the standard format in the following order, activity ID, activity name, original duration,

remaining duration, percent complete, start, finish, late start, late finish, total float, baseline variance, predecessor, successor, and resource ID.

F. Requirements According to schedule item –Design-Builder shall provide the following information:

Item	Requirement
Procedures	Comply with procedures contained the American Association of Cost Engineers (AACE) recommended practices.
Time Frame	Extend project schedule from date established for the Notice to Proceed to the date of Final Completion.
Contract Times	Contract Times shall not be changed unless specifically authorized by Change Order.
Activities	Treat separate major areas as a separate numbered activity for each principal element of the Work. (WBS)
Activity Duration	Define activities so none is longer than 7 days, unless specifically allowed by Owner
Milestones	Include milestones indicated in the Contract Documents in schedule, including, but not limited to, all zero duration events, the Notice to Proceed, Substantial Completion, and Final Completion.
Submittal Review Time	Include review and re-submittal times for review of Shop Drawings and Samples. Each item listed in the Preliminary Schedule of Shop Drawings and Samples shall be included in the schedule.
Procurement Activities	Include separate activities for the procurement process of long-lead and major items that require a cycle of more than 30 days or fall within the critical path. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
Startup and Testing Time	See Sections 01757 – Commissioning and Section 01664 – Training. Incorporate all these requirements with appropriate lead times into the project schedule.
Phasing	Arrange list of activities on schedule by phase.
Submittal Review Time	Include review and re-submittal times for review of Shop Drawings and Samples. Each item listed in the Schedule of Submittals shall be included in the schedule.
Owner Activities	Include a separate activity for each area of the Work performed by Owner and a separate activity for notifying Owner if contractually required or requested.
Products Ordered in Advance	Include a separate activity for each product. Delivery dates indicated stipulate the earliest possible delivery date.
Owner-Furnished Products	Include a separate activity for each product. Delivery dates indicated stipulate the earliest possible delivery date.
Work Restrictions	Show the effect of the following items on the schedule: • Coordination with existing construction. • Limitations of continued occupancies.

Item	Requirement
	• Uninterruptible services. • Partial utilization before Substantial Completion. • Use of premises restrictions. • Provisions for future construction. • Seasonal variations. • Environmental control.
Work Stages	Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following: • Subcontract awards. • Submittals. • Purchases. • Fabrication. • Sample testing. • Deliveries. • Installation. • Tests and inspections. • Adjusting. • Curing. • Startup and placement into final use.
Area Separations	Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities: • Contractor Mobilization • Procurement – Divided by Long Lead and Short Lead • Completion of civil work • Completion of structural work • Completion of HVAC work • Completion of architectural work • Completion of mechanical installation • Completion of electrical installation • Completion of I&C installation • Completion of I&C programing • Partial utilization • Start of Acceptance Testing • End of Acceptance Testing • Substantial Completion • Achievement of Full Operations • Punch List and Final Corrections • Final Completion
Contract Modifications	For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragments to demonstrate the effect of the proposed change on the overall project schedule.
Work under More than One Contract or Subcontract.	Include a separate activity for each contract or subcontract.
Detailed by Work Package	Include detailed information by each work package and display all activities to be accomplished by the workforce with durations of 7 or more calendar days
Detail by Task	Include detail by task to support the short-term planning for the field, normally for those activities of less than 1-week duration.

1.09 SCHEDULE PREPARATION

A. Preparation and submittal of project schedule represents Design-Builder's intention to execute the Work within specified time and constraints.

B. Baseline Schedule: Design-Builder shall submit Baseline Schedule for Owner acceptance in accordance with Article 2.1.3 of the General Conditions and Exhibit 2.1.1 Phase 1 Scope of Services. Baseline Schedule shall extend from date established as Notice to Proceed to the date of Final Completion, for the entire duration of Contract Time.

C. Coordinate preparation and processing of schedules and reports with performance of construction activities including the scheduling and reporting critical path interfaces with Activities by Others as defined in Section 01110 – Summary of Work.

D. Coordinate Baseline Schedule with the Phase 2 Schedule of Values, to estimate a Schedule of Monthly Payments, Schedule of Submittals, progress reports, Application for Payment, and other required schedules and reports.

E. Secure time commitments for performing critical elements of the Work from parties involved. Time commitments should be captured within the schedule.

F. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

G. Activity durations should be in terms of calendar days. Reference schedule to calendar days with beginning of Contract Time as Day "1."

H. Owner prefers a maximum seven-day duration, however activity durations shall not exceed 21 calendar days. Activities longer than 21 calendar days should be subdivided by location, station, or other sub-element to comply with the 21-calendar day criteria. If a duration still exceeds 21 calendar days, then a request should be made to the Owner with an explanation as to why the 21-calendar day criteria needs to be superseded. The following activities are anticipated to have duration of greater than 21 calendar days and will not require individual approval by the Owner: submittal review and acceptance, concrete cure times, equipment and material delivery times, bulk excavation works, landscaping, and functional and performance testing. This list is to be expanded upon with submission of Baseline Schedule.

I. Calendars: Design-Builder can create and utilize any number of calendars necessary to convey the work-periods for accurate duration usage for activities in the project schedule. There are two conditions for these calendars: 1) they shall contain the necessary holidays to be observed by Owner and 2) they shall convey the accurate workdays during which work will be performed.

J. Failure to include an activity required for execution of the Work does not excuse Design-Builder from completing the Work and portions thereof within specified times and at price specified in Contract for Progressive Design-Build Services. Contract for Progressive Design-Build Services requirements are not waived by

failure of Design-Builder to include required schedule constraints, sequences, or milestones in schedule. Contract for Progressive Design-Build Services requirements are not waived by Owner's acceptance of the schedule. In event of conflict between accepted schedule and Contract for Progressive Design-Build Services requirements, terms of Contract for Progressive Design-Build Services govern at all times, unless requirements are waived in writing by the Owner.

K. Baseline Schedule and Final Completion: Should Design-Builder submit a Baseline Schedule showing project completion more than 30 calendar days prior to contract completion date Owner may issue Change Order, at no cost to Owner, revising time of performance of Work and contract completion date to match Design-Builder's schedule completion date. Adjust accordingly any Work milestone dates.

L. Contract Float is for the mutual benefit of both Owner and Design-Builder. Changes to the Project that can be accomplished within this available period of float may be made by Owner without extending the Contract Time, by utilizing float. Time extensions will not be granted nor delay damages owed until Work extends beyond the completion date set forth in the Project Schedule of the Contract for Progressive Design-Build Services. Likewise, Design-Builder may utilize float to offset delays other than delays caused by Owner. Mutual use of float shall continue until all available float shown by schedule has been utilized by either Owner or Design-Builder, or both.

M. Non-sequestering of float: Pursuant to float sharing requirements of this Section, schedule submittals can be rejected for use of float suppression techniques such as preferential sequencing or logic, special lead or lag logic restraints, extended activity durations or imposed dates.

N. Schedule logic: Assembled to show order in which Design-Builder proposes to carry out Work, indicate restrictions of access, availability of Work areas, and availability and use of manpower, materials, and equipment. Form basis for assembly of schedule logic on the following criteria:
   1. Which activities must be completed before subsequent activities can be started?
   2. Which activities can be performed concurrently?
   3. Which activities must be started immediately following completed activities?
   4. What major facility, equipment, or manpower restrictions are required for sequencing these activities?
   5. Show the effect of the following items on the schedule:
      (a) Coordination with existing construction.
      (b) Limitations of continued occupancies.
      (c) Uninterruptible services.
      (d) Partial occupancy before Completion.
      (e) Use of premises restrictions.
      (f) Provisions for future construction.
      (g) Seasonal variations.
      (h) Environmental control.
   6. Design-Builder shall recognize railroad track crossings may be inaccessible at times due to circumstances outside of Owner's control and take such considerations when planning delivery and other hauling activities. Design-

Builder can request historic railroad activity for Design-Builder's planning purposes.

O. Cost Loading: All WBS summary activities shall be cost loaded. The sum total of all cost loaded activities shall equal the total Contract Price of the Contract for Progressive Design-Build Services, including Owner-approved change orders. This shall be equivalent to the total of the Schedule of Values for the Project.

P. Interim milestone dates, operational constraints: In event there are interim milestone dates and/or operational constraints set forth in Contract, show them on schedule. Do not use Zero Total Float constraint or Mandatory Finish Date on such Contract requirements.

Q. Schedule windows for owner-furnished, Design-Builder-installed equipment or materials: Immediately after Award of Contract, obtain from Owner anticipated delivery dates of Owner-furnished equipment or materials. Show these dates in the schedule in same manner indicated by Owner.

R. Contract Modifications: As modifications to the contract are approved by the Owner, the Design-Builder shall add the appropriate activities to the schedule. This shall include the cost and resources required for these activities.

S. Identify the execution of the following, if included in the Work:
   1. Mobilization (Design-Builder and major Subcontractors).
   2. All required submittals and submittal review times showing 21 calendar day duration for such activities and equal amount of time for re-submittal reviews.
   3. Equipment and materials procurement/fabrication/delivery.
   4. Excavation.
   5. Drilled pier installation.
   6. Shoring design and submission of detailed shoring submittals. Identify submission as a milestone.
   7. Shoring review, shoring materials procurement, shoring installation, and shoring removal.
   8. Backfill and compaction.
   9. Dewatering.
   10. Grading, subbase, base, paving, and curb and gutters.
   11. Fencing and landscaping.
   12. Concrete, including installation of forms and reinforcement, placement of concrete, curing, stripping, finishing, and patching.
   13. Tests for leakage of concrete structures intended to hold water or sludge.
   14. Disinfection for drinking water pipes, appurtenances, and structures.
   15. Masonry.
   16. Metal fastenings, framing, structures, and fabrications.
   17. Wood structures, finish carpentry, architectural woodwork, and plastic fabrications.
   18. Waterproofing and damp proofing, insulation, roofing and flashing, and sealants.
   19. Doors and windows, including hardware and glazing.
   20. Finishes including coating and painting, flooring, ceiling, and wall covering.

21. Building specialties including furnishings, laboratory equipment, and toilet and bath accessories.
22. Process equipment, including identification of ordering lead-time, factory testing, and installation.
23. Pumps, blowers, and drives, including identification of ordering lead time, factory testing, and installation.
24. Conveying equipment including hoists and cranes, conveyor systems, and materials handling equipment, including identification of ordering lead-time and installation.
25. Other mechanical equipment including fans and heating, ventilating, and air conditioning equipment.
26. Trenching, pipe laying, and trench backfill and compaction.
27. Piping, fittings and appurtenances, including identification of ordering and fabrication lead time, layout, installation and testing.
28. Valves, gates, and operators, including identification of order lead-time, installation, and testing.
29. Plumbing specialties.
30. Electric transmission, service, and distribution equipment, including identification of ordering lead-time, and factory testing.
31. Other electrical work including lighting, heating and cooling, and special systems, including identification of ordering lead-time.
32. Instrumentation and controls, including identification of ordering lead-time.
33. Factory performance testing.
34. Preliminary testing of equipment, instrumentation, and controls.
35. OCCPs.
36. Inspections.
37. Commissioning and Start-up Phase commencement and completion.
38. Substantial Completion.
39. Punch list work.
40. Final Completion
41. Demobilization.

1.10 NETWORK DETAILS AND GRAPHICAL OUTPUT

A. Produce a clear, legible, and accurate calendar based, time scaled, graphical bar chart diagram showing predecessors, successors, and dependencies. Group activities related to the same physical areas of the Work. Produce the diagram based upon the early start of all activities.

B. Include for each activity, the description, activity number, estimated duration in working days, total float, and all activity relationship lines.

C. Illustrate order and interdependence of activities and sequence in which Work is planned to be accomplished. Show how the start of one activity is dependent upon the start or completion of preceding activities and its completion restricts the start of following activities.

D. Indicate the critical path for the Project.

E. Delineate the specified contract duration and identify the planned completion of the Work as a milestone. Show the time period between the planned and Contract completion dates, if any, as an activity identified as project float unless a Change Order is issued to officially change the Contract completion date.

F. Identify Operational Control Change Plans (OCCPs) in accordance with Section 01140 – Work Restrictions including system shutdown dates, temporary bypass periods, temporary sludge processing period, system tie-in dates, specified interim completion or milestone dates, and contract completion date as milestones. Include all OCCP development activities such as development of draft OCCP, submittal, review, and finalization of OCCPs.

G. Include, in addition to construction activities:
   1. Submission dates and review periods for:
      (a) Equipment and long-lead material deliveries over eight weeks.
      (b) Approvals required by regulatory agencies or other third parties.

H. Produce large poster-sized diagram at start of construction and an updated diagram when construction is 50% complete. Schedule diagram shall be posted somewhere visible within Design-Builder's onsite office/trailer.

1.11 BASELINE SCHEDULE

A. Baseline Schedule shall represent Work of the Project that reflects the knowledge of the project to date. Show sequence and interdependence of all activities required for complete performance of all Work, beginning with date of Notice to Proceed and concluding with date of Final Completion of Contract.

B. Design-Builder shall submit proposed Baseline Schedule in accordance with Article 2.1 of the General Conditions.

C. After successful submission of the schedule and acceptance by the Owner, this schedule will be considered the Baseline Schedule and updated with actual progress monthly at a minimum. An updated progress schedule must be included with each Application for Payment in accordance with Section 01290 – Payment Procedures and Change Management.

D. Baseline Schedule shall be cost-loaded as described in this Section.

E. Critical Path Schedule: Design-Builder shall also submit, with Baseline Schedule, a separate schedule containing only the critical path. Monthly progress shall also be reflected on this schedule.

F. Critical Supply Chains: Design-Builder shall also submit, with Baseline Schedule, a list of critical Equipment and Materials that are required to maintain the Critical Path Schedule. The list should also include required delivery dates to the Project site as the basis for the Critical Path Schedule. Monthly progress shall also be reflected with an update to the list, along with anticipated delays and supporting

correspondence/information from Equipment or Material suppliers (if a delay is anticipated).

G. Acceptance of the Baseline Schedule by the Owner is a condition precedent to executing the Phase 2 Contract Price Amendment and making payments as specified in Article 2.1.2 of the General Conditions and Section 01290 – Payment Procedures and Change Management.

1.12 ADJUSTMENT OF CONTRACT TIMES

A. Contract Time will be adjusted only for causes specified in the Contract for Progressive Design-Build Services.

B. As described in the General Conditions, if the Design-Builder believes that an Excusable Delay has impacted its work, such that the project completion date will be delayed, the Design-Builder must submit proof demonstrating the delay to the critical path. This proof, in the form of a Time Impact Analysis, may entitle the Design-Builder to an adjustment of contract time.

C. Time Impact Analysis:
1. In accordance with Article 8.5.3 of the General Conditions.
2. Use the accepted schedule update that is current relative to the time frame of the delay event (change order, third party delay, or other Owner-caused delay). The following should be included, but not limited to:
3. Actual start dates of activities that have been started.
4. Actual finish dates of activities that have been completed.
5. Percentage of completion of activities that have been started but not finished or a remaining duration for that activity.
6. Actual dates on which milestones were achieved.
7. Activities shall not be updated by inputting percent complete figures only without also inputting actual dates.
8. Retained logic settings should be used for each update.
   (a) When "Out of Sequence" activities occur, the following steps should be taken:
      (1) Create a report that identifies all of the "Out of Sequence" activities.
      (2) Change the logic, add activities or both to correct the "Out of Sequence" condition. Make sure the activities that follow the "Out of Sequence" activity are scheduled as desired.
      (3) Write, as part of the narrative, a description of the "Out of Sequence" work and the changes made to the schedule because of these conditions.
9. Represent the delay event in the schedule by:
   (a) Inserting new activities associated with the delay event into the schedule,
   (b) Revising activity logic, or
   (c) Revising activity durations.
10. If the project schedule's critical path and completion date are impacted as a result of adding this delay event to the schedule, a time extension equal to the magnitude of the impact may be warranted.
11. The Time Impact Analysis submittal must include the following information:

(a) A fragnet of the portion of the schedule affected by the delay event.
(b) A narrative explanation of the delay issue and how it impacted the schedule.
(c) The electronic schedule file used to perform the Time Impact Analysis.
(d) All other requirements in Article 8.5.3 of the General Conditions.

D. Indicate clearly that the Design-Builder has used, in full, all project float available for the work involved in the request, including any float that may exist between the Design-Builder's planned completion date and the Contract completion date. Utilize the latest version of the Schedule Update accepted at the time of the alleged delay, and all other relevant information, to determine the adjustment of the contract time.

E. Adjustment of the Contract Times will be granted only when the float has been fully utilized and only when the revised date of completion of the Work has been pushed beyond the contract completion date. Adjustment of the Contract Times will be made only for the number of days that the planned completion of the work has been extended.

F. Actual delays in activities which do not affect the critical path work or which do not move the Design-Builder's planned completion date beyond the Contract completion date will not be the basis for an adjustment to the contract time or damages.

G. If completion of the Project occurs within the specified contract time, the Design-Builder is not entitled to job-site or home office overhead beyond the Design-Builder's originally planned occupancy of the site.

H. Notify Owner of a request for contract time adjustment. Submit request as specified in the Articles 8.6 and 9.5 of the General Conditions. In cases where the Design-Builder does not submit a request for contract time adjustment for a specific change order, delay, or Design-Builder request within the specified period of time, then it is mutually agreed that the particular change order, delay, or Design-Builder request has no time impact on the Contract completion date and no time extension is required.

I. Owner will, after receipt of Design-Builder's Proposed Change Order review the facts and advise the Design-Builder in writing.
1. Include the new Baseline Schedule data, if Owner issued Change Order, in the next monthly Schedule Update.
2. When the Owner has not yet made a final determination as to the adjustment of the contract time, and the parties are unable to agree as to the amount of the adjustment to be reflected in the Baseline Schedule, reflect that amount of time adjustment in the Baseline Schedule as the Owner may accept as appropriate for such interim purpose. It is understood and agreed that any such interim acceptance by the Owner shall not be binding and shall be made only for the purpose of continuing to schedule the work, until such time as a final determination as to any adjustment of the contract time acceptable to the Owner has been made. Revise the Baseline Schedule prepared thereafter in accordance with the final decision. Interim acceptance shall be identified in Design-Builder's Summary Schedule and Summary Schedule Report.

1.13 PAYMENT REQUESTS AND CASH FLOW

A. Schedule of Monthly Payments: After Baseline Schedule has been submitted and accepted by the Owner, submit a tabular and graphic report showing estimated progress payments for each month of the Project. This tabulation will be based on the summation of the cost-loaded activities each month and the total of all progress payments shall equal the current Contract Price. Submit an updated Monthly Payments Schedule upon any changes to Completion Date or Contract Price.

B. Utilize cost loaded monthly Schedule Updates and the Phase 2 Schedule of Values as the applications for payment specified in Section 01290 – Payment Procedures and Change Management. Payment application shall include a listing in Excel format of all schedule activities showing earned value and percentage completion during the current month for which payment is sought. Submittal of the monthly Schedule Update shall be a condition precedent to the issuance of any payment under this Contract. The payment application procedures are described in more detail in Section 01290 – Payment Procedures and Change Management.

1.14 FIVE-WEEK SCHEDULE / FOUR-WEEK LOOK AHEAD

A. Submit to Owner weekly a Five-Week Schedule showing the activities completed during the previous week and the Design-Builder's schedule of activities, including upcoming OCCPs, for the following four weeks (Four-Week Look Ahead). Design-Builder should indicate what activities have changed durations from the previous look ahead submittal.

B. Use the logic and conform to the status of the current accepted Schedule Update when producing the weekly schedule in CPM schedule or a bar chart format. In the event that the 5-Week Schedule no longer conforms to the current schedule, Design-Builder may be required to revise the Baseline Schedule as specified in this Section.

C. The activity designations used in the Five-Week Schedule must be consistent with those used in the Baseline Schedule and the monthly Schedule Updates.

D. Design-Builder and Owner must agree on the format of the Five-Week Schedule.

1.15 PROGRESS REPORTS

A. Daily Field Observation Reports: Using template provided as Section 01320.01 – Daily Field Observation Report, prepare a daily field observation report to indicate Work observed. Submit Daily Field Observation Reports in accordance with Section 01300 – Submittals.

B. Periodic Field Observation Reports: Using template provided as Section 01320.02 – Periodic Field Observation Report, prepare a periodic field observation report. Submit Periodic Field Observation Report, when requested by Owner, in accordance with Section 01300 – Submittals.

C. Weekly Report of Working Days: Using template provided as Section 01320.03 – Working Day Report, prepare a weekly report of working days.
   1. Design-Builder shall bring completed Weekly Report of Working Days to each Weekly Coordination Meeting and obtain Owner signature.
   2. Submit signed Weekly Report of Working Days in accordance with Section 01300 Submittal Procedures.
   3. In accordance with Section 01140 – Work Restrictions, Design-Builder can only change working times at most monthly with Owner approval.

D. Daily Labor Force Reports: Report is used to compile information for the Certified Payroll Report. Design-Builder shall submit its and its Subcontractors' Daily Labor Force Reports to Owner daily in accordance with Section 01300 – Submittals.
   1. Using template provided as Section 01290.11 – Daily Labor Force Report, prepare a daily labor force report recording the following information concerning events at Project site:
      (a) List of Subcontractors at Project site.
      (b) List of separate Design-Builders at Project site.
      (c) List of all Design-Builder's and Subcontractor's personnel showing hours worked in labor class at Project site.

E. Material Location Reports: At monthly intervals, prepare a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.

F. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare a detailed report. Submit electronically and directly to Owner with an RFI. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

G. Special Reports:
   1. General: Submit special reports within one day of an occurrence.
   2. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events; persons participating; response by Design-Builder's personnel; evaluation of results or effects; and similar pertinent information. Advise Owner in advance when these events are known or predictable.

1.16 SCHEDULE OF VALUES

A. Requirements for Proposed Schedule of Values are specified in Article 2.1.3 of the General Conditions and Section 01290 – Payment Procedures and Change Management.

B. Design-Builder shall update the Proposed Schedule of Values as described in Paragraph 1.09 Schedule Preparation.

C. Submit, in conjunction with the Baseline Schedules, a schedule of values identifying costs of all on-site construction activities as generated by the cost loaded schedule. Equate the aggregate of these costs to the Contract Price.

D. Schedule shall be updated monthly in accordance with Article 8.1.2 of the General Conditions and approved update shall be provided with the monthly payment application in accordance with Section 01290 – Payment Procedures and Change Management.

1.17 SCHEDULE OF SUBMITTALS

A. Preparation: Provide Schedule of Submittals arranged in chronological order by date required by the Baseline Schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery as set forth in the Contract Documents, when establishing dates.

B. Coordinate Schedule of Submittals with list of subcontracts, the Phase 2 Schedule of Values, the estimated Schedule of Monthly Payments, and Progress Schedules.

C. List submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.

D. At Design-Builder's option, show submittals on the Baseline Schedule, instead of tabulating them separately.

E. Based on the Submittals List developed in Phase 1 services, the Schedule of Submittals shall include submittals required in the Contract Documents but not limited to OCCPs, Commissioning and Process Start-up Plans, Training Plans, test procedures, operation and maintenance manuals, shop drawings, samples, record documents, and specifically required certificates, warranties, and service agreements.
1.

F. Schedule of Submittals shall be arranged in chronological order by date required by the Baseline Schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery as set forth in the Contract Documents, when establishing dates.

G. Schedule of Submittals:
1. Due date: After Baseline Schedule has been submitted and accepted by Owner.
2. Format:
   (a) Include submittals using early start dates.
   (b) Include all submittals.
   (c) Indicate week and month anticipated for each submittal.
   (d) Indicate submittals requiring Owner's review.
   (e) Indicate "Priority" submittals where Owner's review time can impact Design-Builder's schedule. Design-Builder may designate an additional 5% of "Priority" submittals as "Critical". Owner will work to review those submittals as quick as practical.

(1) "Priority" and "Critical" indication will not alter review times specified in Section 01300 – Submittals.
(2) Owner will endeavor to provide early review of "Priority" and "Critical" submittals where possible.

3. Submittal of Schedule of Submittals shall be a condition precedent to Owner making progress payments.

H. Provide updated Schedule of Submittals with updated schedules if schedule revisions change listing and timing of submittals.

1.18 COMMISSIONING SCHEDULE SUBMITTAL

A. Commissioning Schedule monthly update requirements:
1. Provide updates of schedule with narrative monthly upon commencement of first Startup Activity on schedule.
2. Divide commissioning activities by unit process and asset. Indicate expected date when beneficial use will occur.
3. Highlight percentages of completion, actual start and finish dates, and remaining durations, as applicable.
4. Include activities not previously included in the previously accepted Commissioning Plan.
5. Change Order required for any change to contractual dates.
6. Reviews of these submittals by Owner will not be construed to constitute acceptance within the time frames, durations, or sequence of work for each added activity.

1.19 FINAL SCHEDULE SUBMITTAL

A. The final Schedule Update becomes the As-Built Schedule.
1. The As-Built Schedule reflects the exact manner in which the project was constructed by reflecting actual start and completion dates for all activities accomplished on the project.
2. Design-Builder's Project Manager and scheduler sign and certify the As-Built Schedule as being an accurate record of the way the project was actually constructed.

1.20 TRAINING SCHEDULE:

A. Provide Training Schedule in accordance with Section 01757 – Commissioning. Schedule is a list of Owner Training sessions and scheduled dates. Design-Builder shall indicate whether trainings are tentative or firmly scheduled and include updated list with monthly updates. Trainings shall be scheduled in accordance with Section 01757 – Commissioning.

1.21 OTHER ADMINISTRATIVE REQUIREMENTS

A. Staff Names: Within 21 calendar days of starting construction operations, submit a list of Key Personnel other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone

numbers, including mobile and office telephone numbers as well as primary vehicle make/model/license plates. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.

1. Post copies of list in Project meeting room; document management system; in Design-Builder's temporary field offices; provide to onsite security, and at the construction site during construction hours.
2. Design-Builder shall provide updated list within one week of changes.
3. Owner offers Design-Builder opportunity to obtain Owner Contractor badges and encourages Key Personnel to obtain Contractor badges.

B. Meetings: Design-Builder shall schedule and hold meetings and conferences at Project site during design and construction, unless otherwise indicated. Meetings are described in more detail in Paragraph 3.01 Meetings.

C. New Subcontractor and Suppliers:
1. Design-Builder shall notify Owner prior to each of its Subcontractors and/or Suppliers beginning Work on the Site.
2. Design-Builder shall require each Subcontractor to complete Form 00490 Pre-Contract Certification and submit in accordance with Section 01300 – Submittals. Design-Builder shall also provide to Civil Rights and Equal Opportunities (CREO) Department within five days after written request. Form is provided to this Section by reference.
3. Design-Builder shall maintain and resubmit Subcontractors and Major Material Suppliers List initially submitted with Phase 2 Proposal with any new or additional Subcontractor and Suppliers in accordance with Owner Charter and Code. Design-Builder shall strike-through Subcontractors and Suppliers on list that were or will not be performing Work. Submit in accordance with Section 01300 – Submittals. For reference, form is provided as Section 01290.09 – Subcontractors and Major Suppliers List.
4. Design-Builder shall submit Form 00485.04 CREO KC Construction Employee Identification Report Form in accordance with Section 00485 CREO Monthly Reporting Instructions.

D. Photographic and Video Documentation:
1. Photographic and Video documentation shall be in accordance with Section 01322 – Photographic and Video Documentation.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

3.01 MEETINGS

A. Preconstruction Conference:

1. Design-Builder will schedule the Preconstruction Conference to occur before the start of general construction at a time convenient to Owner. Hold the conference at Project site or another convenient location. If Baseline Schedule is not ready for discussion at Preconstruction Conference, Owner and Design-Builder may modify, for the purpose of discussion at the Conference for early construction activities with defined scope and budget.
   (a) Attendees: Authorized representatives of Owner, Owner's Advisor, Design Professional, Design-Builder Key Personnel, major Subcontractors and others as appropriate shall attend the conference. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.
   (b) Agenda: Discuss items of significance that could affect progress, including the following:
      (1) Owner, Owner's Advisor, Design-Build team member contacts, roles, responsibilities, communication requirements.
      (2) Distribution of Contract Documents.
      (3) Submission of Owner-approved updated Subcontractors and Major Material Suppliers List, Phase 2 Schedule of Values, and Baseline Schedule.
      (4) Schedules and Milestones.
      (5) Design-Builder work zone and office trailer locations.
      (6) Procedures: Includes change management, document controls, schedule management, submittals management, and RFIs.
      (7) Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and contract closeout procedures.
      (8) Project Record Document Requirements.
      (9) Review of startup requirements and procedures.
      (10) Lockout/tagout procedures and requirements.
      (11) Use of the premises.
      (12) Design-Builder and Owner will discuss additional areas for Design-Builder access.
      (13) Responsibility for temporary facilities and controls including designation of person responsible for traffic control.
      (14) Standard vehicle traffic onsite.
      (15) Parking availability.
      (16) Equipment deliveries and priorities.
      (17) OCCPs.
      (18) Project site safety requirements (safety vests, OSHA), and first aid.
      (19) Plant/site Security/Access Procedures.
      (20) Progress cleaning.
      (21) Meetings.
      (22) Working hours.
   (c) Minutes: Design-Builder shall record minutes and distribute electronic copies within one business day after meeting to participants, with copies to Design-Builder, Owner, and those affected by decisions made.
2. Prior to Preconstruction Conference, Design-Builder shall have submitted the following deliverables for discussion at meeting:
   (a) Baseline Schedule.

(b) Photo and Video Documentation Plan.
(c) Construction Safety Plan.
(d) List of Operational Change Control Plans lasting longer than one week.
(e) Quality Management Plan.
(f) Qualifications of Scheduler, Photographer, and any others as required by Specifications.
(g) And any other deliverables required by Specifications.

B. Monthly Progress Meetings:
1. Design-Builder will schedule and administer formal progress meetings throughout progress of the Work at maximum monthly intervals with the first meeting scheduled approximately 30 calendar days after the Preconstruction Conference.
2. Design-Builder will make arrangements for meetings, prepare agenda with copies for participants, and preside at meetings.
3. Design-Builder shall provide printed copies of latest submitted progress schedules and Schedule Update.
4. Attendance Required: Owner, Owner's Advisor, Design-Builder's Project Manager, Design-Builder's Construction Manager (if different than the Project Manager), as appropriate to agenda topics for each meeting.
5. Agenda shall be reoccurring and approved by Owner. Topics shall include:
(a) Review minutes of previous meetings.
(b) Review of Work progress and future Work.
(c) Review of safety record/events.
(d) Risk register/log.
(e) Change orders.
(f) Quality control.
(g) Pay application.
(h) Schedule reports.
(i) Discuss Stored Material for which the Design-Builder will be requesting payment.
(j) Commissioning.
6. Minutes: Design-Builder will record changes for update and distribute electronic copies within seven calendar days after meeting to participants and file on Owner's document management system.

C. Weekly Coordination Meetings:
1. Upon start of construction, Design-Builder will schedule and administer meetings throughout progress of the Work at maximum weekly intervals.
2. Design-Builder will make arrangements for meetings, prepare agenda with copies for participants, and preside at meetings.
3. Attendance Required: Owner, Owner's Advisor, Design-Builder's Project Manager, Design-Builder's Construction Manager (if different than the Project Manager), Commissioning Manager, superintendents, major Subcontractors and suppliers as appropriate to agenda topics for each meeting.
4. Agenda:
(a) Review of Work progress.
(b) Field observations, problems, and decisions.
(c) Identification of problems delaying planned progress, hazards and risks.

(d) Review of critical submittals.
(e) Deviations in the previous week's Four-Week Schedule.
(f) Review of critical RFIs, change documents, issues and action items.
(g) Review of upcoming OCCPs within 3-week window.
(h) Review of offsite fabrication and delivery schedules.
(i) Maintenance of Baseline Schedule.
(j) Corrective measures to regain projected schedules.
(k) Review Four-Week Schedule and planned progress during succeeding work period.
(l) Schedule Update, if required in accordance with Paragraph 3.02.
(m) Coordination of projected progress.
(n) Maintenance of quality and work standards.
(o) Effect of proposed changes on Baseline Schedule and coordination.
(p) Any requests for stored materials payment
(q) Other business relating to Work.

5. Design-Builder will record minutes and distribute electronic copies within one calendar day after meeting to participants and those affected by decisions made.

D. Daily Coordination Meeting: Upon start of construction, Design-Builder shall hold daily informal meetings with the Owner to discuss planned daily activities by Design-Build team and Owner staff. Owner may elect to merge this meeting with the Division's regular morning meetings.

E. OCCP Coordination Meetings:
1. Design-Builder shall schedule and coordinate with Owner one-week prior to implementation of approved OCCP.
2. Agenda:
   (a) Review Approved OCCP.
   (b) Review safety requirements and preparations.
   (c) Review contingency plans.
   (d) Confirm resource availability for execution of OCCP.
3. Design-Builder may request and coordinate additional meetings with Owner as necessary to facilitate completion and approval of draft OCCPs. Owner will make reasonable effort to accommodate Design-Builder but prefers minimum one week notice.

F. Pre-Installation Conferences:
1. Conduct a Pre-Installation Conference at Project site before each construction activity that requires coordination with other construction or moving heavy equipment within reach of the railroad or powerlines.
2. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Owner of scheduled meeting dates.
3. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
   (a) Contract Documents.
   (b) Options.

(c) Related Change Orders.
(d) Purchases.
(e) Deliveries.
(f) Submittals.
(g) Possible conflicts.
(h) Compatibility problems.
(i) Time schedules.
(j) Weather limitations.
(k) Manufacturer's written recommendations.
(l) Warranty requirements.
(m) Compatibility of materials.
(n) Acceptability of substrates.
(o) Temporary facilities and controls.
(p) OCCPs.
(q) Space and access limitations.
(r) Regulations of authorities having jurisdiction.
(s) Testing and inspecting requirements.
(t) Required performance results.
(u) Protection of construction and personnel.

4. Record significant conference discussions, agreements, and disagreements.
5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

G. Expedited Submittal Review Meetings: To expedite the submittal process and accelerate the delivery schedule for equipment with long delivery lead times, expedited submittal review meetings may will need to be held for equipment identified by Design-Builder. Design-Builder shall identify such meetings on Baseline Construction Schedule and coordinate the meetings as needed.

H. Other Meetings as Required:
1. Maintenance Workshop(s):
   (a) Purpose: Develop the work orders for new and modified assets with the Owner. Design-Builder shall review Original Equipment Manufacturer (OEM) O&M manual maintenance recommendations with Owner. Maintenance activities (Preventive & Predictive) will be divided between operations and maintenance. The updated round sheets for the site(s) will be reviewed for deficiencies. Design-Builder shall facilitate a discussion of which OEM recommended maintenance activities have value after the warranty period. If necessary, Design-Builder and Owner will develop additional maintenance activities not recommended by the OEM with a particular focus on predictive maintenance activities such as vibration testing, lubricant testing, and IR testing to support the Owner's reliability centered maintenance program. Maintenance activity frequency will also be discussed. Lubrication for assets will be discussed with a focus on minimizing new lubricants that will need to be stocked.
   (b) Scheduling: Meetings shall occur after OEM manuals have submitted and approved.

(c) Update Asset Maintenance Summary Form per Section 01021 – Operation and Maintenance Data.

2. O&M Data Meeting
   (a) 90 days prior to Final Completion, a meeting will be held to discuss the steps to prepare the O&M Data for transmittal to the Owner.
3. Spare Parts Coordination Meeting per Section 01600 – Product Delivery Storage and Handling.
4. Commissioning meetings as required in Section 01757 – Commissioning.

3.02 SCHEDULE UPDATES

A. At monthly intervals, update schedule to reflect actual construction progress and activities. Progress Schedule should be provided for review and approval prior to monthly pay request at a mutually agreed upon date each month to enable Owner's review to be complete by the agreed upon monthly pay application date. Progress schedules will be reviewed and discussed at Monthly Progress Meetings.
   1. If there are significant changes to the schedule, submit a written report after the Monthly Progress Meeting if requested by the Owner.
   2. Should monthly Schedule Update show project completion earlier than current Contract completion date, show early completion time as schedule activity, identified as "Project Float."
   3. Should monthly Schedule Update show project completion later than current Contract completion date, prepare and submit a Schedule Revision in accordance with Paragraph 3.03 Revisions to Schedule, if requested by Owner.
   4. Revise schedule immediately after an activity revision has been recognized or made at the direction by Owner. Issue updated schedule concurrently with the report of each such progress meeting.
   5. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
   6. As the Work progresses, indicate actual completion percentage for each activity.
   7. Post copies in Project meeting rooms and temporary field offices.

B. Any update:
   1. Prepare update using most recent accepted version of schedule including:
      (a) Actual start dates of activities that have been started.
      (b) Actual finish dates of activities that have been completed.
      (c) Percentage of completion of activities that have been started but not finished.
      (d) Actual dates on which milestones were achieved.
      (e) Update activities by inputting percent complete figures with actual dates.
      (f) Use retained logic in preparing Schedule Updates.
      (g) When necessary, input remaining durations for activities whose finish dates cannot be calculated accurately with a percent complete figure only.
      (h) Revisions to the schedule may be included that have been previously approved as specified in this Section under Revisions to Schedule.

C. Monthly updates:

1. Submit updated schedule and materials specified under Paragraph 3.04 Submittal of Progress Schedules.
2. Since monthly Schedule Update is the basis for the application for progress payment as specified in Section 01290 – Payment Procedures and Change Management, submittal of the monthly Schedule Update is a condition precedent to the making of any progress payments.

D. Submit written narrative report in conjunction with each Schedule Update as required in Paragraph 3.04 Submittal of Progress Schedules.

3.03 REVISIONS TO SCHEDULE

A. Submit revised Baseline Schedule within five calendar days:
1. When delay in completion of any activity or group of activities indicates an overrun of the Contract time or milestone dates by 28 calendar days or five percent of the remaining duration, whichever is less.
2. When delays in submittals, deliveries, or work stoppages are encountered making necessary the re-planning or rescheduling of activities.
3. When the schedule does not represent the actual progress of activities.
4. When any change to the sequence of activities, the completion date for major portions of the work, or when changes occur which affect the critical path.
5. When Contract modification necessitates schedule revision, submit schedule analysis of change order work with cost proposal.
6. When requested by Owner.

B. Create a separate submittal for Schedule Revisions:
1. Comply with schedule updates as specified in this Section.
2. Do not submit with Schedule Updates.

C. Schedule Revisions will not be reflected in the schedule until after the revision is accepted by the Owner:
1. This includes Schedule Revisions submitted for the purpose of mitigating a Design-Builder-caused project delay (Recovery Schedule).
2. Only after Owner's acceptance of the Schedule Revision shall it be reflected in the next monthly update.

3.04 SUBMITTAL OF PROGRESS SCHEDULES

A. Submit Progress Schedules in accordance with Section 01300 – Submittals.

B. Update the Baseline Schedule and Critical Path Schedule to reflect progress made prior to Monthly Progress Meetings and update the Five-Week Schedule prior to the Weekly Coordination Meetings.

C. Submit, on a monthly basis, seven calendar days before Monthly Progress Meetings, updated schedules and narrative report.

D. Submit revised schedules and Time Impact Analyses as specified in Paragraph 1.12 Adjustment of Contract Times.

E. Revisions to the schedule that have been previously accepted may be included in the current month's updated schedule.

F. Submit written narrative report in conjunction with each Schedule Update. Describe:
1. Activities added to or deleted from schedule. Identify added activities in manner distinctly different from original activity designations.
2. Changes in sequence or estimated duration of activities.
3. "Out of Sequence" analysis as specified.
4. Current or anticipated problems and delays affecting progress, impact of these problems or delays and measures taken to mitigate impact.
5. Assumptions made and activities affected by incorporating change order work into the schedule.
6. Critical Path.
7. Subcontractors onsite.
8. Original Contract Value.
9. Revised Contract Value.
10. Baseline Final Completion Date.
11. Updated Final Completion Date.
12. Description of work done in previous month.

G. Recovery Schedule: If after updating the schedule with the latest information the completion of any activity indicates an overrun of the contract time or milestone dates by more than 28 calendar days, Owner may request a recovery schedule to show what would be required to bring the project schedule back into the required completion times. This schedule shall be submitted by the Design-Builder within seven calendar days after the request. Owner will review and give written comments back to the Design-Builder or schedule a meeting to discuss with Design-Builder within seven calendar days of receipt of the mitigation schedule. Only after Owner's acceptance of the recovery schedule shall it be reflected in the next monthly update. Recovery schedule shall be developed and submitted in accordance with Article 8:8 of General Conditions.

H. Approved Owner Contract modifications, cost and resource loading requirements shall be adhered to concerning activities added to or deleted from the schedule.

3.05 REVIEW AND ACCEPTANCE OF SCHEDULES

A. Owner will review Baseline Schedule, Schedule Updates, Schedule Revisions, and Time Impact Analysis to ascertain compliance with specified project constraints, compliance with milestone dates, reasonableness of durations and sequence, accurate inter-relationships and completeness.

B. Written comments on review of Schedule Updates and Schedule Revisions and Time Impact Analysis will be returned to Design-Builder within 14 calendar days after receipt by Owner.

C. Revise and resubmit schedule in accordance with Owner's comments within 14 calendar days after receipt of such comments, or request joint meeting to resolve objections. If Owner requests a meeting the Design-Builder and all major

Subcontractors must participate in the meeting. Design-Builder shall revise and resubmit schedule within 14 calendar days after meeting.

D. Use accepted schedule for planning, organizing, and directing the work and for reporting progress.

E. Owner's submittal review response:
   1. When schedule reflects Owner's and Design-Builder's agreement of project approach and sequence, schedule will be accepted by Owner.
   2. Owner's submittal review response for schedule submittal will be "Receipt Acknowledged: Filed for Record" including applicable comments in accordance with Section 01300 Submittals.
   3. Acceptance of the schedules by the Owner is for general conformance with the Contract Documents and for Owner's planning information, and does not relieve the Design-Builder of sole responsibility for planning, coordinating, and executing the Work within the contract completion dates. Omissions and errors in the accepted schedules shall not excuse performance less than that required by the Contract Documents. Acceptance by the Owner in no way constitutes an evaluation or validation of the Design-Builder's plan, sequence or means, methods, and techniques of construction.

END OF SECTION

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

DAILY FIELD OBSERVATION REPORT

Project Number 81000999

Project Title Blue River WWTP Grit Removal and Fine Screens Project

Contractor or Design-Builder _____

Report Number _____ Date _____ Time _____

Weather			Site Conditions		Day	
❑ Clear	❑ Snow	❑ Warm	❑ Clear	❑ Dusty	❑ Monday	❑ Thursday
❑ Overcast	❑ Foggy	❑ Hot	❑ Muddy	❑ _____	❑ Tuesday	❑ Friday
❑ Rain	❑ Cold	❑ Temperature Range _____			❑ Wednesday	❑ _____

Persons Contacted:

Work Observed:

Items Discussed:

Materials Delivered:

Requested Revisions or Interpretations:

Nonconforming Work Reported This Date To Contractor:

Remarks:

❑ Attachments

Signed by: Date:

Distribution:
- ❑ Owner
- ❑ Contractor
- ❑ Construction Manager
- ❑ Design Professional
- ❑ Consultant _____
- ❑ Other _____

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

PERIODIC FIELD OBSERVATION REPORT

Project Number 81000999

Project Title Blue River WWTP Grit Removal and Fine Screens Project

Contractor or Design-Builder _____

Report Number _____ Date _____ Time _____

Weather			Site Conditions		Day	
❑ Clear	❑ Snow	❑ Warm	❑ Clear	❑ Dusty	❑ Monday	❑ Thursday
❑ Overcast	❑ Foggy	❑ Hot	❑ Muddy	❑ _____	❑ Tuesday	❑ Friday
❑ Rain	❑ Cold	❑ Temperature Range _____			❑ Wednesday	❑ _____

Persons Contacted:

Work Observed:

Items Discussed:

Remarks:

❑ Attachments

Signed by: Date:

Distribution:
- ❑ Owner
- ❑ Contractor
- ❑ Construction Manager
- ❑ Design Professional
- ❑ Consultant _____
- ❑ Other _____

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

WEEKLY REPORT OF WORKING DAYS

Project Number 81000999

Project Title Blue River WWTP Grit Removal and Fine Screens Project

Contractor or Design-Builder _____

Report Number _____ Week Ending: _____

DATE:	WORKING DAY	REMARKS

TOTAL THIS WEEK	PREVIOUSLY	TOTAL TO DATE	WORKING DAYS IN CONTRACT	REMAINING OR OVERTIME

Signed by OWNER'S REPRESENTATIVE Date:

Signed by CONTRACTOR Date:

Distribution: ❑ OWNER ❑ CONTRACTOR ❑ Construction Manager ❑ Design Professional ❑ Consultant ❑ Other

SECTION 01322 – PHOTOGRAPHIC AND VIDEO DOCUMENTATION

PART 1 - GENERAL

1.01 SUMMARY

A. This Section outlines the requirements for photographic and video documentation. The Contractor is solely responsible for the development of an overall plan to fully document Site conditions and the progress of the Work.

B. The Contractor shall hire a professional photographer to provide the services and deliverables described herein.

C. This section does not include work associated with internal closed-circuit television (CCTV) inspections of sewer gravity pipes. See Section 02686 – CCTV Inspection of Sewer Mains.

1.02 SPECIFICATION MODIFICATIONS

A. It is understood that throughout this section these Specifications may be modified by appropriate items in Section 01015 – Specific Project Requirements or as otherwise indicated in the contract documents.

1.03 RELATED SECTIONS

A. Section 00700 – General Conditions.

B. Section 01015 – Specific Project Requirements.

C. Section 01300 – Submittals.

D. Section 01320 – Construction Progress Documentation.

E. Section 01335 – Document Management.

F. Section 02686 – CCTV Inspection of Sewer Mains.

1.04 DEFINITIONS

A. Pre-Construction Video: A video taken to document Site conditions prior to the start of construction.

B. Pre-Construction Photographs: Photographs taken to document Site conditions prior to the start of construction. All Pre-Construction Photographs shall be digital, indexed on an interactive map and shown on a View Location Map.

C. Construction Progress Photographs: Digital photographs taken to document the progress of construction.

D. Construction Activity Photographs: Digital photographs taken to document specific construction activities.

E. Post-Construction Photographs: Digital photographs taken after final restoration to document the finished condition of the Site.

F. Affidavit of Authenticity: The photographer's signed and notarized affidavit, attesting to the production of the original photographs, videos and their authenticity.

1.05 SUBMITTALS

A. Submit as specified in Section 01300 – Submittals.

B. Other required Submittals:

1. Photographer's Qualifications: Submit for review and approval the qualification information demonstrating the photographer meets the requirements of paragraph 1.06 of this Section.
2. Phasing Plan: If applicable, submit for review and approval a phasing plan for Pre-Construction Photographs and Videos.

3. Pre-Construction Photographs: Submit for review and approval digital pre-construction photographs with an interactive index map, Photograph Navigation System (see paragraph 2.05 of this Section) and affidavit of authenticity.
4. Pre-Construction Video: Submit for review and approval a pre-construction video with a Video Navigation System (see paragraph 2.05 of this Section) and affidavit of authenticity (see paragraph 1.04 of this Section).
5. Construction Progress Photographs: On a monthly basis, submit digital construction photographs, interactive index map and affidavit of authenticity.
6. Construction Activity Photographs: On a monthly basis, submit digital activity photographs (if different than progress photographs), interactive index map and affidavit of authenticity.
7. Post-Construction Photographs/Video: Submit for review and approval digital post-construction photographs or video, interactive index map and affidavit of authenticity.

1.06 QUALITY ASSURANCE

A. The Contractor is responsible for the quality assurance and quality control of the Work.
B. General Quality: Photographs and video shall be clear and of sufficient quality to show relevant detail. They shall not be blurred, taken in shadow or too far away to provide conclusive information. The City may require that the photographs or video be retaken should the quality be insufficient. Costs for such re-takes are the Contractor's sole responsibility and shall be done at no extra cost to the City.
C. Qualifications of Photographer: The Contractor shall engage the services of a professional photographer with a minimum of 3 years of experience in construction photography to document the conditions of the project site. Upon request, samples of the photographer's prior work and/or references shall be submitted.
D. Affidavit of Authenticity: The Contractor shall provide the photographer's signed and notarized affidavit, attesting to the production of the original photographs, videos and their authenticity. An affidavit of authenticity shall be provided with each submittal/deliverable.

1.07 MINIMUM REQUIREMENTS

A. The section specifies several different sets of photographic and video documentation requirements. The extent of documentation will depend upon the size and type of the project. The following table summarizes the basic documentation requirements.

Table 1. Summary of Requirements

Set of Documentation	Mandatory	As Required by Section 01015
Pre-Construction Video		✓
Haul Route Video		✓
Pre-Construction Photographs	✓	
Interactive Index Map		✓
Construction Progress/Activity Photographs		✓
Post-Construction Photographs/Video		✓

1.08 OWNERSHIP

A. The photographs and videos shall become the sole property of the City.

1.09 SCHEDULES

A. Schedule of Values: Photographic/Video documentation shall be listed as one line item in the Schedule of Values.

B. Construction Progress Documentation: Each set of photographs or videos shall be listed in the Preliminary Project Schedule as a discrete activity. See Section 01320 – Construction Progress Documentation.

1.10 PHASING

A. Based on the nature and scope of the Work, the Contractor may phase the Pre-Construction Photographs and Video. If phasing is to be implemented, the following shall apply:
   1. The Contractor shall submit a Phasing Plan that identifies each area of the Work.
   2. For each phase, Pre-Construction Photographs and Videos shall be taken within 21 days of the start of construction activities unless otherwise approved in writing by the City/Design Professional.

B. Under no circumstances shall construction begin in any area until the Pre-Construction Photographs and/or Video have been submitted and approved by the City/Design Professional.

PART 2 - PRODUCTS

2.01 PHOTOGRAPH QUALITY

A. Photographic images shall be captured in digital format, with a minimum of 10-megapixel resolution and taken without JPG compression.

B. Each photograph shall include a date/time stamp in the image, showing when the image was taken.

2.02 VIDEO QUALITY

A. All video recordings shall be captured in full 1080-dpi Hi-Definition digital format, without compression or file-reduction whether applied in-camera or after capture during editing.

B. The original video segments shall be retained in the format captured in camera (such as MP4 or MTS for Canon HD Video) without compression or modification that would reduce resolution or quality. The video shall include a date/time stamp in the image, showing when the image was taken. Video shall include verbal description and narrative of what is being captured.

2.03 METADATA

A. Digital files for photographs and videos shall, at a minimum, contain the following metadata:
   1. Project Name.
   2. Date and Time Taken.
   3. All other metadata inherently provided by the camera/video equipment.

2.04 MEDIA LOG

A. The Contractor shall maintain a media log (photographs and videos) for the project. The log shall include, but is not limited to, the following information for each photograph and/or video:
   1. Project Name.
   2. Project Number.
   3. Contract Number.
   4. Name of City and Department.

5. Name of Contractor.
6. Name of Design Professional.
7. Photograph file name (the specific format should be tied to the project name). Photograph file name shall be unique to each digital file and shall be embedded in the digital image in a manner that is permanent and clearly legible when the file is opened.
8. Include a date designator in file names.
9. Date the photograph was taken.
10. The name of the photographer who took the photograph.

2.05 PHOTOGRAPH AND VIDEO NAVIGATION SYSTEM

A. If specified in Section 01015 – Specific Project Requirements, the Contractor shall provide an electronic photographic and video navigation system (navigation system) for searching and viewing recorded imagery.

B. Interactive Index Map: The navigation system shall indicate the general location of each area photographed or video recorded using icons and other suitable mark-ups on the actual construction drawings in PDF-format.

C. The navigation system shall utilize standard PDF-reader software (such as Adobe Reader, Acrobat, or Bluebeam Vu) or other software that shall be included with the deliverables. Icons shall be individually hyperlinked to the respective photograph, video, affidavit of authenticity and media log file for immediate playback in Windows Media Player, VLC or other players.

D. The navigation system shall include the following:
1. Project Name.
2. Project Number.
3. Contract Number.
4. Name of City.
5. Name of Contractor.
6. Name of Design Professional.
7. Ranges of dates for which the photographs or videos were taken.
8. The name of the photographer.
9. Affidavit of Authenticity.
10. Media Log.
11. Photographs.
12. Videos.

E. A navigation system shall be provided for each set of photographs and videos taken.

PART 3 - EXECUTION

3.01 PRIOR TO PHOTOGRAPHIC AND VIDEO DOCUMENTATION

A. Construction Limits: Prior to the Pre-Construction Photographs and Video, the Contractor shall flag or mark the construction limits and excavation areas for identification, and project centerlines shall be physically marked with survey stakes and/or high visibility paint (including station numbers).

B. Mark Utilities: Prior to the Pre-Construction Photographs or Video, the Contractor shall notify utilities and have them marked so that utility locations are documented.

C. Coordinate with City: For any work that requires a representative of the City to be present, the Contractor shall provide the City a minimum of 2 days' notice.

3.02 PRE-CONSTRUCTION VIDEO

A. If specified in Section 01015 – Specific Project Requirements, the Contractor shall provide a pre-construction video.

B. Scope: Prior to the start of construction, the Contractor shall prepare a color video recording with audio of all the areas to be affected by construction. All pre-construction video recordings shall have sufficient detail to reveal the condition (including defects and damage) of all existing features, such as pavement, driveways, culverts, inlets, sidewalks, landscaping, vegetation, creek banks, trees, structures, foundations and other such items along the construction route and in the immediate adjacent areas, which might be affected by the construction operations. In addition, the videographer shall move beyond the construction zone as needed to ensure documentation of features and areas that may not be adequately recorded from the centerline rotations. Videos shall be taken on both sides of the street when construction is in or along a roadway (use this approach along drainage channels and in other similar situations).

C. Schedule: Taken after utilities have been marked and prior to the placement of materials or equipment on the Site. Videos shall be submitted to the City for review and approval. Under no circumstances shall construction begin until the pre-construction video has been submitted and approved.

D. The pre-construction video recording shall be done in the presence of a representative of the City.

E. The Contractor shall document all pre-existing site conditions/elements of the Site, the same as listed for the Pre-construction Photographs.

F. The video documentation shall provide a clear and continuous view of the project showing all visible utilities and features within the limits of construction.

G. To preclude the possibility of tampering or editing in any manner, all video recordings shall, by electronic means, generate and display continuously and simultaneously on the screen or in the video file metadata properties digital information to include the date and time of recording. The time information shall consist of hours, minutes and seconds, separated by colons (i.e., 10:35:18).

H. The audio/video recording shall consist of one video and one audio track which shall be recorded simultaneously. All tracks shall consist of the original live recordings and thus shall not be copies of other audio or video recordings.

I. The audio track shall contain the narrative commentary. Ample descriptive narrative shall be recorded simultaneously during all recordings. Narration shall include clearly audible comments that will deliver station number and/or street address, locations, direction of view and rotation.

J. Typical video segments should not exceed 10 minutes in length.

K. Rotations of 360-degrees shall be at the beginning and end of each video segment and at each 100 foot increment throughout the video.

L. The rate of speed in the general direction of travel of the conveyance used during recording shall be controlled to provide a usable image. On average, the rate of forward travel during videotaping shall not be less than fifteen minutes for every 1000 linear feet of pipeline route or street centerline; slower rates shall be utilized in residential/commercial areas.

M. Panning rate, zoom-in rate and zoom-out rate shall be controlled sufficiently such that playback will provide clarity of the object viewed.

N. All recording shall be done during times of good visibility. No recording shall be done during periods of precipitation unless authorized by the City.

3.03 HAUL ROUTE VIDEO

A. If specified in Section 01015 – Specific Project Requirements, the Contractor shall provide pre-construction video documentation of all haul routes associated with the Project.
B. Haul route videos shall be made at the time of the Pre-Construction Photographs.
C. Haul Route Videos shall meet the requirements of the paragraph PRE-CONSTRUCTION VIDEO as well as the following:
    1. Haul routes shall be recorded during daylight hours and during good weather conditions.
    2. Video equipment may be mounted on a vehicle. The speed of the vehicle while recording shall not be more than 5 miles per hour (mph). If traffic or safety concerns prohibit driving 5 mph then the video shall be taken while walking the route.
    3. No audio/narrative commentary is required for the haul route video.

3.04 PRE-CONSTRUCTION PHOTOGRAPHS

A. The Contractor shall provide pre-construction photographs as specified in this Section and as specified in Section 01015 – Specific Project Requirements.
B. Scope: The purpose for pre-construction photo documentation is to record existing conditions, damage and features on or adjacent to the project site. The principal reason for obtaining photographs is so that items such as cracked curbs, broken pavement, sidewalks, plugged culverts, driveway conditions, lawn conditions and other existing conditions located in the Project Site may be clearly shown and documented. This will to some degree mitigate the possibility of post-construction restoration issues with property owners in the Project area.
C. Schedule: Take photographs after utilities have been marked, prior to placement of materials or equipment on the Site and prior to the start of construction activities in an area. Photographs shall be submitted to the City for review and approval. Under no circumstances shall construction begin until the pre-construction photographs have been submitted and approved.
D. Pre-construction photographs shall be taken at sufficient intervals to be able to carefully document the pre-construction conditions of the Site and in no case more than 50-foot intervals along the street, right-of-way, drainage easement and water/wastewater line route before commencement of the Work.
E. In addition, select photographs shall be taken as needed along the construction limits, and of adjacent properties, to ensure documentation of features and areas that may not be adequately recorded in the centerline rotations. Photographs shall be taken along both sides of the street when construction is in or along a roadway.
F. Overlapping composition techniques shall be employed to ensure maximum photographic coverage.
G. Pre-construction photographs shall be taken after the utility locations have been marked.
H. Pre-construction photographs shall be taken with a representative of the City present unless otherwise authorized by the City.
I. All Pre-Construction Photographs shall have sufficient detail to reveal the condition (including defects and damage) of all existing features, such as pavement, driveways, culverts, inlets, sidewalks, landscaping, vegetation, creek banks, trees, structures, foundations and other such items along the construction route, and adjacent areas which might be affected by the construction operations. An identifier such as house or business address/signs, property numbers, mail boxes, landscaping, etc… shall be included when practical in each view for ease of identification.
J. At a minimum, pre-construction photographs must be taken of the following views:
    1. The entire street right of way and limits of construction; whichever is greater.
    2. The entire easement width and length (both permanent and temporary).

3. All curb lines (both sides of street) – all pre-existing curb damage not called for replacement within the Work and shall include major cracks.
4. All driveways, steps, and curbs and curb ramps (both sides of street).
5. Fence and gate conditions.
6. Trees, ornamental shrubs, plantings/planter boxes and evidence of irrigation features.
7. Other privately or publicly owned features or facilities that might be disturbed by the construction.
8. Views of structures, both inside and adjacent to the project site and easements in areas where the Contractor will be working within five (5) feet of said structure.
9. Prominent utility features, such as: guy wires, poles, signs, valves, fire hydrants, meters, pull boxes, etc.
10. Streams and stream banks within the limits of construction.
11. At the discretion of the Contractor, photograph offsite roadways that will be subjected to heavy usage such as for haul routes or delivery of heavy components or equipment. Refer to Paragraph HAUL ROAD VIDEO for additional requirements.
12. Other significant or prominent features to protect the City and the Contractor following construction (e.g. close-up photographs of pre-existing broken curbs, cracked/failed pavement, damaged adjacent retaining walls, etc.).
13. Views of structures, both inside and adjacent to the ROW/easement in areas where the Contractor will be working within five (5) feet of said structure.
14. Other views as requested by the City.

3.05 CONSTRUCTION PROGRESS PHOTOGRAPHS

A. If specified in Section 01015 – Specific Project Requirements, the Contractor shall provide Construction Progress Photographs.
B. Scope: The Contractor shall provide construction progress photographs to depict the progress of the work. The Contractor shall be responsible for photographs of the Site to show the existing and general progress of the Work. The City will advise as to which views are of interest.
C. Schedule: Photographs shall be taken at the time of the Pre-construction Photographs, a minimum of once per month throughout the duration of the Project, and at the time of the Post Construction Photographs. Construction Progress Photographs are to be submitted each month with the Contractor's Application for Payment. Applications for Payment was not be considered acceptable until the photographs are provided.
D. This set of photographs will be taken as close as possible to the same locations and views of the pre-construction photography.

3.06 CONSTRUCTION ACTIVITY PHOTOGRAPHS

A. If specified in Section 01015 – Specific Project Requirements, the Contractor shall provide Construction Activity Photographs.
B. Scope: The Contractor shall provide photographs taken to document Site conditions and specific construction activities throughout the duration of the Project.
C. Schedule: Photographs shall be taken two times per month (every two weeks) for the duration of the Project.
D. Construction Activity Photographs are to be submitted each month with the Contractor's Application for Payment.
E. Photographs shall be taken to depict the work accomplished during the month. These photographs are to include, but are not limited to, the following:
   1. Work not yet covered up.
   2. When mechanical, electrical, plumbing or building inspections are scheduled.

3. The beginning of installation of major items of equipment.
4. After installation of major items of equipment.
5. Other significant construction activities.
6. As directed by the City.

3.07 POST-CONSTRUCTION PHOTOGRAPHS

A. If specified in Section 01015 – Specific Project Requirements, the Contractor shall provide Post-Construction Photographs.

B. Scope: The Contractor shall provide Post-Construction Photographs of the project area that documents the final restoration and construction improvements. Post-Construction photographs shall show the general condition of the construction zone (recording finished landscape and other restoration, plus construction improvements), and other areas that may have been affected by construction activities.

C. Schedule
   1. Photographs shall be taken after completion of the Substantial Completion punch list when the project is complete, the Site is restored to the satisfaction of the City, and before submission of the Application for Final Payment.
   2. Post-construction photographs shall be taken after all items have been address from the Substantial Completion inspection, after cleanup and site restoration, and before application for final payment.

D. Post-Construction Photographs are to be submitted with the Contractor's Application for Final Payment.

E. The Contractor shall coordinate the schedule of the post-construction photographs with the City's Project Manager and shall provide at least 5 days written notice to allow the City's Representative to be present when the photographs are taken.

3.08 POST-CONSTRUCTION VIDEO

A. If specified in Section 01015 – Specific Project Requirements, the Contractor shall provide a Post-Construction Video.

B. Scope: The Contractor shall prepare a color video recording with audio of all the areas affected by construction. All Post-Construction video recordings shall have sufficient detail to reveal the final, restored condition of all existing features, such as pavement, driveways, culverts, inlets, sidewalks, landscaping, vegetation, creek banks, trees, structures, foundations, and other such items along the construction route, and in the immediate adjacent areas, which might have been affected by the construction operations. In addition, videographer shall move beyond the construction zone as needed to insure documentation of features and areas that may not be adequately recorded from the centerline rotations. Videos shall be taken on both sides of the street when construction is in or along a roadway (use this approach along drainage channels and in other similar situations).

C. Schedule: The post-construction video shall be taken in conjunction with the post-construction photographs.

D. Post-construction videos are to be submitted with the Contractor's Application for Final Payment.

E. Unless otherwise authorized by the City, the post-construction video recording shall be done with a representative of the City present.

F. The Contractor shall document all post-construction site conditions/elements of the Site as listed for the post-construction Photographs.

G. The video documentation shall provide a clear and continuous view of the project alignment showing all visible utilities and features within the limits of construction.

H. To preclude the possibility of tampering or editing in any manner, all video recordings shall, by electronic means, generate and display continuously and simultaneously on the screen digital information to include the date and time of recording. The time information shall consist of hours, minutes and seconds, separated by colons (i.e., 10:35:18).
I. The audio video recording shall consist of one video and one audio track which shall be recorded simultaneously. All tracks shall consist of original live recordings and thus shall not be copies of other audio and video recordings.
J. The audio track shall contain the narrative commentary. Ample descriptive narrative shall be recorded simultaneously during all recordings. Narration shall include clearly audible comments that will deliver station number and/or street address locations, direction of view and rotation.
K. Typical video segments should not exceed 10 minutes in length.

3.09 DELIVERABLES

A. Refer to Section 01015 – Specific Project Requirements for additional deliverables required for the Project.
B. Delivery of the documentation record shall be made as soon as is practical after the images are recorded. Deliverables include original photographs in JPG format, photographs converted to pdf format, interactive map index and navigation system.
C. Electronic Storage Devices: Submit the navigation system on a non-returnable USB compatible flash drive. Submittals shall conform to the following:
    1. Submit with the monthly invoice two sets of digital photographs and/or videos. Each set shall be contained on a separate electronic storage device.
    2. Each set shall be cumulative of all photographs and/or videos taken to date.
    3. Affidavit(s) of Authenticity shall be included in a digital format.
D. Document Management System: Unless otherwise noted in Section 01015 – Specific Project Requirements, all deliverables shall be provided in an electronic format using the specified document management system and in accordance with paragraph 1.05 of this Section.

END OF SECTION

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

TRANSMITTAL LETTER

Project Number 81000999

Project Title Blue River WWTP Grit Removal and Fine Screens Project

TO: _____ Date _____

Re: _____

ATTN: _____

We are sending you ❑ Attached ❑ Under separate cover via _____ the following items:
❑ Shop Drawings ❑ Prints ❑ Drawings ❑ Samples ❑ Specifications
❑ Copy of Letter ❑ Change Order ❑ _____

Copies	Date	No.	Description

These are transmitted as checked below:

❑ For Approval ❑ Approved as Submitted ❑ Resubmit _____ Copies for Approval
❑ For Your Use ❑ Approved as Noted ❑ Submit _____ Copies for Distribution
❑ As Requested ❑ Returned for Corrections ❑ Return _____ Corrected Prints
❑ For Review and Comment ❑ _____

Remarks: _____

By: _____

Distribution:
❑ Owner
❑ Contractor
❑ Construction Manager
❑ Design Professional
❑ Consultant
❑ Other

SECTION 01335 – DOCUMENT MANAGEMENT

PART 1 - GENERAL

1.01 SUMMARY

A. An internet-based coordination and document management systems (DMS), e-Builder and MBE/WBE payment reporting (B2G), will be used for the Project. This system will be used to manage project documentation among the Owner and Design-Builder. Design-Builder shall utilize the DMS for all project related correspondence and documentation.

B. The DMS will be utilized to create, track and organize Project documentation (Owner's Representative will provide the exceptions), including, but not limited to, the following:
   1. Schedules.
   2. Applications for Payment.
   3. Meeting minutes with action items.
   4. Project correspondence.
   5. Submittals.
   6. Change Management:
      (a) Requests for Interpretation.
      (b) Requests for Proposal.
      (c) Work Change Directives. (Storage only)
      (d) Change Orders.
   7. Reporting:
      (a) Certified Payroll Report. (B2G)
      (b) Subcontractors and Major Material Suppliers List. (B2G)
      (c) Daily Labor Force Reports. (B2G)
      (d) Daily Inspection Reports.
      (e) Photographs and Video.
      (f) Certificates of achievement of full operation:
         (i) Certificate of Substantial Completion.
         (ii) Certificate of Final Completion.
      (g) Contractor Affidavit for Final Payment.
      (h) Subcontractor Affidavit for Final Payment.
      (i) Punch Lists.
   8. Notifications:
      (a) Correction of Defective Work.
      (b) Notification of Non-Compliant Work.

1.02 RELATED SECTIONS

A. General Conditions of Contract for Progressive Design-Build Services.
B. Section 01300 – Submittals.

1.03 COORDINATION MEETING

A. Prior to the Preconstruction Conference, Owner will facilitate a meeting with Design-Builder to review requirements for project coordination, document control and use of the DMS. The meeting should be scheduled to allow Design-Builder time to submit

the initial project correspondence, other requirements and preliminary schedules in accordance with General Conditions.

B. At this meeting, Owner will present the procedures to be used for document management for the Project.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 01340 - PROJECT BIM COORDINATION

PART 1 - GENERAL

1.01 SUMMARY OF WORK

A. This section covers Building Information Modeling (BIM) enabled projects.

1.02 Related Sections

A. Section 01019 – Closeout Procedures.
B. Section 01300 – Submittals.
C. Section 01615 – Equipment Installation and Tagging.
D. Section 01340.A – Attribute Standard.
E. Kansas City Water Services Department Design Standards – CAD Drawing Standards.

1.03 CODES AND SECTIONS

A. Not Used.

1.04 DEFINITIONS

A. General Definitions
   1. BIM – Building Information Modeling.
   2. Design Phase – The overall design is broken into separate stages. Each phase is a certain level of development.
   3. LIDAR - Light Detection and Ranging. This method measures distances using laser light and measuring the reflection with a sensor. This is also called 3-D Laser Scanning.
   4. Modeled Object – An equipment asset created in BIM. Modeled objects are tagged using a parent-child-grandchild data structure with CMMS tag level 6 is the parent, CMMS tag level 7 is the child, CMMS tag level 8 is the grandchild. The grandchild inherits data from the child and the child inherits data from the parent.
   5. Overlay – Placing an object over the surface of another of another object thus allowing the object to be visible on drawings or other deliverables by viewer.
   6. Point Cloud - A set of data points in space used for capturing existing conditions of any site.
   7. Relative File Path – A defined location relative to BIM's current directory.
   8. Site Types
      a. Brownfield – Project locations with hazardous materials at in existing in-use facilities by Owner.
      b. Grayfield - Project locations with existing in-use facilities by Owner.
      c. Greenfield – Project locations with no in-use facilities by Owner.
   9. Standard Component – Any valve, pipe, duct, fitting, cable, cable tray, conduit, wiring, or structural member where aforementioned component is dimensionally defined in a Design Standard.
   10. State Plane Coordinate System – U.S. Coordinate system used by each U.S. state and has between one to six zones depending on size and shape.
B. Software Definitions

1. Software Packages
   a. BIM 360 – Autodesk BIM software that shows the latest published Revit 3D models for design collaboration between Owner and Design-Builder.
   b. CMMS – Computerized Maintenance Management System used for operation and maintenance of facility assets. Owner's current CMMS is Hansen Infor™.
   c. Revit – Autodesk software used for Building design, Foundation design, Structural design, and MEP design.
2. CMMS
   a. CMMS Parameters – Fields within Autodesk Revit associated with identifying and describing an asset or equipment item. These fields allow for the creation of unique identifiers for each piece of equipment, and allowing for synching with Owner's CMMS.
   b. CMMS Synching – Process that integrates the BIM model with CMMS.
3. CMMS Facility Key – Unique identifier used in Owner's asset management system. The asset management system relies on this unique identifier to incorporate all information collected into the asset management system. This may hereinafter also be referred to as the Comp Key.
4. Dynamic – Any item, field, attribute, or other component which receives an active input from a source other than by a manual user.
5. Parameter – Fields with populated values in BIM software. In Autodesk Revit, these are commonly referred to as family parameters.
6. Publish – The process of pushing any model changes into cloud-based BIM software for the purpose of coordination between interdisciplinary and inter-organizational teams.
7. Static – Any item, field, attribute, or other component which requires manual edit to change its value.

1.05 BIM INFORMATION PROVIDED BY OWNER

A. Existing
   1. Existing survey information, GIS data, 2D drawing documents, and existing BIM models will be shared with BIM responsible person(s).
   2. Non-available information will be determined prior to commencing any site visits. If needed, non-available information will be collected while on site and incorporated into the BIM model. Site visits may also identify any additional information needed for completion of Work and needed to be included in the BIM model.
   3. Owner may provide a template from Revit, or BIM 360 before commencement of Work by Design-Consultant.
   4. Owner encourages the use of LIDAR for documenting conditions due to increased efficiency over other methods.
   5. Owner will provide CMMS Facility Key information for existing assets in CMMS.

1.06 BIM INFORMATION PROVIDED BY DESIGN-BUILDER

A. General
   1. All BIM-related design shall be performed in Autodesk Revit.

a. Prior to commencing Work, Design-Builder shall confirm which software version to perform Work in.
b. Scope of BIM Work that may be performed using Autodesk Revit and loaded to a cloud-based location.

2. Design-Builder shall keep a published file for each BIM model revision used for design reviews for the purpose of traceability.
3. All standard pipe, fittings and other components shall be easily identifiable and in addition to geometric dimensions, each standard component shall be specified enough such that it may be furnished and installed from provided design documentation. These components may be pulled from existing catalogs; however, they shall adhere to all data requirements.
   a. Pipe and fittings
   b. Conduit, Cable Tray
   c. Ductwork
   d. Major Structural, and Architectural Elements
   e. Electrical Housing
   f. Instrumentation & Controls Housing
4. Design-Builder shall not add any level 7 equipment tags without Owner approval. Equipment may be given a Level 8 tag. Level 8 changes will be done in coordination with Owner. Level 8 must be coordinated to maintain consistency throughout utilities.
5. Tolerances
   a. Equipment locations shall be within a 1" tolerance. If equipment is installed on foundations with cast-in-place, tolerances shall be tightened such that the equipment aligns with foundations.
   b. All equipment component dimensions in BIM model shall have tolerances no greater than 1/4" and representative of the dimensions for all buildings, tanks, equipment, piping, valves, and appurtenances used during project construction.
   c. BIM tolerances will be within the GIS snapping tolerances required for a utility trace. Design-Builder shall tighten the tolerance of only the equipment items needed for a GIS utility trace.

B. Existing Facility Assets
   1. If the project has a tie-point to an existing asset, it is the Design-Builder's responsibility to include all component information needed to complete the tie-in into the BIM model.
   2. Existing underground utilities shall use 2D representation.
   3. For parameters of exiting assets with missing information and requires an input by software, Design-Builder may use the text "N/A."

C. Equipment and Component Specifications
   1. All final submittals from Suppliers shall be provided to Design-Builder for integration into the BIM model.
   2. For equipment packages, actuated valves, instruments, and piping specialty items, a hyperlink shall be used to connect aforementioned items in the BIM model to the project network location for all equipment with a Level 8 code.

D. BIM Parameters
   1. Design-Builder shall assign equipment tags per Section 01615 – Equipment Identification and Tagging.

2. There shall be a BIM parameter for each field found in Owner's CMMS.
3. Equipment O&M Hyperlinks
    a. All equipment must have parameters added and grouped in accordance with the Owner attribute standards.
    b. In Revit, all CMMS parameters will be located within the "Identity Data" parameter group.
    c. In Revit, All facility asset parameters will be located within the "Data" parameter group.
4. Parameters that are not applicable for components shall be filled in with the text "N/A"

1.07 COORDINATION

A. The coordinate system used for all BIM projects shall be the Missouri Coordinate System of 1983, West Zone and NAVD 88 Datum.
B. Owner and Design-Builder will coordinate project phases and the corresponding LOD for each phase before starting any pre-design work or design work using BIM.
C. Owner preference is to have read-only access to current working models and to be able to download a copy of recently published versions of models.
D. It is Owner's responsibility to integrate BIM with Owner CMMS. Procedure following is provided as a courtesy.
    1. Tagging of all new equipment shall be per Section 01615 – Equipment Identification and Tagging.
    2. Newly assigned tags are provided to Owner for creation of new assets in CMMS.
    3. Owner issues Facility Key for input into BIM model.
    4. Design-Builder will add CMMS Facility Key input as BIM parameter.
    5. BIM will use Facility Key and network location for integration into CMMS.
E. If the project involves the installation of new assets, then Design-Builder shall coordinate with Owner to have new CMMS Facility Keys assigned to the new assets. CMMS Facility Keys will be assigned by Owner after equipment tags have been assigned.

1.08 RECORD BIM DATA

A. General: Transmit published BIM and all related files for Owner's reference during normal working hours. Any construction-related needs will be deferred to construction drawings for interpretation by Design-Builder.
B. At the end of the Project, Record BIM Data shall be incorporated to include but not limited to: 3D representation of Work, all data parameters completed and all linked information in relative file paths.
C. Data Parameters
    1. BIM and its data shall be conformed to construction records prior to BIM turnover.
    2. For BIM facility asset parameters, fill out all data parameters as defined in 013124.A – Attribute Standard including relative hyperlinks per the file structure for all information the Design-Builder has.
    3. Any hyperlink will direct the user to the designated file location.

4. Transmittals required by Design-Builder must be included in the Owner's Record Submittal Zip File. All files stored in Windows 10 shall have tag metadata that includes CMMS Level 1 through CMMS Level 8 asset information.
5. The folder containing the designated file locations will appear as shown in Figure 01.

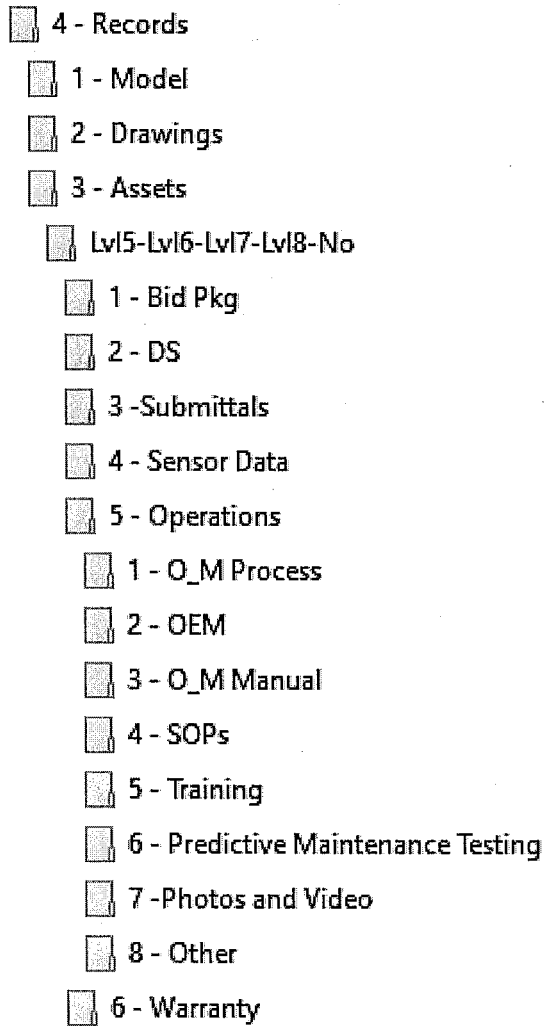


Figure 01: Record Submittal Zip File Structure

D. Submission
   1. BIM model must be cross-checked against field records and be free of conflicting data.
   2. Each BIM parameter with a link to a file shall be confirmed to work using relative file paths. Relative file paths will be used when during turnover of the Revit model and equipment documentation. Refer to Owner's Attribute Standard and Owner zip submittal.

3. Naming of BIM files must be coordinated with Owner's representative prior to submission at Closeout. At Owner's discretion, the file names will change at request by Owner.
4. Give particular attention to information on equipment components that cannot be readily identified in the field and recorded later.

E. For requirements regarding closeout procedures, refer to Section 01019 – Closeout Procedures.

PART 2 - PRODUCTS
Not used.

PART 3 - EXECUTION
Not used.

END OF SECTION

Equipment Parameters

CMMS Parameters

ID Attribute	Attribute Description	Example Data	Comment
01 - CMMSDept	CMMS Department (Lvl. 1)	WSD	Text
02 - CMMSDiv	CMMS Division (Lvl. 2)	Wastewater	Text
03 - CMMSSec	CMMS Section (Lvl. 3)	Treatment	Text
04 - CMMSFacilityKey	CMMS Facility Key	(Assigned by KCWater)	Text
05 - CMMSAddressNumber	CMMS Address Number		Number
06 - CMMSAddressPreDir	CMMSAddressPreDir		Text
07 - CMMSAddressStreet	CMMS Address Street		Text
08 - CMMSAddressSuffix	CMMS Address Suffix		Text
09 - CMMSAddressPostDir	CMMS Address PostDir		Text
10 - CMMSAddressSubdesignation	CMMS Address Subdesignation		Text
11 - CMMSAddressCity	CMMS Address City		Text
12 - CMMSAddressState	CMMS Address State		Text
13 - CMMSAddressZIP	CMMS Address ZIP		Number
14 - CMMSSubArea	CMMS Sub-Area (Lvl. 4)	PXXX	Text
15 - CMMSProc	CMMS Process/Function (Lvl. 5)		Text
16 - CMMSSubProc	CMMS Systems (Lvl. 6)		Text
17 - CMMSEquip	CMMS Equipment (Lvl. 7)		Text
18 - CMMSComp	CMMS Component (Lvl. 8)		Text
19 - CMMSNumb	CMMS Number		Number
20 - CMMSDescription	CMMS Description		Text

Facility Asset Parameters

Design Attribute	Attribute Description	Example Data	Comment
01 - ProjectNumber	Project Number	XXXXXXXXX	Text
02 - BidPkgNumber	Bid Package Number	P-XXXXX	Text
03 - ProvidedBy	Provided By	Contractor	Text
04 - InstalledBy	Installed By	Contractor	Text
05 - LocalRep	Local Representative	Contractor	Text
06 - Manufacturer	Manufacturer	XXXXX	Text
07 - Model	Model	XXXXX	Text
08 - SN	Serial Number	XXXXX	Text
09 - InstallationDate	Installation Date	XXXX.XX.XX	Text
10 - CommissionDate	Commission Date	XXXX.XX.XX	Text
11 - DecommissionDate	Decommission Date	XXXX.XX.XX	Text
12 - WarrantyStartDate	Warranty Start Date	XXXX.XX.XX	Text
13 - WarrantyEndDate	Warranty End Date	XXXX.XX.XX	Text
14 - BidPkg	Bid Package	..\3 - Equipment\(Lvl6).(Lvl7).(Lvl8).No\1 - Bid Pkg	URL
15 - DS	Equipment Datasheet	..\3 - Equipment\(Lvl6).(Lvl7).(Lvl8).No\2 - DS	URL

16 - Submittals	Submittals	..\3 - Equipment\(Lvl6).(Lvl7) (Lvl8).No\3 - Submittals	URL
17 - O_MProcess	Operation & Maintenance Process	..\3 - Equipment\(Lvl6).(Lvl7) (Lvl8).No\5 - Submittals\1 - O_M Process	URL
~~18 - OEMs~~	~~Original Equipment Manufatureres~~	~~..\3 - Equipment\(Lvl6).(Lvl7).(Lvl8).No\5 - Submittals\2 - OEMS~~	~~URL~~
19 - O_Mmanual	Operation & Maintenance Manual	..\3 - Equipment\(Lvl6).(Lvl7).(Lvl8).No\5 - Submittals\3 - O_M Manual	URL
20 - SOPs	Standard Operating Procedures	..\3 - Equipment\(Lvl6).(Lvl7).(Lvl8).No\5 - Submittals\4 - SOPs	URL
21 - Training	Training	..\3 - Equipment\(Lvl6).(Lvl7).(Lvl8).No\5 - Submittals\5 - Training	URL
22 - Other	Other	..\3 - Equipment\(Lvl6).(Lvl7).(Lvl8).No\5 - Submittals\7 -Others	URL
23 - PredictiveMaintTesting	Predicitive Maintenance Testing	..\3 - Equipment\(Lvl6).(Lvl7).(Lvl8).No\5 - Submittals\6 - Predictive Maintenance Testing	URL
24 - PhotosAndVideos	Photos and Videos	..\3 - Equipment\(Lvl6).(Lvl7).(Lvl8).No\5 - Submittals\7 - Photos and Videos	URL
25 - PredictiveMaintLog	Predicitive Maintenance Log	https:\\www.xxxx.com	URL - (Hyperlink to CMMS log)
26 - PreventativeMaintenanceLog	Preventative Maintenance Log	https:\\www.xxxx.com	URL - (Hyperlink to CMMS log)
27 - CorrectiveMaintenanceLog	Corrective Maintenance Log	https:\\www.xxxx.com	URL - (Hyperlink to CMMS log)
28 - GEN	General Notes	..\2 - Drawings\1 - General Notes\Filename.pdf	URL - (To Location of General notes sheet applicable to Equip.)
29 - PID	PID Drawing	..\2 - Drawings\2 - PIDs\Filename.pdf	URL - (To Location of P&ID where Equip. can be found on it)
30 - PL	Plan Drawing	..\2 - Drawings\3 - Plans\Filename.pdf	URL - (To Location of Plan Dwg where Equip. can be found on it)
31 - ELP	Enlarged Plan Drawing	..\2 - Drawings\4 - Enlarged Plans\Filename.pdf	URL - (To Location of Plan Dwg where Equip. can be found on it)
32 - EL	Elevation Drawing	.\2 - Drawings\5 - Elevations\Filename.pdf	URL - (To Location of Elevation Dwg where Equip. can be found on it)
33 - PRO	Profile Drawing	..\2 - Drawings\6 - Profiles\Filename.pdf	URL - (To Location of Profile Dwg where Equip. can be found on it)
34 - SEC	Section Drawing	..\2 - Drawings\7 - Sections\Filename.pdf	URL - (To Location of Section Dwg where Equip. can be found on it)
35 - DET	Detail Drawing	. \2 - Drawings\8 - Details\Filename.pdf	URL - (To Location of Detail Dwg where Equip. can be found on it)

SECTION 01352 – SELECTIVE ALTERATIONS AND DEMOLITION

PART 1 GENERAL

1.01 SUMMARY

A. Section includes:
   1. Cutting or modifying existing or new work.
   2. Partial demolition of structures.

1.02 REFERENCES

A. American National Standards Institute (ANSI):
   1. A10.6 - Safety and Health Program Requirements for Demolition Operations.

B. International Concrete Repair Institute (ICRI):
   1. Guideline No. 310.2R - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair.
   2. Guideline No. 310.3R - Guide for the Preparation of Concrete Surfaces for Repair Using Hydro Demolition Methods.

1.03 RELATED SECTIONS

A. General Conditions of Contract Between Owner and Design-Builder.

B. Section 01020 – Record Documents.

C. Section 01021 – Operation and Maintenance Data.

D. Section 01140 – Work Restrictions.

E. Section 01300 – Submittals.

F. Section 01354 – Hazardous Material Procedures.

G. Section 01566 – Cleanup Operations.

H. Section 01580 – Project Signs.

1.04 DEFINITIONS

A. Chipping hammer: A hand-operated electrical or pneumatic demolition device for removal of hardened concrete or masonry materials having a weight of less than 15 pounds and an impact frequency of greater than 2,000 blows/minute.

B. Concrete breaker: A hand-operated electrical or pneumatic demolition device for removal of hardened concrete or masonry materials having a weight greater or impact frequency less than the limits defined for a chipping hammer.

C. Coring equipment: Non-impact rotary drill with diamond cutting edges.

D. Heavy abrasive blast: Cleaning procedure by which various abrasives materials, or steel shot, are forcibly propelled by high pressure against a surface to remove loose material and produce a concrete surface roughened to ICRI Surface Profile CSP-7, or higher, as specified in ICRI 301.3R.

E. Salvage materials: Materials removed from existing facility.

1.05 DESCRIPTION OF WORK

A. Design-Builder must field verify, confirm, and mark items to be demolished prior to commencing demolition work on the Project.

B. The work includes partial demolition, cutting, and modification of existing facilities, utilities, and/or structures.

C. These facilities may be occupied and/or operational. Satisfactory completion of the work will require that Design-Builder plan activities carefully to work around unavoidable obstacles and to maintain overall stability of structures and structural elements. It will further require restoration of existing facilities, utilities, and structures that are to remain in place and that are damaged by demolition or removal operations.

D. Design-Builder must obtain Owner approval prior to starting any demolition work.

1.06 SUBMITTALS

A. General:
   1. Submit for Owner information as specified in Section 01300 – Submittals.

B. Shop drawings include:
   1. Selective Demolition Plan outlining the proposed sequence of events and procedures to be utilized for any demolition activities required as part of the Work. This plan shall include a plan for proper notification of Owner and other affected parties relative to the respective Work.
   2. The location of all embedded items shall be documented using diagrams and/or other media that clearly show dimensions and locations of existing structural elements, existing embedded items, and any new embedded items and their relationship to each other.

C. Submittals for information only:
   1. Permits and notices authorizing demolition.
   2. Certificates of severance of utility services.
   3. Permit for transport and disposal of debris.

D. Quality assurance submittals:
   1. Qualifications of non-destructive testing agency/agencies.

E. Project record documents.

F. Drawings and/or other media documenting locations of service lines and capped utilities.

G. Asset Retirement List – List of removed assets for retirement from Owner's asset management databases. Design-Builder shall maintain list and include retired assets in asset database in accordance with Section 01021 – Operation and Maintenance Data.

1.07 QUALITY ASSURANCE

A. Qualifications:
   1. Assign relocation, removal, cutting, coring, and patching to trades and workers qualified to perform the Work in a manner that causes the least damage and that provides means of returning surfaces to an appearance at least equal to that of the surrounding areas unaffected by the Work.
   2. Non-destructive testing agencies shall have a minimum of five years experience performing non-destructive testing for location of steel reinforcement in existing concrete under conditions that are similar to that required for this Work.

1.08 SEQUENCING

A. Perform Work in sequences and within times specified in Section 01140 – Work Restrictions.

B. If the facility or utility to be modified cannot be removed from service, perform the Work while the facility is in operation using procedures and equipment that do not jeopardize operation or materially reduce the efficiency of that facility.

C. Coordinate the Work with operation of the facility:
   1. Do not begin alterations of designated portions of the Work until specific permission for activities in each area has been granted by Owner in writing.
   2. Owner will coordinate the planned procedure with facility manager.
   3. Complete Work as quickly and with as little delay as possible.

D. Operational functions of the facility that are required to be performed to facilitate the Work will be performed by facility personnel only.

E. Owner will cooperate in every way practicable to assist in expediting the Work.

F. When necessary for the proper operation or maintenance of portions of the facility, reschedule operations so the Work will not conflict with required operations or maintenance.

1.09 REGULATORY REQUIREMENTS

A. Dispose of debris in accordance with governing regulatory agencies and if hazardous materials, in accordance with Section 01354 – Hazardous Materials Procedures.

B. Comply with applicable air pollution control regulations.

C. Obtain necessary permits for building demolition, transportation of debris to disposal site and dust control.

1.10 PREPARATION

A. Non-destructive evaluation of existing concrete and masonry:
   1. Prior to cutting, drilling, coring, and/or any other procedure that penetrates existing concrete or masonry, retain and pay for the services of a qualified non-destructive testing agency to perform investigations to determine the location of existing steel reinforcement, plumbing, conduit, and/or other embedments in the concrete.
   2. Submit documentation of the investigations to Owner for review and approval as specified in Section 01300 – Submittals before any work involving penetration of existing concrete is initiated.

B. Obtain permission from adjacent property owners, including railroads, when outriggers, swinging cranes, and other equipment may have to traverse or extend into adjacent property. Owner will provide Design-Builder contract information for adjacent property owners.

1.11 PROJECT CONDITIONS

A. Do not interfere with use of adjacent structures and elements of the facility not subject to the Work described in this Section. Maintain free and safe passage to and from such facilities or adequate barriers to prevent unsafe passage.

B. Provide, erect, and maintain barricades, lighting, guardrails, and protective devices as required to protect building occupants, general public, workers, and adjoining property:
   1. Do not close or obstruct roadways without permits.
   2. Conduct operations with minimum interference to public or private roadways.

C. Prevent movement, settlement, or collapse of structures adjacent services, sidewalks, driveways and trees:
   1. Provide and place bracing or shoring.
   2. Cease operations and notify Owner immediately when safety of structures appears to be endangered. Take precautions to properly support structure. Do not resume operations until safety is restored.
   3. Assume liability for movement, settlement, or collapse.
   4. Promptly repair damage.

D. Provide and arrange for capping and plugging utility services. Disconnect and stub off.
   1. Notify affected utility company in advance and obtain approval before starting demolition.
   2. Place markers to indicate location of disconnected services.

E. Unknown conditions:
   1. Information issued with the Request for Proposal (RFP) for Design-Builder Services may not represent all conditions at the site and adjoining areas. Compare actual conditions with drawings before commencement of Work.
   2. Existing utilities and drainage systems below grade are located on the drawings based on information from existing documents and from surface facilities such as manholes, valve boxes, area drains, and other surface fixtures.
   3. If existing active services encountered are not indicated or otherwise made known to Design-Builder and interfere with the permanent facilities under construction, notify Owner in writing, requesting instructions on their disposition. Take immediate steps to

ensure that the service provided is not interrupted, and do not proceed with the Work until written instructions are received from Owner.

PART 2 PRODUCTS

2.01 SALVAGE MATERIALS

A. Design-Builder shall provide Owner the opportunity to salvage any assets removed as part of the Project. Design-Builder shall remove from Site any assets from Project that Owner does not want to salvage.

PART 3 EXECUTION

3.01 EXAMINATIONS

A. Prior to beginning selective demolition operations, perform a thorough inspection of the facility and site, and report to Owner defects and structural damage to, or deterioration of existing construction to remain.

B. Examine areas affected by the Work and verify the following conditions prior to commencing demolition:
   1. Disconnection of utilities as required.
   2. Utilities serving occupied or active portions of surrounding facilities will not be disturbed, except as otherwise indicated.

C. If unsatisfactory conditions exist, notify Owner, and do not begin demolition operations until such conditions have been corrected.

3.02 PREPARATION

A. General:
   1. Review and comply with Section 01354 – Hazardous Material Procedures before beginning selective alterations and demolition work.

B. Protection:
   1. Erect weatherproof closures to protect the interior of facilities and elements or equipment that are not designed for exposure to the weather. Provide temporary heat, cooling, and humidity control as necessary to prevent damage to existing and new construction. Maintain existing exiting paths and/or provide new paths in compliance with Building Code requirements.
   2. Erect and maintain dustproof partitions as required to prevent spread of dust, to other parts of building. Maintain negative pressure in the area where the Work is being performed to prevent the accidental spread of dust and to minimize the spread of fumes related to the Work.
   3. Upon completion of Work, remove weatherproof closures and dustproof partitions, and repair damaged surfaces to match adjacent surfaces.
   4. Provide and maintain protective devices to prevent injury from falling objects.
   5. Locate guardrails in stairwells and around open shafts to protect workers. Post clearly visible warning signs.

6. Cause as little inconvenience to adjacent building areas as possible.
7. Protect landscaping, benchmarks, and existing construction to remain from damage or displacement.
8. Carefully remove designated materials and equipment to be salvaged by Owner or reinstalled.
9. Store and protect materials and equipment to be reinstalled.

C. Layout:
1. The limits of selective demolition shall be indicated in the Contract Documents. Confine demolition operations within the limits indicated on the Contract Documents.
2. Lay out demolition and removal work at the site and coordinate with related Work for which demolition and removal is required. Clearly mark the extent of structural elements to be removed on the actual surfaces that will be removed.
3. Arrange for Owner's inspection of the lay out extents.
4. Do not begin demolition/removal operations until the lay out markings have been reviewed by Owner.

3.03 DEMOLITION

A. General:
1. Perform demolition work in accordance with ANSI A10.6.
2. Demolish designated portions of structures and appurtenances in orderly and careful manner in accordance with the Owner-approved Selective Demolition Plan.
3. Conduct demolition and removal work in a manner that will minimize dust and flying particles.
   a. Use water or dust palliative when necessary to prevent airborne dust.
   b. Provide and maintain hoses and connections to water main or hydrant.
4. Demolish concrete and masonry in small sections. Perform demolition with small tools as much as possible. Blasting with explosive charges is not permitted.
5. Sawcut concrete to establish the edges of demolition, wherever possible.
   a. Do not use a concrete breaker within 6 inches of reinforcing or structural metals that are designated to remain.
   b. At edges that are not sawcut, remove the final six inches of material with a chipping hammer as defined herein. At surfaces where material is removed with a chipping hammer, follow with a heavy abrasive blast to remove all loose material and microcracking.
   c. Alternate techniques to remove concrete may be used if acceptable to Design-Builder; however, techniques other than those deemed by ICRI Guideline No. 310.2R to provide a low risk of introducing microcracking will require a subsequent procedure to remove loose material.
   d. Provide final surface preparation for concrete repairs as specified in Division 3 specifications.
6. At locations indicated on the drawings that the existing reinforcing is to be preserved, remove concrete using methods that do not damage the reinforcing. Use one of the following techniques:
   a. Hydro demolition techniques as outlined in ICRI Guideline No. 310.3R.
   b. Chipping hammer, as defined herein, followed by heavy abrasive blast to remove all loose material and microcracking at remaining surfaces impacted by the chipping hammer.
   c. Alternate methods may be used, only if acceptable to Owner.

d. For all methods, provide a small, completed area for Owner's review and acceptance. If the proposed method, in the opinion of Owner, damages the reinforcing, revise the removal method to remove the concrete with a less aggressive technique to protect the reinforcing.

7. Remove materials carefully, to the extent indicated and as required.
   a. Provide neat and orderly junctions between existing and new materials.
   b. Use methods that terminate surfaces in straight lines at natural points of division.
8. Do not remove anything beyond the limits of Work indicated without prior written authorization of the Owner. If in doubt about whether to remove an item, obtain written authorization of Owner prior to proceeding.
9. Perform work to provide the least interference and most protection to existing facilities to remain.
10. Assume possession of demolished materials, unless otherwise indicated on the Project drawings or specified.
    a. Remove demolished materials from site at least weekly and dispose of in accordance with Laws and Regulations.
11. Do not burn materials onsite.

B. Sizing of openings in existing concrete or masonry:
   1. Make openings large enough to permit final alignment of pipe and fittings without deflections, but without oversizing.
   2. Allow adequate space for packing around pipes and conduit to ensure watertightness.
   3. If Design-Builder deems the opening to be insufficient in size to accomplish these criteria, remove additional material using the procedures outlined in this Section.

C. Cutting openings in existing concrete or masonry:
   1. Do not allow saw cuts to extend beyond limits of openings.
   2. Create openings by the following method or other means acceptable to the Owner that prevents over-cutting of member at corners:
      a. Core-drill through slab or wall at corners, being careful not to damage materials beyond the area to be removed.
      b. Saw cut completely through the member, between the core holes at the corners.
      c. As an alternate to sawcutting through the member, score the edges of the opening with a saw to a one-inch depth on both surfaces (when accessible).
         1) Remove concrete or masonry to within six inches of material to remain with a concrete breaker.
         2) Remove the remaining material with a chipping hammer.
      d. Remove the remaining material at the corners left by the core-drilling with a chipping hammer.
   3. Prevent debris from falling into adjacent tanks or channels in service or from damaging existing equipment and other facilities.

D. Immediately upon discovery, remove and dispose of contaminated, vermin-infested, or dangerous materials using safe means that will not endanger health of workers and public.

E. Backfill open pits and holes caused by demolition.

F. Rough grade areas affected by demolition.

G. Remove demolished materials, tools, and equipment upon completion of demolition.

3.04 RESTORATION

A. General:
   1. Repair damage caused by demolition to conditions equal to those that existed prior to beginning of demolition.
      a. Patch and replace portions of existing finished surfaces that are damaged, lifted, and discolored with matching material. Refinish patched portion surfaces in a manner which produces uniform color and texture to entire surface.
      b. When existing finish cannot be matched, refinish entire surface to nearest change of plane where angle of change exceeds 45 degrees.
   2. The cost of repairs shall be at Design-Builder's expense, and no increase in the Contract Price.
   3. When new construction abuts or finishes flush with existing construction, make smooth transitions. Match finish of existing construction.
   4. Where partitions are removed, patch floors, walls, and ceilings with finish materials that match existing materials.
   5. Where removal of partitions results in adjacent spaces becoming one, rework floors, walls, and ceilings to provide smooth planes without breaks, steps, or bulkheads.
   6. Where changes of plane exceed two inches, request instructions for making transition.
   7. Trim and refinish existing doors as necessary to clear new floors.
   8. Match patched construction with adjacent construction in texture and appearance so that patch or transition is invisible at five-foot distance.
   9. When finished surfaces are cut so that smooth transition is impossible, terminate existing surface in neat manner along straight line at natural line of division and provide appropriate trim.

B. Restore existing concrete reinforcement as follows:
   1. Where existing reinforcement is to be incorporated into the new Work, protect, clean, and extend into new concrete.
   2. Where existing reinforcement is not to be retained, cut off as follows:
      a. At the removal line where new concrete joins existing concrete, cut reinforcement flush with concrete surface.
      b. Where concrete surface at the removal line will become the finished surface, cut reinforcement two inches below the surface, paint ends with epoxy, and patch holes with dry pack mortar.

C. Restore areas affected by removal of existing equipment, equipment pads and bases, piping, supports, electrical panels, electric devices, and conduits such that little or no evidence of the previous installation remains:
   1. Fill areas in existing floors, walls, and ceilings from removed piping, conduit, and fasteners with non-shrink grout and finish smooth.
   2. Remove concrete bases for equipment and supports by:
      a. Saw cutting clean, straight lines with a depth equal to the concrete cover over reinforcement minus 1/2 inch below finished surface.
         1) Do not cut existing reinforcement on floors.
      b. Chip concrete within scored lines and cut exposed reinforcing steel and anchor bolts.
      c. Patch with non-shrink grout to match adjacent grade and finish.
   3. Terminate abandoned piping and conduits with blind flanges, caps, or plugs.

3.05 3.05 FIELD QUALITY CONTROL

A. Do not proceed with demolition without Owner's inspection of layout.

B. Do not deviate from the Owner-approved Selective Demolition Plan without notifying Owner prior to Work.

End of Section

SECTION 01354 – HAZARDOUS MATERIAL PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes procedures required when encountering hazardous materials, including asbestos and lead-based paint (LBP), at the Work site.

1.02 REFERENCES

A. Occupational Safety and Health Administration (OSHA) United States Code of Federal Regulations (CFR) including, but not limited to:
    1. Title 29 - Labor:
        a. 1910 – Occupational Safety and Health Standards
            (1) 1910.1025 – Lead
            (2) 1910.1001 – Asbestos
            (3) 1910.1200 – Hazard Communication
        b. 1926 – Safety and Health Regulations for Construction
            (1) 1926.62 – Lead
            (2) 1926.1101 – Asbestos
            (3) 1926.65 – Hazardous waste operations and emergency response (HAZWOPER)
            (4) 1926.59 – Hazard Communication
B. United States Environmental Protection Agency (USEPA) including, but not limited to:
    1. Title 40 - Protection of Environment:
        a. Part 61, Subpart M – National Emission Standard for Asbestos
        b. Part 261 - Identification and Listing of Hazardous Waste
        c. Part 763 – Asbestos
C. Missouri Department of Natural Resources (MDNR):
    1. Revised Statutes of Missouri Title XL Additional Executive Departments
        a. Chapter 643 – Air Conservation
            (1) 225 – 265 – Asbestos Abatement and Asbestos Removal
D. Society for Protective Coatings (SSPC):
    1. SSPC Guide 6 (SSPC-6) – Guide for Containing Surface Preparation Debris Generated During Paint Removal Operations
    2. SSPC Guide 7 (SSPC-7) – Guide to Disposal of Lead-Contaminated Surface Preparation Debris
E. Existing KCMO Owner Reports regarding dual 60-inch force mains
    1. Provided as RFP Attachment C3 Dual 60-Inch Force Main Reports.

1.03 RELATED SECTIONS

A. Section 01020 – Record Documents.
B. Section 01140 – Work Restrictions.
C. Section 01300 – Submittals.
D. Section 01566 – Cleanup Operations.
E. Section 01580 – Project Signs.

1.04 SUBMITTALS

A. Hazardous Materials Management Plan (HMMP):
    1. If needed, the HMMP will be submitted at least ten days prior to the commencement of the Work and is Design-Builder's comprehensive plan for the management of hazards encountered during the Work, and should include:
        a. Spill management procedures in the event of asbestos, lead or any other hazardous materials release.
        b. Intended methods of hazardous materials removal, containment, and disposal, including description of engineering controls, personal protective equipment (PPE), and compliance monitoring.
        c. Schedule and sequence of Work for all hazardous materials work.
        d. A copy of the Site-Specific Hazard Communication Plan in accordance with 29 CFR 1910.1200.
        e. Copies of licenses, certifications, fit test records, medical surveillance records and notifications to handle and control hazardous materials, as applicable.
B. Submit laboratory reports, as applicable.

1.05 HAZARDOUS MATERIALS PROCEDURES

A. When hazardous materials are encountered that were identified by existing reports prepared for Owner:
    1. Prepare and initiate implementation of the HMMP, as detailed in Part 1.04 of this Section.
    2. Complete notifications to Federal, State and local agencies as required by applicable Laws and Regulations within the times stipulated by such Laws and Regulations.
    3. Design-Builder will designate a CIH, as required per Part 1.04 of this Section, to issue pertinent instructions and recommendations for protection of workers and other affected persons' health and safety.
    4. Identify and contact Subcontractors and licensed personnel qualified to undertake storage, removal, transportation, disposal, and other remedial work required by, and in accordance with, applicable laws and regulations.
B. When hazardous materials are encountered that were not identified by existing reports prepared for Owner:
    1. Prepare and initiate implementation of the HMMP as detailed in Part 1.04 of this Section.
    2. Notify immediately Owner, Design-Builder and other affected parties.
    3. Complete notifications to Federal, State and local agencies as required by applicable Laws and Regulations within the times stipulated by such Laws and Regulations.
    4. Design-Builder will designate a CIH, as required per Part 1.04 of this Section, to issue pertinent instructions and recommendations for protection of workers and other affected persons' health and safety.

5. Identify and contact Subcontractors and licensed personnel qualified to undertake storage, removal, transportation, disposal, and other remedial work required by, and in accordance with, applicable laws and regulations.

C. Forward to Owner copies of reports, permits, receipts, and other documentation related to remedial work.

D. Design-Builder will assume responsibility for worker health and safety, including health and safety of Subcontractors and their workers.
   1. Provide training to workers on recognition, reporting, and safety and health procedures required when hazardous materials are encountered, as relevant to the Work.

E. File requests for adjustments to Contract Times and Contract Price due to the finding of previously unidentified hazardous materials at the Work site in accordance with Contract Documents.
   1. Design-Builder and subcontractors will minimize delays by continuing performance of the Work in areas not affected by hazardous materials operations.

1.06 LEAD-BASED PAINT REMOVAL AND DISPOSAL

A. Includes existing paint on the interior and/or exterior surfaces, as outlined in the LBP Survey Report for Owner per SSPC specifications, which may contain lead in concentrations which will require implementation of hazardous material compliance procedures as legislated by CFR Title 29 and Title 40.

B. Design-Builder and/or its' Subcontractors will collect samples of suspected LBP using the methods and frequencies prescribed by CFR Title 29 and Title 40 from the structures identified herein and have samples tested by a certified testing laboratory to determine lead content in samples.
   1. Collect a sufficient number of paint samples to provide adequate information regarding lead content in paint on the interior and/or exterior surfaces outlined in the LBP Survey Report for OWNER per SSPC specifications.
   2. Ensure that samples contain the total thickness of the paint to the substrate, where removed.
   3. Ensure that each sample contains a sufficient quantity of paint to facilitate proper and adequate analyses by testing laboratory.
   4. Ensure that samples are adequately identified with location from which it was removed.

C. Laboratory testing will be completed in accordance with applicable testing standards by a National Lead Laboratory Accreditation Program (NLLAP) –certified laboratory.
   1. Submit ten copies of complete laboratory analyses of paint samples.

D. Prior to beginning the Work associated the removal, containment, and disposal of LBP and associated debris, prepare and submit to Owner10 copies of the HMMP, as required by Part 1.04 of this Section. The HMMP will detail the following:
   1. Listing of LBP removal equipment to be used.
   2. Outline of procedures to be used to remove LBP.
   3. Data and specifications describing chemical stripping materials to be used, if applicable.
   4. Data and specifications describing abrasive blast materials and grit size to be used, if applicable.
   5. Description of planned LBP removal, hazardous waste debris containment, and hazardous waste disposal methods.
   6. Design-Builder shall update and resubmit the Phase 2 Health and Safety Plan, to include written plan of action covering operational requirements for safe removal of LBP, safe handling and containment of waste and debris generated by the operation, and safe disposal of hazardous waste and non-hazardous waste materials, complying with the most stringent requirements of the following:

a. Equipment and material manufacturer's safety sheets.
b. 29 CFR 1910.1025.
c. 29 CFR 1926.62.

7. Certifications of personnel to perform Work.
8. Selection of an appropriately permitted disposal facility.

E. Carry out LBP removal, containment, and disposal work in accordance with SSPC guidelines.
F. Assume responsibility for the proper implementation of the LBP removal method selected. When abrasive blast cleaning is selected to remove LBP, comply with all applicable Federal, State, and local air quality, pollution, and environmental control regulations for blast cleaning. When chemical stripping is selected to remove the LBP, adhere to the chemical manufacturer's recommendations for the application of the product, the removal of the paint, and the containment of the debris.
G. LBP removal work shall be performed by a Contractor having prior experience in the removal method selected and shall provide at least five references of similar projects completed, three of which must have been completed within the past 12 months, documenting their experience.
H. Utilize a minimum of Class 3 containment and ventilation system, as described in SSPC-6, during LBP removal and containment procedures, as required for the conditions.
I. Do not leave spent abrasive blast material, chemical stripping material, or LBP debris uncontained on the project site overnight.
J. Test each container of paint debris, spent blast cleaning abrasive, chemical stripping debris, and other waste material generated by the operation to determine the waste material hazardous waste classification, as required by 40 CFR 261 and the selected disposal facility.
K. Assume responsibility for the disposal of LBP waste and associated waste generated by the removal of the LBP and the preparation of the surfaces for recoating. Dispose in accordance with applicable Federal, State, local, and selected disposal facility requirements and regulations.
L. Accurately complete the Uniform Hazardous Waste Manifest included at the end of SSPC-7. Indicate on the Manifest that Owner is the hazardous waste generator and obtain Owner's USEPA identification number for use in completing the Manifest.

1.08 ASBESTOS MATERIALS

A. It is the specific intent of these Contract Documents to exclude from the Work any and all new products or materials containing asbestos. No products containing asbestos shall be incorporated in the Work.
B. Refer to the list of reports prepared for Owner, referenced in Part 1.2 of this Section, identifying locations which may have ACM. The reports also designate the condition of the ACM in each location as either friable or non-friable.

PART 2 - PRODUCTS

Not used.

PART 3 – EXECUTION

3.01 ASBESTOS MATERIALS

A. Notifications:
1. Design-Builder shall notify OSHA 24 hours prior to performing ACM removal operations.
2. Design-Builder will provide written notification to USEPA Regional Asbestos NESHAP contact at least 20 working days prior to the start of the Work.

3. Design-Builder shall notify MDNR at least ten working days prior to the start of performing ACM removal operations.
4. Design-Builder shall notify Owner three working days in advance of commencing asbestos material removal operations.

B. Work area:
1. Design-Builder will establish a regulated work area, using at a minimum, construction warning tape to establish limits of work area for the asbestos material removal.
2. Onsite stockpiling or storage of ACM designated for disposal shall not be allowed.

C. Safety:
1. Design-Builder's safety plan will be provided as part of the HMMP (Part 1.02) and will detail requirements, as outlined in 29 CFR 1910.1001, 40 CFR 1926.1101 and 40 CFR 1926.65.

End of Section

SECTION 01400 - QUALITY CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This Section includes administrative and procedural requirements for products and workmanship and includes the following:
   1. Construction quality management.
   2. Quality Management Plan.
   3. Sampling and testing of materials.
   4. Material testing and inspection.
   5. Requirements for testing laboratories.
   6. Procedures and limitations of inspection.
   7. Owner directed testing.
   8. Special Tests and Inspections.
   9. Quality management personnel.
   10. Design-Builder's responsibilities.
   11. Manufacturer's field services.
   12. Quality control.

B. Compatibility of Options: If Design-Builder is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

C. Each Subcontractor is responsible for providing products and construction methods compatible with products and construction methods of other Subcontractors.

1.02 RELATED SECTIONS

A. Section 01300 – Submittals

1.03 QUALITY ASSURANCE - CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Owner before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Perform Work by persons qualified to produce required and specified quality.

1.04 REFERENCES AND STANDARDS

A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard by date of issue current on date for receiving bids, except where a specific date is established by code.

C. Obtain copies of standards where required by product specification sections.

D. Neither the contractual relationships, duties, nor responsibilities of the parties in Contract nor those of the Owner shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

E. AASHTO Accreditation Program (AAP) for Testing Laboratories.

F. International Building Code (IBC), version in effect as of Notice to Proceed.

G. American Society for Testing and Materials (ASTM): E 329, Standard for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.

H. Conform to reference standard by date of issue current on date of Contract Documents, except where specific date is established by code or the Technical Specifications.

I. Neither contractual relationships, duties, nor responsibilities of parties in this Contract nor those of Owner shall be altered from Contract Documents by mention or inference otherwise in reference documents.

1.05 DEFINITIONS

A. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

B. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

C. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

D. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those

performed for installations of the system, assembly, or products that are similar to those indicated for this Project in material, design, and extent.

F. Specialists: Certain sections of the Technical Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
   1. Requirement for specialists shall not supersede building codes and similar regulations governing the Work, nor interfere with local trade union jurisdictional settlements and similar conventions.

G. Preconstruction Testing: Testing agency shall perform preconstruction testing for compliance with specified requirements for performance and test methods.
   1. Design-Builder responsibilities include the following:
      a. Provide test specimens and assemblies representative of proposed materials and construction. Provide sizes and configurations of assemblies to adequately demonstrate capability of product to comply with performance requirements.
      b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
      c. Fabricate and install test assemblies using installers who will perform the same tasks for Project.
      d. When testing is complete, remove assemblies; do not reuse materials on Project.

H. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and ensure that proposed construction complies with requirements.

I. Quality Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that completed construction comply with requirements. Services do not include contract enforcement activities performed by Owner's Representative.

J. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

1.06 SUBMITTALS

A. Submit in accordance with Section 01300 – Submittals.

B. Quality Management Plan in accordance with Exhibit 2.1.1 Phase 1 Scope of Services and Paragraph 1.08 of this Section.

C. Qualification Data: For testing agencies specified in Paragraph 1.14 of this Section to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

D. Delegated-Design Submittal: In accordance with Paragraph 1.15 Delegated-Design, in addition to Shop Drawings, Product Data, and other required submittals, submit a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Design-Builder to be designed or certified by a design professional,

indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

E. Independent Testing Firm Reports: After each test, promptly post to Design-Builder's document control system and provide access to Owner. When requested by Owner, provide interpretation of test results. Include the following:
   1. Date of issue.
   2. Project title and number.
   3. Name, address, and telephone number of testing agency.
   4. Dates and locations of samples and tests or inspections.
   5. Names of individuals making tests and inspections.
   6. Description of the Work and test and inspection method.
   7. Identification of product and Specification Section.
   8. Type of test or inspection.
   9. Complete test or inspection data.
   10. Test and inspection results and an interpretation of test results.
   11. Ambient conditions at time of sample taking and testing and inspecting.
   12. Conformance with Contract Documents.
   13. Name and signature of laboratory inspector.
   14. Recommendations on retesting and re-inspecting.

F. Daily Quality Control Records: Complete legible copies of Quality Control daily records shall be made available to the Owner from Design-Builder's document management system. These records shall be maintained using the form provided in Section 01320.01 – Daily Field Observation Report and include:
   1. Description of Work inspected.
   2. Quality characteristics of compliant work.
   3. Identification of Nonconforming Work.
   4. Corrective action taken on current and previous Nonconforming Work.
   5. A signed statement that all supplies and materials incorporated into the Work fully comply will all requirements of the construction documents and the Contract unless identified as Nonconforming Work.

G. Monthly Quality Report. Furnish a monthly quality report. The monthly quality report shall be submitted with the monthly Application for Payment in accordance with Section 01290 – Payment Procedures. This monthly report shall include as a minimum:
   1. Summary of quality control staff onsite during the month.
   2. Summary of quality control activities during the month.
   3. Detailed summary of all tests performed by category. Include special tests and special inspections, as defined in Paragraph 1.11 of this Section.
   4. Trend analysis of quality control test results.
   5. Log of all outstanding unresolved failing tests.
   6. Nonconforming Work status.
   7. Quality problems and resolutions.
   8. Summary of Certificates of Compliance.

H. Prior to Acceptance of the work that is inspected by the Independent Testing Firm, a principal of the Independent Testing Firm, licensed as a Missouri Professional Engineer

must certify in writing that all testing performed by them meets or exceeds the testing requirements of the construction documents and the Contract.

I. Manufacturer's Field Reports in Accordance with Paragraph 1.13 of this Section and Section 01300 – Submittals.

1.07 CONSTRUCTION QUALITY MANAGEMENT

A. Design-Builder shall establish and maintain procedures for inspection and material testing to assess the quality of Work and to ensure the quality of the Work meets the minimum quality levels required by the Contract. The procedures shall apply to monitoring suppliers, manufacturers, products, services, site conditions, and workmanship. The procedures shall completely describe all quality management functions and shall contain information as specified herein or required by the Owner.

B. Design-Builder shall maintain current daily records of all quality control operations performed.

C. Nonconforming Work that is completed shall be brought to the attention of the Owner upon discovery of the Nonconforming Work.

D. Design-Builder shall maintain records and make them available to Owner as requested:
   1. Maintain evidence of activities affecting quality; including operating logs, records of inspection, audit reports, personnel qualification and certification records, procedures, and document review records.
   2. Maintain quality records in a manner that provides for timely retrieval and traceability. Protect quality records from deterioration, damage, and destruction.

1.08 PHASE 2 QUALITY MANAGEMENT PLAN

A. Design-Builder shall follow Owner-approved Phase 2 Quality Management Plan (QMP) per Phase 2 Contract Price Amendment.

B. Subcontractors shall each have a quality control program and will perform quality control activities; however, the final responsibility for overall quality management rests with Design-Builder.

C. No changes to the procedures may be made by Design-Builder without prior written acceptance by the Owner. Submit updated QMP within one week of when any changes are made.

D. The QMP shall include as a minimum:
   1. A description of the quality management organization, including:
      a. An organization chart showing relationships among the parties including the Owner, additional agencies (as needed) and other company organizational elements.
      b. The name, qualifications, resumes, duties, responsibilities, and authorities of each person assigned a quality management function or a quality assurance function.
      c. Quality Control (QC) staffing requirements including the inspectors and material testers needed to thoroughly monitor the Work in progress at all times.

d. The persons responsible for the development, completion of construction certification and all other required forms.
e. Statement by Design-Builder designating the Quality Control Manager (QCM) and specifying the authority delegated to the QCM.

2. Material Testing and Inspection Plans (MTIP): Specific tests required, minimum frequency of tests, and test procedures shall be in accordance with the design. Plan shall identify hold/inspection points.
3. Plans for quality control for special processes (e.g., welding soldering, heat treating, cleaning, plating, non-destructive examination) that may reference detailed specifications.
4. Procedures and resources to provide certification of construction in accordance with International Building Code (IBC), Chapter 17.
5. Procedures to ensure that equipment or materials that have been accepted at the site are properly stored, identified, installed, and tested.
6. Procedures to verify that procured products and services conform to the requirements of the Specifications. Requirements of these procedures shall be applied, as appropriate, to lower-tier suppliers and/or Subcontractors.
7. Instructions for recording inspections and requirements for demonstrating quality through the Daily Quality Control Records that Work inspected was in compliance or a deficiency was noted and action to be taken.
8. Procedures for handling deficiencies and non-conforming Work. Deficiencies and nonconforming Work are defined as documentation, drawings, material, equipment, or Work not conforming to the indicated requirements or procedures. Conditions having adverse effects on quality shall be promptly identified and reported to the senior level management. The cause of conditions adverse to quality shall be determined and documents and measures implemented to prevent recurrence. In addition, at a minimum, this procedure shall address:
   a. Personnel responsible for identifying deficient and non-complying items within Work.
   b. Halting or rejecting Work.
   c. How to preclude the covering of deficient or rejected Work.
   d. How and by whom deficient and non-compliant items are documented "in the field."
   e. The personnel and process utilized for logging deficient and non-compliant Work at the end of each day onto a deficiency log.
   f. Tracking processes and tracking documentation for deficient and nonconforming Work.
   g. Resolution of differences between the QCM and the production personnel.
   h. Personnel responsible for achieving resolution of outstanding deficiencies.
   i. Nonconformance Report (NCR) closeout including who needs to accept the final recommended disposition of the report.

E. Provide with QMP a Schedule of Tests and Inspections. Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Schedule shall include the following:
   1. Specification Section number and title.
   2. Description of test and inspection.
   3. Identification of applicable standards.
   4. Identification of test and inspection methods.
   5. Number of tests and inspections required.
   6. Time schedule or time span for tests and inspections.

7. Entity responsible for performing tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

F. Audits: The QMP shall provide for regularly scheduled documented audits to verify that QC procedures are being fully implemented by Design-Builder and its Subcontractors. Audit records shall be made available to Owner upon request.

1.09 SAMPLING AND TESTING

A. General:
1. Testing, inspections and source quality control may occur on or off project site. Perform offsite testing, inspections and source quality control as required by the Contract Documents and Owner.
2. Prior to delivery and incorporation in the Work, submit listing of sources of materials when specified in the technical specifications where materials are specified.
3. When specified in technical specifications where products are specified:
   a. Submit sufficient quantities of representative samples of character and quality required of materials to be used in the Work for testing or examination.
   b. Test materials in accordance with standards of national technical organizations.

B. Sampling:
1. Furnish specimens of materials when requested.
2. Do not use materials which are required to be tested until testing indicates satisfactory compliance with specified requirements.
3. Specimens of materials will be taken for testing whenever necessary to determine quality of material.
4. Assist Owner in preparation of test specimens at site of Work, when requested, such as soil samples and concrete test cylinders.

C. Testing:
1. When protesting failed tests of material in place or to be used, take additional specimens and have specimens tested.
   a. When original test proves to have been in error, file claim for reimbursement of direct costs for sampling and testing.

D. Test Standards:
1. Perform sampling, specimen preparation, and testing of materials in accordance with specified standards, and when no standard is specified, in accordance with standard of nationally recognized technical organization.
2. Physical characteristics of materials not particularly specified shall be in accordance with ASTM, where applicable.
3. Standards and publication references in Contract Documents shall be edition or revision in effect on date stipulated.

1.10 MATERIALS TESTING AND INSPECTION

A. Material and equipment, and workmanship shall be subject to inspection and rejection when not in conformance with Contract Documents.

B. Owner's observation of Work that will be covered up:
   1. When directed to allow observation of work before it is covered up, provide timely notification of work readiness and allow Owner reasonable time to observe such work before covering it up.
   2. Uncover, at Design-Builder's cost, work covered up for which Owner was not given timely notification or reasonable time to conduct observations.
   3. Owner may specify time requirements for timely notification and for performing observations.

C. Testing and employment of testing agency, laboratory, or inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Design-Builder of obligation to perform Work in accordance with requirements of Contract Documents.
   1. Specific QC requirements for individual construction activities are specified in the technical specifications that specify those activities. Requirements in those technical specifications may also cover production of standard products.
   2. Specified tests, inspections, and related actions do not limit Design Builder's QC procedures that facilitate compliance with the Contract Document requirements.
   3. Requirements for Design-Builder to provide QC services required by Owner or authorities having jurisdiction are not limited by provisions of this Section.
   4. Unless otherwise specified, Design-Builder shall provide all testing services in connection with the following:
      a. Concrete materials and trial batch mixtures.
      b. Masonry units and masonry grout and mortar materials and design mixtures.
      c. Asphaltic concrete materials and design mixtures.
      d. Embedment, fill, and backfill materials.
      e. All other tests and engineering data required for Design-Builder's review of materials and equipment proposed to be used in the Work.

D. Design-Builder shall contract with independent testing firm, acceptable to the Owner, to:
   1. Perform quality control testing to demonstrate compliance with specified requirements in the Contract Documents for various work and materials.
   2. Perform special inspections of prefabricated assemblies required to be inspected for compliance with the governing codes.
   3. The firm shall not be a subsidiary of Design-Builder or any of its Subcontractors.
   4. The firm shall have no principal owners who have any ownership or part ownership in the design-build firm or any of its Subcontractors.

E. Prior to start of Work, submit the following:
   1. Testing laboratory name, address, and telephone number, and names of full-time registered Engineer and responsible officer.
   2. Copy of report of laboratory facilities inspection made by Materials Reference Laboratory of National Bureau of Standards during most recent inspection, with memorandum of remedies of deficiencies reported by inspection.

F. The independent testing firm will perform and meet the following requirements:
   1. Use a laboratory authorized to operate in State of Missouri.
   2. Meet "Recommended Requirements for Independent Laboratory Qualification," published by the American Council of Independent Laboratories.

3. Meet the requirements of ASTM E329.
4. Maintain full time registered Engineer on staff assigned to the Project to review services.
5. Calibrate testing equipment at reasonable intervals with devices of accuracy traceable to National Bureau of Standards (NBS) or accepted values of natural physical constants.

G. Reports will be submitted by independent testing firm to Design-Builder and Owner indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.

H. Retesting or reinspection required because of nonconformance to specified requirements will be performed by same independent testing firm on request by Owner. Payment for retesting or reinspection will be paid for by Design-Builder.

I. Material Testing Firm Responsibilities:
1. Test samples of mixes submitted by Design-Builder.
2. Provide qualified personnel at site. Cooperate with Owner and Design-Builder in performance of services.
3. Perform specified inspections, sampling and testing of products and materials and methods of construction in accordance with specified standards to ascertain compliance of materials with requirements of Contract Documents.
4. Promptly notify Owner and Design-Builder of observed irregularities or nonconformance of Work or products.
5. Attend preconstruction meetings and progress meetings.
6. Promptly submit written report of each test and inspection; one copy each to Owner and Design-Builder, and one copy to file as Record Documents in accordance with Section 01020 – Record Documents. Each report shall include:
   a. Date issued.
   b. Project title and number.
   c. Testing laboratory name, address and telephone number.
   d. Name and signature of laboratory inspector.
   e. Date and time of sampling or inspection.
   f. Record of temperature and weather conditions.
   g. Date of test.
   h. Identification of product and Specification section.
   i. Location of sample or test in Project.
   j. Type of inspection or test.
   k. Results of tests and compliance or non-compliance with Contract Documents.
   l. Interpretation of test results, when requested by Owner.

J. Limits on Testing Authority:
1. Agency or laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Agency or laboratory may not approve or accept any portion of the Work.
3. Agency or laboratory may not assume duties of Design-Builder.
4. Agency or laboratory may not stop the Work.

K. The material testing firm shall not perform any other functions other than those described for the material testing firm.

L. As a minimum, material testing firm shall use the testing frequencies in accordance with the approved Testing Schedule, as included within the QMP.

M. Remove defective work and products from Work site, whether in place or not, and replace or renew with work, material or equipment in conformance with Contract Documents.

N. Questions concerning acceptability of materials, classification of materials, and execution of the Work will be decided by Owner.

1.11 SPECIAL TESTS AND INSPECTIONS

A. Owner will employ and pay for services of an independent testing firm to perform testing and inspection as required in the Contract Documents for Owner furnished special inspections for various work and materials to confirm Design-Builder's compliance with the Contract Documents and other Owner verification testing performed at the discretion of the Owner.
   1. Design-Builder shall coordinate date and time of testing services directly with Owner-hired firm.
   2. Design-Builder shall provide Owner one-day advanced notification of all planned testing services by Owner-hired firm.
   3. Unless otherwise specified, Owner may provide for tests and Special Inspections made on the following materials and equipment:
      a. Concrete.
      b. Tests of masonry prisms.
      c. Field control test of masonry.
      d. Moisture-density (Proctor) tests and relative density tests on embedment, fill, and backfill materials.
      e. CLSM tests.
      f. In-place field density tests on embedment at the discretion of the Owner.

B. Unless otherwise indicated herein, Owner will engage a testing agency to conduct special tests and inspections as required by authorities having jurisdiction as the responsibility of Owner.
   1. Testing agency will notify Owner and Design-Builder promptly of irregularities and deficiencies observed in the Work during performance of its services.
   2. Testing agency will submit a certified written report of each test, inspection, and similar quality-control service to Design-Builder and Owner and to authorities having jurisdiction.
   3. Testing agency will submit a final report of special tests and inspections at Acceptance, which includes a list of unresolved deficiencies.
   4. Testing agency will interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
   5. Testing agency will retest and re-inspect corrected work.

1.12 QUALITY MANAGEMENT PERSONNEL

A. Quality Control Manager (QCM): Design-Builder shall employ a QCM for the Work. The QCM shall have a minimum of ten years experience in quality management of wastewater facility construction. The QCM's responsibilities shall be limited to ensuring Design-Builder

compliance with the QMP, resolution of quality related issues, and to administering contracts with the independent testing firms retained for Inspection and Testing or professional services.

B. Design-Builder's quality control personnel shall be qualified to conduct the sampling, testing, and inspection performed.

C. Design-Builder's QC staffing is subject to Owner's review and continued acceptance. Owner may direct Design-Builder to remove and replace the QCM.
   1. Acceptance of the Phase 2 QMP by the Owner is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction.

1.13 MANUFACTURER'S FIELD SERVICES

A. See Section 01433 – Manufacturer's Field Services.

1.14 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
   1. Owner will furnish Design-Builder with names, addresses, and telephone numbers of testing agencies engaged and a description of the types of testing and inspecting they are engaged to perform.
   2. Payment for these services will be made by the Owner.
   3. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Design-Builder.

B. Design-Builder Responsibilities: Unless otherwise indicated herein, provide quality-control services specified and required.
   1. Where services are indicated as Design-Builder's responsibility, engage a qualified testing/professional services agency with the approval of the Owner to perform these quality-control services.
      a. Design-Builder shall not employ the same entity engaged by Owner, unless agreed to in writing by Owner.
      b. Design-Builder will furnish Owner with names, addresses, and telephone numbers of testing agencies engaged and a description of the types of testing and inspecting they are engaged to perform.
   2. Payment for these services will be made by Design-Builder.
   3. Comply with all requirements in this Section.
   4. Notify Owner's independent testing firm 48 hours in advance of when observations, inspections, and testing is needed for laboratory to schedule and perform in accordance with their notice of response time.
   5. Where QC services are indicated as Design-Builder's responsibility, submit a certified written report, in duplicate, of each QC service.
   6. Testing and inspecting requested by Design-Builder and not required by the Contract Documents are Design-Builder's responsibility.
   7. Submit additional copies of each written report when so directed.

8. Secure and make available to Owner's independent testing firm or laboratory adequate quantities of representative samples of materials proposed to be used and which require testing.
9. Cooperate with Owner's independent testing firm, furnish samples of materials, design mix, equipment, tools, storage, safe access to construction and manufacturing operations, and assistance by incidental labor as requested.
10. Furnish incidental labor and facilities.
11. Obtain and handle samples at Work site or at source of product to be tested.
12. Facilitate inspections and tests.
13. Accommodate storage and curing of test samples.
14. Make arrangements with Owner's independent testing firm and pay for additional samples and tests required for Design-Builder's use.
15. Facilitate inspection by maintaining proper facilities and providing safe access to the Work, to shops where products are in preparation, and to warehouses and storage yards where products are stored.

C. Retesting/Re-inspecting: Regardless of whether original tests or inspections were Design-Builder's responsibility, provide quality-control services, including retesting and re-inspecting, for construction that revised or replaced Work that failed to comply with requirements established by the Contract Documents. Re-testing or re-inspection shall be performed by same Owner's independent testing firm. Payment for re-testing or re-inspection will be charged to Design-Builder by deducting testing charges from Contract Price with a deductive Change Order.

D. Testing Agency Responsibilities: Cooperate with Owner and Design-Builder in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Owner and Design-Builder promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
3. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Design-Builder.
4. Do not release, revoke, alter, or increase requirements of the Contract Documents or approve or accept any portion of the Work.
5. Do not perform any duties of Design-Builder.

E. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field-curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspecting equipment at Project site.

F. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
   1. Schedule times for tests, inspections, obtaining samples, and similar activities.

1.15 DELEGATED-DESIGN

A. Performance and Design Criteria: Where professional design services or certifications by the Engineer-of-Record are specifically required of Design-Builder or Owner by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
   1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Owner.
   2. All engineering certifications will be performed by an engineer registered in the State of Missouri.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.

B. Examine and verify specific conditions described in the applicable individual specification sections.

3.02 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

End of Section.

SECTION 01410 - REGULATORY REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

A. Section includes: Regulatory authorities and codes. Any costs associated with code compliance with the Kansas City, Missouri Codes Department are the responsibility of Design-Builder.

1.02 AUTHORITIES HAVING JURISDICTION

A. Building Department: City of Kansas City, Missouri.

1.03 APPLICABLE CODES

A. International Code Council (ICC).
   1. Building code:
      a. International Building Code (IBC), 2018.
         1) With City of Kansas City, Missouri amendments.
      b. International Existing Building Code (IEBC), 2018.
   2. With City of Kansas City, Missouri amendments Electrical code:
      a. National Fire Protection Association (NFPA), NFPA 70: National Electrical Code (NEC), 2017.
         1) With City of Kansas City, Missouri amendments.
   3. Energy code:
      a. International Energy Conservation Code (IECC), 2021.
         1) With City of Kansas City, Missouri amendments.
   4. Fire code:
      a. International Fire Code (IFC), 2018.
         1) With City of Kansas City, Missouri amendments.
   5. Fuel gas code:
      a. International Fuel Gas Code (IFGC) – 2018.
         1) With City of Kansas City, Missouri amendments.
   6. Mechanical code:
      a. International Mechanical Code (IMC), 2018.
         1) With City of Kansas City, Missouri amendments.
   7. Plumbing code:
      a. Uniform Plumbing Code (UPC2018).
         1) With City of Kansas City, Missouri amendments.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

SECTION 01433 – MANUFACTURER'S FIELD SERVICES

PART 1 – GENERAL

1.01 SUMMARY

A. This Section includes procedural requirements including field services for testing, startup, and training for the City of Kansas City Missouri.
B. Design-Builder shall furnish all labor, materials, equipment, and incidentals as necessary to comply with these requirements.

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract; including all applicable Division 01 Sections, and all applicable Division Sections; apply to this Section.
B. Related Sections include the following:
   1. Divisions 02 through 16 Sections for specific requirements for any field services and startup instructions of applicable products in those Sections.
   2. Section 01300 – Submittals.
   3. Section 01664 – Training.
   4. Section 01757 – Commissioning.

1.03 SUBMITTALS

A. Informational submittals:
   1. Training Schedule: Submit in accordance with requirements of this Specification and Section 01664 – Training not less than 30 days prior to start of equipment installation and revise as necessary for acceptance.
   2. Lesson plan: Submit, in accordance with requirements of this Specification and Section 01664 - Training, proposed lesson plan not less than 30 days prior to scheduled training and revise as necessary for acceptance. Lesson plan will also be submitted and approve for training credit by the Missouri Department of Natural Resources Operator Certification Program.
   3. Submit qualifications of the manufacturer's representative to Owner as a part of the material/equipment submittal package no later than 30 calendar days in advance of required observations. Manufacturer's representative subject to approval of Owner. No substitute representatives will be allowed unless prior written approval by such has been given.

1.05 QUALIFICATIONS OF MANUFACTURER'S REPRESENTATIVE

A. Authorized representative of the manufacturer, factory trained, and experienced in the technical applications, installation, operation, and maintenance of respective equipment, subsystems, or system, with full authority by the equipment manufacturer to issue the certifications required of the manufacturer. Additional qualifications may be specified in the individual specification section.
B. Representative subject to acceptance by the Owner's Representative. No substitute representatives will be allowed unless prior written approval by such has been given.

PART 2 – PRODUCTS

(Not Used)

PART 3 – EXECUTION

3.01 FULFILLMENT OF SPECIFIED MINIMUM SERVICES

A. When specified in Design-Builder's specifications, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, including service connections, quality of workmanship, start-up of equipment, and test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.
B. Comply with the requirements in Section 01757 – Commissioning.
C. Where time is necessary in excess of that stated in the Specifications for manufacturers' services, or when a minimum time is not specified, time required to perform specified services shall be considered incidental.
D. Design-Builder shall schedule manufacturers' services to avoid conflict with other onsite testing in this project and others, other training of division personnel or other manufacturers' onsite services.
E. Before scheduling services, determine the conditions necessary to allow successful testing have been met including obtaining approval on all Operational Change Control Plans (OCCPs).
F. Only those days of service approved by Owner's Representative will be credited to fulfill specified minimum services.
G. Design-Builder shall coordinate manufacturer's field services with the systems integrator, so both are onsite during field services if desired by Owner.
H. When specified in individual specification sections, manufacturer's onsite services shall include:
    1. Assistance during product (system, subsystem, or component) installation to include observation, guidance, instruction of Design-Builder's assembly, erection, installation, or application procedures.
    2. Inspection, checking, and adjustment as required for product (system, subsystem, or component) to function as warranted by manufacturer and necessary to furnish Manufacturer's Certificate of Installation and Functionality Compliance (Supplement to Section 01757 – Commissioning).
    3. Providing, on a daily basis, copies of manufacturers' representatives field notes and data to Owner.
    4. Revisiting the site as required to correct problems and until installation and operation are acceptable to Owner or Owner's Representative.
    5. Resolution of assembly or installation problems attributable to or associated with respective manufacturer's products and system.
    6. Assistance during functional and performance testing, commissioning, and system startup and evaluation.
    7. Training of Owner's personnel in the operation and maintenance of respective product as required.
I. Report results in writing within two weeks of last day of field service. A separate Manufacturer's Field Report shall be provided for each field service regardless if performed by same representative. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to Manufacturer's written instructions. Design-Builder shall submit Manufacturer's Field Report in accordance with Section 01300 – Submittal Procedures.

3.02 MANUFACTURER'S CERTIFICATE OF COMPLIANCE

A. When specified, a Manufacturer's Certificate of Compliance form, provided in this Section, shall be completed in full, signed by an entity supplying the product, material, or service, and submitted prior to shipment of product or material or execution of the services.
B. Owner's Representative may permit use of certain materials or assemblies prior to sampling and testing if accompanied by accepted certification of compliance.
C. Such form shall certify proposed product, material, or service complies with that specified. Attach supporting reference data, affidavits, and certifications as appropriate.
D. May reflect recent or previous test results on material or product, if acceptable to the Owner's Representative.

3.03 MANUFACTURER'S CERTIFICATE OF INSTALLATION AND FUNCTIONALITY COMPLIANCE

A. When specified, a copy of the Manufacturer's Certificate of Installation and Functionality Compliance form shall be completed and signed by equipment Manufacturer's Representative in accordance with Section 01757 – Commissioning).
B. This form shall certify signing party is a duly authorized representative of the manufacturer, is empowered by the manufacturer to inspect, approve, and operate their equipment, and is authorized to make recommendations required to ensure equipment is complete and operational.

3.04 TRAINING

A. Refer to Section 01664 – Training for training requirements.

3.05 SUPPLEMENTS

A. Supplements listed below, following "End of Section," are part of this Specification.
   1. Manufacturer's Certificate of Compliance Form.
   2. Manufacturer's Certificate of Installation and Functionality Compliance (provided in Section 01757 – Commissioning).

End of Section

MANUFACTURER'S CERTIFICATE OF COMPLIANCE FORM

OWNER: _____ PROJECT, MATERIAL OR SERVICE SUBMITTED:

_____

PROJECT NAME: _____ PROJECT NO. _____

COMMENTS:

_____

_____

_____

_____

I hereby certify that the above referenced product, material, or service called for by the Contract for the named Project will be furnished in accordance with the applicable requirements. I further certify that the product, material, or service are of the quality specified and conform in all respects with the Contract requirements and are in the quantity shown.

Date of Execution _____ , 20 ____

Manufacturer: _____

Manufacturer's Authorized Representative (print) _____

Manufacturer's Authorized Representative (Signature) _____

SECTION 01480 – WATER TIGHTNESS

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes hydrostatic leakage testing for concrete water-containing structures.

1.02 REFERENCES

A. Reference standards.
    1. Section 01300 – Submittals.

1.03 DEFINITIONS

A. Definitions.
    1. Damp spots: Surfaces where visible moisture can be picked up by a dry hand.
    2. Containment structure lined: Liquid-containing structure with barrier coating or membrane applied to the inside surfaces to prevent leaking of contents to the outside.
    3. Containment structure, unlined: Liquid containing structure where only the concrete structure itself is used to prevent leaking of contents to the outside.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination.
B. Pre-installation meetings.
C. Sequencing.
D. Scheduling.

1.05 SUBMITTALS

A. Shop drawings:
    1. Description and details of each evaporation/precipitation-measuring device anticipated for use during the test.
B. Tests and evaluation reports:
    1. Results of water leakage test for each structure and for each portion of a structure designated for testing.
C. Special procedure submittals:
    1. Submit in accordance with Section 1300 – Submittals.
    2. Testing plan for each structure, or portion thereof, required to be tested.
        a. Describe methods of obtaining water for testing and of releasing water for disposal, including provisions for dechlorination if required.
        b. Include plans showing locations where measurements will be made and locations of evaporation/precipitation-measuring device.
        c. Indicate plans for filling and draining structure(s).
        d. Include schedule showing duration of test for each structure or cell to be tested, date and time for start of each test, dates and times of observations and measurements during the test, dates and times for closeout of testing procedures, and date for submittal of final results.
    3. Proposed procedures and products for repair of leaks.

PART 2 - PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 GENERAL

A. Test structures and portions of structures listed in the following paragraphs for water leakage.
    1. Unless otherwise specified, Design-Builder shall:
        a. Obtain all required permits for discharging testing water.
        b. Provide dechlorination of such water if required by the permits.
        c. Prepare and fill the structures.
        d. Provide access and equipment required for testing and for recording test results.
        e. Take measurements and make observations required for testing.
    2. At all times during testing, the Owner shall have access to observe measurements by others or to make independent measurements.
B. Test all new concrete structures for water leakage:
C. Required preparation for testing is designated in this Section. Waiver of, or failure to complete preparations shall not change the testing criteria or approval criteria for the areas tested.
D. Retest structures and portions of structures until the evaluation criteria are satisfied.

3.02 TEST WATER SOURCE AND DISPOSAL

A. Water used for the first filling of the tank will be furnished by Owner.
    1. Design-Builder shall obtain water for leakage testing from:
        a. Disinfected effluent between April 1 and October 31.
        b. Secondary effluent between November 1 and March 31.
B. In the event that retesting is required, Design-Builder shall bear the cost of refilling the tank for subsequent tests.
C. After leakage testing is complete, Design-Builder shall dispose of water by discharging to the Headworks.

3.03 PREPARATION

A. For each structure to be tested, prepare and submit a plan showing schedule and sequence of activities, method of filling, and methods of disposing of test water. Design-Builder shall also prepare an Operational Change Control Plan (OCCP) as specified in Section 01140 – Work Restrictions. OCCP will identify test water source(s) as well as disposal location(s).
B. Sequencing requirements:
    1. Complete construction of concrete structure and cure concrete to obtain minimum specified 28-day compressive strength.
        a. Do not begin tests until all portions of structure are complete and have reached their minimum specified 28-day compressive strength.
        b. Do not begin tests until at least 14-days have passed since completion of the last concrete placement.
    2. Complete tests before:
        a. Covering any surface of the structure with materials that might mask the location of leaks or obscure damp concrete surfaces. Such coverings include, but are not limited to basin bottom grout, masonry veneer, stucco, plaster, and other coatings.
        b. Installation of equipment, unless otherwise approved by Owner.
        c. Backfilling structures to elevations above the limits indicated in the following paragraphs.

3. Liners and coatings:
    a. Field-coated or installed liners and coatings shall be applied in strict conformance to manufacturer's standards.
    b. Install liners that are mechanically locked to the concrete surface during placement of plastic concrete and before leakage testing.
        (1) Examine liners for pinholes, tears, and partially fused splices, complete all required liner integrity testing, and make required repairs before commencing leakage testing.
    c. Unless otherwise specified, do not install surface-applied protective or decorative coatings and linings until leakage tests have been completed.

C. Weather requirements:
    1. Tests on structures with tops open to the atmosphere shall not be scheduled for periods when the ten-day weather forecast indicates a substantial change in weather patterns.
    2. Measurements of water surface levels in the structure shall not be scheduled for periods when the weather forecast indicates a difference of more than 35 degrees Fahrenheit between the ambient temperature readings at the times of initial and final measurements.
    3. Tests shall not be scheduled for periods when the ten-day weather forecast indicates that the water surface may freeze before the test is complete.

D. Groundwater requirements:
    1. Bring groundwater to a level not higher than three feet below the bottom of the structure and maintain at that level for the duration of the test.

E. Clean interior of structure:
    1. Remove dirt, contaminants, and construction debris.
    2. Flush floors and sumps to provide clean surfaces.
    3. Remove standing water that would interfere with examination of surfaces, cracks, or joints.

F. Observe the structure, or portions of the structure being tested, for potential leak locations.
    1. Give particular attention to cracks, open joints, voids, and honeycombed and repaired surfaces.
    2. Visually observe openings, fitting, and pipe penetrations in the structure at both faces, if possible.
    3. Repair potential leak locations in accordance with these Specifications and as approved by the Owner.
    4. Backfill excavations to the top of the structure foundation. Do not place backfill against water-bearing walls or over footings unless approved in advance by Owner.
        a. If requesting backfilling of walls before testing, include a description of methods that will be used to detect leakage in the backfilled areas.
    5. Owner's approval of backfilling before testing shall not relieve Design-Builder of the responsibility to conduct leakage tests, to satisfy the leakage acceptance criteria for the structure, or to repair leaking portions of the structure, including those portions below or behind the backfill.

G. Inlets to/outlets from the structure:
    1. Inlets to and outlets from the structure shall be watertight.
        a. Include valves, sluice, and/or slide gate valves and temporary bulkheads as required.
        b. Inlets and outlets not required to be operable may be temporarily sealed before testing the compartments to which they open.
        c. Secure inlets used to fill the structure for testing to ensure that no water is entering or leaving the structure once it has been filled to the test level.

2. Adjustments to measured leakage at inlets and outlets based on manufacturers or Design-Builder's estimates will not be allowed.
    a. Adjustments to measured leakage may be permitted by Owner, and, at their discretion, only when Design-Builder makes specific measurements of leakage at each individual inlet and outlet using methods approved by Owner.

3.04 HYDROSTATIC LEAKAGE TEST FOR OPEN OR COVERED CONTAINMENT STRUCTURES

A. Isolate sections of water-holding structures that can be isolated in actual operation. Fill and test sections for leakage separately.
    1. Fill structures and sections of structures scheduled for testing to the normal operating water level indicated on the Hydraulic Profile indicated on the Drawings.
B. Initial rate for filling of structures shall not exceed eight feet in 24 hours.
C. HST-100 testing includes two parts, "Qualitative Testing," and "Quantitative Testing," as described in the following paragraphs:
    1. HST-100, Part 1 - Qualitative Testing:
        a. During the first 24 hours after structures are filled, examine exposed concrete surfaces for damp spots or flowing water.
            (1) Make observations in early morning, at midday, and in late afternoon.
            (2) Continue observations through the duration of the Quantitative Testing period.
            (3) Pay particular attention to conditions at joints, honeycombed areas, cracks, and repaired portions of the structure.
        b. Evaluation criteria:
            (1) The structure shall be considered to have failed these Qualitative Testing requirements if any of the following conditions are observed.
                (a) Water droplets or moist areas on an outside surface that could only have originated inside the structure.
                (b) Water is flowing or seeping from joints, cracks, or surfaces.
                    (i) Exception: Dampness or wetness on top of a footing, in the absence of flowing water, shall not be considered as failure to meet this criterion.
                (c) Moisture can be transferred to a dry hand from the outside surfaces of the filled area.
        c. Repairs and retesting:
            (1) Where damp spots or flowing water as described in the preceding paragraphs are observed, mark locations, provide repairs, and retest the structure as specified in subsequent paragraphs.
    2. HST-100 - Part 2: Quantitative Testing:
        a. If approved by the Owner, Quantitative Testing may begin before repairs are made to areas failing Part 1 of this test; however:
            (1) Adjustments to volume loss calculations of Quantitative Testing based on observed leakage will not be permitted.
            (2) All defects identified for repair during Qualitative Testing shall be repaired to the satisfaction of the Owner before approval of the structure.

b. Report the results of Quantitative Testing on "Leakage Test Report" included as Figure A at the end of this Section, or similar form prepared by Design-Builder and containing at least the information included in Figure A.

c. Unlined concrete structures:
   (1) Fill to the designated water surface elevation. Maintain that level for at least 72 hours before recording initial water levels for leakage test.
   (2) Duration of test:
      (a) Theoretical time required to lower the water surface in the structure by 3/8 inch when leakage is occurring at the maximum allowable rate specified in subsequent paragraphs of this Section.
      (b) The duration ("D") of the test in days is determined by the following equation:

$$D = \frac{.375\ inches}{0.005\ in/in/day \times H\ ft \times 12\ in/ft}$$

$$Where\ H = Maximum\ Liquid\ Depth$$

         (i) Round results upward to the next full 24-hour period (day).
         (ii) Minimum duration of test: 24 hours (one day).
         (iii) Maximum duration of test: 120 hours (five days).

d. Lined concrete structures and secondary containment areas:
   (1) Fill to the designated water surface elevation. Recording of water levels for leakage tests may begin as soon as the designated water surface level is reached and the water surface is calm.
   (2) 2) Duration of test: 72 hours (three days).

e. Measurements: Water level:
   (1) Record water levels at 24-hour intervals for the full duration of the test period.
   (2) Measure water levels at not less than two locations on opposite ends of the structure, and preferably at four locations spaced equally around the structure. Mark locations on the structure and take measurements at the same locations throughout the duration of the test.
   (3) Measure, to an accuracy of 1/16 inch, the vertical distance to the water surface from a fixed point on the structure above.

f. Measurements: Temperatures:
   (1) As part of the first and last sets of level measurements, record water temperature at a depth of 18 inches below the water surface. Measure temperature at the same locations where level measurements are taken.
   (2) Record ambient temperature at the time of each water level measurement.

g. Measurements: Evaporation and precipitation:
   (1) Measure evaporation and precipitation by floating pans inside the structures during testing.
      (a) For uncovered structures, measure both evaporation and precipitation.
      (b) For covered structures that are well ventilated, measure evaporation.
   (2) Measure using specially constructed clear containers:
      (a) Provide clear plastic, calibrated, open-top containers not less than 18 inches in diameter and 18-inches deep.

(b) Partially fill containers with water and float inside the structure. Make provisions to hold containers in place at each measurement location, but away from structure walls and items passing overhead, such as beams or pipes.

(c) Measure initial depth of water in each device. Measure changes in water level in each device at the same time measurements of the water level inside the structure are taken.

h. Restart of test:

(1) Owner may order a restart of the test when, in Owner's opinion, measurements have become unreliable due to unusual precipitation or other factors.

(2) If measurements or observed leakage during the testing period indicate that the allowable leakage requirements will be exceeded, the test may be terminated before completion of the full test period. Take appropriate actions to correct problems before restarting the test.

i. Calculations of leakage test results:

(1) For each section of the structure tested, use water surface level records to calculate average loss of volume per 24-hour interval.

(a) For each 24-hour interval during the test, calculate the average of all measured drops in water level around the structure.

(b) Use the average drop thus determined to calculate an average loss of volume for each 24-hour interval.

(2) Adjustments to leakage calculations:

(a) For uncovered basins, calculations shall be corrected for precipitation added to the structure.

(b) Calculations may be corrected for evaporation and water temperature.

j. Evaluation criteria:

(1) Unless otherwise specified, the average loss of volume during any 24-hour interval shall not exceed the limits shown in Table A.

Table A - Loss of Volume Criteria for Leakage Tests

Structure Type	Maximum Loss of Water Volume
• Structure fully lined prior to leakage test. • Secondary containment areas.	No measurable loss over 72-hour test period.
• Structure with monolithically placed membrane floor slab.	0.0125 percent of volume per 24-hour period.
• Concrete paved canals, drying beds, lagoons, and similar structures.	0.100 percent of volume per 24-hour period.
• Other containment structures.	0.050 percent of volume per 24-hour period.

k. Repairs and retesting:

(1) Structures and portions of structures that have satisfied the qualitative requirements of HST-100, but have failed to satisfy the quantitative requirements of HST-100 may be immediately retested for volume loss.
   (a) If the structure fails the second test for volume loss, the structure shall be drained, and Design-Builder shall observe the interior for probable areas of leakage.
   (b) The structure shall not be retested until repairs to the probable areas of leakage are complete.

3.05 REPAIRS FOR RETESTING

A. Locations showing damp spots or flowing water:
   1. Mark locations of visible leaks and damp spots.
   2. Drain structures for repair.
   3. Repair defects causing damp spots and flowing water using methods approved by Owner.
      a. Repair both interior and exterior surfaces and make structures watertight.
      b. Submit proposed repair products and procedures for Owner's review.
      c. Refill structures for retesting.
   4. Repeat filling, observations, and repairs until no leaks or damp spots appear.
B. Structures for which loss of water volume loss exceeds the limits specified after adjustments for evaporation, and precipitation:
   1. Determine cause of volume loss.
   2. Drain structures of water.
   3. Repair defects causing loss of water volume using methods approved by Owner.
      a. Submit proposed repair products and procedures for Owner's review.
   4. Refill water-holding structures.
   5. Repeat testing and repairs until volume loss does not exceed specified limits.

End of Section

FIGURE A

WATERTIGHTNESS TEST REPORT

PROJECT: _____ SUBMITTED BY:

STRUCTURE: _____ WITNESSED BY:

AREA: _____ TEST DATES:

TEST DURATION: _____ TEST DURATION:

Surface area of structure tested: _____ (square feet)

Volume of structure tested: _____ (cubic feet)

Volume of structure tested: _____ (gallons)

Measured loss through gates, etc.: _____ (gallons / day)

Allowable loss of water volume: _____ (per day)

Allowable loss of water volume: _____ (% in 24 hours) Allowable

measured loss over test duration (inches): _____

Measured loss of water: _____ (gallons / day - From E below)

Measured loss of water volume (%): _____ (in 24 hours - From E below)

Water Temperature: Start of test: °F End of test: °F

			Water Surface Elevation (top of structure to top of water)				
			Location #1	Location #2	Location #3	Location #4	Initials**
Day	Date	Time	(inches)	(inches)	(inches)	(inches)	
1							
2							
3							
4							
5							
Changes in Level:							

A. Average change in level (feet): (Average of total charges for all locations)

B. Correction for precipitation: _____
(Measured from pan)

C. Correction for evaporation: _____ (Measured from pan)

D. Corrected change in level (CL): _____

E. Total days tested: _____

Average measured % water loss in 24 F. hours: _____ = $\frac{\text{(CL) x (surface area) x } 100}{\text{(initial water volume) x (number of test days)}}$

Notes and field observations□□

□□ Place date and initials at the beginning of each entry

SECTION 01500 – TEMPORARY FACILITIES

PART 1 - GENERAL

1.01 SUMMARY

A. This specification covers the requirements for temporary construction facilities required on all projects.

B.

1.02 RELATED SECTIONS

A. Section 01300 – Submittals.

1.03 CODES AND STANDARDS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

B. National Fire Protection Association:

1. NFPA 10 - Standard for Portable Fire Extinguishers.
2. NFPA 70 - National Electric Code.
3. NFPA 241 - Standard for Safeguarding Construction, Alternation and Demolition Operations.

1.04 INFORMATION PROVIDED BY OWNER

A. As provided in the Contract Documents.

1.05 SUBMITTALS

A. Submit as specified in Section 01300 – Submittals.

1.06 QUALITY ASSURANCE

A. Design-Builder is responsible for the quality assurance and quality control of the Work.

B. Regulations – Comply with industry standards and applicable laws and regulations of authorities having jurisdiction, including but not limited to:

1. Building Code requirements.
2. Health and safety regulations.
3. Utility company regulations.
4. Police, Fire Department and rescue squad rules.

C. Standards:

1. Comply with NFPA 10 and 241 and ANSI A10 Series standards "Temporary Electrical Facilities."
2. Comply with NEMA, NECA and UL standards and regulations for temporary electric service. Install service in compliance with NFPA 70.

D. Inspections – Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

3.01 OFFICE

A. Stationary Office – Design-Builder shall maintain a suitable stationary office at or near the Site during the performance of the Work.

B.

C. The office shall serve as the headquarters of the Design-Builder's Representative authorized to receive Contract Documents, instructions, other communication or articles associated with the Work.

D. Any communication given to the Design-Builder's representative or delivered to Design-Builder's office at the site of the Work shall be deemed to have been delivered to Design-Builder.

E. Copies of the Contract Documents shall be kept at the office and shall be available for use at all times.

3.02 FIELD OFFICE FOR RESIDENT PROJECT REPRESENTATIVE

A. Design-Builder shall provide a field office for the Owner's Resident Project Representative as mutually agreed with Owner.

3.03 TEMPORARY UTILITIES

A. Provide temporary utilities required for construction. Materials may be new or used, must be adequate for the required usage, not create unsafe conditions and not violate applicable codes and standards.

B. Power:
   1. All power for lighting, operations of the Design-Builder's plant/equipment or for any other use which may be required for proper completion of the Work shall be provided by the Design-Builder.
   2. Temporary heat and lighting shall be maintained until the Work is accepted.

C. Telephone/internet service:
   1. Contractor shall make all necessary arrangements and pay all installation and monthly charges for telephone/internet service for the temporary office at the site and shall provide all required devices for such service.

D. Sanitary Facilities:
   1. Design-Builder shall furnish temporary sanitary facilities at the site, as provided herein, for the needs of all construction workers and others performing work or furnishing services on the Project.
   2. Sanitary facilities shall be of reasonable capacity, properly maintained throughout the construction period and obscured from public view to the greatest practical extent. If toilets of the chemically treated type are used, at least one toilet will be furnished for each 20 persons. Design-Builder shall enforce the use of such sanitary facilities by all personnel at the site.
   3. Ventilate the units to control odors and fumes and empty and clean them at least once a week or more often if required by Owner. The doors shall be self-closing. Locate the facility behind the construction fence or out of the public view.

3.04 SECURITY

A. Design-Builder shall be responsible for keeping Site, including parking, laydown areas, and storage secure.

B. Overall Blue River WWTP plant security will be provided by Owner.

3.05 PARKING

A. Design-Builder shall be responsible for identifying sufficient parking and maintaining the parking area. Parking arrangements shall be approved by Owner in Design-Builder's Phase 2 Proposal.

END OF SECTION

SECTION 01566 – CLEANUP OPERATIONS

PART 1 - GENERAL

1.01 SUMMARY

A. Design-Builder shall provide all material, labor and equipment necessary for cleanup operations. Design-Builder shall maintain a neat and clean job site at all times.

1.02 SPECIFICATION MODIFICATIONS

A. It is understood that throughout this section these Specifications may be modified by appropriate items as indicated on the Contract Drawings.

1.03 RELATED SECTIONS

A. General Conditions of Contract for Progressive Design-Build Services.
B. Section 01300 – Submittals.

1.04 CODES AND STANDARDS

A. Not used.

1.05 DEFINITIONS

A. Not used.

1.06 INFORMATION PROVIDED BY THE CITY

A. As provided in the Contract Documents.

1.07 SUBMITTALS

A. Design-Builder shall submit as specified in Section 01300 Submittals, if proposing alternate methods and facilities for concrete washout facilities.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 SITE MAINTENANCE

A. Adequate cleanup shall be a condition for the processing of Design-Builder's monthly progress payment applications.
B. Design-Builder shall, at all times, keep the premises from accumulations of excavated materials, waste materials and other debris resulting from the Work. Site maintenance shall include, but is not limited to, the following:
   1. Design-Builder shall sweep streets daily to maintain the site in a neat and clean condition.
   2. Provide adequate trash receptacles on the site and promptly empty when filled.
   3. Conduct periodic cleanup of the site to avoid hazards, interference with traffic or operations at the site.
   4. Keep construction materials such as pipe, forms and scaffolding neatly stacked.
   5. Conduct immediate cleanup to protect the Work by removing splattered concrete, asphalt, oil, paint, corrosive liquids and cleaning solutions from all surfaces

(linear construction) including walls, floors and metal surfaces (vertical construction) before the surfaces are marred.

6. Volatile wastes shall be properly stored in covered metal containers and removed from the site daily.
7. Wastes shall not be buried on the site or disposed of into storm drains, sanitary sewers, streams or waterways. All wastes shall be removed from the site and disposed of in a manner complying with all local permits, ordinances and anti-pollution laws.
8. Overloading of trucks is prohibited to prevent spillages on all access and haul routes. Design-Builder shall provide periodic inspection of traffic areas to enforce the requirements of this Section.
9. Design-Builder shall prevent all excess material from washing into stream beds, storm water facilities, streets, culverts, etc.

C. All excavated material not incorporated into the Work shall be removed and disposed of by Design-Builder so that the site will be left in equal or better condition than its original state.

D. Any deficiency in the quantity of material for filling depressions caused by settlement shall be supplied by Design-Builder.

E. Design-Builder shall remove all mobilized equipment, surplus materials, debris and temporary facilities from the site. The construction site shall be left in its original condition or better condition than before the Work commenced.

F. In addition, as directed by Owner, Design-Builder may be required to obtain an Owner-approved release form, signed by the property owners affected by the Work.

3.02 DUST CONTROL

A. Design-Builder shall take all reasonable measures to prevent unnecessary dust. Earth surfaces subject to dusting shall be kept moist with water or by the approved application of an approved chemical suppressant. When practical, dusty materials in piles or in transit shall be covered to prevent blowing.

B. Design-Builder shall make provisions so that buildings or operating facilities that may be adversely affected by dust shall be adequately protected from dust. Existing or new machinery, motors, instrument panels or similar equipment shall be protected by suitable dust screens. Proper ventilation shall be included with dust screens.

C. Design-Builder shall maintain and keep all streets clean throughout the Work period. Design-Builder shall perform street sweeping on a daily basis to remove dust and debris from paved areas within the Work site as well as on all access and haul routes.

3.03 CONCRETE WORK

A. Three working days after all subsurface work has been completed, Design-Builder shall initiate the following restoration work: seed and/or sod (depending on contract requirements and/or written agreements with property owners), replacing concrete sidewalks, curbs, gutters, driveways and other surfaces impacted by the Work.

B. Three working days after the placement of concrete, Design-Builder shall conduct cleanup operations related to the completed concrete work as follows:

1. Removal of forms, backfilling of the form excavation and debris removal from streets, sidewalks and parkway areas shall be accomplished within three working days after the concrete placement. The backfilled areas within one foot of new concrete shall not be compacted until the concrete has cured a minimum of five days.

2. Five working days after the concrete is placed, Design-Builder shall complete all joint caulking, pavement restoration, seeding and sodding. If construction is being performed during periods other than designated seeding and sodding seasons, all locations without turf cover shall be completed within ten working days after the beginning of the next seeding and sodding season.
3. If cleanup, backfilling, sodding, joint caulking or pavement restoration is not accomplished within the above limits, all tear-out and installation operations shall cease until these items are finished. Proceeding without these items being completed is at the sole discretion of Owner.
4. All excavated material shall be removed and disposed of by Design-Builder so that the grounds will be left in equal or better condition than its original state. Any deficiency in the quantity of material for filling depressions caused by settlement shall be supplied by Design-Builder.
5. Surplus materials, equipment, tools, temporary facilities and structures shall be removed by Design-Builder; all debris shall be hauled away by Design-Builder and the construction site shall be left in equal or better condition than its original state. Payment of completed items on the Schedule of Values shall be subject to the completion of the cleanup operations.
6. Tear-out and installation shall not begin if unfavorable conditions for concrete placement are forecast for the next day.
7. All cleanup operations, as stated above, shall be completed five working days after concrete placement.

C. Concrete Washout Facilities:
1. Design-Builder shall provide facilities for concrete washout to collect and retain all the concrete washout water and solids in leak proof containers.
2. Lined wash pits or washout boxes are acceptable.
3. Alternative methods for washout facilities may be considered by Owner. Design-Builder shall submit for review and approval, per Section 01300 – Submittals, the alternate methods and facilities to be used.
4. The location of washout facilities shall be as agreed upon by Owner and Design-Builder.
5. Concrete washout facilities shall be inspected daily and after heavy rains to check for leaks, identify any plastic linings or sidewalls that have been damaged by construction activities and determine whether they have been filled to over 75 percent capacity.
6. When the washout container is filled to over 75 percent of its capacity, the wash-water shall be vacuumed out or allowed to evaporate to avoid overflows. When the remaining cementitious solids have hardened, they shall be removed from the site.
7. Damages to the washout container shall be repaired promptly.
8. Before heavy rains, the washout container's liquid level shall be lowered or the container shall be covered to avoid an overflow during the rain storm.
9. Washout facilities shall be removed from the site upon completion of the Work and the area restored as specified herein.

3.04 PROGRESS CLEANING AND WASTE REMOVAL

A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 degrees Fahrenheit.
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations and Section 01354 – Hazardous Materials Procedures.
4. Collect and remove waste materials, debris, and rubbish from site weekly and dispose offsite.
5. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing spaces.
6. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

B. Site: Maintain Project site free of waste materials and debris. Maintain site in clean and orderly condition.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work. Maintain areas free of waste materials, debris, and rubbish.
1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
3. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration through Final Completion.

F. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.
1. Provide waste disposal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations and with the requirements of this Section.
2. Arrange for and dispose of surplus materials, waste products, and debris off-site.
3. Prior to making disposal on private property, obtain written permission from owner of such property.
4. Do not create unsightly or unsanitary nuisances during disposal operations.
5. Maintain disposal site in safe condition and good appearance.
6. Complete leveling and cleanup prior to making request for final inspection for Final Completion.
7. Promptly remove from the site material that may generate additional odors.
8. Owner may direct the prompt removal of odorous material generated by Design-Builder.
9. Comply with Section 01354 – Hazardous Material Procedures for disposal of hazardous materials.

G. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration through Final Completion.

H. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period in accordance with Section 01600 – Product Delivery Storage and Handling. Adjust and lubricate operable components to ensure operability without damaging effects.

I. Limiting Exposures: Supervise construction operations to assure that no part of the construction; completed or in progress; is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

END OF SECTION

SECTION 01570 - TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 – GENERAL

1.01 SUMMARY

A. Design-Builder shall furnish all labor, superintendence, project management, materials, equipment, and incidentals as necessary to comply with these requirements.

B. It is the responsibility of Design-Builder to be aware of and follow all current Missouri Department of Natural Resources (MDNR) and KCMO erosion control regulations.

C. Design-Builder shall provide erosion and sediment control measures for all areas within and adjacent to the Project site. Design-Builder shall assume that the work is to be done under Owner's General Operating Permit (Permit No: MO-0024911). Contractor or Design-Builder does not need to make separate application to the MDNR.

D. Specific erosion and sediment control measures are specified in APWA 5100 and Standard Erosion and Sediment Control (ESC) Drawings. These measures shall be implemented in order to control erosion and water pollution.

E. No separate payment shall be made for ESC. Design-Builder shall include in the Contract Price: all labor, material and equipment necessary to comply with this Section and all other Work indicated in the Contract Documents.

1.02 DESCRIPTION

A. Design-Builder shall install and maintain temporary erosion and sediment control devices prior to commencing construction operations and continue through the construction period until such time as seeding and sodding has been completed and turf is established on all graded areas.

B. Design-Builder shall prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) utilizing the latest version of Owner's SWPPP template to develop the plan. This template is provided as supplement to this Section. The plan must include a narrative of the types and appropriate uses of Best Management Practices (BMPs) for ESC and stormwater management. The requirements of the SWPPP must be as stringent as those described in Owner's General Operating Permit and 10 CSR 20-6.200. Additionally, the SWPPP must comply with the City of Kansas City's MS4 permit.

C. Failure to control erosion and water pollution will result in Design-Builder being noncompliant. Any noncompliance constitutes grounds for the following enforcement actions. Design-Builder shall have 24 hours after receiving a notice of noncompliance from the Owner's Representative (i.e. Project Manager, Inspector/ Representative of the City) to correct the problem. If weather conditions prevent the correction of BMPs within seven calendar days, the reasons for the delay must be documented (including pictures) and there must be a narrative explaining why the work cannot be accomplished within the seven day time period. The documentation must be filed with the regular inspection reports. Design-Builder shall correct the problem as soon as weather conditions allow. If Design-Builder fails to correct the problem after the time prescribed, Owner will hire a remediation expert to fix the problem. In such an event, Design-Builder shall be liable to Owner for the remediation costs plus a ten percent mark-up of the total purchase order or contract price. If Design-Builder continues to be noncompliant, the Owner (or an authorized agent thereof) may issue a stop work order and delay any payment until control measures are properly functioning and any damage has been mitigated. In such an event, any delay to the Project schedule will result in liquidated damages assessed against Design-Builder.

1.03 RELATED SECTIONS

A. Section 01300 – Submittals.

1.04 QUALITY ASSURANCE

A. Design-Builder is responsible for the quality assurance and quality control of the Work. The Work shall be performed by a contractor with a proven record of performance for similar ESC work.

1.05 INFORMATION PROVIDED BY THE OWNER

A. As provided in the Contract Documents.

1.06 DESIGN-BUILDER SUBMITTALS

A. Design-Builder shall submit to the Owner for review and approval, in accordance with Section 01300 – Submittals, all specifications and data covering the proposed materials to be used for ESC work.

B. Design-Builder shall submit the following to the Owner for review and approval prior to the Preconstruction Conference:

1. Design-Builder shall prepare a SWPPP for Projects that disturb one or more acres of land or disturb less than one acre when part of a larger Project which will disturb one or more acres over the life of the Project.
2. The SWPPP shall meet the requirements of this Section, applicable references on the plans, Owner's adopted Erosion and Sediment Control Specifications (ESCS), and all sections of the APWA-KCMO specifications that reference erosion control requirements. Design-Builder shall develop, implement, and adhere to the erosion control and stormwater pollution prevention plan based upon Owner's guidelines and requirements.
3. No Work can begin until the SWPPP is approved by Owner.
4. Design-Builder shall update and maintain the SWPPP as necessary to develop ongoing site-specific control measures until final acceptance of the Project.

PART 2 – PRODUCTS

2.01ACCEPTABLE PRODUCTS

A. Unless otherwise specified, acceptable products for Inlet Protection include the following:

1. Gutter Buddy, Dandy Curb® or approved equal.

PART 3 – EXECUTION

3.01 SAFETY

A. Perform all work in accordance with applicable Occupational Safety and Health Administration (OSHA) standards.

3.02 PERFORMANCE

A. Owner Projects are covered by a general NPDES permit maintained by the Water Services Department's Storm Water Division. The Permit imposes a number of obligations including, but not limited to, the following:

1. New Projects must be reported to the MDNR 90 days before the Project starts.
2. Each site must have and follow a written SWPPP. Each site must be inspected weekly and following each rain event, for compliance with the SWPPP. Written inspection reports must be kept.

3. All personnel onsite must be briefed on the requirements of the SWPPP.
4. A copy of the SWPPP must be on site at all times.
5. All deficient items shall be promptly corrected. In no case shall the correction period exceed two calendar days.
6. Quarterly reports must be filed by Owner with MDNR identifying and giving the status and percent complete of each Project.
7. MDNR must be notified if hazardous substances or contaminated soil are discovered on site.

B. Design-Builder shall follow the approved SWPPP, as well as all erosion control measures included in the Contract Documents and implement other BMP measures as directed by Owner.

C. Design-Builder shall prevent erosion during his operations until vegetation is re-established. Design-Builder shall prepare erosion control plans and submit in writing to Owner any proposed modifications to the plans. The proposed modifications shall describe materials that will be used and the tasks that will be performed to control runoff on the site.

D. Erosion control devices shall be in place before land is disturbed.

E. All earthen structures shall be seeded or sodded.

F. Vegetation shall be established to provide adequate protection or develop other suitable means.

G. Sediment trapping devices shall been installed in the proper location prior to grading.

H. Design-Builder shall establish perimeter sediment trapping measures that function properly.

I. Design-Builder shall prevent sediment from leaving the site and/or from damaging adjacent property.

J. Design-Builder shall prevent and or remove mud on public roads or at intersections with public roads that is related to the Project work being completed.

K. Design-Builder shall provide a temporary construction entrance to reduce/eliminate the transport of mud from the construction site onto public right of ways.

L. Design-Builder shall provide dust control measures for any graveled areas or exposed soil areas.

M. Design-Builder shall temporarily or permanently stabilize all areas with exposed soil.

N. Design-Builder shall adequately stabilize all finished cut and fill slopes.

O. All onsite drainage channels and outlets shall be adequately stabilized.

P. Route stream around work areas.

Q. Repair stream channel damages per the Contract Documents.

R. Provide stabilization or a temporary stream channel crossing where needed.

3.03 INSTALLATION

A. Methods, materials and maintenance shall be the sole responsibility of Design-Builder. Design-Builder and the Owner shall conduct weekly onsite inspections using the "Erosion and Sediment Control Checklist" provided by the Water Services Department. Remove any onsite pollutant sources (debris piles with petroleum cans, chemical containers, fueling trucks/tanks or other possible sources of pollution). Upon notification of a weather forecast with a reasonable likelihood of rain, or at the direction of the Owner, Design-Builder shall construct temporary berms and install erosion control fencing as necessary to control the potential eroded sediment and prevent it from leaving the construction area. If Design-Builder's construction operations are complete to the point where seeding or sodding is the major item at hand before final acceptance can be made, and seeding or sodding is out-of-season or disallowed by the Owner, Design-Builder shall construct one of the following erosion control measures:

1. Incorporate the use of erosion control fencing immediately downstream of vulnerable areas that are susceptible to the formation of small streams. Maintain the erosion control devices until seeding or sodding season returns. Upon return of the sodding season, the area shall be re-graded to the lines and grades established in the Contract Drawings and sodded at the direction of the Owner.
2 Terrace the ground with graded berms and incorporate the use of both temporary slope drains (See ESCS Section 10.03.4.3) and erosion control fencing (as specified in this Section). Maintain the erosion control devices until seeding or sodding season returns. Upon return of the seeding or sodding season, the area shall be re-graded to the lines and grades established in the Contract Drawings and seeded/sodded at the direction of the Owner.
3. Fertilize, place seed or sod, and irrigate as directed by APWA-KCMO 2400. Maintain the erosion control devices until seeding or sodding season returns. Upon return of the seeding or sodding season Design-Builder shall re-establish the grade and replace all dead seed or sod at the direction of the Owner.

B. Silt fence shall be installed, inspected and maintained in accordance with APWA ESC–10.

C. Berms shall be constructed in accordance to APWA ESC–29:
1. Berms are required if the silt fence is not installed or properly maintained.
2. Inspection shall be frequent and repair or replacement shall be made promptly as needed.
3. Remove sediment deposits as necessary to provide adequate storage volume for the next rain.
4. Design-Builder shall remove berms when they have served their usefulness.
5. Sediment trapped by this practice shall be uniformly distributed on the source area prior to seeding or sodding.

D. The Rock Check Dam shall be constructed, inspected and maintained in accordance to APWA ESC–15.

E. Inlet Protection. Work covered under this item consists of installing a Gutter Buddy, Dandy Curb® or equal inlet protection system for inlets and median barrier inlets without grates. The purpose is to keep silt, sediment and construction debris out of the storm system:
1. The inlet protection system shall be a sewn fabric unit enclosing a porous structure in the form of a cylindrical tube placed in front of and extending beyond the inlet opening on both sides.
2. Place inlet protection unit on the street with aggregate pouch near the inlet it will be installed to protect.
3. For oil and sediment, place absorbent in the sock tube.
4. Center the unit against curb or median inlet opening so that the curb side of the unit creates a seal with the curb or median barrier and inlet structure. There will be approximately twelve (12) inches of the inlet protection unit overhanging on each side of the opening. If the unit is not installed in this manner, it will not function properly.
5. Design-Builder shall remove all accumulated sediment and debris from in front of the unit and from the street surface in the vicinity of every installed unit after each rain event or as directed by Owner. Dispose of the unit at an appropriate recycling or solid waste facility when the unit is no longer being used.
6. Oil and sediment. Remove and replace absorbent when near saturation.

3.04 MAINTENANCE AND REPAIR

A. Design-Builder is responsible for maintaining all erosion and sediment control measures until acceptance of the Project by Owner.

B. Erosion control measures showing evidence of overtopping, breaks or erosion shall be repaired or replaced with suitable materials.

C. All storm sewer inlets shall be regularly maintained so that sediment will not enter the system.

D. Repair and clean-out all control measures that are not functioning properly.

E. Remove temporary measures that are no longer needed.

F. Seeded or sodded areas requiring maintenance (fertilizer, re-sodding, re-seeding or additional mulch and watering) shall be promptly addressed.

G. Once the site has been fully stabilized against erosion, remove sediment control devices and all accumulated silt. Dispose of silt and waste materials in a proper manner. Regrade all areas disturbed during this process and stabilize against erosion with surfacing materials as indicated on the Drawings.

3.05 WARRANTY

A. Seeding and sodding work shall have taken root and established satisfactory coverage before acceptance by Owner. Design-Builder shall maintain as described in paragraph 3.04 above and shall guarantee seeding and sodding for one (1) year after acceptance. Design-Builder shall scarify, re-seed or re-sod, fertilize and mulch (seeded areas) any barren area greater than one square foot.

3.06 SUPPLEMENTS

A. The following documents are provided as supplement to this Section:

1. SWPPP Version 8.2 Template, October 2022.

END OF SECTION

CITY OF KANSAS CITY, MISSOURI

STORMWATER POLLUTION PREVENTION PLAN

(SWPPP)

For Capital Improvement Projects Disturbing One or More Acres

Missouri State General Operating Permit (Land Disturbance Permit) MO-R100000

(July 2022 – Jun 2027)

(Insert Project Name)

(Insert Project Site Address)

(Insert Owner Department)

(Insert Project Site Telephone Number {if applicable})

Contacts in case of spills:

For **hazardous substances releases**, under the Missouri Spill Bill, responsible parties or spillers are required to report to Missouri Department of Natural Resources 24-hour Environmental Emergency Response Spill Line at **(573) 634-2436**, or the National Response Center at (800)-424-8802.

For **non-hazardous substances releases**, should a spill or an unauthorized discharge cause or permit any contaminants, other than sediment, or hazardous substance to discharge or enter waters of the state, the unauthorized discharge must be reported to the Missouri Department of Natural Resources regional office as soon as practicable but no more than 24 hours after the discovery of the discharge. Call Kansas City Regional Office **(816) 251-0700**, or the Department's Environmental Services Program (573) 526-3315.

CERTIFICATIONS
(To be Completed by ALL PARTIES)

Design Professional's Declaration:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Design Professional: _____

Print Name: _____ Title: _____

Signature: _____ Date: _____

City's Review:

I have reviewed this SWPPP for compliance with the requirements contained in the City's Missouri State Operating Permit for land disturbance activities and have found the plan complete prior to commencement of land disturbance activities.

Owner Department: _____

Print Name: _____ Title: _____

Signature: _____ Date: _____

General Contractor's Certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

General Contractor: _____

Print Name: _____ Title: _____

Signature: _____ Date: _____

Note: Name the person(s) responsible for inspection, operation, and maintenance of BMPs. The SWPPP shall list the names and describe the role of all owners/primary operators (such as general contractor, project manager) responsible for environmental or sediment and erosion control at the land disturbance site.

Subcontractors Certification:

I hereby certify that I understand the requirements stated in this SWPPP, that I am responsible for completing the requirements, which have been listed in the plan as being a part of my scope of work.

Subcontractor/Project Role: _____
Signature: _____ Title: _____
Print Name: _____ Date: _____

Subcontractor/Project Role: _____
Signature: _____ Title: _____
Print Name: _____ Date: _____

Subcontractor/Project Role: _____
Signature: _____ Title: _____
Print Name: _____ Date: _____

Subcontractor/Project Role: _____
Signature: _____ Title: _____
Print Name: _____ Date: _____

Subcontractor/Project Role: _____
Signature: _____ Title: _____
Print Name: _____ Date: _____

Subcontractor/Project Role: _____
Signature: _____ Title: _____
Print Name: _____ Date: _____

Subcontractor/Project Role: _____
Signature: _____ Title: _____
Print Name: _____ Date: _____

Contents

CERTIFICATIONS I
PART I: GENERAL PROJECT INFORMATION 1
PART II: GENERAL REQUIREMENTS 2
PART III: PROJECT PLANNING & DESIGN 3
PART IV: PROJECT INFORMATION 12
PART V: BMP PERFORMANCE REQUIREMENTS 15
PART VI: SITE INSPECTION REPORT 19
Appendix A – SWPPP Update and Modification Log 22
Appendix B – Public Notification Sign 24
Appendix C – General Location Map 26
Appendix D – Site Map(s) 28
Appendix E – Site Inspection Reports 31
Appendix F – City's Construction General Permit & Additional Information 36

PART I: GENERAL PROJECT INFORMATION
(To be completed by Owner Department or Design Professional)

1. Project Site Name: _____

Project Site Address/Location: _____

City: _____ **State:** _____ **Zip Code:** _____ **County:** _____

Section, Township, Range: _____

Project Number: _____

Owner Department: _____

Address: _____

City: _____ **State:** _____ **Zip Code:** _____

Phone: _____ **Fax:** _____

E-mail: _____ **Cell Phone:** _____

2. Record of Important Dates: fill in during construction activities.

Completed SWPPP approval	
Groundbreaking activities begin	
Stabilization measures initiated	
Permanent stabilization achieved	

Describe the Nature of the Land Disturbance Activity:

(a) The function of the project (e.g., low density residential, shopping mall, highway, etc.),
(b) The intended sequence and timing of activities that disturb the soils at the site; and
(c) Estimates of the total area expected to be disturbed by excavation, grading, or other land disturbance support activities including off-site borrow and fill areas.

(*Use additional sheets as necessary*)

(a)	
(b) 1)	7)
2)	8)
3)	9)
4)	10)
5)	11)
6)	12)

Estimated Project Start Date: _____

Estimated Project Completion Date: _____

(c) **Total Site Area (in acres):** _____

Estimated Total Area (in acres) to be disturbed by all activities: _____

PART II: GENERAL REQUIREMENTS (Applicable to All PARTIES)

1. Conditions for SWPPP Update

The SWPPP shall be amended and updated as appropriate during the term of the land disturbance activity. All SWPPP modifications shall be signed and dated. The SWPPP shall be amended to incorporate any significant site condition changes which impact the nature and condition of stormwater discharges. At a minimum, these changes include whenever:

(a) The location, design, operation, or maintenance of BMPs is changed;

(b) Design of the construction project is changed that could significantly affect the quality of the stormwater discharges;

(c) Site inspections indicate deficiencies in the SWPPP or any BMP;

(d) Missouri Department of Natural Resources notifies the permittee in writing of deficiencies in the SWPPP;

(e) The SWPPP is determined to be ineffective in minimizing or controlling erosion and sedimentation (e.g., there is visual evidence of excessive site erosion or sediment deposits in streams, lakes, or downstream waterways, sediment or other wastes off site); and/or

(f) Missouri Department of Natural Resources determines violations of water quality standards may occur or have occurred.

2. Record of SWPPP Update: fill in **Appendix A**

3. Restriction and Limitations

The land disturbance permit does NOT allow placement of fill material into any stream or wetland, alteration of a stream channel, or obstruction of stream flow unless authorized by a CWA Section 404 Permit, or placement of fill in floodplains unless authorized by appropriate federal and/or state floodplain development authorities.

The land disturbance permit does NOT supersede any requirement of the National Environmental Policy Act; the Endangered Species Act; the National Historic Preservation Act; the Comprehensive Environmental Response, Compensation and Liability Act; the Resource Conservation and Recovery Act; or any other relevant acts.

4. Erosion and Sediment Controls

Ensure the **design, installation, and maintenance** of effective erosion and sediment controls to minimize the discharge of pollutants. At a minimum, such controls must be designed, installed, and maintained to:

(a) Control stormwater volume, velocity, and peak flow rates to minimize soil erosion;

(b) Control stormwater discharges, including both peak flow rates and total stormwater volume, to minimize erosion at outlets and to minimize downstream channel and stream bank erosion and scour;

(c) Minimize the amount of exposed soil during construction activity;

(d) Minimize the disturbance of steep slopes;

(e) Minimize sediment discharges from the site. Address factors such as:

1) The amount, frequency, intensity, and duration of precipitation;

2) The nature of resulting stormwater runoff;

3) Expected flow from impervious surfaces, slopes, and drainage features; and

4) Soil characteristics, including the range of soil particle size expected to be present on the site.

(f) Provide and maintain natural buffers around surface waters as detailed in the Permit – Part V. BMP REQUIREMENTS Condition 7, direct stormwater to vegetated areas to increase sediment removal and maximize stormwater infiltration and filtering, unless infeasible; and

(g) Minimize soil compaction and preserve topsoil where practicable.

PART III: PROJECT PLANNING & DESIGN
(To be completed by DESIGN PROFESSIONAL)

1. General Information

Design Professional develops the initial SWPPP, including narrative description and SITE MAP (s) containing all the information as required by the MO-R100000 (effective July 2022).

Designer's Name: _____
Company Name: _____
Address: _____
City: _____ **State:** _____ **Zip Code:** _____
Phone: _____ **Fax:** _____
E-mail: _____ **Cell Phone:** _____

2. Soil Disturbing Activities:

Soil disturbing activities for this project will include the following (Check all that apply):

☐ Clearing and grubbing of existing trees
☐ Stripping of topsoil within the limits of construction
☐ Stockpiling and re-spreading
☐ Utility trench excavation and backfill
☐ Preparing sub grade for streets and sidewalks
☐ Backfilling curbs and sidewalks
☐ Disposal areas for excess excavated material
☐ Borrow areas for fill material
☐ Construction of sediment basins or storm water
☐ Construction of compacted fill areas for residential building
☐ Minimize soil compaction and preserve topsoil
☐ Provide and maintain natural buffers around surface waters
☐ Other: _____

3. Downstream Information:

Name of primary receiving water body: _____

Does this Project require 404 Permit? ☐ Permit Number: _____

☐ Water Quality Certification Number: _____

List and Describe the location of all outfalls:

Outfall Location	Receiving Waterbody	Distance to receiving waterbody
1)		
2)		
3)		
4)		
5)		

4. Determine the 2-year, 24-hour Storm Event

A 2-year, 24-hour storm event can be determined for the project location using the National Oceanic and Atmospheric Administration's National Weather Service Atlas 14 https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html, or can be determine using local rainfall distribution for a 2-year, 24 hours storm event using multi-decade local high density rain gauge data, as approved by Missouri Department of Natural Resources.

Specify the method used to determine the 2-year, 24-hour storm event for the project location:

☐ NOAA Atlas 14

☐ Based on multi-decade local high density rain gauge data, as approved by the Department

Specify the 2-year, 24-hour storm event for the project location: _____ inch

5. Authorized Non-stormwater Discharges

Authorized non-stormwater discharges associated with construction activities: check all occurring on site, and note where these discharges occur.

☐ (a) Discharges from emergency fire-fighting activities;

Where: _____

☐ (b) Hydrant flushing and water line flushing, provided the discharged water is managed to avoid instream water quality impacts;

Where: _____

☐ (c) Landscape watering, including to establish vegetation;

Where: _____

☐ (d) Water used to control dust;

Where: _____

☐ (e) Waters used to rinse vehicles and equipment, provided there is no discharge of soaps, solvents, or detergents used for such purposes;

Where: _____

☐ (f) External building washdown, provided soaps, solvents, and detergents are not used, and external surfaces do not contain hazardous substances (e.g., paint or caulk containing polychlorinated biphenyls (PCBs)

Where: _____

☐ (g) Pavement wash waters, provided spills or leaks of toxic or hazardous substances have not occurred (unless all spill material has been removed) and where soaps, solvents, and detergents are not used. Directing pavement wash waters directly into any Waters of the State, storm drain inlet, or stormwater conveyance (constructed or natural site drainage features), unless the conveyance is connected to an effective control, is prohibited;

Where: _____

☐ (h) Uncontaminated air conditioning or compressor condensate;

Where: _____

☐ (i) Uncontaminated, non-turbid discharges of ground water or spring water;

Where: _____

☐ (j) Foundation or footing drains where flows are not contaminated with process materials;

Where: _____

and

☐ (k) Uncontaminated construction dewatering water discharged in accordance with requirements found in this permit for ecific dewatering activities.

Where: _____

6. Requirements for Best Management Practices (BMPs)

BMPs for land disturbance are a schedule of activities, practices, or procedures that reduces the amount of soil available for transport or a device that reduces the amount of suspended solids in runoff before discharge to waters of the state. BMPs are divided into two main categories: structural or non-structural; and they are also classified as temporary or permanent. Temporary BMPs may be added and removed as necessary with updates to the Stormwater Pollution Prevention Plan (SWPPP).

(1) Site Preservation:

(a) **EXISTING VEGETATION, TREES, AND TOPSOIL SHALL BE PRESERVED WHERE PRACTICABLE.**

(b) The disturbance of steep slopes shall be minimized.

(2) Riparian Buffer or a Structural Equivalent for Surface Waters of the State:

For surface Waters of the State, defined in Section 644.016.1(27) RSMo, located on or adjacent to the site, a riparian buffer or structural equivalent must be maintained in accordance with at least one of the following options.

(a) Provide and maintain a 50-foot undisturbed natural buffer; or

(b) Provide and maintain an undisturbed natural buffer that is less than 50 feet and is supplemented by erosion and sediment controls that achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer; or

(c) If infeasible to provide and maintain an undisturbed natural buffer of any size, implement erosion and sediment controls to achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.

(d) Exempt from compliance with (a), (b), or (c) above if one or more of the following exceptions apply and documentation is provided in the SWPPP:

1) As authorized per CWA Section 404 Department of the Army permit and its associated Section 401 Water Quality Certification from the Department.

2) If there is no discharge of stormwater to waters of the state through the area between the disturbed portions of the site and Waters of the State located within 50 feet of the site. This includes situations where permanent control measures have been implemented that will prevent such discharges, such as a berm or other barrier.

3) Where no natural buffer exists due to preexisting development disturbances that occurred prior to the initiation of planning for the current development of the site.

a. Where some natural buffer exists but portions of the area within 50 feet of the Waters of the State are occupied by preexisting development disturbances the permittee is required to comply with (a), (b), or (c) above.

4) For linear projects where site constraints make it infeasible to implement a buffer or equivalent provided the permittee limit disturbances within 50 feet of any Waters of the State and/or supplemental erosion and sediment controls are provided to treat stormwater discharges from earth disturbances within 50 feet of the Waters of the State. It must also be documented in the SWPPP the rationale for why it is infeasible to implement (a), (b), or

(c) and describe any buffer width retained and supplemental BMPs installed.

(e) Where the permittee is retaining a buffer of any size, the buffer should be measured perpendicularly from any of the following points, whichever is further landward from the water:

1) The ordinary high water mark of the water body, defined as the line on the shore established by fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, and/or the presence of litter and debris; or

2) The edge of the stream or river bank, bluff, or cliff, whichever is applicable.

(3) Perimeter Control:

Sediment controls shall be used along any perimeter areas of the site that are downgradient from any exposed soil or other disturbed areas. Prevent stormwater from circumventing the edge of the perimeter control. For sites where perimeter controls are infeasible, other practices shall be implemented to minimize discharges to perimeter areas of the site.

(4) Stockpile Management:

Manage stockpiles or land clearing debris piles composed, in whole or in part, of sediment and/or soil.

(a) Locate the piles outside of any natural buffers zones, established under the condition above, and away from any stormwater conveyances, drain inlets, and areas where stormwater flow is concentrated;
(b) Install a sediment barrier along all downgradient perimeter areas;
(c) Divert surface flows around stockpiles to reduce and minimize erosion of the stockpile.

(5) Sedimentation Basins:

A sedimentation basin shall be included for each drainage area with ten or more acres disturbed at one time.

(a) The sedimentation basin shall be sized, at a minimum, to treat a local 2-year, 24-hour storm.
(b) Sediment basins shall not be constructed in any Waters of the State or natural buffer zones.
(c) Discharges from dewatering activities shall be managed by appropriate controls. The SWPPP shall include a description of any anticipated dewatering methods and specific BMPs designed to treat dewatering water.
    1) Appropriate controls include, but are not limited to, sediment socks, dewatering tanks, tube settlers, weir tanks, filtration systems (e.g., bag or sand filters), and passive treatment systems that are designed to remove or retain sediment.
    2) Erosion controls and velocity dissipation devices (e.g., check dams, riprap, and vegetated buffers) to minimize erosion at inlets, outlets, and discharge points from shall be utilized.

Where use of a sediment basin is infeasible, the SWPPP shall evaluate and specify other similarly effective BMPs to be employed to control erosion and sediment. These similarly effective BMPs shall be selected from appropriate BMP guidance documents authorized by this permit. The BMPs must provide equivalent water quality protection to achieve compliance with this permit. The SWPPP shall require both temporary and permanent sedimentation basins to have a stabilized spillway to minimize the potential for erosion of the spillway or basin embankment.

(6) Concrete Washout Facilities:

Concrete washout facilities shall be used to contain concrete waste from the activities onsite, unless the washout of trucks and equipment is managed properly at an off-site location. The washout facility shall be managed to prevent solid and/or liquid waste from entering Waters of the State by the following:

(a) Direct the wash water into leak-proof containers or pits designed so that no overflows can occur due to inadequate sizing or precipitation;
(b) Locate washout activities away from Waters of the State, stormwater inlets, and/or stormwater conveyances where practicable. If not practicable, use BMPs to reduce risk of waste leaving the washout facility;
(c) Designate the washout area(s) and conduct such activities only in these areas.
(d) Ensure contractors are aware of the location, such as by marking the area(s) on the map or signage visible to the truck and/or equipment operators.

(7) Sediment Trackout from the Site:

Minimize sediment trackout from the site and sediment transport onto roadways.

(a) Restrict vehicle traffic to designated exit points.
(b) Use appropriate stabilization techniques or BMPs at all points that exit onto paved roads or areas outside of the site.
(c) Use additional controls or BMPs to remove sediment from vehicle and equipment tires prior to exit from facility where necessary.
(d) Stormwater inlets susceptible to receiving sediment or other pollutants from the permitted land disturbance site shall have curb inlet protection. This may include inlets off the active area where track out from vehicles and equipment could impact the stormwater runoff to those inlets.

(8) Selection of BMPs:

Appropriate BMPs shall be selected for use at the site.

(a) Stormwater volume and velocity shall be considered when selecting effective BMPs.
(b) A BMP that has demonstrated ineffectiveness in preventing or minimizing sediment or other pollutants from leaving a given site shall be replaced with a more effective BMP, or additional and sequential BMPs and treatment devices may be incorporated as site conditions allow.
(c) A schedule for performing erosion control measures shall be considered in selecting BMPs.

(d) Stormwater discharges which leave the site from disturbed areas shall pass through an appropriate impediment to sediment movement such as a sedimentation basin, sediment traps (including vegetative buffers), or silt fences prior to leaving the land disturbance site.

(9) Types of BMPs:

Check all the types of BMPs used at the site:

- ***Soil Stabilization and Slope Protection BMPs***

☐ Scheduling ☐ Hydro-seeding ☐ Earth Dikes/Swales & Lined Ditches

☐ Straw Mulch ☐ Hydraulic/Wood Mulch ☐ Outlet Protection/Velocity

☐ Slope Drains ☐ Streambank Stabilization ☐ Preservation of Existing Vegetation

☐ Soil Binders ☐ Geotextiles, ECBs or TRMs ☐ Other (specify): _____

- ***Perimeter Controls & Sediment Barriers***

☐ Silt Fence ☐ Sandbag Barrier ☐ Storm Drain Inlet Protection ☐ Fiber Rolls

☐ Sediment Traps ☐ Check Dam ☐ Sediment/Desilting Basin ☐ Gravel Bag Berm

☐ Street Sweeping and Vacuuming ☐ Direct Stormwater to vegetated areas

☐ Maintain natural buffers around surface waters ☐ Other (specify): _____

- ***Establish Stabilized Construction Exits***

☐ Stone Pads ☐ Entrance/Outlet Tire Wash ☐ Other (specify): _____

- ***Non-Storm Water Management BMPs***

☐ Pile Driving ☐ Concrete Finishing ☐ Demolition/Removal Over Water

☐ Dewatering ☐ Concrete Curing ☐ Illicit/Illegal Discharge

☐ Clean Water ☐ Paving & Grinding ☐ Vehicle & Equipment Cleaning

☐ Dust Control ☐ Water Conservation Practices ☐ Temporary Stream Crossing

☐ Material/Equipment Use Over water ☐ Vehicle & Equipment Fueling & Maintenance

☐ Other (specify): _____

- ***Waste Management & Materials Pollution Control BMPs***

☐ Spill Prevention & Control ☐ Liquid Waste Management ☐ Sanitary/Septic Waste Management

☐ Stockpile Management ☐ Concrete Waste Management (Washout Area) ☐ Hazardous Waste Management

☐ Solid Waste Management ☐ Material Delivery/Storage/Use ☐ Contaminated Waste Management

☐ Other (specify): _____

- ***Permanent Stabilization BMPs***

☐ Retaining Walls ☐ Infiltration Basins ☐ Outlet Protection/Velocity Dissipation

☐ Biofilters ☐ Vegetative Buffers ☐ Earth Dikes, Drainage Swales & Lined Ditches

☐ Porous Pavement ☐ Slope Protection ☐ Detention/Retention Devices

☐ Other (specify): _____

Note: make copies of this page if more BMP instances are to be included

(10) Description of BMPs:

Describe both structural and non-structural BMPs that will be used at the site.

(a) Provide the following general information for each BMP type which will be used one or more times at the site:

BMP Type 1:

Physical description:

Site conditions required:

Installation/construction procedures (including typical drawing):

Operation/maintenance procedures and schedules:

BMP Type 2:

Physical description:

Site conditions required:

Installation/construction procedures (including typical drawing):

Operation/maintenance procedures and schedules:

Note: make copies of this page if more BMP instances are to be included

(b) Provide the following information for each specific instance where a BMP is to be installed:

1) The BMP is temporary or permanent
2) When the BMP will be installed in relation to each phase of the land disturbance procedures to complete the project
3) Site conditions required before removal of the temporary BMP

BMP 1:

The BMP is temporary ☐, or permanent ☐.

Describe when the BMP will be installed in relation to each phase of the land disturbance procedures to complete the project:

Installation/construction procedures (including typical drawing):

Operation/maintenance procedures and schedules:

BMP 2:

The BMP is temporary ☐, or permanent ☐.

Describe when the BMP will be installed in relation to each phase of the land disturbance procedures to complete the project:

Installation/construction procedures (including typical drawing):

Operation/maintenance procedures and schedules:

7. Site Map Requirements:

Create a legible site map or multiple maps if necessary, identifying:

(a) Site boundaries of the property;
(b) Locations of all waters of the state (including wetlands) within the site and half a mile downstream of the site's outfalls;
(c) Location of all outfalls;
(d) Location of stormwater inlets and conveyances including ditches, pipes, man-made conduits, and swales;
(e) Areas of soil disturbance and areas that will not be disturbed (or a statement that all areas of the site will be disturbed unless otherwise noted);
(f) Locations of on-site and off-site material, waste, borrow, concrete washout facility, disposal of the material removed from sediment basins, equipment storage areas and stockpiles;
(g) Designated points where vehicles will exit the site;
(h) Location of structural and non-structural BMPs, including natural buffer areas, identified in the SWPPP;
(i) Direction(s) of stormwater flow (use arrows) and approximate slopes before and after grading activities;
(j) Location and timing of stabilization measures;
(k) Areas where final stabilization has been achieved;
(l) Change of a drainage course; and
(m) The sloped areas for all phases of the project.

Add the maps to Appendices C and D.

8. Resources:

The contractor must select, install, use, operate, and maintain appropriate BMPs for the permitted sites. The following manuals are acceptable resources for the selection of appropriate BMPs, but should not be considered exclusive:

- Kansas City Metro Chapter of the American Public Works Association:
  Design Guidance Documents: Division 5100 Erosion and Sediment Control manual.

  Standard Drawings: Erosion and Sediment Control Details (2/2017)
  http://kcmetro.apwa.net/Content/Chapters/kcmetro.apwa.net/File/Specifications%2FErosion%20and%20Sediment%20Control_Details_APWA%20021517.pdf

- National Menu of Best Management Practices (BMPs) for Stormwater-Construction. United States Environmental Protection Agency USEPA (1/27/2022).
  https://www.epa.gov/npdes/national-menu-best-management-practices-bmps-stormwater-construction

- Developing Your Stormwater Pollution Prevention Plan: A Guide for Construction Sites. United States Environmental Protection Agency (USEPA), EPA 833-R-06-004 (May 2007).
  https://www.epa.gov/sites/production/files/2015-10/documents/sw_swppp_guide.pdf

- Developing a Stormwater Pollution Prevention Plan (SWPPP)
  https://www.epa.gov/npdes/developing-stormwater-pollution-prevention-plan-swppp

- Protecting Water Quality: A field guide to erosion, sediment and stormwater best management practices for development sites in Missouri. Missouri Department of Natural Resources. 1/7/2016
  https://dnr.mo.gov/document-search/protecting-water-quality-field-guide

PART IV: PROJECT INFORMATION
(To be completed by OWNER DEPARTMENT & GENERAL CONTRACTOR)

1. Project Contact Information

City Department: _____
Project Manager's Name: _____
Address: _____
Phone: _____ **Fax:** _____
E-mail: _____ **Cell Phone:** _____

Note: The project manager is responsible for notifying the landowner and each contractor or entity (including utility crews and city employees or their agents) who will perform work at the site, of the existence of the SWPPP, and what actions or precautions shall be taken while on site to minimize the potential for erosion and the potential for damaging any BMP. The project manager and owner department are responsible for any damage a subcontractor may do to established BMPs, and any subsequent water quality violation resulting from the damage.

General Contractor's Name: _____
Company Name: _____
Address: _____
City: _____ **State:** _____ **Zip Code:** _____
Phone: _____ **Fax:** _____
E-mail: _____ **Cell Phone:** _____

Contractor's Environmental Lead
Designated Individual: _____
Address: _____
City: _____ **State:** _____ **Zip Code:** _____
Phone: _____ **Fax:** _____
E-mail: _____ **Cell Phone:** _____

Note: The General Contractor must designate an environmental lead who has primary responsibility for ensuring compliance with the Storm Water Pollution Prevention Plan (SWPPP) during construction. This environmental lead shall have knowledge in erosion, sediment, and stormwater control principles, knowledge of the permit, and the site's SWPPP. The environmental lead shall ensure all personnel and contractors understand any requirements of this permit may be affected by the work they are doing. The environmental lead or designated inspector(s) knowledgeable in erosion, sediment, and stormwater control principles, shall inspect all structures that function to prevent or minimize pollution of Waters of the State.

State Contacts for Spills, Overflows, and Other Unauthorized Discharges:
Should an unauthorized discharge cause or permit any contaminants, other than sediment, or hazardous substance to discharge or enter waters of the state, the unauthorized discharge must be reported to the Missouri Department of Natural Resources regional office, **(816) 251-0700**, as soon as practicable but no more than 24 hours after the discovery of the discharge.
If the spill or overflow needs to be reported after normal business hours or on the weekend, the facility must call the Department's Environmental Emergency Response hotline at **(573) 634-2436**. Leaving a message on a Department staff member voice-mail does not satisfy this reporting requirement.

Note: A record of all spills shall be retained with the SWPPP and made available to the Department upon request.

Subcontractors: Check all items for which subcontractors will be used and provide a list of all the subcontractor's company names:

☐ Gas ☐ Grading ☐ Sanitary sewers ☐ Concrete flatwork ☐ Concrete drainage structures

☐ Water ☐ Blasting ☐ Storm sewers ☐ Sediment controls ☐ Seeding & Mulching

☐ Electric ☐ Paving ☐ Curb & Gutters ☐ Other (specify): _____

List All Additional subcontractors used on the project whose scope of work includes land disturbance activities (keep list updated throughout the project):

Contact Name / Project Role (including inspection, operation, and maintenance of BMPs)	**Phone Number**

Other Utilities and Contractors: List all other utility companies and contractors which will be doing work on the site with their own sub-contractors involving land disturbance:

Contact Name / Project Role	**Phone Number**

2. Sequence of Construction:

The General Contractor must complete the following intended construction sequence and timing for major activities, including any opportunities for phasing, grading and stabilization activities to minimize the overall amount of disturbed soil that will be subject to potential erosion at one time.

	Phase	BMP's & Stabilization Methods
1)		
2)		
3)		
4)		
5)		
6)		
7)		
8)		
9)		
10)		
11)		
12)		
13)		
14)		
15)		
16)		
17)		

PART V: BMP PERFORMANCE REQUIREMENTS (To be Implemented by GENERAL CONTRACTOR)

1. On-site Record Keeping

(1) The SWPPP must be developed and implemented prior to conducting any land disturbance activities and must be specific to the land disturbance activities at the site.

(2) The SWPPP shall be updated any time site conditions warrant adjustments to the project or BMPs. See Part I. General Requirements – 1. SWPPP Update and 2. Record of SWPPP Update.

(3) An electronic copy or a paper copy of the SWPPP, and any required reports, must be accessible to anyone on site at all times when land disturbance operations are in process or other operational activities that may affect the maintenance or integrity of the BMP structures and made available.

(4) A log of each inspection and/or copy of the inspection report shall be kept readily accessible and must be made available upon request by the Missouri Department of Natural Resources. Electronic logs are acceptable, as long as reports can be provided within 24 hours. The inspection report shall be signed by the environmental lead or designated inspector.

(5) A record of all spills shall be retained with the SWPPP.

2. General Requirements

(1) Notification Sign:

A public notification sign shall be posted at the main entrance to the site, or a publicly visible location, with the specific MOR100 permit number. See Appendix B. for the sign. The public notification sign must be visible from the public road that provides access to the site's main entrance. An alternate location is acceptable provided the public can see it and it is noted in the SWPPP. The public notification sign must remain posted at the site until the site is finalized.

(2) Housekeeping Practices:

Good housekeeping practices shall be maintained at all times to keep waste from entering waters of the state.

(a) Provide solid and hazardous waste management practices, including providing trash containers, regular site cleanup for proper disposal of solid waste such as scrap building material, product/material shipping waste, food/ beverage containers, spent structural BMPs;

(b) Provide containers and methods for proper disposal of waste paints, solvents, and cleaning compounds.

(c) Manage sanitary waste. Portable toilets shall be positioned so they are secure and will not be tipped or knocked over and so they are located away from waters of the state and stormwater inlets and stormwater conveyances.

(d) Ensure the storage of construction materials be kept away from drainage courses, stormwater conveyances, storm drain inlets, and low areas.

(3) Fueling Facilities:

All fueling facilities present shall, at all times adhere to applicable federal and state regulations concerning underground storage, above ground storage, and dispensers.

(4) Equipment and Vehicle Washing:

No detergents, additives, or soaps of any kind shall be discharged. Rinse waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge.

(5) Hazardous Wastes:

Any hazardous wastes that are generated onsite shall be managed, stored, and transported according to the provisions of the Missouri Hazardous Waste Laws and Regulations.

(6) Material and Chemical Storage:

(a) Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste, and other materials present on the site to precipitation and to stormwater;

(b) Store all paints, solvents, petroleum products, petroleum waste products, and storage containers (such as drums, cans, or cartons) so they are not exposed to stormwater or provide other prescribed BMPs (such as plastic lids and/or portable spill pans) to prevent the commingling of stormwater with container contents. Commingled water may not be discharged.

(c) Provide spill prevention, control, and countermeasures to contain the spill. Any containment system used to implement this requirement shall be constructed of materials compatible with the substances contained and shall prevent the contamination of groundwater.

(7) Leak and Spill Prevention:

Implement measures intended to prevent the spillage or loss of fluids, oil, grease, fuel, etc. from vehicles and equipment to thereby prevent the contamination of stormwater from these substances. This may include prevention measures such as, but not limited to, utilizing drip pans under vehicles and equipment stored outdoors, covering fueling areas, using dry clean-up methods, use of absorbents, and cleaning pavement surfaces to remove oil and grease.

(8) Spills, Overflows, and Other Unauthorized Discharges:

(a) Any spill, overflow, or other discharge not specifically authorized in the permit are unauthorized.
(b) Spills must be cleaned up as soon as possible to prevent entrainment in stormwater.
(c) Should a spill or an unauthorized discharge cause or permit any contaminants, other than sediment, or hazardous substance to discharge or enter waters of the state, the unauthorized discharge must be reported to the Missouri Department of Natural Resources regional office as soon as practicable but no more than 24 hours after the discovery of the discharge. If the spill or overflow needs to be reported after normal business hours or on the weekend, the facility must call the Department's Environmental Emergency Response hotline at (573) 634-2436. Leaving a message on a Department staff member voice-mail does not satisfy this reporting requirement.
(d) A record of all spills shall be retained with the SWPPP and made available to the Missouri Department of Natural Resources upon request.

3. Structural BMP Installation and Maintenance

All BMPs shall be properly installed and operational at the locations and relative times specified in the SWPPP. Installation of BMPs necessary to prevent soil erosion and sedimentation at the downgradient project boundary (e.g. buffers, perimeter controls, exit point controls, storm drain inlet protection) must be complete prior to the start of all phases of construction. By the time construction activity in any given portion of the site begins, downgradient BMPs must be installed and operational to control discharges from the initial site clearing, grading, excavating, and other earth-disturbing activities. Additional BMPs shall be installed as necessary throughout the life of the project.

All BMPs shall be maintained and remain in effective operating condition during the entire duration of the project, with repairs made within the timeframes specified elsewhere in this permit, until final stabilization has been achieved. BMPs must be protected from activities that would reduce their effectiveness. Any sediment must be removed per the BMP manufacturer's instructions or before it has accumulated to one-half of the above-ground height of any BMP that collects sediment (i.e., silt fences, sediment traps, etc.). The project is considered to achieve final stabilization when Condition 5 listed below is met.

(1) Perimeter Control BMPs:

(a) Perimeter control BMPs for runoff from disturbed areas shall be installed before general site clearing is started. Note this requirement does not apply to earth disturbances related to initial site clearing and establishing entry, exit, or access of the site, which may require that stormwater controls be installed immediately after the earth disturbance.
(b) For phased projects, BMPs shall be properly installed as necessary prior to construction activities.
(c) Install sediment controls along any perimeter areas of the site that are downgradient from any exposed soil or other disturbed areas. Prevent stormwater from circumventing the edge of the perimeter control. For sites where perimeter controls are infeasible, other practices shall be implemented to minimize discharges to perimeter areas of the site.
(d) Stormwater discharges which leave the site from disturbed areas shall pass through an appropriate impediment to sediment movement such as a sedimentation basin, sediment traps (including vegetative buffers), or silt fences prior to leaving the land disturbance site.

(2) Stockpiles or Land Clearing Debris Piles of Sediment or Soil:

(a) Install a sediment barrier along all downgradient perimeter areas;
(b) Divert surface flows around stockpiles to reduce and minimize erosion of the stockpile.
(c) For piles that will be unused for 14 or more days, provide cover with appropriate temporary stabilization.
(d) It is prohibited to rinse, sweep, or otherwise place any soil, sediment, debris, or stockpiled product which has accumulated on pavement or other impervious surfaces into any stormwater conveyance, storm drain inlet, or Water of the State.

(3) Sedimentation Basins:

A sedimentation basin shall be used for each drainage area with ten or more acres disturbed at one time.

(a) Sediment basins shall not be constructed in any Waters of the State or natural buffer zones.

(b) Both temporary and permanent sedimentation basins shall have a stabilized spillway to minimize the potential for erosion of the spillway or basin embankment.

(c) The basin shall be maintained until final stabilization of the disturbed area served by the basin.

(d) Accumulated sediment shall not exceed 50% of total volume or as prescribed in the design, whichever is less.

(e) Dewatering:

1) Discharges from dewatering activities shall be managed by appropriate controls as specified in the SWPPP. Appropriate controls may include, but are not limited to, sediment socks, dewatering tanks, tube settlers, weir tanks, filtration systems (e.g. bag or sand filters), and passive treatment systems that are designed to remove or retain sediment.

2) Erosion controls and velocity dissipation devices (e.g., check dams, riprap, and vegetated buffers) to minimize erosion at inlets, outlets, and discharge points from shall be utilized.

3) Water with an oil sheen, or visible floating solids and foam shall not be discharged.

4) Prevent discharges to the receiving stream causing excessive visual turbidity. Visual turbidity refers to a sediment plume or other cloudiness in the water caused by sediment that can be identified by an observer.

5) Until final stabilization has been achieved, sediment basins and impoundments shall utilize outlet structures or floating skimmers that withdraw water from the surface when discharging. Under frozen conditions, it may be considered infeasible to withdraw water from the surface and an exception can be made for that specific period as long as discharges that may contain sediment and other pollutants are managed by appropriate controls. If determined infeasible due to frozen conditions, documentation must be provided in the SWPPP to support the determination, including the specific conditions or time period when this exception applies.

(4) Sediment Trackout and Sediment Transport:

Minimize sediment trackout from the site and sediment transport onto roadways.

(a) Restrict vehicle traffic to designated exit points.

(b) Use appropriate stabilization techniques or BMPs at all points that exit onto paved roads or areas outside of the site.

(c) Use additional controls or BMPs to remove sediment from vehicle and equipment tires prior to exit from facility where necessary.

(d) Any sediment or debris that is tracked out past the exit pad or is deposited on a roadway after a precipitation event shall be removed by the shorter of either the same business day (for business days only), or by the end of the next business day if track-out occurs on a non-business day, and before predicted rain events. Remove the track-out sediment by sweeping, shoveling, or vacuuming these surfaces, or by using other similarly effective means of sediment removal. Sediment or debris tracked out on pavement or other impervious surfaces shall not be disposed of into any stormwater conveyance, storm drain inlet, or Waters of the State.

(e) Stormwater inlets susceptible to receiving sediment or other pollutants from the permitted land disturbance site shall have curb inlet protection. This may include inlets off the active area where track out from vehicles and equipment could impact the stormwater runoff to those inlets.

(5) Concrete Washout Facilities:

Concrete washout facilities shall be used to contain concrete waste from the activities onsite, unless the washout of trucks and equipment is managed properly at an off-site location. The washout facility shall be managed to prevent solid and/or liquid waste from entering Waters of the State by the following:

(a) Direct the wash water into leak-proof containers or pits designed so that no overflows can occur due to inadequate sizing or precipitation;

(b) Locate washout activities away from Waters of the State, stormwater inlets, and/or stormwater conveyances where practicable. If not practicable, use BMPs to reduce risk of waste leaving the washout facility;

(c) Washout facilities shall be cleaned, or new facilities must be constructed and ready for use, once the washout is 75% full;

(d) Designate the washout area(s) and conduct such activities only in these areas.

(e) Ensure contractors are aware of the location, such as by marking the area(s) on the map or signage visible to the truck and/or equipment operators.

(6) Immediate Stabilization After Soil Disturbing Activities:

Soil disturbing activities on site that have ceased either temporarily or permanently shall initiate stabilization immediately in accordance with the options below.

(a) For soil disturbing activities that have been temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days:
   1) BMPs shall be constructed to establish interim stabilization;
   2) Interim stabilization must be initiated immediately and completed within 14 calendar days.
(b) For soil disturbing activities that have been permanently ceased on any portion of the site:
   1) Final stabilization of disturbed areas shall be implemented;
   2) Final stabilization must be initiated immediately and completed within 14 calendar days.
(c) If the slope of the area is greater than 3:1 (three feet horizontal to one foot vertical), then interim stabilization shall be established within seven calendar days of ceasing operations on that part of the site.
(d) Allowances to the 14-day completion period for temporary and final stabilization may be made due to weather and equipment malfunctions. The use of allowances shall be documented in the SWPPP. Allowances may be determined unnecessary after review by the Department.
(e) The following activities would constitute the immediate initiation of stabilization:
   1) Prepping the soil for vegetative or non-vegetative stabilization as long as seeding, planting, and/or installation of non-vegetative stabilization products takes place as soon as practicable;
   2) Applying mulch or other non-vegetative product to the exposed areas;
   3) Seeding or planting the exposed areas;
   4) Finalizing arrangements to have stabilization product fully installed in compliance with the deadlines for completing stabilization.
(f) Until stabilization is complete, interim sediment control shall consist of well-established and maintained BMPs that are reasonably certain to protect waters of the state from sediment pollution over an extended period of time. This may require adding more BMPs to an area than is normally used during daily operations. The types of BMPs used must be suited to the area disturbed, taking into account the number of acres exposed and the steepness of the slopes.
(g) If vegetative stabilization measures are being implemented, stabilization is considered "installed" when all activities necessary to seed or plant the area are completed. Installed does not mean established.
(h) If non-vegetative stabilization measures are being implemented, stabilization is considered "installed" when all such measures are implemented or applied. Non-vegetative stabilization shall prevent erosion and shall be chosen for site conditions, such as slope and flow of stormwater.
(i) Final stabilization is not considered achieved until vegetation has grown and established to meet the requirements below.

(7) Final Stabilization:

Prior to removal of BMPs, ceasing site inspections, and removing from the quarterly report, final stabilization must be achieved. Final stabilization shall be achieved as soon as possible once land disturbance activities have ceased. Document in the SWPPP the type of stabilization and the date final stabilization is achieved.

(a) The project is considered to have achieved final stabilization when perennial vegetation (excluding volunteer vegetation), pavement, buildings, or structures using permanent materials (e.g., riprap, gravel, etc.) cover all areas that have been disturbed. With respect to areas that have been vegetated, vegetation must be at least **70%** coverage of 100% of the vegetated areas on site. Vegetation must be evenly distributed.
(b) Disturbed areas on agricultural land are considered to have achieved final stabilization when they are restored to their preconstruction agricultural use. If former agricultural land is changing to non-agricultural use, this is no longer considered agricultural land and shall follow condition (a).
(c) If the intended function of a specific area of the site necessitates that it remains disturbed, final stabilization is considered achieved if all of the following are met:
   1) Only the minimum area needed remains disturbed (i.e., dirt access roads, motocross tracks, utility pole pads, areas being used for storage of vehicles, equipment, materials). Other areas must meet the criteria above.
   2) Permanent structural BMPs (e.g., rock checks, berms, grading, etc.) or non-vegetative stabilization measures are implemented and designed to prevent sediment and other pollutants from entering waters of the state.
   3) Inspection requirements in Part IV. SWPPP MANAGEMENT REQUIREMENT, Condition 11 are met and documented in the SWPPP.
   4) Winter weather and frozen conditions do not excuse any of the above final stabilization requirements. If vegetation is required for stabilization the permittee must maintain BMPs throughout winter weather and frozen conditions until thawing and vegetation meets final stabilization criteria above. Document stabilization attempts during frozen conditions in the SWPPP. Consider future freezing when removing vegetation and plan with temporary stabilization techniques before the ground becomes frozen.

PART VI: SITE INSPECTION REPORT
(To be Maintained by GENERAL CONTRACTOR)

Refer to page 4 in Part III. Project Planning & Design, specify the **2-year, 24-hour storm event** for the project location:

_____ inch.

Specify the notification method when stormwater runoff occurs: _____

1. Site Inspector:

Regularly scheduled inspections shall be conducted by a qualified person (an inspector). An inspector can be the environmental lead or a person trained by and directly supervised by the environmental lead. The inspector shall be knowledgeable in erosion, sediment, and stormwater control principles, and shall have knowledge of the permit, and the site's SWPPP.

2. Scope of Inspection:

Refer to **Appendix E** for the site inspection report. Site inspections shall include, at a minimum, the following:

(1) Inspect all structures that function to prevent or minimize pollution of Waters of the State.
(2) For disturbed areas that have not achieved final stabilization, all installed BMPs and other pollution control measures shall be inspected to ensure they are properly installed, appear to be operational, and are working as intended to minimize the discharge of pollutants.
(3) For areas on site that have achieved either temporary or final stabilization, while at the same time active construction continues on other areas, ensure that all stabilization measures are properly installed, appear to be operational, and are working as intended to minimize the discharge of pollutants.
(4) Inspect all material, waste, borrow, and equipment storage and maintenance areas that are covered by this permit. Inspect for conditions that could lead to spills, leaks, or other accumulations of pollutants on the site.
(5) Inspect all areas where stormwater typically flows within the site, including drainage ways designed to divert, convey, and/or treat stormwater.
(6) All stormwater outfalls shall be inspected for evidence of erosion, sediment deposition, or impacts to the receiving stream. If a discharge is occurring during an inspection, the inspector must observe and document the visual quality of the discharge and take note of the characteristics of the stormwater discharge, including turbidity, color; odor; floating, settled, or suspended solids; foam; oil sheen; and other indicators of stormwater pollutants.
(7) When practicable the receiving stream shall also be inspected for a minimum of 50 feet downstream of the outfall.
(8) The perimeter of the site shall be inspected for evidence of BMP failure to ensure concentrated flow does not develop a new outfall.

3. Inspection Frequency:

All BMPs must be inspected in accordance to one of the schedules listed below. The inspection frequency shall be documented in the table below, and any changes to the frequency of inspections, including switching between the options listed below, must be documented on the inspection report:

(1) **7-day option:** at least once every seven (7) calendar days and within 48 hours after any storm event equal to or greater than a 2-year, 24-hour storm has ceased during a normal workday or within 72 hours if the rain event ceases during a non-work day such as a weekend or holiday; or
(2) **14-day option:** once every 14 calendar days and within 24 hours of the occurrence of a storm event of 0.25 inches of precipitation or greater, or the occurrence of runoff from snowmelt. To determine if a storm event of 0.25 inches or greater has occurred on the site, the permittee shall either keep a properly maintained rain gauge on site, or obtain the storm event information from a weather station near the site location.
   (a) Inspections are only required during the project's normal working hours.
   (b) An inspection must be conducted within 24 hours of a storm event which has produced 0.25 inches. The inspection shall be conducted within 24 hours of the event end, or within 72 hours if the rain event ceases during a non-work day such as a weekend or holiday.
   (c) If it is elected to inspect every 14 calendar days and there is a storm event at the site that continues for multiple days, and each day of the storm produces 0.25 inches or more of rain, the permittee shall conduct an inspection

within 24 hours of the end of the storm or within 72 hours if the rain event ceases during a non-work day such as a weekend or holiday.

Specify the inspection frequency based on the above (1) 7-Day option, or (2) 14-day option. Any changes to the frequency of inspections, including switching between the options, must be documented both here and on the inspection report:

Option	Date Implemented

(3) Areas on site that have achieved stabilization, while at the same time active construction continues on other areas, may reduce inspection frequency to monthly, for those stabilized areas, if the following conditions exist:
   (a) For areas where disturbed portions have undergone temporary stabilization, inspections shall occur at least once a month while stabilized and when re-disturbed shall follow either frequency outlined in (1) or (2) above.
   (b) Areas on site that have achieved final stabilization must be inspected at least once per month until the permit is terminated.

(4) If construction activities are suspended due to frozen conditions, the permittee may temporarily reduce site inspections to monthly until thawing conditions begin to occur if all of the following are met:
   (a) Land disturbances have been suspended; and
   (b) All disturbed areas of the site have been stabilized per BMP requirements.
   (c) The change shall be noted in the table above.

(5) Any basin dewatering shall be inspected daily when discharge is occurring. The discharge shall be observed, and dewatering activities shall be ceased immediately if the receiving stream is being impacted. These inspections shall be noted on a log or on the inspection report.

4. Site Inspection Reports:

A log of each inspection and/or copy of the inspection report shall be kept readily accessible and must be made available upon request by the Department. Electronic logs are acceptable as long as reports can be provided within 24 hours. If inspection reports are kept off site, the SWPPP must indicate where they are stored. The inspection report shall be signed by the environmental lead or designated inspector (electronically or otherwise).

(1) The inspection report is to include the following minimum information:
   (a) Inspector's name and title.
   (b) Date and time of inspection.
   (c) Observations relative to the effectiveness of the BMPs and stabilization measures. The following must be documented:
      1) Whether BMPs are installed, operational, and working as intended;
      2) Whether any new or modified stormwater controls are needed;
      3) Facilities examined for conditions that could lead to spill or leak;

4) Outfalls examined for visual signs of erosion or sedimentation at outfalls. Excessive erosion or sedimentation may be due to BMP failure or insufficiency. Response to observations should be addressed in the inspection report.

(d) Corrective actions taken or necessary to correct the observed problem.

(e) Listing of areas where land disturbance operations have permanently or temporarily stopped.

5. Inspection Follow-up

Any structural or maintenance deficiencies for BMPs or stabilization measures shall be documented and corrected as soon as possible, but no more than seven (7) calendar days after the inspection.

(1) Corrective action documentation shall be stored with the associated site inspection report.

(2) Immediately take all reasonable steps to address the condition, including cleaning up any contaminated surfaces so the material will not discharge in subsequent storm events.

(3) If weather conditions or other issues prevent correction of BMPs within seven calendar days, the reasons for the delay must be documented (this may include pictures) and there must be a narrative explaining why the work cannot be accomplished within the seven-day time period. The problem shall be corrected as soon as weather conditions or issues allow.

(4) Corrective actions may be required by the Missouri Department of Natural Resources. The site operator must comply with any corrective actions required by the Department as a result of permit violations found during an inspection.

Appendix A – SWPPP Update and Modification Log

SWPPP UPDATE & MODIFICATION LOG
(To be completed, when necessary, during design modification or construction)

Create a log here of the changes and updates to the SWPPP. You should include additions of new BMPs, significant changes in the activities or their timing on the project, changes in personnel, changes in inspection and maintenance procedures, and updates to the SITE MAP, etc.

Summary of Content Updates	Date

Appendix B – Public Notification Sign

MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

STORMWATER DISCHARGES FROM THIS LAND DISTURBANCE SITE ARE AUTHORIZED BY THE MISSOURI STATE OPERATING PERMIT NUMBER:

ANYONE WITH QUESTIONS OR CONCERNS ABOUT STORMWATER DISCHARGES FROM THIS SITE, PLEASE CONTACT THE MISSOURI DEPARTMENT OF NATURAL RESOURCES AT

1-800-361-4827

Appendix C – General Location Map

Attach the General Location Map

Appendix D – Site Map(s)

SITE MAP REQUIREMENTS:

The first should show the undeveloped site and its current features. An additional map or maps should be created to show the developed site. These maps should include the following:

- ☐ Site boundaries of the property;
- ☐ Locations of all Waters of the State (including wetlands) within the site and half a mile downstream of the site's outfalls;
- ☐ Location of all outfalls;
- ☐ Location of stormwater inlets and conveyances including ditches, pipes, man-made conduits, and swales;
- ☐ Areas of soil disturbance and areas that will not be disturbed (or a statement that all areas of the site will be disturbed unless otherwise noted);
- ☐ Locations of on-site and off-site material, waste, borrow, concrete washout facility, disposal of the material removed from sediment basins, equipment storage areas and stockpiles;
- ☐ Designated points where vehicles will exit the site;
- ☐ Location of structural and non-structural BMPs, including natural buffer areas, identified in the SWPPP;
- ☐ Direction(s) of stormwater flow (use arrows) and approximate slopes before and after grading activities;
- ☐ Location and timing of stabilization measures;
- ☐ Areas where final stabilization has been achieved;
- ☐ Change of a drainage course; and
- ☐ The sloped areas for all phases of the project.

Attach SITE MAPs.

Appendix E – Site Inspection Reports

Instructions

Using the Inspection Report

This inspection report is designed to be customized according to the BMP's and conditions at your site. For ease of use, you should take a copy of your site plan and number all of the stormwater BMPs and areas of your site that will be inspected. A brief description of the BMP or area should then be listed in the site-specific section of the inspection report. For example, specific structural BMPs such as construction site entrances, sediment ponds, or specific areas with silt fence (e.g., silt fence along Main Street; silt fence along slope in NW corner, etc.) should be numbered and listed. You should also number specific non-structural BMPs or areas that will be inspected (such as trash areas, material storage areas, temporary sanitary waste areas, etc.).

You can complete the items in the "General Information" section that will remain constant, such as the project name, NPDES tracking number, and inspector (if you only use one inspector). Print out multiple copies of this customized inspection report to use during your inspections.

When conducting the inspection, walk the site by following your SITE MAP and numbered BMPs/areas for inspection.

Also note whether the overall site issues have been addressed (customize this list according to the conditions at your site). Note any required corrective actions, the date, and responsible person for the correction in the Corrective Action Log.

Stormwater Construction Site Inspection Report

General Information			
Project Name:			
NPDES Tracking No.:		**Location:**	
Date of Inspection:		**Start/End Time:**	
Inspector's Name(s):			
Inspector's Title(s):			
Inspector's Contact:			
Inspector's Qualifications:			
Describe present phase of construction:			
Type of Inspection: ☐ Regular - ☐ 7-day, ☐ 14-day ☐ Pre-storm Event ☐ During Storm Event ☐ Post-storm Event			
Weather Information			
Has there been a storm event since the last inspections? ☐ **Yes** ☐ **No**			
If yes, provide: Storm Start Date & Time Storm Duration (hrs) Approximate Amount of Precipitation (in.)			
Weather at time of this Inspection? ☐ Clear ☐ Cloudy ☐ Rain ☐ Sleet ☐ Fog ☐ Snowing ☐ High Winds ☐ Other: Temperature:			
Have any discharges occurred since the last inspection?	☐ Yes ☐ No		
If yes, describe:			
Are there any discharges at the time of inspection?	☐ Yes ☐ No		
If yes, describe the visual quality of the discharge including turbidity; color; odor; floating, settled, or suspended solids; foam; oil sheen; and other indictors of stormwater pollutants:			

Site-specific BMPs

- Number the structural and non-structural BMPs identified in your SWPPP on your SITE MAP and list them below (add as many BMPs as necessary). Carry a copy of the numbered SITE MAP with you during your inspections. This list will ensure that you are inspecting all required BMPs at your site.
- Describe corrective actions initiated, date completed, and note the person that completed the work in the Corrective Action Log.

	BMP	BMP Installed Properly?	BMP Maintenance Required?	Corrective Action Needed and Notes
1		☐ Yes ☐ No	☐ Yes ☐ No	
2		☐ Yes ☐ No	☐ Yes ☐ No	
3		☐ Yes ☐ No	☐ Yes ☐ No	
4		☐ Yes ☐ No	☐ Yes ☐ No	
5		☐ Yes ☐ No	☐ Yes ☐ No	
6		☐ Yes ☐ No	☐ Yes ☐ No	
7		☐ Yes ☐ No	☐ Yes ☐ No	

8		☐ Yes ☐ No	☐ Yes ☐ No	
9		☐ Yes ☐ No	☐ Yes ☐ No	
10		☐ Yes ☐ No	☐ Yes ☐ No	
11		☐ Yes ☐ No	☐ Yes ☐ No	
12		☐ Yes ☐ No	☐ Yes ☐ No	
13		☐ Yes ☐ No	☐ Yes ☐ No	
14		☐ Yes ☐ No	☐ Yes ☐ No	
15		☐ Yes ☐ No	☐ Yes ☐ No	
16		☐ Yes ☐ No	☐ Yes ☐ No	
17		☐ Yes ☐ No	☐ Yes ☐ No	
18		☐ Yes ☐ No	☐ Yes ☐ No	
19		☐ Yes ☐ No	☐ Yes ☐ No	
20		☐ Yes ☐ No	☐ Yes ☐ No	

Overall Site Issues

Below are some general site issues that should be assessed during inspections. Customize this list as needed for conditions at your site.

	BMP/activity	Implemented?	Maintenance Required?	Corrective Action Needed and Timeline Requirements
1	Are all slopes and disturbed areas not actively being worked properly stabilized?	☐ Yes ☐ No	☐ Yes ☐ No	
2	Are natural resource areas (e.g., streams, wetlands, mature trees, etc.) protected with barriers or similar BMPs?	☐ Yes ☐ No	☐ Yes ☐ No	
3	Are perimeter controls and sediment barriers adequately installed (keyed into substrate) and maintained?	☐ Yes ☐ No	☐ Yes ☐ No	
4	Are discharge points free of sediment deposition, erosion, or impacts on the receiving stream?	☐ Yes ☐ No	☐ Yes ☐ No	
5	If practicable, is the receiving stream (including 50 ft or more downstream) free from the impact of the discharge points?	☐ Yes ☐ No	☐ Yes ☐ No	
5	Are storm drain inlets properly protected?	☐ Yes ☐ No	☐ Yes ☐ No	
6	Is the construction exit equipped to prevent sediment from being tracked out?	☐ Yes ☐ No	☐ Yes ☐ No	

7	Is trash, litter or other type of waste on site properly handled?	☐ Yes ☐ No	☐ Yes ☐ No	
8	Are washout facilities (e.g., paint, stucco, concrete) available, clearly marked, and maintained?	☐ Yes ☐ No	☐ Yes ☐ No	
9	Are vehicle and equipment fueling, cleaning, storage and maintenance areas free of spills, leaks, or any other deleterious material?	☐ Yes ☐ No	☐ Yes ☐ No	
10	Are materials that are potential stormwater contaminants stored inside or under cover?	☐ Yes ☐ No	☐ Yes ☐ No	
11	Are non-stormwater discharges (e.g., wash water, dewatering) properly controlled?	☐ Yes ☐ No	☐ Yes ☐ No	
12	(Other)	☐ Yes ☐ No	☐ Yes ☐ No	

Non-Compliance

CERTIFICATION STATEMENT

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Print name and title: _____

Signature: _____ Date: _____

Appendix F – City's Construction General Permit & Additional Information

STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

MISSOURI STATE OPERATING PERMIT

In compliance with the Missouri Clean Water Law, (Chapter 644 R.S. Mo. as amended, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92nd Congress) as amended,

Permit No. MO-R100000

Owner:
Address:

Continuing Authority:
Address:

Facility Name:
Facility Address:

Legal Description:
UTM Coordinates:

Receiving Stream:
First Classified Stream and ID:
USGS Basin & Sub-watershed No.:

is authorized to discharge from the facility described herein, in accordance with the effluent limitations, inspection, reporting, and monitoring requirements as set forth herein:

FACILITY DESCRIPTION

All Outfalls
Construction or land disturbance activity (e.g., clearing, grubbing, excavating, grading, filling, and other activities that result in the destruction of the root zone and/or land disturbance activity that is reasonably certain to cause pollution to waters of the state).

This permit authorizes stormwater and certain non-stormwater discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; it does not apply to other regulated areas. This permit may be appealed in accordance with Section 644.051.6 of the Law.

July 5, 2022
Effective Date

June 30, 2027
Expiration Date

Chris Wieberg
Chris Wieberg, Director, Water Protection Program

I. APPLICABILITY

A. Permit Coverage and Authorized Discharges

1. This Missouri State Operating Permit (permit) authorizes the discharge of stormwater and certain non-stormwater discharges from land disturbance sites that disturb one or more acres, or disturb less than one acre when part of a larger common plan of development or sale that will disturb a cumulative total of one or more acres over the life of the project.

   A Missouri State Operating Permit must be issued before any site vegetation is removed or the site disturbed. Any site owner/operator subject to these requirements for stormwater discharges and who disturbs land prior to permit issuance from the Missouri Department of Natural Resources (Department) is in violation of both State regulations per 10 CSR 20-6.200(1)(A) and Federal regulations per 40 CFR 122.26. The owner/operator of this permit is responsible for compliance with this permit [10 CSR 20-6.200 (3)(B)].

2. This general permit is issued to a city, county, state or federal agency, other governmental jurisdiction, or other private area-wide projects as determined by the Department on a case-by-case basis, for land disturbance projects performed by or under contract to the permittee.

3. This permit authorizes stormwater discharges from land disturbance support activities (e.g., equipment staging yards, material storage areas, excavated material disposal areas, borrow areas, concrete, or asphalt batch plants) provided appropriate stormwater controls are designed, installed, and maintained and the following conditions are met and addressed in the Stormwater Pollution Prevention Plan (SWPPP). The permittee is responsible for compliance with this permit for any stormwater discharges from construction support activity.
   (a) The support activity is directly related to the construction site required to have permit coverage for stormwater discharges;
   (b) The support activity is not a commercial operation or serve multiple unrelated construction sites;
   (c) The support activity does not continue to operate beyond the completion of the construction activity at the project it supports;
   (d) Sediment and erosion controls are implemented in accordance with the conditions of this permit; and
   (e) The support activity is strictly stormwater discharges or non-stormwater discharges listed in PART I, APPLICABILTY, Condition A.4. Support activities which discharge process water shall apply for separate coverage (e.g.,a concrete batch plant discharging process water shall be covered under a MOG49).

4. This permit authorizes non-stormwater discharges associated with your construction activity from the following activities provided that these discharges are treated by appropriate Best Management Practices (BMPs) where applicable and addressed in the permittee's site specific SWPPP required by this general permit:
   (a) Discharges from emergency fire-fighting activities;
   (b) Hydrant flushing and water line flushing, provided the discharged water is managed to avoid instream water quality impacts;
   (c) Landscape watering, including to establish vegetation;
   (d) Water used to control dust;
   (e) Waters used to rinse vehicles and equipment, provided there is no discharge of soaps, solvents, or detergents used for such purposes;
   (f) External building washdown, provided soaps, solvents, and detergents are not used, and external surfaces do not contain hazardous substances (e.g., paint or caulk containing polychlorinated biphenyls (PCBs))
   (g) Pavement wash waters, provided spills or leaks of toxic or hazardous substances have not occurred (unless all spill material has been removed) and where soaps, solvents, and detergents are not used. Directing pavement wash waters directly into any water of the state, storm drain inlet, or stormwater conveyance (constructed or natural site drainage features), unless the conveyance is connected to an effective control, is prohibited;
   (h) Uncontaminated air conditioning or compressor condensate;
   (i) Uncontaminated, non-turbid discharges of ground water or spring water;
   (j) Foundation or footing drains where flows are not contaminated with process materials; and
   (k) Uncontaminated construction dewatering water discharged in accordance with requirements found in this permit for specific dewatering activities.

B. Permit Restrictions and Limitations

1. This permit does not authorize the discharge of process wastewaters, treated or otherwise.

2. For sites operating within the watershed of any Outstanding National Resource Water (which includes the Ozark National Riverways and the National Wild and Scenic Rivers System), sites that discharge to an Outstanding State Resource Water, or facilities located within the watershed of an impaired water as designated in the Clean Water Act (CWA) Section 303(d) list with an impairment for sedimentation/siltation:
   (a) This permit authorizes stormwater discharge provided no degradation of water quality occurs due to discharges from the permitted facility per 10 CSR 20-7.031(3)(C).
   (b) A site with a discharge found to be causing degradation or contributing to an impairment by discharging a pollutant of concern, during an inspection or through complaint investigations, may be required to become a no discharge facility or obtain a site-specific permit with more stringent monitoring and SWPPP requirements.

3. This permit does not allow placement of fill material into any stream or wetland, alteration of a stream channel, or obstruction of stream flow unless the appropriate CWA Section 404 permitting authority provides approval for such actions or determines such actions are exempt from Section 404 jurisdiction. Additionally, this permit does not authorize placement of fill in floodplains unless approved or determined exempt by appropriate federal and/or state floodplain development authorities.

4. This operating permit does not affect, remove, or replace any requirement of the National Environmental Policy Act; the Endangered Species Act; the National Historic Preservation Act; the Comprehensive Environmental Response, Compensation and Liability Act; the Resource Conservation and Recovery Act; or any other relevant acts. Determination of applicability to the above mentioned acts is the responsibility of the permittee. Additionally, this permit does not establish terms and conditions for runoff resulting from silvicultural activities listed in Section 402(l)(3)(a) of the Clean Water Act.

5. Compliance with all requirements in this permit does not supersede any requirement for obtaining project approval from an established local authority nor remove liability for compliance with county and other local ordinances.

6. The Department may require any facility or site authorized by a general permit to apply for a site-specific permit [10 CSR 20-6.010(13)(C)].

7. If a facility or site covered under a current general permit desires to apply for a site-specific permit, the facility or site may do so by contacting the Department for application requirements and procedures.

8. Any discharges not expressly authorized in this permit and not clearly disclosed in the permit application cannot become authorized or shielded from liability under CWA section 402(k) or Section 644.051.16, RSMo, by disclosure to EPA, state, or local authorities after issuance of this permit via any means, including any other permit applications, funding applications, the SWPPP, discharge monitoring reporting, or during an inspection. Discharges at the facility not expressly authorized by this permit must be covered by another permit, be exempt from permitting, or be authorized through some other method.

II. EXEMPTIONS FROM PERMIT REQUIREMENTS

1. Sites that discharge all stormwater runoff directly to a combined sewer system (as defined in 40 CFR 122.26 and 40 CFR 35.2005) connecting to a publicly owned treatment works which has consented to receive such a discharge are exempt from Department stormwater permit requirements.

2. Land disturbance activities that disturb less than one (1) acre of total land area which are not part of a common plan or sale where water quality standards are not exceeded are exempt from Department stormwater permit requirements.

3. Oil and gas related activities as listed in 40 CFR 122.26(a)(2)(ii) where water quality standards are not exceeded are exempt from Department stormwater permit requirements.

4. Linear, strip, or ribbon construction or maintenance operations meeting one (1) of the following criteria are exempt from Department stormwater permit requirements:
   (a) Grading of existing dirt or gravel roads which does not increase the runoff coefficient and the addition of an impermeable surface over an existing dirt or gravel road;
   (b) Cleaning or routine maintenance of roadside ditches, sewers, waterlines, pipelines, utility lines, or similar facilities;
   (c) Trenches two (2) feet in width or less; or
   (d) Emergency repair or replacement of existing facilities as long as BMPs are employed during the emergency repair.

III. REQUIREMENTS

1. The permittee shall post a public notification sign at the main entrance to the site, or a publically visible location, with the specific MOR100 permit number. The public notification sign must be visible from the public road that provides access to the site's main entrance. An alternate location is acceptable provided the public can see it and it is noted in the SWPPP. The public notification sign must remain posted at the site until the site is finalized.

2. The permittee shall be responsible for notifying the land owner and each contractor or entity (including utility crews and city employees or their agents) who will perform work at the site of the existence of the SWPPP and what actions or precautions shall be taken while on site to minimize the potential for erosion and the potential for damaging any BMP. The permittee is responsible for any damage a subcontractor may do to established BMPs and any subsequent water quality violation resulting from the damage.

3. Ensure the design, installation, and maintenance of effective erosion and sediment controls to minimize the discharge of pollutants. At a minimum, such controls must be designed, installed, and maintained to:
   (a) Control stormwater volume, velocity, and peak flow rates to minimize soil erosion;
   (b) Control stormwater discharges, including both peak flow rates and total stormwater volume, to minimize erosion at outlets and to minimize downstream channel and stream bank erosion and scour;
   (c) Minimize the amount of exposed soil during construction activity;
   (d) Minimize the disturbance of steep slopes;
   (e) Minimize sediment discharges from the site. Address factors such as:
      1) The amount, frequency, intensity, and duration of precipitation;
      2) The nature of resulting stormwater runoff;
      3) Expected flow from impervious surfaces, slopes, and drainage features; and
      4) Soil characteristics, including the range of soil particle size expected to be present on the site.
   (f) Provide and maintain natural buffers around surface waters as detailed in Part V. BMP REQUIREMENTS Condition 7, direct stormwater to vegetated areas to increase sediment removal and maximize stormwater infiltration and filtering, unless infeasible; and
   (g) Minimize soil compaction and preserve topsoil where practicable.

   A 2-year, 24-hour storm event can be determined for the project location using the National Oceanic and Atmospheric Administration's National Weather Service Atlas 14 which can be located at https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html, or the permittee can determine local rainfall distribution for a 2-year, 24 hours storm event using multi-decade local high density rain gauge data, as approved by the Department.

4. BMPs for land disturbance [10 CSR 20-6.200(1)(D)2] are a schedule of activities, practices, or procedures that reduces the amount of soil available for transport or a device that reduces the amount of suspended solids in runoff before discharge to waters of the state. The term BMPs are also used to describe the sediment and erosion controls and other activities used to prevent stormwater pollution. BMPs are divided into two main categories: structural or non-structural; and they are also classified as temporary or permanent.
   Temporary BMPs may be added and removed as necessary with updates to the SWPPP as specified in the requirements below.

5. Installation of BMPs necessary to prevent soil erosion and sedimentation at the downgradient project boundary (e.g. buffers, perimeter controls, exit point controls, storm drain inlet protection) must be complete prior to the start of all phases of construction. By the time construction activity in any given portion of the site begins, downgradient BMPs must be installed and operational to control discharges from the initial site clearing, grading, excavating, and other earth-disturbing activities. Additional BMPs shall be installed as necessary throughout the life of the project.

6. All BMPs shall be maintained and remain in effective operating condition during the entire duration of the project, with repairs made within the timeframes specified elsewhere in this permit, until final stabilization has been achieved.
   (a) Ensure BMPs are protected from activities that would reduce their effectiveness.
   (b) Remove any sediment per the BMP manufacturer's instructions or before it has accumulated to one-half of the above-ground height of any BMP that collects sediment (i.e., silt fences, sediment traps, etc.)
   (c) The project is considered to achieve final stabilization when Part V. BMP REQUIREMENTS, Condition 13 is met.

7. Minimize sediment trackout from the site and sediment transport onto roadways.
   (a) Restrict vehicle traffic to designated exit points.
   (b) Use appropriate stabilization techniques or BMPs at all points that exit onto paved roads or areas outside of the site.
   (c) Use additional controls or BMPs to remove sediment from vehicle and equipment tires prior to exit from facility where necessary.
   (d) Any sediment or debris that is tracked out past the exit pad or is deposited on a roadway after a precipitation event shall be removed by the shorter of either the same business day (for business days only), or by the end of the next business day if track-out occurs on a non-business day, and before predicted rain events. Remove the track-out sediment by sweeping, shoveling, or vacuuming these surfaces, or by using other similarly effective means of sediment removal. Sediment or debris tracked out on pavement or other impervious surfaces shall not be disposed of into any stormwater conveyance, storm drain inlet, or water of the state.
   (e) Stormwater inlets susceptible to receiving sediment or other pollutants from the permitted land disturbance site shall have curb inlet protection. This may include inlets off the active area where track out from vehicles and equipment could impact the stormwater runoff to those inlets.

8. Concrete washout facilities shall be used to contain concrete waste from the activities onsite, unless the washout of trucks and equipment is managed properly at an off-site location.
   The washout facility shall be managed to prevent solid and/or liquid waste from entering waters of the state by the following:
   (a) Direct the wash water into leak-proof containers or pits designed so that no overflows can occur due to inadequate sizing or precipitation;
   (b) Locate washout activities away from waters of the state, stormwater inlets, and/or stormwater conveyances where practicable. If not practicable, use BMPs to reduce risk of waste leaving the washout facility;
   (c) Washout facilities shall be cleaned, or new facilities must be constructed and ready for use, once the washout is 75% full;
   (d) Designate the washout area(s) and conduct such activities only in these areas.
   (e) Ensure contractors are aware of the location, such as by marking the area(s) on the map or signage visible to the truck and/or equipment operators.

9. Good housekeeping practices shall be maintained at all times to keep waste from entering waters of the state.
   (a) Provide solid and hazardous waste management practices, including providing trash containers, regular site cleanup for proper disposal of solid waste such as scrap building material, product/material shipping waste, food/beverage containers, spent structural BMPs;
   (b) Provide containers and methods for proper disposal of waste paints, solvents, and cleaning compounds.
   (c) Manage sanitary waste. Portable toilets shall be positioned so that they are secure and will not be tipped or knocked over and so that they are located away from waters of the state and stormwater inlets and stormwater conveyances.
   (d) Ensure the storage of construction materials be kept away from drainage courses, stormwater conveyances, storm drain inlets, and low areas.

10. All fueling facilities present shall at all times adhere to applicable federal and state regulations concerning underground storage, above ground storage, and dispensers.

11. Any hazardous wastes that are generated onsite shall be managed, stored, and transported according to the provisions of the Missouri Hazardous Waste Laws and Regulations.

12. Store all paints, solvents, petroleum products, petroleum waste products, and storage containers (such as drums, cans, or cartons) so they are not exposed to stormwater or provide other prescribed BMPs (such as plastic lids and/or portable spill pans) to prevent the commingling of stormwater with container contents. Commingled water may not be discharged under this permit. Provide spill prevention, control, and countermeasures to contain the spill. Any containment system used to implement this requirement shall be constructed of materials compatible with the substances contained and shall prevent the contamination of groundwater.

13. Implement measures intended to prevent the spillage or loss of fluids, oil, grease, fuel, etc. from vehicles and equipment to thereby prevent the contamination of stormwater from these substances. This may include prevention measures such as, but not limited to, utilizing drip pans under vehicles and equipment stored outdoors, covering fueling areas, using dry clean-up methods, use of absorbents, and cleaning pavement surfaces to remove oil and grease.

14. Spills, Overflows, and Other Unauthorized Discharges.
    (a) Any spill, overflow, or other discharge not specifically authorized in the permit above are unauthorized.
    (b) Should an unauthorized discharge cause or permit any contaminants, other than sediment, or hazardous substance to discharge or enter waters of the state, the unauthorized discharge must be reported to the regional office as soon as practicable but no more than 24 hours after the discovery of the discharge. If the spill or overflow needs to be reported after normal business hours or on the weekend, the facility must call the Department's Environmental Emergency Response hotline at (573) 634-2436. Leaving a message on a Department staff member voice-mail does not satisfy this reporting requirement.
    (c) A record of all spills shall be retained with the SWPPP and made available to the Department upon request.
    (d) Other spills not reaching waters of the state must be cleaned up as soon as possible to prevent entrainment in stormwater but are not required to be reported to the Department.

15. The full implementation of this operating permit shall constitute compliance with all applicable federal and state statutes and regulations in accordance with RSMo 644.051.16 and the CWA §402(k); however, this permit may be reopened and modified or alternatively revoked and reissued to comply with any applicable effluent standard or limitation issued or approved under Clean Water Act §§ 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) if the effluent standard or limitation so issued or approved contains different conditions or is otherwise more stringent than any effluent limitation in the permit or controls any pollutant not limited in the permit. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, termination, notice of planned changes, or anticipated non-compliance does not stay any permit condition.

IV. STORMWATER POLLUTION PREVENTION PLAN (SWPPP) MANAGEMENT REQUIREMENTS

1. The primary requirement of this permit is the development and implementation of a SWPPP which incorporates site specific practices to best minimize the soil exposure, soil erosion, and the discharge of pollutants, including solids for each site covered under this permit.

   The purpose of the SWPPP is to ensure the design, implementation, management, and maintenance of BMPs in order to prevent sediment and other pollutants in stormwater discharges associated with the land disturbance activities [40 CFR 122.44 (k)(4)] from entering waters of the state above established general and narrative criteria; compliance with Missouri Water Quality Standards; and compliance with the terms and conditions of this general permit.

   (a) **The SWPPP must be developed and implemented prior to conducting any land disturbance activities and must be specific to the land disturbance activities at the site.**
   (b) The permittee shall fully implement the provisions of the SWPPP required under this permit as a condition of this general permit throughout the term of the land disturbance project. Failure to develop, implement, and maintain a SWPPP may lead to immediate enforcement action.

(c) The SWPPP shall be updated any time site conditions warrant adjustments to the project or BMPs.
(d) Either an electronic copy or a paper copy of the SWPPP, and any required reports, must be accessible to anyone on site at all times when land disturbance operations are in process or other operational activities that may affect the maintenance or integrity of the BMP structures and made available as specified under Part VIII. STANDARD PERMIT CONDITIONS, Condition 1 of this permit. The SWPPP shall be readily available upon request and should not be sent to the Department unless specifically requested

2. Failure to implement and maintain the BMPs chosen, which can be revised and updated, is a permit violation. The chosen BMPs will be the most reasonable and cost effective while also ensuring the highest quality water discharged attainable for the facility. Facilities with established SWPPPs and BMPs shall evaluate BMPs on a regular basis and change the BMPs as needed if there are BMP deficiencies.

3. The SWPPP must:
   (a) List and describe the location of all outfalls;
   (b) List any allowable non-stormwater discharges occurring on site and where these discharges occur;
   (c) Incorporate required practices identified below;
   (d) Incorporate sediment and erosion control practices specific to site conditions;
   (e) Discuss whether or not a 404 Permit is required for the project; and
   (f) Name the person(s) responsible for inspection, operation, and maintenance of BMPs. The SWPPP shall list the names and describe the role of all owners/primary operators (such as general contractor, project manager) responsible for environmental or sediment and erosion control at the land disturbance site.

4. The SWPPP briefly must describe the nature of the land disturbance activity, including:
   (a) The function of the project (e.g., low density residential, shopping mall, highway, etc.);
   (b) The intended sequence and timing of activities that disturb the soils at the site; and
   (c) Estimates of the total area expected to be disturbed by excavation, grading, or other land disturbance support activities including off-site borrow and fill areas;

5. In order to identify the site, the SWPPP shall include site information including size in acres. The SWPPP shall have sufficient information to be of practical use to contractors and site construction workers to guide the installation and maintenance of BMPs.

6. The function of the SWPPP and the BMPs listed therein is to prevent or minimize pollution to waters of the state. A deficiency of a BMP means it was not effective in preventing or minimizing pollution of waters of the state.

   The permittee shall select, install, use, operate and maintain appropriate BMPs for the permitted site. The following manuals are acceptable resources for the selection of appropriate BMPs.

   Developing Your Stormwater Pollution Prevention Plan: A Guide for Construction Sites, (Document number EPA 833-R-06-004) published by the United States Environmental Protection Agency (USEPA) in May 2007. This manual as well as other information, including examples of construction SWPPPs, is available at the USEPA internet site at https://www.epa.gov/sites/production/files/2015-10/documents/sw_swppp_guide.pdf; and https://www.epa.gov/npdes/developing-stormwater-pollution-prevention-plan-swppp.

   The latest version of *Protecting Water Quality: A field guide to erosion, sediment and stormwater best management practices for development sites in Missouri,* published by the Department. This manual is available at: https://dnr.mo.gov/document-search/protecting-water-quality-field-guide.

   The permittee is not limited to the use of these guidance manuals. Other guidance publications may be used to select appropriate BMPs. However, all BMPs must be described and justified in the SWPPP. Although the use of these manuals or other resources is recommended and may be used for BMP selection, they do not supersede the conditions of this permit. They may be used to inform in the decision making process for BMP selection but they are not themselves part of the permit conditions.

The permittee may retain the SWPPP, inspection reports, and all other associated documents (including a copy of this permit) electronically pursuant to RSMo 432.255. The documents must be made available to all interested persons in either paper or electronic format as required by this permit and the permittee must remit a copy (electronic or otherwise) of the SWPPP and inspection reports to the Department upon request.

7. The SWPPP must contain a legible site map, multiple maps if necessary, identifying:
   (a) Site boundaries of the property;
   (b) Locations of all waters of the state (including wetlands) within the site and half a mile downstream of the site's outfalls;
   (c) Location of all outfalls;
   (d) Direction(s) of stormwater flow (use arrows) and approximate slopes before and after grading activities;
   (e) Areas of soil disturbance and areas that will not be disturbed (or a statement that all areas of the site will be disturbed unless otherwise noted);
   (f) Location of structural and non-structural BMPs, including natural buffer areas, identified in the SWPPP;
   (g) Locations where stabilization practices are expected to occur;
   (h) Locations of on-site and off-site material, waste, borrow, or equipment storage areas and stockpiles;
   (i) Designated points where vehicles will exit the site;
   (j) Location of stormwater inlets and conveyances including ditches, pipes, man-made conduits, and swales; and
   (k) Areas where final stabilization has been achieved.

8. An individual shall be designated by the permittee as the environmental lead. This environmental lead shall have knowledge in erosion, sediment, and stormwater control principles, knowledge of the permit, and the site's SWPPP. The environmental lead shall ensure all personnel and contractors understand any requirements of this permit may be affected by the work they are doing. The environmental lead or designated inspector(s) knowledgeable in erosion, sediment, and stormwater control principles shall inspect all structures that function to prevent or minimize pollution of waters of the state.

9. Throughout coverage under this permit, the permittee shall amend and update the SWPPP as appropriate during the term of the land disturbance activity. All SWPPP modifications shall be signed and dated. The permittee shall amend the SWPPP to incorporate any significant site condition changes which impact the nature and condition of stormwater discharges. At a minimum, these changes include whenever the:
   (a) Location, design, operation, or maintenance of BMPs is changed;
   (b) Design of the construction project is changed that could significantly affect the quality of the stormwater discharges;
   (c) The permittee's inspections indicate deficiencies in the SWPPP or any BMP;
   (d) Department notifies the permittee in writing of deficiencies in the SWPPP;
   (e) SWPPP is determined to be ineffective in minimizing or controlling erosion and sedimentation (e.g., there is visual evidence of excessive site erosion or sediment deposits in streams, lakes, or downstream waterways, sediment or other wastes off site); and/or
   (f) Department determines violations of water quality standards may occur or have occurred.

10. Site Inspections: The environmental lead, or a designated inspector, shall conduct regularly scheduled inspections. These inspections shall be conducted by a qualified person, one who is responsible for environmental matters at the site, or a person trained by and directly supervised by the person responsible for environmental matters at the site. Site inspections shall include, at a minimum, the following:
   (a) For disturbed areas that have not achieved final stabilization, all installed BMPs and other pollution control measures shall be inspected to ensure they are properly installed, appear to be operational, and are working as intended to minimize the discharge of pollutants.
   (b) For areas on site that have achieved either temporary or final stabilization, while at the same time active construction continues on other areas, ensure that all stabilization measures are properly installed, appear to be operational, and are working as intended to minimize the discharge of pollutants.
   (c) Inspect all material, waste, borrow, and equipment storage and maintenance areas that are covered by this permit. Inspect for conditions that could lead to spills, leaks, or other accumulations of pollutants on the site.
   (d) Inspect all areas where stormwater typically flows within the site, including drainage ways designed to divert, convey, and/or treat stormwater.

(e) All stormwater outfalls shall be inspected for evidence of erosion, sediment deposition, or impacts to the receiving stream. If a discharge is occurring during an inspection, the inspector must observe and document the visual quality of the discharge and take note of the characteristics of the stormwater discharge, including turbidity, color; odor; floating, settled, or suspended solids; foam; oil sheen; and other indicators of stormwater pollutants.
(f) When practicable the receiving stream shall also be inspected for a minimum of 50 feet downstream of the outfall.
(g) The perimeter of the site shall be inspected for evidence of BMP failure to ensure concentrated flow does not develop a new outfall.
(h) The SWPPP must explain how the environmental lead will be notified when stormwater runoff occurs.

11. Inspection Frequency: All BMPs must be inspected in accordance to one of the schedules listed below. The inspection frequency shall be documented in the SWPPP, and any changes to the frequency of inspections, including switching between the options listed below, must be documented on the inspection form:
(a) At least once every seven (7) calendar days and within 48 hours after any storm event equal to or greater than a 2-year, 24-hour storm has ceased during a normal work day or within 72 hours if the rain event ceases during a non-work day such as a weekend or holiday; or
(b) Once every 14 calendar days and within 24 hours of the occurrence of a storm event of 0.25 inches of precipitation or greater, or the occurrence of runoff from snowmelt. To determine if a storm event of 0.25 inches or greater has occurred on the site, the permittee shall either keep a properly maintained rain gauge on site, or obtain the storm event information from a weather station near the site location.
1) Inspections are only required during the project's normal working hours.
2) An inspection must be conducted within 24 hours of a storm event which has produced 0.25 inches. The inspection shall be conducted within 24 hours of the event end, or within 72 hours if the rain event ceases during a non-work day such as a weekend or holiday.
3) If it is elected to inspect every 14 calendar days and there is a storm event at the site that continues for multiple days, and each day of the storm produces 0.25 inches or more of rain, the permittee shall conduct an inspection within 24 hours of the end of the storm or within 72 hours if the rain event ceases during a non-work day such as a weekend or holiday.
(c) Areas on site that have achieved stabilization, while at the same time active construction continues on other areas, may reduce inspection frequency to monthly, for those stabilized areas, if the following conditions exist:
1) For areas where disturbed portions have undergone temporary stabilization, inspections shall occur at least once a month while stabilized and when re-disturbed shall follow either frequency outlined in (a),(b), or (c) above.
2) Areas on site that have achieved final stabilization must be inspected at least once per month until the permit is terminated.
(d) If construction activities are suspended due to frozen conditions, the permittee may temporarily reduce site inspections to monthly until thawing conditions begin to occur if all of the following are met:
1) Land disturbances have been suspended; and
2) All disturbed areas of the site have been stabilized in accordance with Part V. BMP REQUIREMENTS, Condition 13.
3) The change shall be noted in the SWPPP.
(e) Any basin dewatering shall be inspected daily when discharge is occurring. The discharge shall be observed and dewatering activities shall be ceased immediately if the receiving stream is being impacted. These inspections shall be noted on a log or on the inspection report.

If weather conditions or other issues prevent correction of BMPs within seven calendar days, the reasons for the delay must be documented (including pictures), and there must be a narrative explaining why the work cannot be accomplished within the seven day time period. The documentation must be filed with the regular inspection reports. The corrections shall be made as soon as weather conditions or other issues allow.

12. Site Inspection Reports: A log of each inspection and/or copy of the inspection report shall be kept readily accessible and must be made available upon request by the Department. Electronic logs are acceptable as long as reports can be provided within 24 hours. If inspection reports are kept off site, the SWPPP must indicate where they are stored. The inspection report shall be signed by the environmental lead or designated inspector (electronically or otherwise).
(a) The inspection report is to include the following minimum information:
1) Inspector's name and title.
2) Date and time of inspection.
3) Observations relative to the effectiveness of the BMPs and stabilization measures. The following must be

documented:
a. Whether BMPs are installed, operational, and working as intended;
b. Whether any new or modified stormwater controls are needed;
c. Facilities examined for conditions that could lead to spill or leak;
d. Outfalls examined for visual signs of erosion or sedimentation at outfalls. Excessive erosion or sedimentation may be due to BMP failure or insufficiency. Response to observations should be addressed in the inspection report.

4) Corrective actions taken or necessary to correct the observed problem.
5) Listing of areas where land disturbance operations have permanently or temporarily stopped.

13. Any structural or maintenance deficiencies for BMPs or stabilization measures shall be documented and corrected as soon as possible but no more than seven (7) calendar days after the inspection.
(a) Corrective action documentation shall be stored with the associated site inspection report.
(b) Immediately take all reasonable steps to address the condition, including cleaning up any contaminated surfaces so the material will not discharge in subsequent storm events.
(c) If weather conditions or other issues prevent correction of BMPs within seven calendar days, the reasons for the delay must be documented (this may include pictures) and there must be a narrative explaining why the work cannot be accomplished within the seven day time period. The permittee shall correct the problem as soon as weather conditions or issues allow.
(d) Corrective actions may be required by the Department. The permittee must comply with any corrective actions required by the Department as a result of permit violations found during an inspection.

V. BMP REQUIREMENTS

1. The information, practices, and BMP requirements in this section shall be implemented on site and, where noted, provided for in the SWPPP.

2. Existing vegetation and trees shall be preserved where practicable. The permittee is encouraged to preserve topsoil where practicable.

3. The permittee shall select appropriate BMPs for use at the site and list them in the SWPPP. When selecting effective BMPs, the permittee shall consider stormwater volume and velocity. A BMP that has demonstrated ineffectiveness in preventing or minimizing sediment or other pollutants from leaving a given site shall be replaced with a more effective BMP, or additional and sequential BMPs and treatment devices may be incorporated as site conditions allow. The permittee should consider a schedule for performing erosion control measures when selecting BMPs.

4. The SWPPP shall include a description of both structural and non-structural BMPs that will be used at the site.
(a) The SWPPP shall provide the following general information for each BMP which will be used one or more times at the site:
1) Physical description of the BMP;
2) Site conditions that must be met for effective use of the BMP;
3) BMP installation/construction procedures, including typical drawings; and
4) Operation and maintenance procedures and schedules for the BMP.
(b) The SWPPP shall provide the following information for each specific instance where a BMP is to be installed:
1) Whether the BMP is temporary or permanent;
2) When the BMP will be installed in relation to each phase of the land disturbance procedures to complete the project; and
3) Site conditions that must be met before removal of the BMP if the BMP is not a permanent BMP.

5. Structural BMP Installation: The permittee shall ensure all BMPs are properly installed and operational at the locations and relative times specified in the SWPPP.
(a) Perimeter control BMPs for runoff from disturbed areas shall be installed before general site clearing is started. Note this requirement does not apply to earth disturbances related to initial site clearing and establishing entry, exit, or access of the site, which may require that stormwater controls be installed immediately after the earth

disturbance.
(b) For phased projects, BMPs shall be properly installed as necessary prior to construction activities.
(c) Stormwater discharges which leave the site from disturbed areas shall pass through an appropriate impediment to sediment movement such as a sedimentation basin, sediment traps (including vegetative buffers), or silt fences prior to leaving the land disturbance site.
(d) A drainage course change shall be clearly marked on a site map and described in the SWPPP.
(e) If vegetative stabilization measures are being implemented, stabilization efforts are considered "installed" when all activities necessary to seed or plant the area are completed. Vegetative stabilization is not considered "operational" until the vegetation is established.

6. Install sediment controls along any perimeter areas of the site that are downgradient from any exposed soil or other disturbed areas. Prevent stormwater from circumventing the edge of the perimeter control. For sites where perimeter controls are infeasible, other practices shall be implemented to minimize discharges to perimeter areas of the site.

7. For surface waters of the state, defined in Section 644.016.1(27) RSMo, located on or adjacent to the site, the permittee must maintain a riparian buffer or structural equivalent in accordance with at least one of the following options. The selection and location must be described in the SWPPP.
   (a) Provide and maintain a 50-foot undisturbed natural buffer; or
   (b) Provide and maintain an undisturbed natural buffer that is less than 50 feet and is supplemented by erosion and sediment controls that achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer; or
   (c) If infeasible to provide and maintain an undisturbed natural buffer of any size, implement erosion and sediment controls to achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.
   (d) The permittee is not required to comply with (a), (b), or (c) above if one or more of the following exceptions apply and documentation is provided in the SWPPP:
      1) As authorized per CWA Section 404 Department of the Army permit and its associated Section 401 Water Quality Certification from the Department.
      2) If there is no discharge of stormwater to waters of the state through the area between the disturbed portions of the site and waters of the state located within 50 feet of the site. This includes situations where the permittee has implemented permanent control measures that will prevent such discharges, such as a berm or other barrier.
      3) Where no natural buffer exists due to preexisting development disturbances that occurred prior to the initiation of planning for the current development of the site.
         a. Where some natural buffer exists but portions of the area within 50 feet of the waters of the state are occupied by preexisting development disturbances the permittee is required to comply with (a), (b), or (c) above.
      4) For linear projects where site constraints make it infeasible to implement a buffer or equivalent provided the permittee limit disturbances within 50 feet of any waters of the state and/or the permittee provides supplemental erosion and sediment controls to treat stormwater discharges from earth disturbances within 50 feet of the water of the state. The permittee must also document in the SWPPP the rationale for why it is infeasible for the permittee to implement (a), (b), or (c) and describe any buffer width retained and supplemental BMPs installed.
   (e) Where the permittee is retaining a buffer of any size, the buffer should be measured perpendicularly from any of the following points, whichever is further landward from the water:
      1) The ordinary high water mark of the water body, defined as the line on the shore established by fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, and/or the presence of litter and debris; or
      2) The edge of the stream or river bank, bluff, or cliff, whichever is applicable.

8. Slopes for disturbed areas must be identified in the SWPPP. A site map or maps defining the sloped areas for all phases of the project must be included in the SWPPP. The disturbance of steep slopes shall be minimized.
9. Manage stockpiles or land clearing debris piles composed, in whole or in part, of sediment and/or soil.
   (a) Locate the piles outside of any natural buffers zones, established under the condition above, and away from any stormwater conveyances, drain inlets, and areas where stormwater flow is concentrated;
   (b) Install a sediment barrier along all downgradient perimeter areas;
   (c) Divert surface flows around stockpiles to reduce and minimize erosion of the stockpile.

(d) For piles that will be unused for 14 or more days, provide cover with appropriate temporary stabilization in accordance with Part V. BMP REQUIREMENTS, Condition 13.
(e) Rinsing, sweeping, or otherwise placing any soil, sediment, debris, or stockpiled product which has accumulated on pavement or other impervious surfaces into any stormwater conveyance, storm drain inlet, or water of the state is prohibited.

10. The site shall include BMPs for pollution prevention measures and shall be noted in the SWPPP. At minimum such measures must be designed, installed, implemented, and maintained to:
(a) Minimize the discharge of pollutants from equipment and vehicle rinsing; no detergents, additives, or soaps of any kind shall be discharged. Rinse waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;
(b) Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste, and other materials present on the site to precipitation and to stormwater;
(c) Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures, including, but not limited to, the installation of containment berms and use of drip pans at petroleum product and liquid storage tanks and containers; and
(d) Prevent discharges from causing or contributing to an exceedance of water quality standards including general criteria.

11. Sedimentation Basins: The SWPPP shall include a sedimentation basin for each drainage area with ten or more acres disturbed at one time.
(a) The sedimentation basin shall be sized, at a minimum, to treat a local 2-year, 24-hour storm.
(b) Sediment basins shall not be constructed in any waters of the state or natural buffer zones.
(c) Discharges from dewatering activities shall be managed by appropriate controls. The SWPPP shall include a description of any anticipated dewatering methods and specific BMPs designed to treat dewatering water.
1) Appropriate controls include, but are not limited to, sediment socks, dewatering tanks, tube settlers, weir tanks, filtration systems (e.g. bag or sand filters), and passive treatment systems that are designed to remove or retain sediment.
2) Erosion controls and velocity dissipation devices (e.g., check dams, riprap, and vegetated buffers) to minimize erosion at inlets, outlets, and discharge points from shall be utilized.
3) Water with an oil sheen shall not be discharged and shall be marked in SWPPP.
4) Visible floating solids and foam shall not be discharged.
(d) Until final stabilization has been achieved, sediment basins and impoundments shall utilize outlet structures or floating skimmers that withdraw water from the surface when discharging.
1) Under frozen conditions, it may be considered infeasible to withdraw water from the surface and an exception can be made for that specific period as long as discharges that may contain sediment and other pollutants are managed by appropriate controls. If determined infeasible due to frozen conditions, documentation must be provided in the SWPPP to support the determination, including the specific conditions or time period when this exception applies.
(e) Accumulated sediment shall not exceed 50% of total volume or as prescribed in the design, whichever is less. Note in the SWPPP the locations for disposal of the material removed from sediment basins.
(f) Prevent discharges to the receiving stream causing excessive visual turbidity. For the purposes of this permit, visual turbidity refers to a sediment plume or other cloudiness in the water caused by sediment that can be identified by an observer.
(g) The SWPPP shall require the basin be maintained until final stabilization of the disturbed area served by the basin.

Where use of a sediment basin is infeasible, the SWPPP shall evaluate and specify other similarly effective BMPs to be employed to control erosion and sediment. These similarly effective BMPs shall be selected from appropriate BMP guidance documents authorized by this permit. The BMPs must provide equivalent water quality protection to achieve compliance with this permit. The SWPPP shall require both temporary and permanent sedimentation basins to have a stabilized spillway to minimize the potential for erosion of the spillway or basin embankment.

12. Soil disturbing activities on site that have ceased either temporarily or permanently shall initiate stabilization immediately in accordance with the options below. For soil disturbing activities that have been temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days:
    (a) The permittee shall construct BMPs to establish interim stabilization; and
    (b) Stabilization must be initiated immediately and completed within 14 calendar days.
    (c) For soil disturbing activities that have been permanently ceased on any portion of the site, final stabilization of disturbed areas must be initiated immediately and completed within 14 calendar days.
        1) Allowances to the 14-day completion period for temporary and final stabilization may be made due to weather and equipment malfunctions. The use of allowances shall be documented in the SWPPP. Allowances may be determined unnecessary after review by the Department.
    (d) Until stabilization is complete, interim sediment control shall consist of well-established and maintained BMPs that are reasonably certain to protect waters of the state from sediment pollution over an extended period of time. This may require adding more BMPs to an area than is normally used during daily operations. The types of BMPs used must be suited to the area disturbed, taking into account the number of acres exposed and the steepness of the slopes. If the slope of the area is greater than 3:1 (three feet horizontal to one foot vertical), then the permittee shall establish interim stabilization within seven days of ceasing operations on that part of the site. The following activities would constitute the immediate initiation of stabilization:
        1) Prepping the soil for vegetative or non-vegetative stabilization as long as seeding, planting, and/or installation of non-vegetative stabilization products takes place as soon as practicable;
        2) Applying mulch or other non-vegetative product to the exposed areas;
        3) Seeding or planting the exposed areas;
        4) Finalizing arrangements to have stabilization product fully installed in compliance with the deadlines for completing stabilization.
    (e) If vegetative stabilization measures are being implemented, stabilization is considered "installed" when all activities necessary to seed or plant the area are completed. Installed does not mean established.
    (f) If non-vegetative stabilization measures are being implemented, stabilization is considered "installed" when all such measures are implemented or applied.
        1) Non-vegetative stabilization shall prevent erosion and shall be chosen for site conditions, such as slope and flow of stormwater.
    (g) Final stabilization is not considered achieved until vegetation has grown and established to meet the requirements below.

13. Prior to removal of BMPs, ceasing site inspections, and removing from the quarterly report, final stabilization must be achieved. Final stabilization shall be achieved as soon as possible once land disturbance activities have ceased. Document in the SWPPP the type of stabilization and the date final stabilization is achieved.
    (a) The project is considered to have achieved final stabilization when perennial vegetation (excluding volunteer vegetation), pavement, buildings, or structures using permanent materials (e.g., riprap, gravel, etc.) cover all areas that have been disturbed. With respect to areas that have been vegetated, vegetation must be at least 70% coverage of 100% of the vegetated areas on site. Vegetation must be evenly distributed.
    (b) Disturbed areas on agricultural land are considered to have achieved final stabilization when they are restored to their preconstruction agricultural use. If former agricultural land is changing to non-agricultural use, this is no longer considered agricultural land and shall follow condition (a).
    (c) If the intended function of a specific area of the site necessitates that it remain disturbed, final stabilization is considered achieved if all of the following are met:
        1) Only the minimum area needed remains disturbed (i.e., dirt access roads, motocross tracks, utility pole pads, areas being used for storage of vehicles, equipment, materials). Other areas must meet the criteria above.

2) Permanent structural BMPs (e.g., rock checks, berms, grading, etc.) or non-vegetative stabilization measures are implemented and designed to prevent sediment and other pollutants from entering waters of the state.
3) Inspection requirements in Part IV. SWPPP MANAGEMENT REQUIREMENT, Condition 11 are met and documented in the SWPPP.

(d) Winter weather and frozen conditions do not excuse any of the above final stabilization requirements. If vegetation is required for stabilization the permittee must maintain BMPs throughout winter weather and frozen conditions until thawing and vegetation meets final stabilization criteria above. Document stabilization attempts during frozen conditions in the SWPPP. Consider future freezing when removing vegetation and plan with temporary stabilization techniques before the ground becomes frozen.

VI. SITE FINALIZATION & PERMIT TERMINATION

1. Until a site is finalized, the permittee must comply with all conditions in the permit, including continuation of site inspections and reporting quarterly to the Department. To finalize the site and remove from this permit coverage, the site shall meet the following requirements:
   (a) For any areas that (1) were disturbed during construction, (2) are not covered over by permanent structures, and (3) over which the permittee had control during the construction activities, the requirements for final vegetative or non-vegetative stabilization in Part V. BMP REQUIREMENTS, Condition 13;
   (b) The permittee has removed and properly disposed of all construction materials, waste, and waste handling devices and has removed all equipment and vehicles that were used during construction, unless intended for long-term beyond construction phase;
   (c) The permittee has removed all temporary BMPs that were installed and maintained during construction, except those that are intended for long-term use or those that are biodegradable; and
   (d) The permittee has removed all potential pollutants and pollutant-generating activities associated with construction, unless needed for long-term use following the construction activities.

2. The permit may be terminated if;
   (a) There has been a transfer of control of all areas of the site for which the current permittee is responsible under this permit to another operator, and that operator has obtained coverage under this permit;
   (b) Active sites obtain coverage under an individual or alternative general NPDES permit, with land disturbance conditions; or
   (c) This permit may be terminated when all projects covered under this permit are finalized. In order to terminate the permit, the permittee shall notify the Department by submitting a Request for Termination along with the final quarterly report for the current calendar quarter.

VII. REPORTING AND SAMPLING REQUIREMENTS

1. The permittee is not required to sample stormwater under this permit. The Department may require sampling and reporting as a result of illegal discharges, compliance issues related to water quality concerns, or evidence of off-site impacts from activities at a site. If such an action is needed, the Department will specify in writing the sampling requirements, including such information as location and extent. If the permittee refuses to perform sampling when required, the Department may terminate the general permit and require the facility to obtain a site-specific permit with sampling requirements.

2. Electronic Discharge Monitoring Report (eDMR) Submission System. The NPDES Electronic Reporting Rule, 40 CFR Part 127, reporting of any report required by the permit shall be submitted via an electronic system to ensure timely, complete, accurate, and nationally consistent set of data for the NPDES program. The eDMR system is currently the only Department-approved reporting method for this permit unless specified elsewhere in this permit, or a waiver is granted by the Department. The facility must register in the Department's eDMR system through the Missouri Gateway for Environmental Management (MoGEM) before the first report is due.

3. Permittees shall prepare a quarterly report with a list of active land disturbance sites including any off-site borrow or depositional areas associated with the construction project and submit the following information electronically as an

attachment to the eDMR system until such a time when the current or a new system is available to allow direct input of the data:

(a) The name of the project;
(b) The location of the project (including the county);
(c) The name of the primary receiving water(s) for each project;
(d) A description of the project;
(e) The number of acres disturbed;
(f) The percent of completion of the project; and
(g) The projected date of completion.

The quarterly report(s) shall be maintained by the permittee and readily available for review by the Department at the address provided on the application as well as submitted quarterly via the Department's eDMR system. The permittee shall submit quarterly reports according to Table A.

Table A	**Schedule for Quarterly Reporting**
Activity for the months of:	Report is due:
January, February, March (1st Quarter)	April 28
April, May, June (2nd Quarter)	July 28
July, August, September (3rd Quarter)	October 28
October, November, December (4th Quarter)	January 28

VIII. STANDARD PERMIT CONDITIONS

1. Records: The permittee shall retain copies of this general permit, the SWPPP and all amendments for the site named in the State Operating Permit, results of any monitoring and analysis, and all site inspection records required by this general permit.
   (a) The records shall be accessible during normal business hours and retained for a period of at least three (3) years from the date of termination.
   (b) The permittee shall provide a copy (electronic or otherwise) of the SWPPP to the Department, USEPA, or any local agency or government representative if they request a copy in the performance of their official duties within 24 hours of the request (or next working day), unless given more time by the representative.
   (c) The permittee shall provide a copy of the SWPPP to those who are responsible for installation, operation, or maintenance of any BMP. The permittee, their representative, and/or the contractor(s) responsible for installation, operation and maintenance of the BMPs shall have a current copy of the SWPPP with them when on the project site.

2. Land Ownership and Change of Ownership: Federal and Missouri stormwater regulations [10 CSR 20-6.200(1) (B)] require a stormwater permit and erosion control measures for all land disturbances of one or more acres. These regulations also require a permit for less than one acre lots if the lot is part of a larger common plan of development or sale where that plan is at least one acre in size.
   (a) If the permittee sells any portion of a permitted site to a developer for commercial, industrial, or residential use, this land remains a part of the common sale and the new owner must obtain a permit prior to conducting any land disturbance activity. Therefore, the original permittee must amend the SWPPP to show that the property has been sold and, therefore, no longer under the original permit coverage.
   (b) Property of any size which is part of a larger common plan of development where the property has achieved final stabilization and the original permit terminated will require application of a new land disturbance permit for any future land disturbance activity unless the activity is by an individual residential building lot owner on a site less than one acre.
   (c) If a portion of a larger common plan of development is sold to an individual for the purpose of building his or her own private residence, a permit is required if the portion of land sold is equal to or greater than one acre. No permit is required, however, for less than one acre of land sold.

3. Permit Transfer: This permit may not be transferred to a new owner.

4. Termination: This permit may be terminated when the project has achieved final stabilization, defined in Part VI. SITE FINALIZATION & PERMIT TERMINATION.
   (a) In order to terminate the permit, the permittee shall notify the Department by submitting the form Request for Termination of Operating Permit Form MO 780-2814. The form should be submitted to the appropriate regional office or through an approved electronic system if it should become available.
   (b) The Cover Page (Certificate Page) of the Master General Permit for Land Disturbance specifies the "effective date" and the "expiration date" of the Master General Permit. The "issued date" along with the "expiration date" will appear on the State Operating Permit issued to the applicant. **This permit does not continue administratively beyond the expiration date.**

5. Duty to Reapply: If the project or development completion date will be after the expiration date of this general permit, then the permittee must reapply to the Department for a new permit. This permit may be applied for and issued electronically in accordance with Section 644.051.10, RSMo.
   (a) Due to the nature of the electronic permitting system, a period of time may be granted at the discretion of the Department in order to apply for a new permit after the new version is effective. Applicants must maintain appropriate best management practices and inspections during the discretionary period.

6. Duty to Comply: The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Missouri Clean Water Law and Federal Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

7. Modification, Revocation, and Reopening:
   (a) If at any time the Department determines that the quality of waters of the state may be better protected by reopening this permit, or revoking this permit and requiring the owner/operator of the permitted site to apply for a site-specific permit, the Department may revoke a general permit and require any person to obtain such an operating permit as authorized by 10 CSR20-6.010(13) and 10 CSR 20-6.200(1)(B).
   (b) If this permit is reopened, modified, or revoked pursuant to this Section, the permittee retains all rights under Chapter 536 and 644 Revised Statutes of Missouri upon the Department's reissuance of the permit as well as all other forms of administrative, judicial, and equitable relief available under law.

8. Other Information: Where the permittee becomes aware that it failed to submit any relevant facts in a permit application or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or information.

9. Duty to Provide Information: The permittee shall furnish to the Department, within 24 hours unless explicitly granted more time in writing, any information which the Department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish to the Department upon request, copies of records required to be kept by this permit.

10. Inspection and Entry: The permittee shall allow the Department, or an authorized representative (including an authorized contractor acting as a representative of the Department), upon presentation of credentials and other documents as may be required by law, to:
    (a) Enter upon the permittee's premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of the permit;
    (b) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
    (c) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
    (d) Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Federal Clean Water Act or Missouri Clean Water Law, any substances or parameters at any location.

11. Signatory Requirement:
    (a) All permit applications, reports required by the permit, or information requested by the Department shall be signed and certified. (See 40 CFR 122.22 and 10 CSR 20-6.010)
    (b) The Federal Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit (including monitoring reports or reports of compliance or non-compliance) shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than six (6) months per violation, or by both.
    (c) The Missouri Clean Water Law provides that any person who knowingly makes any false statement, representation or certification in any application, record, report, plan, or other document filed or required to be maintained pursuant to sections 644.006 to 644.141 shall, upon conviction, be punished by a fine of not more than ten thousand dollars, or by imprisonment for not more than six months, or by both.

12. Property Rights: This permit does not convey any property rights of any sort or any exclusive privilege.

13. Notice of Right to Appeal: If you were adversely affected by this decision, you may be entitled to pursue an appeal before the administrative hearing commission (AHC) pursuant to Sections 621.250 and 644.051.6 RSMo. To appeal, you must file a petition with the AHC within thirty days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC. Any appeal should be directed to:

Administrative Hearing Commission
U.S. Post Office Building, Third Floor
131 West High Street, P.O. Box 1557
Jefferson City, MO 65102-1557
Phone: 573-751-2422
Fax: 573-751-5018
Website: https://ahc.mo.gov

MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

STORMWATER DISCHARGES FROM THIS LAND DISTURBANCE SITE ARE AUTHORIZED BY THE MISSOURI STATE OPERATING PERMIT NUMBER:

ANYONE WITH QUESTIONS OR CONCERNS ABOUT STORMWATER DISCHARGES FROM THIS SITE, PLEASE CONTACT THE MISSOURI DEPARTMENT OF NATURAL RESOURCES AT

1-800-361-4827

MISSOURI DEPARTMENT OF NATURAL RESOURCES
FACT SHEET FOR MASTER GENERAL PERMIT
MO-R100XXX

The Federal Water Pollution Control Act [Clean Water Act (CWA)] Section 402 of Public Law 92-500 (as amended) established the National Pollution Discharge Elimination System (NPDES) permit program. This program regulates the discharge of pollutants from point sources into the waters of the United States and the release of stormwater from certain point sources. All such discharges are unlawful without a permit (Section 301 of the CWA). After a permit is obtained, a discharge not in compliance with all permit terms and conditions is unlawful. Missouri State Operating Permits (MSOPs) are issued by the Missouri Department of Natural Resources (Department) under an approved program operated in accordance with federal and state laws (Federal CWA and Missouri Clean Water Law Section 644 as amended). Permits are issued for a period of five (5) years unless otherwise specified.

Per 40 CFR 124.56, 40 CFR 124.8, and 10 CSR 20-6.020(1)(A)2, a Fact Sheet shall be prepared to give pertinent information regarding the applicable regulations, rationale for the development of effluent limitations and conditions, and the public participation process for the permit. A Fact Sheet is not an enforceable part of an MSOP.

DEFINITIONS FOR THE PURPOSES OF THIS PERMIT:

Common Promotional Plan: A plan undertaken by one (1) or more persons to offer lots for sale or lease; where land is offered for sale by a person or group of persons acting in concert, and the land is contiguous or is known, designated, or advertised as a common unit or by a common name or similar names, the land is presumed, without regard to the number of lots covered by each individual offering, as being offered for sale or lease as part of a common promotional plan.

Dewatering: The act of draining rainwater and/or groundwater from basins, building foundations, vaults, and trenches.

Effective Operating Condition: For the purposes of this permit, a stormwater control is kept in effective operating condition if it has been implemented and maintained in such a manner that it is working as designed to minimize pollutant discharges.

Emergency-Related Project: A project initiated in response to a public emergency (e.g. earthquakes, extreme flooding conditions, tornado, disruptions in essential public services, pandemic) for which the related work requires immediate authorization to avoid imminent endangerment to human health/safety or the environment or to reestablish essential public services.

Exposed Soils: For the purposes of this permit, soils that as a result of earth-disturbing activities are left open to the elements.

Immediately: For the purposes of this permit, immediately should be defined as within 24 hours.

Impervious Surface: For the purpose of this permit, any land surface with a low or no capacity for soil infiltration including, but not limited to, pavement, sidewalks, parking areas and driveways, packed gravel or soil, or rooftops.

Infeasible: Infeasible means not technologically possible or not economically practicable and achievable in light of best industry practices.

Install or Installation: When used in connection with stormwater controls, to connect or set in position stormwater controls to make them operational.

Land Disturbance Site or Site: The land or water area where land disturbance activities will occur and where stormwater controls will be installed and maintained. The land disturbance site includes construction support activities, which may be located at a different part of the property from where the primary land disturbance activity will take place or on a different piece of property altogether. Off-site borrow areas directly and exclusively related to the land disturbance activity are part of the site and must be permitted.

Larger Common Plan of Development or Sale: A continuous area where multiple separate and distinct construction activities are occurring under one plan, including any off-site borrow areas that are directly and exclusively related to the land disturbance activity. Off-site borrow areas utilized for multiple different land disturbance projects are considered their own entity and are not part of the larger common plan of development or sale. See definition of Common Promotional Plan to understand what a 'common plan' is.

Minimize: To reduce and/or eliminate to the extent achievable using stormwater controls that are technologically available and economically practicable and achievable in light of best industry practices.

Non-structural Best Management Practices (BMPs): Institutional, educational, or pollution prevention practices designed to limit the amount of stormwater runoff or pollutants that are generated in the landscape. Examples of non-structural BMPs include picking up trash and debris, sweeping up nearby sidewalks and streets, maintaining equipment, and training site staff on stormwater control practices.

Operational: for the purposes of this permit, stormwater controls are made "operational" when they have been installed and implemented, are functioning as designed, and are properly maintained.

Ordinary High Water Mark: The line on the shore established by fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, and/or the presence of litter and debris.

Peripheral: For the purposes of this permit, peripheral should be defined as the outermost boundary of the area that will be disturbed.

Permanently: For the purposes of this permit, permanently is defined as any activity that has been ceased without any intentions of future disturbance.

Pollution Prevention Controls (or Measures): Stormwater controls designed to reduce or eliminate the addition of pollutants to construction site discharges through analysis of pollutant sources, implementation of proper handling/disposal practices, employee education, and other actions.

Qualified Person (inspections): A person knowledgeable in the principles and practice of erosion and sediment controls and pollution prevention who possesses the appropriate skills and training to assess conditions at the construction site that could impact stormwater quality and the appropriate skills and training to assess the effectiveness of any stormwater controls selected and installed to meet the requirements of this permit.

Stormwater Control (also referred to as sediment/erosion controls): refers to any temporary or permanent BMP or other method used to prevent or reduce the discharge of pollutants to waters of the state.

Structural BMP: Physical sediment/erosion controls working individually or as a group (treatment train) appropriate to the source, location, and area climate for the pollutant to be controlled. Examples of structural BMPs include silt fences, sedimentation ponds, erosion control blankets, and seeding.

Temporary Stabilization: A condition where exposed soils or disturbed areas are provided temporary vegetation and/or non-vegetative protective cover to prevent erosion and sediment loss. Temporary stabilization may include temporary seeding, geotextiles, mulches, and other techniques to reduce or eliminate erosion until either final stabilization can be achieved or until further construction activities take place to re-disturb this area.

Treatment Train: A multi-BMP approach to managing the stormwater volume and velocity and often includes erosion prevention and sediment control practices often applied when the use of a single BMP is inadequate in preventing the erosion and transport of sediment. A good option to utilize as a corrective action.

Volunteer Vegetation: A volunteer plant is a plant that grows on its own, rather than being deliberately planted for stabilization purposes. Volunteers often grow from seeds that float in on the wind, are dropped by birds, or are inadvertently mixed into soils. Commonly, volunteer vegetation is referred to as 'weeds'. This does not meet the requirements for final stabilization.

Waters of the State: Section 644.016.1(27) RSMo. defines waters of the state as, "All waters within the jurisdiction of this state, including all rivers, streams, lakes and other bodies of surface and subsurface water lying within or forming a part of the boundaries of the state which are not entirely confined and located completely upon lands owned, leased or otherwise controlled by a single person or by two or more persons jointly or as tenants in common."

PART I – BASIC PERMIT INFORMATION

Facility Type:	Industrial Stormwater; Land Disturbance
Facility SIC Code(s):	1629
Facility Description:	Construction or land disturbance activity (e.g., clearing, grubbing, excavating, grading, filling, and other activities that result in the destruction of the root zone and/or land disturbance activity that is reasonably certain to cause pollution to waters of the state).

This permit establishes a Stormwater Pollution Prevention Plan (SWPPP) requirement for pollutants of concern from this type of facility or for all facilities and sites covered under this permit. 10 CSR 20-6.200(7) specifies "general permits shall contain BMP requirements and/or monitoring and reporting requirements to keep the stormwater from becoming contaminated".

Land disturbance activities include clearing, grubbing, excavating, grading, filling and other activities that result in the destruction of the root zone and/or other activities that are reasonably certain to cause pollution to waters of the state. A Missouri State Operating Permit for land disturbance permit is required for construction disturbance activities of one or more acres or for construction activities that disturb less than one acre when they are part of a larger common plan of development or sale that will disturb a cumulative total of one or more acres over the life of the project.

The primary requirement of a land disturbance permit is the development of a SWPPP which incorporates site-specific BMPs to minimize soil exposure, soil erosion, and the discharge of pollutants. The SWPPP ensures the design, implementation, management, and maintenance of BMPs in order to prevent sediment and other pollutants from leaving the site.

When it precipitates, stormwater washes over the loose soil on a construction site and various other materials and products being stored outside. As stormwater flows over the site, it can pick up pollutants like sediment, debris, and chemicals from the loose soil and transport them to nearby storm sewer systems or directly into rivers, lakes, or coastal waters.

The Missouri Department of Natural Resources is responsible for ensuring that construction site operators have the proper stormwater controls in place so that construction can proceed in a way that protects your community's clean water and the surrounding environment. One way the department helps protect water quality is by issuing land disturbance permits.

Local conditions are not considered when developing conditions for a general permit. A facility may apply for a site-specific permit if they desire a review of site-specific conditions.

PART II – RECEIVING STREAM INFORMATION

APPLICABLE DESIGNATIONS OF WATERS OF THE STATE:
Per Missouri Effluent Regulations (10 CSR 20-7.015), the waters of the state are divided into seven (7) categories. This permit applies to facilities discharging to the following water body categories:

- ✓ Missouri or Mississippi River [10 CSR 20-7.015(2)]
- ✓ Lakes or Reservoirs [10 CSR 20-7.015(3)]
- ✓ Losing Streams [10 CSR 20-7.015(4)]
- ✓ Metropolitan No-Discharge Streams [10 CSR 20-7.015(5)]
- ✓ Special Streams [10 CSR 20-7.015(6)]
- ✓ Subsurface Waters [10 CSR 20-7.015(7)]
- ✓ All Other Waters [10 CSR 20-7.015(8)]

Missouri Water Quality Standards (10 CSR 20-7.031) defines the Clean Water Commission water quality objectives in terms of "water uses to be maintained and the criteria to protect those uses." The receiving stream and/or 1st classified receiving stream's designated water uses shall be maintained in accordance with 10 CSR 20-7.031(24). A general permit does not take into consideration site-specific conditions.

MIXING CONSIDERATIONS:
This permit applies to receiving streams of varying low flow conditions. Therefore, the effluent limitations must be based on the smallest low flow streams considered, which includes waters without designated uses. As such, no mixing is allowed [10 CSR 20-7.031(5)(A)4.B.(I)(a)]. No Zone of Initial Dilution is allowed. [10 CSR 20-7.031(5)(A)4.B.(I)(b)].

RECEIVING STREAM MONITORING REQUIREMENTS:
There are no receiving water monitoring requirements recommended at this time.

PART III – RATIONALE AND DERIVATION OF EFFLUENT LIMITATIONS & PERMIT CONDITIONS

305(B) REPORT, 303(d) LIST, & TOTAL MAXIMUM DAILY LOAD (TMDL):
Section 305(b) of the Federal CWA requires each state identify waters not meeting Water Quality Standards and for which adequate water pollution controls have not been required. Water Quality Standards protect such beneficial uses of water as whole body contact, maintaining fish and other aquatic life, and providing drinking water for people, livestock, and wildlife. The 303(d) list helps state and federal agencies keep track of waters which are impaired but not addressed by normal water pollution control programs.

A TMDL is a calculation of the maximum amount of a given pollutant a body of water can absorb before its water quality is affected. If a water body is determined to be impaired as listed on the 303(d) list, then a watershed management plan will be developed which shall include the TMDL calculation. For facilities with an existing general permit before a TMDL is written on their receiving stream, the Department will evaluate the permit and may require any facility authorized by this general permit to apply for and obtain a site-specific operating permit.

ANTI-BACKSLIDING:
A provision in the Federal Regulations [CWA Section 303(d)(4); CWA Section 402(c); 40 CFR Part 122.44(I)] requires a reissued permit to be as stringent as the previous permit with some exceptions.
✓ Not Applicable: All effluent limitations in this permit are at least as protective as those previously established.

ANTIDEGRADATION:
Antidegradation policies ensure protection of water quality for a particular water body on a pollutant by pollutant basis to ensure Water Quality Standards are maintained to support beneficial uses such as fish and wildlife propagation and recreation on and in the water. This also includes special protection of waters designated as an Outstanding National Resource Water or Outstanding State Resource Water [10 CSR 20-7.031(3)(C)]. Antidegradation policies are adopted to minimize adverse effects on water.

The Department has determined the best avenue forward for implementing the Antidegradation requirements into general stormwater permits is by requiring the appropriate development and maintenance of a SWPPP. The SWPPP must identify all reasonable and effective BMPs, taking into account environmental impacts and costs. This analysis must document why no discharge or no exposure options are not feasible at the facility. This selection and documentation of appropriate control measures will then serve as the analysis of alternatives and fulfill the requirements of the Antidegradation Rule and Implementation Procedure 10 CSR 20-7.031(3) and 10 CSR 20-7.015(9)(A)5.

Any facility seeking coverage under this permit which undergoes expansion or discharges a new pollutant of concern must update their SWPPP and select reasonable and cost effective new BMPs. New facilities seeking coverage under this permit are required to develop a SWPPP including this analysis and documentation of appropriate BMPs. Renewal of coverage for a facility requires a review of the SWPPP to ensure the selected BMPs continue to be appropriate.
✓ Applicable; the facility must review and maintain stormwater BMPs as appropriate.

BENCHMARKS:
When a permitted feature or outfall consists of only stormwater, a benchmark may be implemented at the discretion of the permit writer. Benchmarks require the facility to monitor and, if necessary, replace and update stormwater control measures. Benchmark concentrations are not effluent limitations. A benchmark exceedance, therefore, is not a permit violation; however, failure to take corrective action is a violation of the permit. Benchmark monitoring data is used to determine the overall effectiveness of control measures and to assist the permittee in knowing when additional corrective actions may be necessary to comply with the limitations of the permit.
✓ Not applicable; this permit does not contain numeric benchmarks.

BEST MANAGEMENT PRACTICES (BMPS):
Minimum site-wide BMPs are established in this permit to ensure all permittees are managing their sites equally to protect waters of the state from certain activities which could cause negative effects in receiving water bodies. While not all sites require a SWPPP because the SIC codes are specifically exempted in 40 CFR 122.26(b)(14), these BMPs are not specifically included for stormwater purposes. These practices are minimum requirements for all industrial sites to protect waters of the state. If the minimum BMPs are not followed, the facility may violate general criteria [10 CSR 20-7.031(4)]. Statutes are applicable to all permitted facilities in the state; therefore, pollutants cannot be released unless in accordance with RSMo 644.011 and 644.016 (17).

CHANGES IN DISCHARGES OF TOXIC POLLUTANT:
This special condition reiterates the federal rules found in 40 CFR 122.44(f) and 122.42(a)(1). In these rules, the facility is required to report changes in amounts of toxic substances discharged. Toxic substances are defined in 40 CFR 122.2 as "...any pollutant listed as toxic under section 307(a)(1) or, in the case of "sludge use or disposal practices," any pollutant identified in regulations implementing section 405(d) of the CWA." Section 307 of the CWA then refers to those parameters found in 40 CFR 401.15.

The permittee should also consider any other toxic pollutant in the discharge as reportable under this condition.

EFFLUENT LIMITATION GUIDELINE:
Effluent Limitation Guidelines, or ELGs, are found at 40 CFR 400-499. These are limitations established by the EPA based on the SIC code and the type of work a facility is conducting. Most ELGs are for process wastewater and some address stormwater. All are technology based limitations which must be met by the applicable facility at all times.

✓ The industries covered under this permit have an associated Effluent Limit Guideline (ELG) which is applicable to the stormwater discharges in this permit and is applied under 40 CFR 125.3(a).

ELECTRONIC DISCHARGE MONITORING REPORT (EDMR) SUBMISSION SYSTEM:
The U.S. Environmental Protection Agency (EPA) promulgated a final rule on October 22, 2015, to modernize CWA reporting for municipalities, industries, and other facilities by converting to an electronic data reporting system. The final rule requires regulated entities and state and federal regulators to use information technology to electronically report data required by the National Pollutant Discharge Elimination System (NPDES) permit program instead of filing paper reports. To comply with the federal rule, the Department is requiring all permittees to begin submitting discharge monitoring data and reports online.

✓ Applicable; this permit requires quarterly reports.

GENERAL CRITERIA CONSIDERATIONS:
In accordance with 40 CFR 122.44(d)(1), effluent limitations shall be placed into permits for pollutants determined to cause, have reasonable potential to cause, or to contribute to, an excursion above any water quality standard, including narrative water quality criteria. In order to comply with this regulation, the permit writer has completed a reasonable potential determination on whether discharges have reasonable potential to cause or contribute to an excursion of the general criteria listed in 10 CSR 20-7.031(4). In instances where reasonable potential exists, the permit includes limitations within the permit to address the reasonable potential. In discharges where reasonable potential does not exist, the permit may include monitoring to later determine the discharge's potential to impact the narrative criteria. Additionally, RSMo 644.076.1, as well as Standard Permit Conditions Part VIII of this permit state it shall be unlawful for any person to cause or allow any discharge of water contaminants from any water contaminant or point source located in Missouri in violation of sections 644.006 to 644.141 of the Missouri Clean Water Law or any standard, rule, or regulation promulgated by the commission.

LAND APPLICATION:
Land application, or surficial dispersion of wastewater and/or sludge, is performed by facilities to maintain a basin as no-discharge. Requirements for these types of operations are found in 10 CSR 20-6.015; authority to regulate these activities is from RSMo 644.026.

✓ Not applicable; this permit does not authorize operation of a surficial land application system to disperse wastewater or sludge.

LAND DISTURBANCE:
Land disturbance, sometimes called construction activities, are actions which cause disturbance of the root layer or soil; these include clearing, grading, and excavating of the land. 40 CFR 122.26(b)(14) and 10 CSR 20-6.200(3) requires permit coverage for these activities. Coverage is not required for facilities when only providing maintenance of original line and grade, hydraulic capacity, or to continue the original purpose of the facility.

✓ Applicable; this permit provides coverage for land disturbance activities. These activities have SWPPP requirements and may be combined with the standard site SWPPP. Land disturbance BMPs should be designed to control the expected peak discharges. The University of Missouri has design storm events for the 25 year 24 hour storm; these can be found at: http://ag3.agebb.missouri.edu/design_storm/comparison_reports/20191117_25yr_24hr_comparison_table.htm; to calculate peak discharges, the website https://www.lmnoeng.com/Hydrology/rational.php has the rational equation to calculate expected discharge volume from the peak storm events.

NUTRIENT MONITORING:
Nutrient monitoring is required for facilities characteristically or expected to discharge nutrients (nitrogenous compounds and/or phosphorus) when the design flow is equal to or greater than 0.1 MGD per 10 CSR 20-7.015(9)(D)8.

✓ This is a stormwater only permit; therefore, it is not subject to provisions found in 10 CSR 20-7.015 per 10 CSR 20-7.015(1)(C).

OIL/WATER SEPARATORS:
Oil water separator (OWS) tank systems are frequently found at industrial sites where process water and stormwater may contain oils and greases, oily wastewaters, or other immiscible liquids requiring separation. Food industry discharges typically require pretreatment prior to discharge to municipally owned treatment works. Per 10 CSR 26-2.010(2)(B), all oil water separator tanks must be operated according to manufacturer's specifications and authorized in NPDES permits per 10 CSR 26-2.010(2) or may be regulated as a petroleum tank.

✓ Not applicable; this permit does not authorize the operation of OWS. The facility must obtain a separate permit to cover operation of and discharge from these devices.

PERMIT SHIELD:
The permit shield provision of the CWA (Section 402(k)) and Missouri Clean Water Law (644.051.16 RSMo) provides that when a permit holder is in compliance with its NPDES permit or MSOP, they are effectively in compliance with certain sections of the CWA and equivalent sections of the Missouri Clean Water Law. In general, the permit shield is a legal defense against certain enforcement actions but is only available when the facility is in compliance with its permit and satisfies other specific conditions, including having completely disclosed all discharges and all facility processes and activities to the Department at time of application. It is the facility's responsibility to ensure that all potential pollutants, waste streams, discharges, and activities, as well as wastewater land application, storage, and treatment areas, are all fully disclosed to the Department at the time of application or during the draft permit review process. Subsequent requests for authorization to discharge additional pollutants or expanded or newly disclosed flows, or for authorization for previously unpermitted and undisclosed activities or discharges, will likely require permit modification or may require the facility be covered under a site specific permit.

PRETREATMENT PROGRAM:
This permit does not regulate pretreatment requirements for facilities discharging to an accepting permitted wastewater treatment facility. If applicable, the receiving entity (the publicly owned treatment works - POTW) must ensure compliance with any effluent limitation guidelines for pretreatment listed in 40 CFR Subchapter N per 10 CSR 20-6.100. Pretreatment regulations per RSMo 644.016 are limitations on the introduction of pollutants or water contaminants into publicly owned treatment works or facilities.

✓ Not Applicable; the facilities covered under this permit are not required to meet pretreatment requirements under an ELG.

PUBLIC NOTICE OF COVERAGE FOR AN INDIVIDUAL FACILITY:
Public Notice of reissuance of coverage is not required unless the facility is a specific type of facility as defined in 10 CSR 20-6.200(1). The need for an individual public notification process shall be determined and identified in the permit [10 CSR 20-6.020(1)(C)5.].

✓ Not applicable; public notice is not required for coverage under this permit to individual facilities. The MGP is public noticed in lieu of individual permit PN requirements.

REASONABLE POTENTIAL ANALYSIS (RPA):
Federal regulation 40 CFR Part 122.44(d)(1)(i) requires effluent limitations for all pollutants which are or may be discharged at a level which will cause or have the reasonable potential to cause or contribute to an in-stream excursion above narrative or numeric water quality standard. In accordance with 40 CFR Part 122.44(d)(iii) if the permit writer determines any given pollutant has the reasonable potential to cause or contribute to an in-stream excursion above the water quality standard, the permit must contain effluent limits for the pollutant.

✓ The permit writer reviewed industry materials, available past inspections, and other documents and research to evaluate general and narrative water quality reasonable potential for this permit. Permit writers also use the Department's permit writer's manual, the EPA's permit writer's manual (https://www.epa.gov/npdes/npdes-permit-writers-manual), program policies, and best professional judgment. For each parameter in each permit, the permit writer carefully considers all applicable information regarding technology based effluent limitations, effluent limitation guidelines, and water quality standards. Best professional judgment is based on the experience of the permit writer, cohorts in the Department and resources at the EPA, research, and maintaining continuity of permits if necessary. For stormwater permits, the permit writer is required per 10 CSR 6.200(6)(B)2 to consider: A. application and other information supplied by the permittee; B. effluent guidelines; C. best professional judgment of the permit writer; D. water quality; and E. BMPs.

SCHEDULE OF COMPLIANCE (SOC):
Per § 644.051, RSMo, a permit may be issued with a Schedule of Compliance (SOC) to provide time for a facility to come into compliance with new state or federal effluent regulations, water quality standards, or other requirements. Such a schedule is not allowed if the facility is already in compliance with the new requirement or if prohibited by other statute or regulation. An SOC includes an enforceable sequence of interim requirements (e.g. actions, operations, or milestone events) leading to compliance with the Missouri Clean Water Law, its implementing regulations, and/or the terms and conditions of an operating permit. *See also* Section 502(17) of the CWA, and 40 CFR 122.2. For new effluent limitations, the permit may include interim monitoring for the specific parameter to demonstrate the facility is not already in compliance with the new requirement. Per 40 CFR 122.47(a)(1) and 10 CSR 20-7.031(11), compliance must occur as soon as possible. If the permit provides a schedule for meeting new water quality based effluent limits, an SOC must include an enforceable, final effluent limitation in the permit even if the SOC extends beyond the life of the permit.
✓ Not Applicable: This permit does not contain a SOC.

SETBACKS:
Setbacks, sometimes called separation distances, are common elements of permits and are established to provide a margin of safety in order to protect the receiving water and other features from accidents, spills, unusual events, etc. Specific separation distances are included in 10 CSR 20-8 for minimum design standards of wastewater structures. While wastewater is considered separately from stormwater under this permit, the guides and Chapter 8 distances may remain relevant to requirements under this permit if deemed appropriate by the permittee.
✓ Discharge to the watersheds of a Metropolitan No-Discharge Stream (10 CSR 20-7.031 Table F) is authorized by this permit if the discharges are in compliance with 10 CSR 20-7.015(5) and 10 CSR 20-7.031(7). Discharges to these watersheds are authorized for uncontaminated stormwater discharges only.
✓ This permit authorizes stormwater discharges which are located in a way to allow water to be released into sinkholes, caves, fissures, or other openings in the ground which could drain into aquifers (except losing streams) per 10 CSR 20-7.015(7). It is the best professional judgment of the permit writer to allow discharges to losing streams as the effluent is stormwater only.
✓ This permit authorizes stormwater discharge in the watersheds of Outstanding state Resource Waters (OSRW); Outstanding National Resources Waters (ONRW), which includes the Ozark National Riverways and the National Wild and Scenic Rivers System; and impaired waters as designated in the 305(b) Report provided no degradation of water quality occurs in the OSRW and ONRW due to discharges from the permitted facility per 10 CSR 20-7.015(6)(B) and 10 CSR 20-7.031(3)(C). Additionally, if the facility is found to be causing degradation or contributing to an impairment by discharging a pollutant of concern during an inspection or through complaint investigations, they will be required to become a no discharge facility or obtain a site specific permit with more stringent monitoring and SWPPP requirements. Missouri's impaired waters can be found at https://dnr.mo.gov/water/what-were-doing/water-planning/quality-standards-impaired-waters-total-maximum-daily-loads/impaired-waters. Sites within 1000 feet of a OSRW, ONRW, or water impaired for sediment must operate as a no-discharge facility. These additional protections are borrowed from the USEPA 2021 draft Construction General Permit.

SLUDGE – DOMESTIC BIOSOLIDS:
Biosolids are solid materials resulting from domestic wastewater treatment meeting federal and state criteria for beneficial use (i.e. fertilizer). Sewage sludge is solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works; including, but not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment process; and material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screening generated during preliminary treatment of domestic sewage in a treatment works.

✓ This permit does not authorize discharge or land application of biosolids. Sludge/biosolids is not generated by this industry.

SLUDGE – INDUSTRIAL:
Industrial sludge is solid, semi-solid, or liquid residue generated during the treatment of industrial process wastewater in a treatment works; including, but not limited to, scum or solids removed in primary, secondary, or advanced wastewater treatment process; scum and solids filtered from water supplies and backwashed; and a material derived from industrial sludge.

✓ Not applicable; sludge is not generated by this industry.

SPILL REPORTING:
Any emergency involving a hazardous substance must be reported to the Department's 24 hour Environmental Emergency Response hotline at (573) 634-2436 at the earliest practicable moment after discovery. The Department may require the submittal of a written report detailing measures taken to clean up a spill. These reporting requirements apply when the spill results in chemicals or materials leaving the permitted property or reaching waters of the state. This requirement is in addition to the noncompliance reporting requirement found in Standard Conditions Part I. https://dnr.mo.gov/waste-recycling/investigations-cleanups/environmental-emergency-response.

Underground and above ground storage devices for petroleum products, vegetable oils, and animal fats may be subject to control under federal Spill Prevention, Control, and Countermeasure Regulation and are expected to be managed under those provisions, if applicable. Substances regulated by federal law under the Resource Conservation and Recovery Act (RCRA) or the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) which are transported, stored, or used for maintenance, cleaning or repair shall be managed according to the provisions of RCRA and CERCLA.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):
In accordance with 40 CFR 122.44(k), BMPs must be used to control or abate the discharge of pollutants when: 1) Authorized under section 304(e) of the CWA for the control of toxic pollutants and hazardous substances from ancillary industrial activities; 2) Authorized under section 402(p) of the CWA for the control of stormwater discharges; 3) Numeric effluent limitations are infeasible; or 4) the practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA. In accordance with the EPA's *Developing Your Stormwater Pollution Prevention Plan: A Guide for Construction Sites,* (Document number EPA 833-R-06-004) published by the EPA in 2007 https://www.epa.gov/sites/production/files/2015-10/documents/sw_swppp_guide.pdf, BMPs are measures or practices used to reduce the amount of pollution entering waters of the state from a permitted facility. BMPs may take the form of a process, activity, or physical structure. Additionally, in accordance with the Stormwater Management, a SWPPP is a series of steps and activities to 1) identify sources of pollution or contamination, and 2) select and carry out actions which prevent or control the pollution of storm water discharges. Additional information can be found in *Stormwater Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices* (EPA 832-R-92-006; September 1992).

A SWPPP must be prepared if the SIC code for the facility is found in 40 CFR 122.26(b)(14) and/or 10 CSR 20-6.200(2). A SWPPP may be required of other facilities where stormwater has been identified as necessitating better management.

The purpose of a SWPPP is to comply with all applicable stormwater regulations by creating an adaptive management plan to control and mitigate stream pollution from stormwater runoff. Developing a SWPPP provides opportunities to employ appropriate BMPs to minimize the risk of pollutants being discharged during storm events. The following paragraph outlines the general steps the permittee should take to determine which BMPs will work to achieve the benchmark values or limits in the permit. This section is not intended to be all encompassing or restrict the use of any physical BMP or operational and maintenance procedure assisting in pollution control. Additional steps or revisions to the SWPPP may be required to meet the requirements of the permit.

Areas which should be included in the SWPPP are identified in 40 CFR 122.26(b)(14). Once the potential sources of stormwater pollution have been identified, a plan should be formulated to best control the amount of pollutant being released and discharged by each activity or source. This should include, but is not limited to, minimizing exposure to stormwater, good housekeeping measures, proper facility and equipment maintenance, spill prevention and response, vehicle traffic control, and proper materials handling. Once a plan has been developed, the facility will employ the control measures determined to be adequate to prevent pollution from entering waters of the state. The facility will conduct inspections of the BMPs to ensure they are working properly and re-evaluate any BMP not achieving compliance with permitting requirements. For example if the BMP being employed is deficient in controlling stormwater pollution, corrective action should be taken to repair, improve, or replace the failing BMP. If failures do occur, continue this trial and error process until appropriate BMPs have been established.

The EPA has developed factsheets on the pollutants of concern for specific industries along with the BMPs to control and minimize stormwater (https://www.epa.gov/npdes/stormwater-discharges-industrial-activities). Along with EPA's factsheets, the International Stormwater BMP database (https://bmpdatabase.org/) may provide guidance on BMPs appropriate for specific industries.

For new, altered, or expanded stormwater discharges, the SWPPP shall identify reasonable and effective BMPs while accounting for environmental impacts of varying control methods. The antidegradation analysis must document why no discharge or no exposure options are not feasible. The selection and documentation of appropriate control measures shall serve as an alternative analysis of technology and fulfill the requirements of antidegradation [10 CSR 20-7.031(3)].

Alternative analysis evaluation of the BMPs is a structured evaluation of BMPs which are reasonable and cost effective. The alternative analysis evaluation should include practices designed to be: 1) non-degrading; 2) less degrading; or 3) degrading water quality. The glossary of the *Antidegradation Implementation Procedure* defines these three terms. The chosen BMP will be the most reasonable and effective management strategy while ensuring the highest statutory and regulatory requirements are achieved and the highest quality water attainable for the facility is discharged. The alternative analysis evaluation must demonstrate why "no discharge" or "no exposure" is not a feasible alternative at the facility. This structured analysis of BMPs serves as the antidegradation review, fulfilling the requirements of 10 CSR 20-7.031(3) Water Quality Standards and *Antidegradation Implementation Procedure*, Section II.B.

✓ Applicable: A SWPPP shall be developed and implemented for each site and shall incorporate required practices identified by the Department with jurisdiction, incorporate control practices specific to site conditions, and provide for maintenance and adherence to the plan.

UNDERGROUND INJECTION CONTROL (UIC):
The UIC program for all classes of wells in the State of Missouri is administered by the Missouri Department of Natural Resources and approved by EPA pursuant to section 1422 and 1425 of the Safe Drinking Water Act (SDWA) and 40 CFR 147 Subpart AA. Injection wells are classified based on the liquids which are being injected. Class I wells are hazardous waste wells which are banned by RSMo 577.155; Class II wells are established for oil and natural gas production; Class III wells are used to inject fluids to extract minerals; Class IV wells are also banned by Missouri in RSMo 577.155; Class V wells are shallow injection wells; some examples are heat pump wells and groundwater remediation wells. Domestic wastewater being disposed of sub-surface is also considered a Class V well.

In accordance with 40 CFR 144.82, construction, operation, maintenance, conversion, plugging, or closure of injection wells shall not cause movement of fluids containing any contaminant into Underground Sources of Drinking Water (USDW) if the presence of any contaminant may cause a violation of drinking water standards or groundwater standards under 10 CSR 20-7.031 or other health-based standards or may otherwise adversely affect human health. If the Department finds the injection activity may endanger USDWs, the Department may require closure of the injection wells or other actions listed in 40 CFR 144.12(c), (d), or (e). In accordance with 40 CFR 144.26, the permittee shall submit a Class V Well Inventory Form for each active or new underground injection well drilled, or when the status of a well changes, to the Missouri Department of Natural Resources, Geological Survey Program, P.O. Box 250, Rolla, Missouri 65402. Single family residential septic systems and non-residential septic systems used solely for sanitary waste and having the capacity to serve fewer than 20 persons a day are excluded from the UIC requirements (40 CFR 144.81(9)).

✓ Not applicable; this permit does not authorize subsurface wastewater systems or other underground injection. These activities must be assessed under an application for a site specific permit. Certain discharges of stormwater into sinkholes may qualify as UIC. It is important the permittee evaluate all stormwater basins, even those holding water; as sinkholes have varying seepage rates. This permit does not allow stormwater discharges into sinkholes. The facility must ensure sinkholes are avoided in the construction process. The State's online mapping resource https://modnr.maps.arcgis.com/apps/webappviewer/index.html?id=87ebef4af15d438ca658ce0b2bbc862e has a sinkhole layer.

VARIANCE:
Per the Missouri Clean Water Law Section 644.061.4, variances shall be granted for such period of time and under such terms and conditions as shall be specified by the commission in its order. The variance may be extended by affirmative action of the commission. In no event shall the variance be granted for a period of time greater than is reasonably necessary for complying with the Missouri Clean Water Law Section 644.006 to 644.141 or any standard, rule, or regulation promulgated pursuant to Missouri Clean Water Law Section 644.006 to 644.141.
✓ Not Applicable: This permit is not drafted under premises of a petition for variance.

WASTELOAD ALLOCATIONS (WLA) FOR LIMITATIONS:
Per 10 CSR 20-2.010(78), the amount of pollutant each discharger is allowed by the Department to release into a given stream after the Department has determined total amount of pollutant which may be discharged into the stream without endangering its water quality. Water quality based maximum daily and average monthly effluent limitations were calculated using methods and procedures outlined in USEPA's Technical Support Document For Water Quality-based Toxics Control (TSD) (EPA/505/2-90-001).
✓ Not applicable; water quality limitations were not applied in this permit.

WATER QUALITY STANDARDS:
Per 10 CSR 20-7.031(4), General Criteria shall be applicable to all waters of the state at all times, including mixing zones. Additionally, 40 CFR 122.44(d)(1) directs the Department to include in each NPDES permit conditions to achieve water quality established under Section 303 of the CWA, including state narrative criteria for water quality.

WHOLE EFFLUENT TOXICITY (WET) TEST:
Per 10 CSR 20-7.031(1)(FF), a toxicity test conducted under specified laboratory conditions on specific indicator organism; and per 40 CFR 122.2, the aggregate toxic effect of an effluent measured directly by a toxicity test. A WET test is a quantifiable method of determining if a discharge from a facility may be causing toxicity to aquatic life by itself, in combination with, or through synergistic responses when mixed with receiving water.
✓ Not applicable: At this time, permittees are not required to conduct a WET test. This permit is for stormwater only.

PART IV – EFFLUENT LIMITATIONS DETERMINATION

EPA Construction General Permit (CGP)
The CGP was used to research and support best professional judgment decisions made in establishing technology-based conditions for this general permit which are consistent with national standards. The permit writer determined the standards established by the CGP are achievable and consistent with federal regulations. Additionally, the conditions reflecting the best practicable technology currently available are utilized to implement the ELG.

In this general permit, technology-based effluent conditions are established through the SWPPP and BMP requirements. Effective BMPs should be designed on a site-specific basis. The implementation of inspections provides a tool for each facility to evaluate the effectiveness of BMPs to ensure protection of water quality. Any flow through an outfall is considered a discharge. Future permit action due to permit modification may contain new operating permit terms and conditions which supersede the terms and conditions, including effluent limitations, of this operating permit.

PART V–REPORTING REQUIREMENTS

SAMPLING:
The permittee is not required to sample stormwater under this permit. The Department may require sampling and reporting as a result of illegal discharges, compliance issues related to water quality concerns or BMP effectiveness, or evidence of off-site impacts from activities at the facility. If such an action is needed, the Department will specify in writing the sampling requirements, including such information as location and extent. If the permittee refuses to perform sampling when required, the Department may terminate the general permit and require the facility to obtain a site-specific permit with sampling requirements.

REPORTING:
There are quarterly reporting requirements for MO-R100xxx land disturbance permits. Project specific information is required to be report to the Department through the eDMR system.

PART VI – RAINFALL VALUES FOR MISSOURI & SURFACE WATER BUFFER ZONES

Knowledge of the 2-year, 24-hour storm event is used in this permit for two main reasons:
1) The design, installation, and maintenance of effective erosion and sediment controls to minimize the discharge of pollutants.
2) If the seven-day inspection frequency is utilized, an inspection must occur within 48 hours after any storm event equal to or greater than a 2-year, 24 hour storm has ceased.
For site-specific 2-year, 24-hour storm event information utilize the National Oceanic and Atmospheric Administration's National Weather Service Atlas 14 (NOAA Atlas 14) which is located at https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html. For more information visit; https://www.weather.gov/media/owp/oh/hdsc/docs/Atlas14_Volume8.pdf.

Surface Water Buffer Zones: In order to design controls that match the sediment removal efficiency of a 50-foot buffer, you first need to know what this efficiency is for your site. The sediment removal efficiencies of natural buffers vary according to a number of site-specific factors, including precipitation, soil type, land cover, slope length, width, steepness, and the types of erosion and sediment controls used to reduce the discharge of sediment prior to the buffer. For additional information; https://www.epa.gov/sites/default/files/2017-02/documents/2017_cgp_final_appendix_g_-_buffer_reqs_508.pdf

PART VII – ADMINISTRATIVE REQUIREMENTS

On the basis of preliminary staff review and applicable standards and regulations, the Department, as administrative agent for the Missouri Clean Water Commission, proposes to issue a permit(s) subject to certain effluent limitations, schedules, and special conditions contained herein and within the permit. The proposed determinations are tentative pending public comment.

PUBLIC MEETING:
The department hosted three public meetings for this permit. The meetings were held on January 27, February 17, and March 9, 2021.

PUBLIC NOTICE:
The Department shall give public notice when a draft permit has been prepared and its issuance is pending. Additionally, public notice will be issued if a public hearing is to be held because of a significant degree of interest or because of water quality concerns related to a draft permit. No public notice is required when a request for a permit modification or termination is denied; however, the requester and facility must be notified of the denial in writing.

The Department must give public notice of a pending permit or of a new or reissued Missouri State Operating Permit. The public comment period is a length of time not less than thirty (30) days following the date of the public notice, during which interested persons may submit written comments about the proposed permit.

For persons wanting to submit comments regarding this proposed permit, please refer to the Public Notice page located at the front of this draft permit. The Public Notice page gives direction on how and where to submit appropriate comments.

- ✓ The Public Notice period for this permit is started March 25, 2022 and ended April 25, 2022. Two comment letters were received.

DATE OF FACT SHEET: 03/2/2022

COMPLETED BY:
SARAH WRIGHT
MS4 & LAND DISTURBANCE PERMITTING COORDINATOR
MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
OPERATING PERMITS SECTION - STORMWATER AND CERTIFICATION UNIT
(573) 526-1139
Sarah.wright@dnr.mo.gov, dnr.generalpermits@dnr.mo.gov

SECTION 01580 – PROJECT SIGNS

PART 1 - GENERAL

1.01 SUMMARY

A. Design-Builder shall provide all material, labor and equipment necessary for the fabrication, printing, and installation of Project signs.

B. This section covers project sign requirements for all Owner projects which includes the following:

1. Project identification sign description
2. Project sign installation
3. Maintenance and removal of Project sign
4. Printing of signs
5. Installation of signs

1.02 SPECIFICATION MODIFICATIONS

A. It is understood that throughout this section these Specifications may be modified by appropriate items in Contract Documents, or as otherwise indicated on the Drawings.

1.03 RELATED SECTIONS

A. Section 01581 – Public Communications

1.04 INFORMATION PROVIDED BY OWNER

A. Owner shall provide the graphic design templates of the Project sign in an electronic format to be used in the printing process.

1.05 SUBMITTALS

A. Submit as specified in Section 01330 – Submittals.

B. Other

1. Project Sign Locations: Submit for review and approval a map of the Project area of marked up Drawings showing the location and orientation of each project sign.
2. Submit for review and approval notifications to homeowners and business adjacent to the location of the Project signs.
3. Re-use of Placards: If Design-Builder has salvaged placards from previous projects, they may be re-used if approved by Owner. Submit color photographs that accurately show the condition of each placard to be re-used for review and approval.
4. Notice of Removal: Submit written notification to Owner that all Project signs have been removed.

PART 2 - PRODUCTS

2.01 PRINTERS

A. A list of printing companies that have previous experience may be provided by Owner upon requested by Design-Builder.

2.02 FRAME

A. Metal frame and hardware shall be in conformance with Water Services standard detail D-20142 – Installation Detail for Project Signs (see Figure 3).

2.03 PLACARDS

A. Upper Placard Size: 6 feet wide by 4 feet tall.
B. Lower Placard Size: 6 feet wide by 1 foot tall.
C. Material: Coroplast® corrugated plastic sheeting or approved equal.
D. Sheeting Thickness: 10 mm (approximately one-half (3/8) inch thickness).
E. Sheeting Color: White.
F. Print Method: Direct to Coroplast® with outdoor UV laminate coating.

2.04 PLACARD CONTENT

A. Construction Phase Upper Placard: For each project sign Design-Builder shall provide an upper placard which will be displayed through construction. An example of the Construction Phase Upper Placard is shown in Figure 1.
B. Lower Placard: For each project sign, Design-Builder shall provide a lower placard. Example of the Lower Placard is shown in Figure 1.
C. Owner will provide graphic images for all placards.

2.05 NUMBER OF SIGNS TO BE PROVIDED

A. One project sign to be provided and include the following:
   1. One Construction Phase Upper Placard to be displayed during construction.
B. Frames as shown in Water Services standard detail D-20142 – Installation Detail for Project Signs (see Figure 2).

PART 3 - EXECUTION

3.01 INSTALLATION AND PLACEMENT OF SIGNS

A. Installation: Project signs shall be fabricated and installed in accordance with Water Services standard detail D-20142 – Installation Detail for Project Signs (see Figure 2).
B. Location: Project signs shall be located within the Site as required by Owner. Project signs shall be erected in a conspicuous place but shall not interfere with the vision of pedestrian or vehicular traffic such as to create a hazard. Locations of signs shall be coordinated with Owner prior to installation and submitted accordance with Paragraph 1.05 of this Section.
C. Notifications: Design-Builder shall notify any homeowners or businesses adjacent to the location of the signs at least three days prior to erecting signs.
D. Project sign(s) shall be erected not less than two days before the start of construction activities. No construction activities are allowed until the Project signs are erected.
E. Project signs shall remain in place for the duration of the Project and shall be maintained true, plumb, and in neat condition.

3.02 REMOVAL OF PROJECT SIGNS

A. All Project signs shall be maintained for 30 calendar days after completion of the Work, or as otherwise directed by Owner.
B. Design-Builder shall remove all Project signs and restore the area disturbed by construction activities.
C. Project signs shall be removed from the Project areas and will become property of Design-Builder.
D. Design-Builder may dispose of Project signs or salvage and reuse them on future Owner projects. Owner will assess the condition of the signs and determine the appropriateness of reuse.
E. Within three days of removal of signs, Design-Builder shall provide Owner written notice that all Project signs have been removed from the site.

END OF SECTION



EXAMPLE Obtain Graphic from city

Figure 1 – Example Construction Phase Upper Placard and Lower Placard

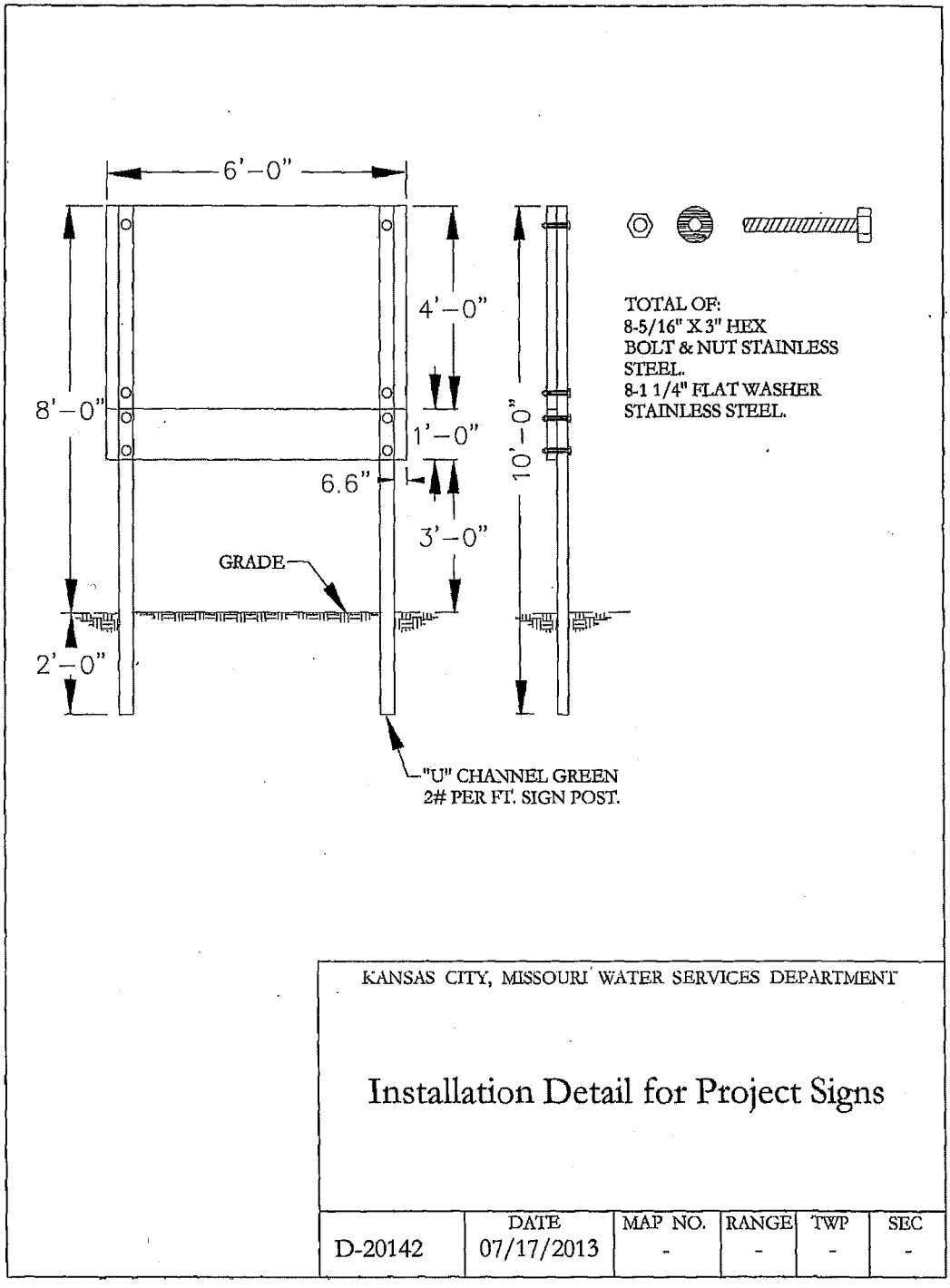


Figure 2 – Installation Detail for Project Sign

SECTION 01581 – PUBLIC COMMUNICATIONS

PART 1 - GENERAL

1.01 SUMMARY

A. This section covers communication procedures between Design-Builder and the general public affected by construction activities.

B. All written communications between Design-Builder and the public shall be subject to review and approval by Owner.

1.02 DEFINITIONS

A. Affected Properties: Homeowners, businesses, tenants or other entities whose everyday activities could be affected by the Work.

1.03 INFORMATION PROVIDED BY OWNER

A. Owner will provide Design-Builder an electronic mailing list of affected property owners as needed for the Project.

B. Owner may provide Design-Builder an electronic copy of approved communications (such as door hangers) to be distributed to affected properties.

1.04 SUBMITTALS

A. Submit as specified in Section 01330 – Submittals.

B. Notifications: Submit for review and approval all notifications developed by Design-Builder that are to be distributed affected properties.

1.05 DOOR HANGERS AND OTHER PRINTED COMMUNICATIONS

A. Description: Door hangers and other printed communications (fact sheets, post cards, signs, etc.) throughout construction shall be distributed to inform homes and businesses of disruptions.

B. Template: Owner will provide templates for door hangers and other printed communications in an electronic format. See Figures 1 through 5 for an example door hanger.

C. Template Modification: Design-Builder may need to annotate the printed door hangers with project specific information. This effort may include checking a box to describe the work and adding an applicable date and time.

D. Review Submittal: Not required.

E. Printing and Reproduction: Design-Builder shall print door hangers and other communications.

F. Distribution List: The list of affected property owners will be provided by Owner.

G. Mailing and Distribution: Design-Builder shall distribute the door hangers or other printed communications to the affected property owners. Door hangers are to be hand-delivered. Other printed communications will be delivered in a manner acceptable to Owner.

H. Costs: Costs to develop, reproduce, deliver or mail notifications shall be included in Contract Price.

1.06 NOTICES TO PROPERTY OWNERS AND AUTHORITIES

A. Design-Builder shall notify adjacent property owners and utilities when execution of the Work may affect them.

B. Work Notice
   1. General notice to affected property owners in advance of the work. Notice is required for any work within an easement. Notice may be given for work within the Owner's right-of-way.
   2. Type of notification shall be a door hanger.

C. Denial of Access
   1. Notice for when it is necessary to temporarily deny access to property, driveway, sidewalk, or other facility.
   2. Type of notification shall be a door hanger.

D. Smoke Testing
   1. Notice for when the Project involves smoke testing.
   2. Type of notification shall be a door hanger.

E. Utility Service Interruption
   1. Notice for when any utility service connection must be interrupted.
   2. Type of notification shall be a door hanger.

F. Street Closures and Changes to Traffic Patterns
   1. Notices to utilities and other concerned agencies prior to cutting or closing streets or other traffic areas or excavating near underground utilities or pole lines.
   2. Type of notification will be written communication prepared and distributed by Design-Builder.

G. Schedule: Notices shall be received by the affected properties no less than two and no more than seven calendar days prior to the work, Denial of Access, Smoke Testing, Utility Service Interruption, Street Closures and Changes to Traffic Patterns, or other work that may require notification

1.07 OTHER COMMUNICATIONS

A. See Contract Documents for additional communication requirements not specifically included herein or otherwise required by the Contract Documents.

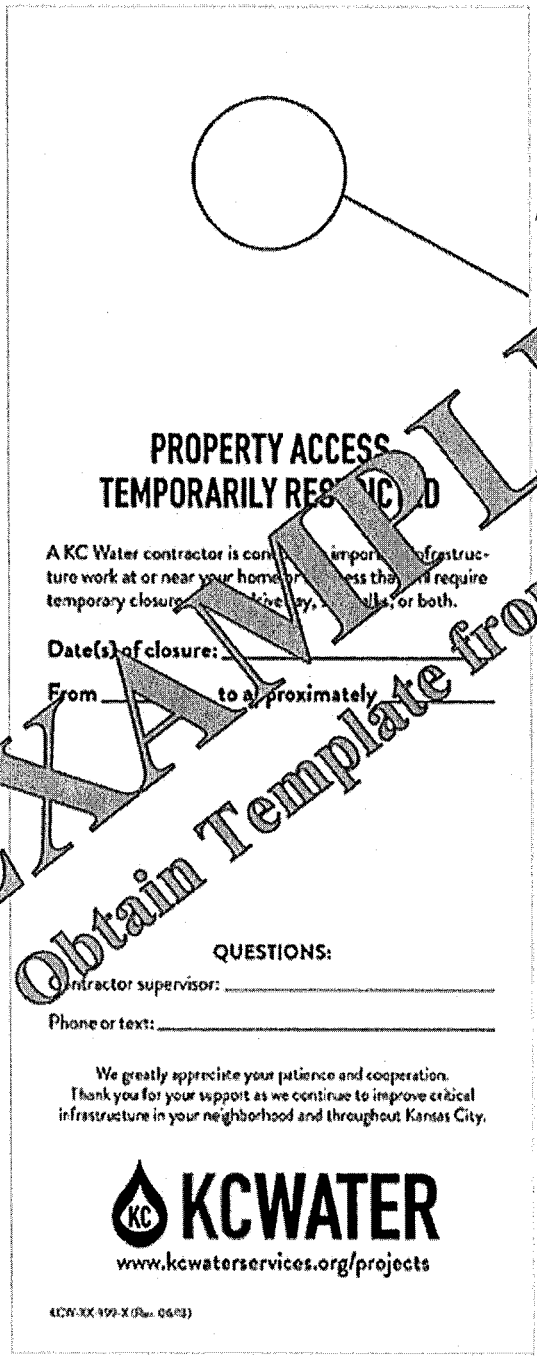
PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

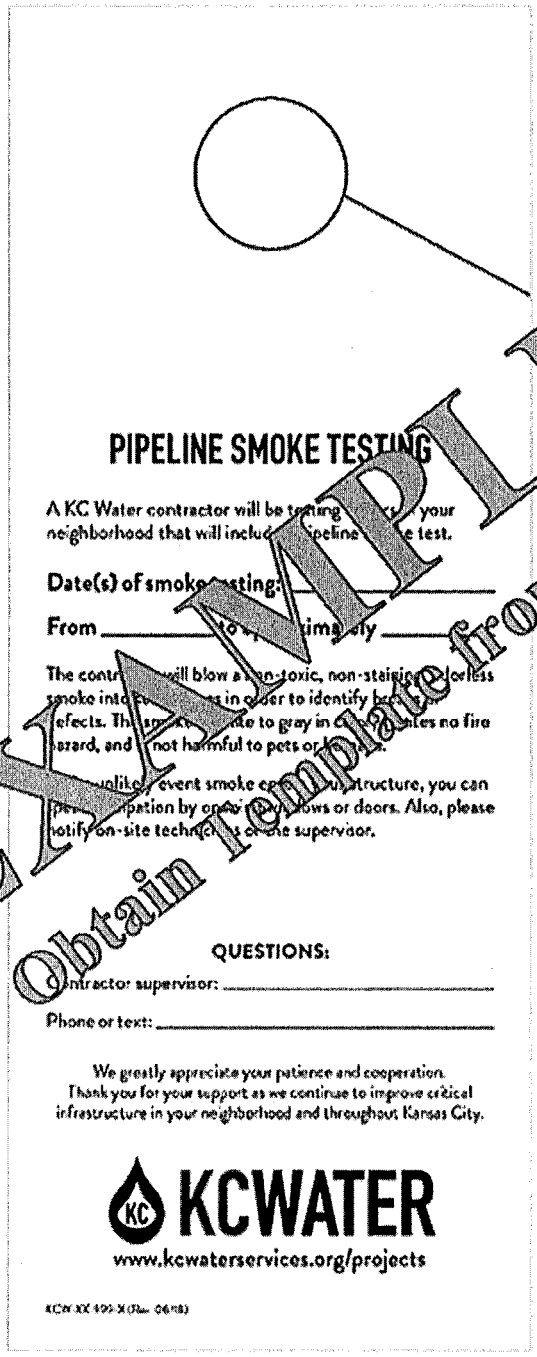
3.01 See Figures 1 through 6.

END OF SECTION



EXAMPLE
Obtain Template from City

Figure 1 – Denial of Access Door Hanger



PIPELINE SMOKE TESTING

A KC Water contractor will be testing [illegible] your neighborhood that will include [illegible] pipeline [illegible] test.

Date(s) of smoke testing: _____

From _____ to approximately _____

The contractor will blow a non-toxic, non-staining, odorless smoke into [illegible] in order to identify [illegible] defects. The smoke [illegible] white to gray in color, creates no fire hazard, and is not harmful to pets or humans.

In the unlikely event smoke enters your structure, you can prevent its occupation by opening windows or doors. Also, please notify on-site technicians or the supervisor.

QUESTIONS:

Contractor supervisor: _____

Phone or text: _____

We greatly appreciate your patience and cooperation. Thank you for your support as we continue to improve critical infrastructure in your neighborhood and throughout Kansas City.

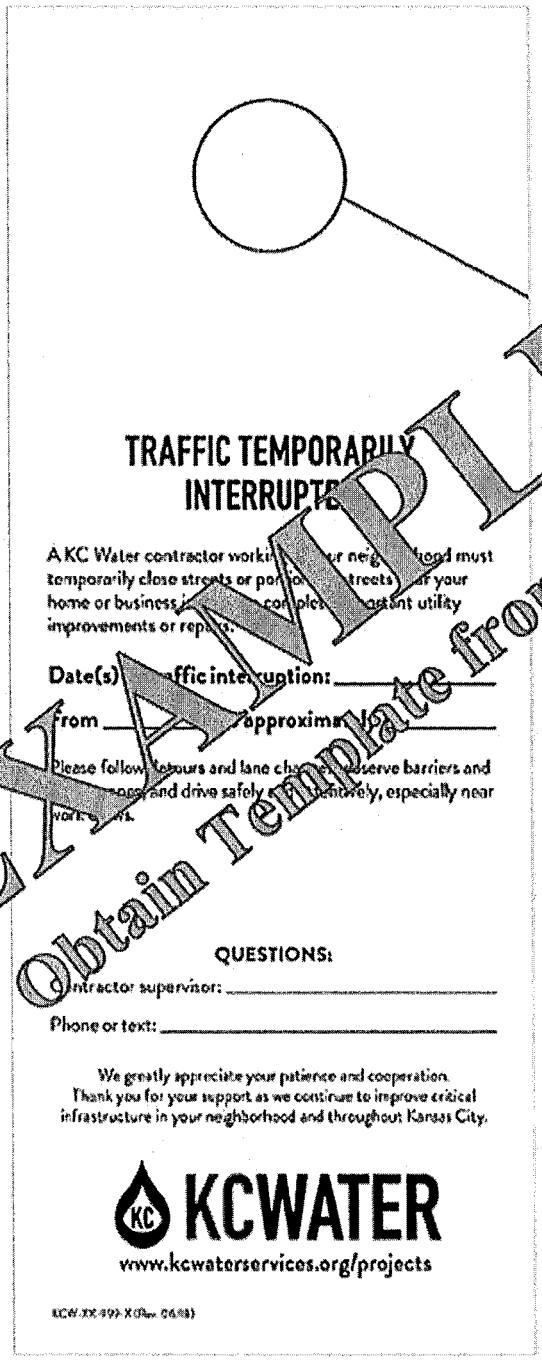
KCWATER

www.kcwaterservices.org/projects

KCW XX 499-X (Rev. 06/18)

EXAMPLE
Obtain Template from City

Figure 2 – Smoke Testing Door Hanger



TRAFFIC TEMPORARILY
INTERRUPTED

A KC Water contractor working in your neighborhood must temporarily close streets or portions of streets near your home or business to complete important utility improvements or repairs.

Date(s) of traffic interruption: _____

From _____ approximately _____

Please follow detours and lane closures, observe barriers and signs, and drive safely and attentively, especially near work zones.

QUESTIONS:

Contractor supervisor: _____

Phone or text: _____

We greatly appreciate your patience and cooperation. Thank you for your support as we continue to improve critical infrastructure in your neighborhood and throughout Kansas City.

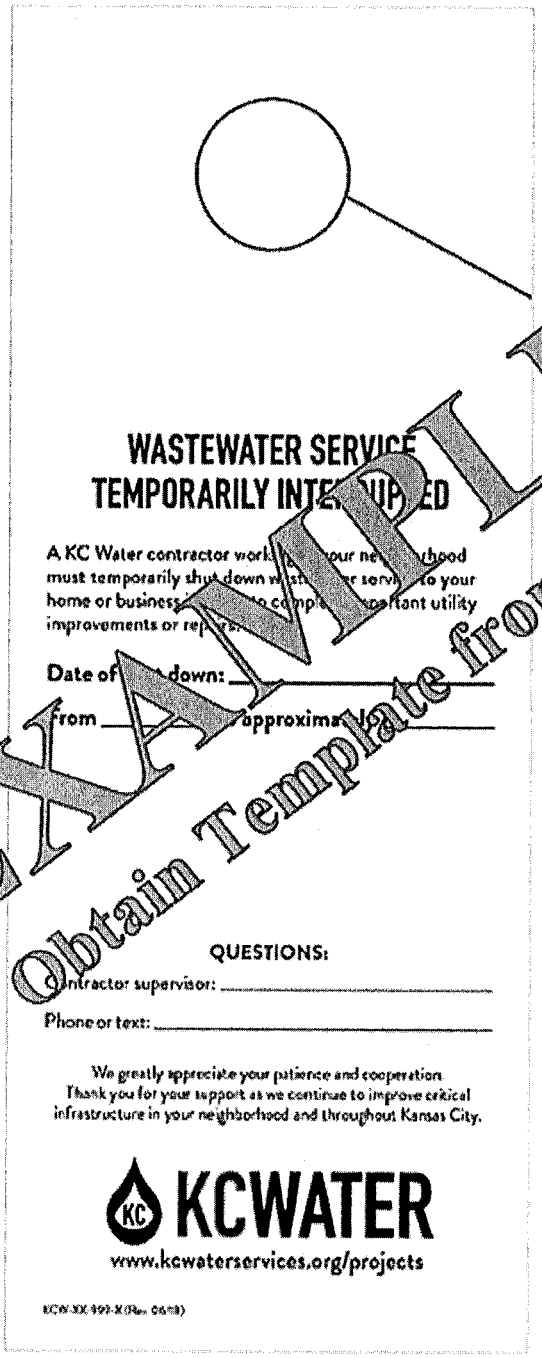
KCWATER

www.kcwaterservices.org/projects

KCW-XX-999-X (Rev. 06/18)

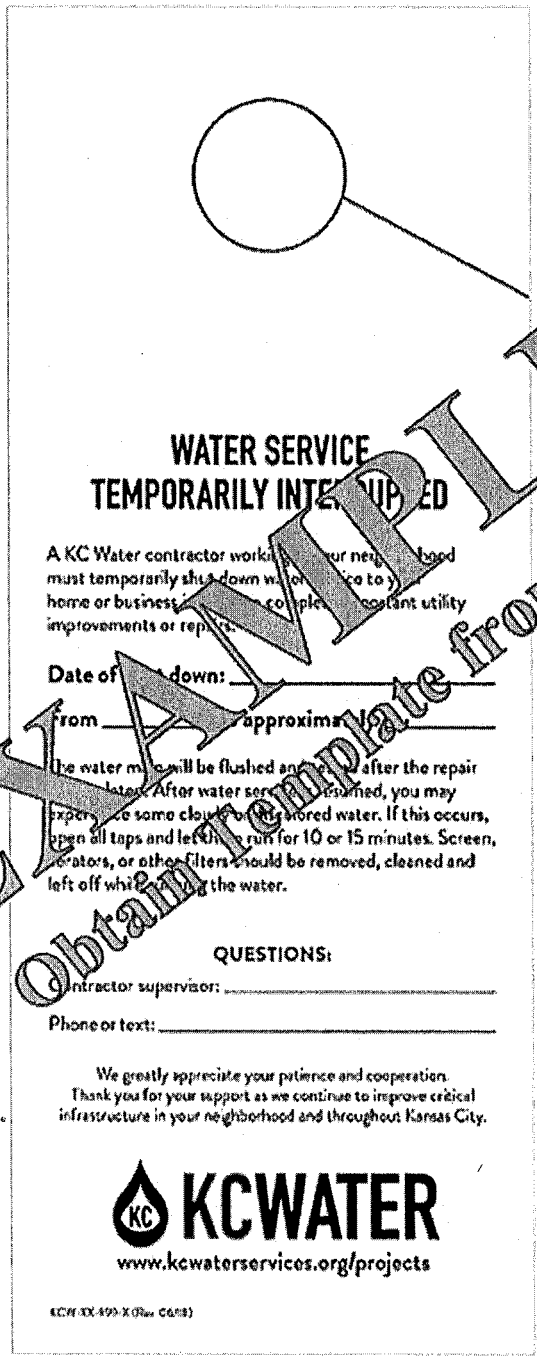
EXAMPLE
Obtain Template from City

Figure 3 – Traffic Interruption Door Hanger



EXAMPLE
Obtain Template from City

Figure 4 – Wastewater Service Interruption Door Hanger



WATER SERVICE
TEMPORARILY INTERRUPTED

A KC Water contractor working in your neighborhood must temporarily shut down water service to your home or business to complete important utility improvements or repairs.

Date of shut-down: _____

From _____ approximately _____

The water main will be flushed and restored after the repair is complete. After water service is returned, you may experience some cloudy or discolored water. If this occurs, open all taps and let the water run for 10 or 15 minutes. Screen, aerators, or other filters should be removed, cleaned and left off while using the water.

QUESTIONS:

Contractor supervisor: _____

Phone or text: _____

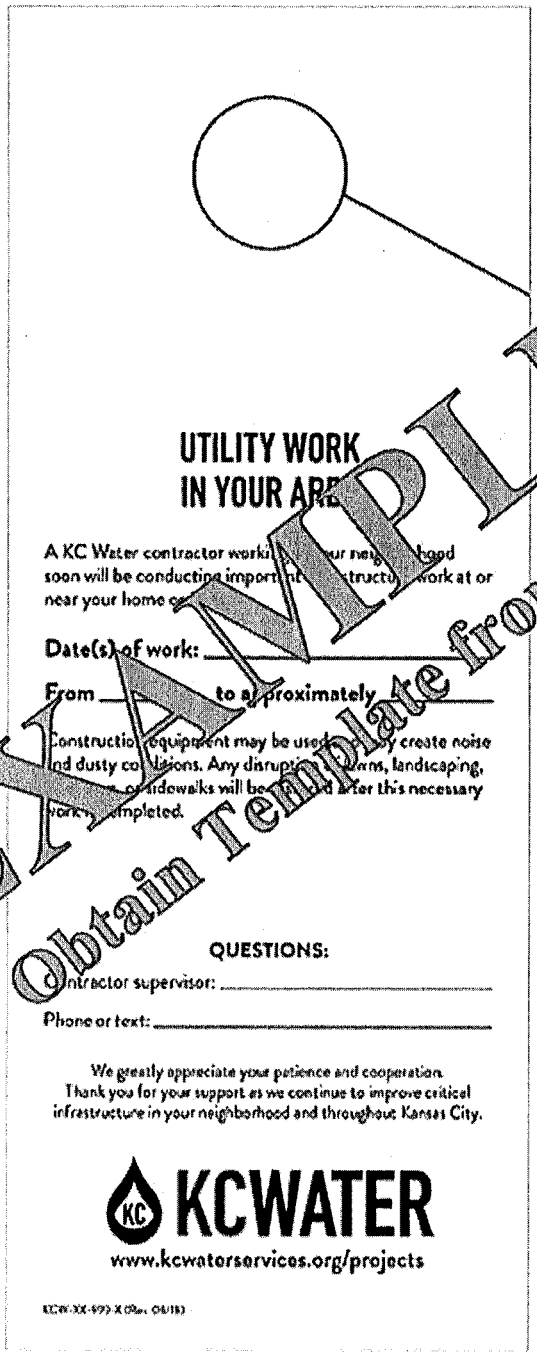
We greatly appreciate your patience and cooperation. Thank you for your support as we continue to improve critical infrastructure in your neighborhood and throughout Kansas City.

KCWATER
www.kcwaterservices.org/projects

KCW XX-499-X (Rev. 02/18)

EXAMPLE
Obtain template from City

Figure 5 – Water Service Interruption Door Hanger



EXAMPLE
Obtain Template from City

Figure 6 – Work Notice Door Hanger

SECTION 01600 – PRODUCT DELIVERY STORAGE AND HANDLING

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes: Product requirements; product selection; product options and substitutions; quality assurance; shipping, delivery, handling, and storage; and instructions for spare parts, maintenance products, and special tools.

1.02 REFERENCES

A. American National Standards Institute (ANSI).
B. NSF International (NSF):
    1. 61 - Drinking Water System Components – Health Effects.
    2. 372 - Drinking Water System Components – Lead Content.

1.03 RELATED SECTIONS

A. Section 01019 – Closeout Procedures.
B. Section 01300 – Submittals.
C. Section 01630 – Substitution Request Form.
D. Section 01757 – Commissioning.

1.04 DEFINITIONS

A. Products: Inclusive of raw materials, finished goods, equipment, systems, and shop fabrications.
B. Special tools: Tools that have been specifically made for use on a product for assembly, disassembly, repair, or maintenance.
C. Execution: Inclusive of performance, workmanship, installation, erection, application, field fabrication, field quality control and protection of installed products.

1.05 SUBMITTALS

A. As specified in Section 01300 – Submittals.
B. Calculations/certifications in accordance with NSF 61 and 372 for materials in contact with drinking water.

1.06 GENERAL REQUIREMENTS

A. Comply with specifications and referenced standards as minimum requirements.
B. Provide products by same manufacturer when products are of similar nature, unless otherwise specified.
C. Provide like parts of duplicate units that are interchangeable.
D. Provide equipment that has not been in service prior to delivery, except as required by tests.
E. When necessary, modify manufacturer's standard product to conform to specified requirements or requirements indicated on the Drawings.
F. Require each equipment manufacturer to have maintenance facilities meeting the following requirements:
    1. Minimum three years operational experience.
    2. Location in continental United States.
    3. Equipment and tools capable of making repairs.

4. Staff qualified to make repairs.
5. Inventory of maintenance spare parts.
6. Equipment shall be purchased through a local representative if the manufacturer has local representatives in the States of Missouri and Kansas.

1.07 SUBSTITUTIONS

A. Whenever a product is specified by Design-Builder using a name of a particular manufacturer or supplier, the specific item cited shall be understood as establishing type, function, dimension, appearance, and quality desired.
B. Other manufacturer's products will be considered for acceptance provided sufficient information is submitted to the Owner for review to determine that the products proposed are equivalent to those named.
C. Formal substitution request procedure:
    1. Submit a written formal substitution request using provided Substitution Request Form as specified in Section 01630 – Substitution Request for each proposed substitution.
    2. Owner will return initial opinion and request for additional information within 30 days.
    3. Owner will notify Design-Builder in writing of decision to accept or reject the substitution request within 30 days of receiving required information.
    4. Owner is not responsible for any delays caused due to review of substitution request provided requests are reviewed as described herein.
D. Formal substitution request shall include:
    1. Manufacturer's literature including:
        a. Manufacturer's name and address.
        b. Product name.
        c. Product description.
        d. Reference standards.
        e. Certified performance and test data.
        f. Operation and maintenance data.
    2. Samples, if applicable.
    3. Shop drawings, if applicable.
    4. Reference projects where the product has been successfully used:
        a. Name and address of project.
        b. Year of installation.
        c. Year placed in operation.
        d. Name of product installed.
        e. Point of contact: Name and phone number.
    5. Itemized comparison of the proposed substitution with product specified including a list of significant variations:
        a. Design features.
        b. Design dimensions.
        c. Installation requirements.
        d. Operations and maintenance requirements.
    6. Define impacts:
        a. Impacts to construction schedule.
        b. Impacts to other contracts.
        c. Impacts to other work or products.
        d. Impact to Contract Price:

(1) Do not include costs under separate contracts.
(2) Do not include Engineer's costs for redesign or revision of Contract Documents.
(3) Required license fees or royalties.

e. Availability of maintenance services and sources of replacement materials.

7. Design-Builder represents the following:
   a. Design-Builder shall pay associated costs for the Owner or the Owner's Representative to evaluate the substitution.
   b. Design-Builder bears the burden of proof of the equivalency of the proposed substitution.
   c. Proposed substitution does not change the design intent and will have equal performance to the specified product.
   d. Proposed substitution is equal or superior to the specified product.
   e. Design-Builder will provide the warranties or bonds that would be provided on the specified product on the proposed substitution, unless Owner requires a Special Warranty.
   f. Design-Builder will coordinate installation of accepted substitution into the Work and will be responsible for the costs to make changes as required to the Work.
   g. Design-Builder waives rights to claim additional costs caused by proposed substitution which may subsequently become apparent.

E. Substitutions will not be considered for acceptance under the following conditions:
   1. No formal substitution request is made.
   2. The substitution is simply implied or indicated on shop drawings or product data submittals.
   3. The formal substitution request is submitted by a Subcontractor or Supplier.

F. Substitution requests submitted after the deadline will not be considered unless the following evidence is submitted to Owner:
   1. Proof that the specified product is unavailable for reasons beyond the control of Design-Builder.
      a. Reasons may include manufacturing discontinued, bankruptcy, labor strikes, or acts of God.
      b. Design-Builder placed or attempted to place orders for the specified products within ten days after the effective date of the Agreement.
      c. The formal substitution request is submitted to Owner within ten days of the Design-Builder discovering the specified product cannot be obtained.

G. Owner's decision on a substitution requests will be final and binding.
   1. Approved substitutions will be incorporated into the Contract Documents with a Change Order.
   2. Requests for time extensions and additional costs based on submission of, approval of, or rejection of substitutions will not be allowed.

PART 2 – PRODUCTS

2.01 GENERAL

A. Material requirements:

1. Materials: Provide corrosion resistance suitable for project conditions as specified in Representative Project.
2. Dissimilar metals: Separate contacting surfaces with dielectric material.

B. Edge grinding:
   1. Sharp projections of cut or sheared edges of ferrous metals which are not to be welded shall be ground to a radius required to ensure satisfactory paint adherence.

2.02 PRODUCTS IN CONTACT WITH DRINKING WATER

A. Materials in contact with drinking waters: In accordance with NSF 61 and NSF 372.
   1. Certification by an independent ANSI accredited third party, including, but not limited to, NSF International, as being lead free.

2.03 PRODUCT SELECTION

A. When products are specified by standard or specification designations of technical societies, organizations, or associations only, provide products that meet or exceed reference standard and Specifications.
B. When products are specified with names of manufacturers but no model numbers or catalog designations, provide:
   1. Products by one of named manufacturers that meet or exceed specifications.
   2. Owner deemed "or equal" evidenced by an approved shop drawing or other written communication.
C. When products are specified with names of manufacturers and model numbers or catalog designations, provide:
   1. Products with model numbers or catalog designations by one of named manufacturers.
   2. Owner deemed "or equal" evidenced by an approved shop drawing or other written communication.
D. When products are specified with names of manufacturers, but with brand or trade names, model numbers, or catalog designations by one manufacturer only, provide:
   1. Products specified by brand or trade name, model number, or catalog designation.
   2. Products by one of named manufacturers proven, in accordance with requirements for an "or equal", to meet or exceed quality, appearance and performance of specified brand or trade name, model number, or catalog designation.
   3. Owner deemed "or equal" evidenced by an approved shop drawing or other written communication.
E. When Products are specified with only one manufacturer followed by "or Equal," provide:
   1. Products meeting or exceeding Specifications by specified manufacturer.
   2. Owner deemed "or equal" evidenced by an approved shop drawing or other written communication.
F. Providing something other than described above constitutes a Change and requires Owner approval. Design-Builder shall request change in accordance with Paragraph 1.07 Substitutions.

2.04 SHIPMENT

A. Mandatory requirements prior to shipment of equipment:
   1. Owner approved shop drawings.
   2. Owner approved Manufacturer's Certificate of Source Testing as specified in Section 01757 – Commissioning, when required by specifications.

3. Draft operations and maintenance manuals, when required by specifications.

B. Prepare products for shipment by:
   1. Tagging or marking products to agree with delivery schedule or shop drawings.
   2. Including complete packing lists and bills of material with each shipment.
   3. Packaging products to facilitate handling and protection against damage during transit, handling, and storage.
   4. Securely attach special instructions for proper field handling, storage, and installation to each piece of equipment before packaging and shipment.
C. Transport products by methods that avoid product damage.
D. Deliver products in undamaged condition in manufacturer's unopened containers or packaging.

2.05 SPARE PARTS, MAINTENANCE PRODUCTS, AND SPECIAL TOOLS

A. Provide spare parts and maintenance products as required by Specifications.
B. Provide one set of special tools required to install or service the equipment.
C. Box, tag, and clearly mark items.
D. Contractor is responsible for spare parts, maintenance products, and special tools until acceptance by Owner.
E. Store spare parts, maintenance products, and special tools in enclosed, weatherproof, and lighted facility during the construction period.
   1. Protect parts subject to deterioration, such as ferrous metal items and electrical components with appropriate lubricants, desiccants, or hermetic sealing.
   2. Document storage of all spare parts, maintenance products, and special tools in the Inventory List provided as Supplement to this Section. Inventory List shall be maintained and made available for Owner review
F. Provide Spare Parts and Special Tools Inventory List, see Supplement:
   1. Equipment tag number.
   2. Equipment manufacturer.
   3. Subassembly component, if appropriate.
   4. Quantity.
   5. Storage location.
G. Store large items individually:
   1. Weight: Greater than 50 pounds.
   2. Size: Greater than 24 inches wide by 18 inches high by 36 inches long.
   3. Clearly labeled:
      a. Equipment tag number.
      b. Equipment manufacturer.
      c. Subassembly component, if appropriate.
H. Store in spare parts box smaller items:
   1. Weight: Less than 50 pounds.
   2. Size: Less than 24 inches wide by 18 inches high by 36 inches long.
   3. Clearly labeled:
      a. Equipment tag number.
      b. Equipment manufacturer.
      c. Subassembly component, if appropriate.
I. Spare parts and special tools box:
   1. Wooden box:
      a. Size: 24 inches wide by 18 inches high by 36 inches long.

2. Hinged wooden cover:
    a. Strap type hinges.
    b. Locking hasp.
    c. Spare parts inventory list taped to underside of cover.
3. Coating: As specified in Division 9 Specifications.
4. Clearly labeled:
    a. The words "Spare Parts and/or Special Tools".
    b. Equipment tag number.
    c. Equipment manufacturer.

J. Spare Parts Coordination Meeting. Design-Builder shall attend a minimum of one meeting with the Owner to coordinate the delivery and transfer of spare parts to Owner. The Spare Parts Coordination meeting shall occur upon Substantial Completion. Additional meetings may be required to coordinate spare parts delivery and/or transfer to the Owner. No spare parts will be accepted prior to this meeting.

PART 3 – EXECUTION

3.01 DELIVERY AND HANDLING

A. Handle equipment in accordance with manufacturer's instructions.
B. Provide equipment and personnel to handle products by methods to prevent soiling or damage.
C. Upon delivery, promptly inspect shipments:
    1. Verify compliance with Contract Documents, correct quantities, and undamaged condition of products.
    2. Acceptance of shipment does not constitute final acceptance of equipment.

3.02 STORAGE AND PROTECTION

A. Immediately store and protect products and materials until installed in Work.
B. Store products with seals and legible labels intact.
C. Maintain products within temperature and humidity ranges required or recommended by manufacturer.
D. Protect painted surfaces against impact, abrasion, discoloration, and other damage.
    1. Repaint damaged painted surfaces.
E. Exterior storage of fabricated products:
    1. Place on aboveground supports that allow for drainage.
    2. Cover products subject to deterioration with impervious sheet covering.
    3. Provide ventilation to prevent condensation under covering.
F. Store moisture sensitive products in watertight enclosures.
G. Furnish covered, weather-protected storage structures providing a clean, dry, noncorrosive environment for mechanical equipment, valves, architectural items, electrical and instrumentation equipment and special equipment to be incorporated into this project.
    1. Storage of equipment shall be in strict accordance with the "instructions for storage" of each equipment supplier and manufacturer including connection of heaters, placing of storage lubricants in equipment, etc.
    2. Design-Builder shall furnish a copy of the manufacturer's instructions for storage to the Engineer prior to storage of all equipment and materials.
    3. Pumps, motors, electrical equipment, and all equipment with antifriction or sleeve bearings shall be stored in weathertight structures maintained at a temperature above 60°F. Electrical

equipment, controls, and insulation shall be protected against moisture and water damage. All space heaters furnished in equipment shall be connected and operated continuously.

H. Unless otherwise instructed by or required by the equipment manufacturer:
    1. Equipment having moving parts, such as gears, bearings, and seals, shall be stored fully lubricated with oil, grease, etc.
    2. Equipment having moving parts shall be rotated a minimum of twice a month to ensure proper lubrication and to avoid metal to metal "welding".
I. Store loose granular materials on solid surfaces in well-drained area.
    1. Prevent materials mixing with foreign matter.
    2. Provide access for inspection.
J. Payment will not be made for equipment and materials improperly stored or stored without providing Owner with the manufacturer's instructions for storage.
K. Provide an Equipment Maintenance Log on a monthly basis to Owner including, as a minimum, the equipment identification, date stored, date of inspection/maintenance, date removed from storage, copy of manufacturer's recommended storage guidelines, description of inspection/maintenance activities performed, and signature of party performing inspection/maintenance.

3.03 PROTECTION AFTER INSTALLATION

A. Provide substantial coverings as necessary to protect installed products from damage from traffic and subsequent construction operations.
    1. Remove covering at Substantial Completion or when no longer needed.
    2. Replace corroded, damaged, or deteriorated equipment and parts before acceptance of the project.
B. Update Equipment Maintenance Log on a monthly basis with description of maintenance activities performed in accordance with the manufacturer's recommendation and industry standards and signature of party performing maintenance.
C. Upon installation of the equipment, Design-Builder shall, at the discretion of Owner, start the equipment at one-half load for an adequate period of time to ensure that the equipment does not deteriorate from lack of use.
D. Unless otherwise instructed by or required by the equipment manufacturer, lubricants shall be changed upon completion of installation and as frequently as required thereafter during the period between installation and acceptance. New lubricants shall be put into the equipment by Design-Builder at the time of Final Completion

3.04 QUALITY ASSURANCE

A. Employ entities that meet or exceed specified qualifications to execute the Work.
B. Inspect conditions before executing subsequent portions of the Work. Accept responsibility for correcting unsatisfactory conditions upon executing subsequent portions of the Work
C. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking.

3.05 COMMISSIONING

A. As specified in Section 01757 – Commissioning.

3.06 CLOSEOUT ACTIVITIES

A. Owner may request advanced delivery of spare parts, maintenance products, and special tools.

1. Deduct the delivered items from the Inventory List and provide transmittal documentation.

B. Immediately prior to the date of Final Completion, arrange to deliver spare parts, maintenance products, and special tools to Owner at a location on site chosen by the Owner.
   1. Provide itemized list of spare parts and special tools that matches the identification tag attached to each item.
   2. Owner will review the inventory and the itemized list to confirm it is complete and in good condition prior to signing for acceptance.

3.07 ATTACHMENTS

A. Spare Parts, Maintenance Products, and Special Tools Inventory List.

END OF SECTION

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

SECTION 01600 – SUPPLEMENT

SPARE PARTS, MAINTENANCE PRODUCTS, AND SPECIAL TOOLS INVENTORY LIST

Owner: City of Kansas City, Missouri **Date:** _____

Design-Builder: _____ **Project No.:** 81000999

Project Name: Blue River WWTP Grit Removal and Fine Screens Project

Inventory List				
Spec Number: _____		Spec Title _____		
Equipment Tag No.: _____		Equipment Manufacturer: _____		
Quantity	**Subassembly Component**	**Description**	**Manufacturer's Part Number**	**Storage Location**

SECTION 01615 – EQUIPMENT IDENTIFICATION AND TAGGING

PART 1 - GENERAL

A. The following is a guide to the various types of tags used for KC Water (Wastewater Division) asset identification.

1.01 SUMMARY

B. This section describes tag structures KC Water uses to label an asset for different purposes. These tags include:
    1. CMMS tags (Asset IDs)
        a. These tags are used to identify assets in Owner's CMMS (Computerized Maintenance Management System).
        b. CMMS is primarily used for maintenance scheduling and financial tracking of assets.
        c. Not every asset will need an Asset ID, reference Owner's Tag Generator Spreadsheet (available upon request from Design-Builder) for more details about which assets need this type of tag.
            (1) CMMS tags for all new assets will be created using the Owner's Tag Generator Spreadsheet.

    2. PLC Shortcuts
        a. Shortcuts are used in the OIT (Operator Interface Terminal)/HMI (Human Machine Interface) to establish a path from the HMI to the PLC.
        b. These tags are only used to identify/label PLCs.
        c. See Owner's SCADA Standards for more details.

    3. P&ID Tags
        a. These tags are used to identify equipment and instruments on P&IDs (Process and Instrumentation Drawings).
        b. These tags are composed of a 3-5 digit equipment or instrument code followed by a 5 digit loop number.
        c. See Owner P&ID tagging standards for more details.

    4. PlantPax Tags
        a. PlantPax Tags are used in the PLC program as object names for all standard PlantPax objects.
        b. The tagging convention for these tags is based on ANSI/ISA Table 4.1 and also utilizes the loop numbers from the P&ID's
        c. See SCADA Standards for more details.

    5. NonPlantPax Tags
        a. NonPlantPax tags are used for objects that are not in the standard PlantPax library of objects. This might include objects that a vendor has created or possibly objects that a local integrator might need to create for specialty equipment that doesn't already have an object type in the standard PlantPax library.

    6. Other Tags/Names (See SCADA Standards for details)

a. HMI Application/Display Names.
b. OIT Application Names.
c. Thin/Thick Client Names.
d. ControlLogix PLC Program Filenames.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

SUBSTITUTION REQUEST

Project Number 81000999

Project Title Blue River WWTP Grit Removal and Fine Screens Project

To: _____ Authorization Number: _____
From: _____
Re: _____ Date: _____
Contract For: _____

Specification Title: _____
Section: _____ Page: _____ Article/Paragraph: _____

Proposed Substitution: _____
Manufacturer: _____ Address: _____ Phone No. _____
Trade Name: _____ Model No. _____
Installer: _____ Address: _____ Phone No. _____
History: ❑ New Product ❑ 2-5 years old ❑ 5-10 years old ❑ More than 10 years old
Differences between proposed substitution and specified product: _____

❑ Point-by-point comparative data attached – REQUIRED

Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance, service, and availability of replacement parts, as applicable, are available.
- Proposed substitution will not affect or delay Progress Schedule, except as stated below.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances, except as stated below.
- Payment will be made for changes to building design, including architectural or engineering design, detailing, licenses, royalties, and construction costs caused by the requested substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be completed in all respects.

Reason for not providing specified item: _____

Similar Installation:
Project: _____ Design Professional: _____
Address: _____ Owner: _____
Date Installed: _____
Proposed substitution affects other parts of Work: ❑ No ❑ Yes; explain _____

Savings to Owner for accepting substitution: _____

Proposed substitution changes Contract Time: ❑ No ❑ Yes; add/deduct _____ days.

Supporting Data Attached:
❑ Product Data ❑ Drawings ❑ Tests ❑ Reports ❑ Samples ❑ _____
Attachments: _____

Submitted by: _____
Signature: _____
Firm: _____
Address: _____

Telephone: _____ Fax: _____ E-Mail: _____

Additional Comments: ❑ Contractor ❑ Subcontractor ❑ Supplier ❑ Manufacturer ❑ DP ❑ _____

DESIGN PROFESSIONAL'S REVIEW AND ACTION

- ❑ Substitution approved – Make submittals in accordance with Specification Section 01300.
- ❑ Substitution approved as noted – Make submittals in accordance with Specification Section 01300.
- ❑ Substitution rejected – Use specified materials.
- ❑ Substitution Request received too late – Use specified materials.

Signed by: _____ Date: _____

Distribution:
- ❑ Owner
- ❑ Design Professional
- ❑ Contractor
- ❑ Consultant
- ❑ Construction Manager
- ❑ Other

SECTION 01664 - TRAINING

PART 1 – GENERAL

1.01 DESCRIPTION

A. Design-Builder shall provide Equipment Training, Process Training, and Process Control and Instrumentation System (PCIS) Training as detailed in this section and other technical specifications and shall do the necessary work for operators to receive training credit with Missouri Department of Natural Resources (MDNR) such as preparing required documentation and communicating with MDNR.
B. This section contains requirements for training the Owner's personnel by the Manufacturer's Representative in the proper operation and maintenance of the equipment and systems installed under this Contract and other training required to operate the Work.
C. Training outcomes: Owner's operations, maintenance, and engineering staff have the information needed to safely operate, maintain, and repair the equipment/systems provided in the Contract Documents.

1.02 RELATED SECTIONS

A. Section 01300 – Submittals.
B. Section 01320 – Construction Progress Documentation.
C. Section 01757 – Commissioning.

1.03 QUALITY ASSURANCE

A. Where required by the technical specifications, the Manufacturer's Representative shall provide on-the-job training of the Owner's personnel. The training sessions shall be conducted by qualified, experienced, factory trained representatives of the various equipment manufacturers familiar with operation and maintenance manual information. Commissioning Manager may perform other training sessions as approved by the Owner's Representative.
B. Trainers shall be knowledgeable in the equipment/system for which they are training. Trainer's qualifications shall be submitted in a form provided by the Owner and specifically demonstrating operational knowledge of the specific systems and components and treatment facility classroom and field training experience.

1.04 SUBMITTALS

A. The following information shall be submitted to Owner in accordance with the provisions of Section – 01300 Submittals.
B. Training Plan and Schedule
    1. Owner training will include Equipment Training and Process Training.
        a. Equipment Training:
            (1) Design-Builder shall coordinate and pay for equipment manufacturers to provide Equipment Training to the Owner as required in the technical specifications.
            (2) Equipment Training sessions shall be conducted by qualified, experienced, factory-trained representatives of the various equipment manufacturers familiar with Original Equipment Manufacturer (OEM) O&M manual information specified in Section 01770 – Closeout Procedures.

b. Process Training:
    (1) Design Builder shall develop a process training program for operation of the sludge screening facility constructed under this Project.
    (2) Process Training shall occur after Equipment Training is complete and after Standard Operating Procedures (SOPs) have been drafted and reviewed by the Owner.
    (3) Training shall focus on troubleshooting and intended function based on developed SOPs and shall include key aspects of process control and recovery from adverse conditions and troubleshooting interacting unit processes.
    (4) Process Training shall consist of unit process training and project process training as described in this Section.
    (5) Each Process Training course shall be conducted in five sessions convenient to the Owner such that operators working all shifts will be able to attend during their normal work hours.
    (6) Each Process Training course shall be no longer than two hours, of which no more than 60 percent of the time may be classroom training.
    (7) Process training courses shall be scheduled a minimum of two months prior to first planned Process Training session.
    (8) The following Process Training courses, at a minimum, shall be provided:
        (a) Project Overview Process Training.
        (b) Fine Screening and Washing.
        (c) Grit Removal and Washing.

2. Training shall be provided by Design-Builder to Owner.
3. Design-Builder shall submit a Training Plan that includes a framework for performing both Equipment Training and Process Training. The Training Plan shall include the most current version of the Training Schedule not less than one year prior to the Scheduled Acceptance Date.
4. The Training Plan shall be submitted for Owner review in accordance with Section 01300 – Submittals.
5. Training plans for unit processes that may be partially occupied by Owner prior to Substantial Completion shall be submitted not less than 120 days prior to planned completion of applicable unit processes.
    a. Process-specific training plans submitted earlier than the Training Plan, shall be compiled into the overall Training Plan prior to submission of the Training Plan, even if previously submitted and approved.
6. Training Schedule:
    a. List specified equipment and systems that require training services and show:
        (1) Respective manufacturer.
        (2) Estimated dates for installation completion.
        (3) Estimated training dates and fixed training dates, as available.
    b. Allow for separate training sessions for maintenance staff and operations staff.
    c. Allow for multiple session for Operations training:
        (1) Provide a minimum of five training sessions for each topic to accommodate different shifts. One will be for each shift (day, evening, and night). Sessions for each topic shall be offered on multiple days.

(2) Adjust schedule to ensure training of appropriate personnel as deemed necessary by Owner, and to allow full participation by manufacturer's representatives.
(3) Adjust schedule for interruptions in operability of equipment.

d. Design-Builder shall provide draft training schedule within 120 days following Notice to Proceed of the Phase 2 Contract Price Amendment.
e. Following each training session, participants shall be requested to complete the Training Evaluation Form attached as a supplement to this section.

C. Lesson plans for each training session to be conducted by the manufacturer's representatives. Lessons plans shall be submitted 45 days prior to the scheduled training. In addition, training manuals, handouts, visual aids, and other reference materials shall be included.
D. Subject of each training session, instructor(s) and qualifications of individuals conducting the training, and tentative date and time of each training session. Owner has the right to request instructor substitution that are not appropriately qualified.
E. Training schedule including respective manufacturer, estimated dates for installation completion and estimated training dates will be incorporated into the project schedule in the commissioning section consistent with direction provided by the Owner's affected facility or division.
F. Submit other audio-visual aids utilized during each training course.
G. Provide two electronic copies and three hard copies organized in notebooks of the training course material 7 days prior to training.

PART 2 – PRODUCTS

2.01 GENERAL

A. Where specified, Design-Builder's Commissioning Manager shall conduct training sessions for the Owner's personnel to instruct staff on the proper operation, care, and maintenance of the equipment and systems installed under this contract.
B. Training shall take place at the site of the work and under the conditions specified in the following paragraphs. Approved operation and maintenance manuals shall be available at least 30 days prior to the date schedule for the individual training session. Furnish a copy of each complete training package, to include operation and maintenance data for distribution to each trainee.
C. Commissioning Manager shall meet with Owner's designated training manager to develop a list of personnel to be trained and to establish expected training outcomes and objectives 120 days prior to commissioning of equipment/system and schedule the training.
D. Commissioning Manager shall conduct commissioning progress meetings throughout construction to plan, scope, coordinate, schedule future activities and resolve issues at least monthly. This meeting may be part of the weekly progress meetings.

2.02 LOCATION

A. Training sessions shall take place at the site of the work or at the Water Services Department offices as determined by the Owner.

2.03 LESSON PLANS

A. Lesson plans shall contain an outline of the material to be presented along with a description of the visual aids to be utilized during the sessions. Each plan shall contain time allocation for each subject and time spent on each form of training.
B. Lesson plans shall contain the following minimum information:

1. Title and objectives
2. Recommended attendees (i.e. managers, engineers, operators, maintenance)
3. Course description, outline of course content, and estimated class duration.
4. Format (i.e. lecture, self-study, demonstration, hands-on)
5. Instruction materials and equipment requirements.
6. Resumes of instructors providing training.
7. Provide performance-based learning objectives.
8. State learning objectives in terms of what the trainees will be able to do at the end of the lesson.
9. Define student conditions of performance and criteria utilizing learning objectives for evaluating instructional success.
10. Provide necessary information for submission to MDNR for approval of training hours in compliance with certified operator regulations for certificate renewal.
11. Correspondence that a submission to MDNR for training hours has been completed and approved.
12. Provide maintenance instruction lessons plans to include mechanical, HVAC, instrumentation, and electrical aspects.
13. Equipment operation:
    a. Describe equipment process function and system theory.
    b. Describe equipment fundamental operating principles and dynamics.
    c. Identify equipment mechanical, electrical, and electronic components and features.
    d. Identify support equipment associated with the operation of subject equipment.
    e. Detail the relationship of each piece of equipment or component to the subsystems, systems, and process.
    f. Cite hazards associated with the operations, exposure to chemicals associated with the component, or the waste stream handled by the component.
    g. Specify appropriate safety precautions, equipment, and procedures to eliminate, reduce, or overcome hazards.
14. Detailed component description:
    a. Define preventative maintenance inspection procedures required on equipment in operation and identify troubleshooting and potential issues as a result of the troubleshooting,
    b. Identify predictive maintenance that may be applicable (infrared analyses, oil evaluation, vibration analyses) to the component or system.
    c. Identify preventive maintenance tasks and frequencies and provide in a table.
    d. Identify each component function and describe in detail.
    e. Where applicable, group relative components into subsystems.
    f. Identify and describe in detail equipment safety features, permissives and controls interlocks.
15. Define and provide training on recommended systematic troubleshooting procedures as they relate to specific craft problems and provide component specific troubleshooting checklists as they relate to specific craft problems.
16. One complete set of originals of the lesson plans, training manuals, handouts, visual aids and reference materials shall be the property of the Owner and shall be suitable bound for proper organization and easy reproduction. Design-Builder shall furnish up to 40 copies of necessary training manuals, handouts, visual aids, and reference materials at least one week prior to each training session. Specific quantities will be identified during progress or other meetings.

2.04 FORMAT AND CONTENT

A. Each training session shall be comprised of time spent both in the classroom and at the specific location of the subject equipment or system.
B. Instructors shall apply adult education best practices, emphasizing learner participation and activity.
C. Training delivery may include problem solving, question/answer, hands-on instruction, practice, evaluation/feedback tools, and lecture.
D. Visual aids must support training objectives.
E. Delivery time should be less than 30 percent of class time.
F. Delivery time is a minimum of one hour and a maximum of two hours.
G. Longer training sessions requires Owner approval.
H. Refreshment and breaks within the Owner's customary schedule or as predetermined in advance of the training delivery.
I. Estimated maximum class size will vary for class and field training sessions. This will be determined in advanced. Commissioning Manager and Owner will develop a headcount one week prior to the class so the instructor can provide the correct number of aids and know the correct number of repeated sessions.
J. Training Modules:
    1. Provide a training module for each equipment category.
    2. Divide each training module's instructional content into discrete lesson plans with a division between operations and maintenance training if directed by the Owner's Representative.
K. Training Aids:
    1. Instructors are to utilize P&IDs and are encouraged to use audio-visual devices, models, charts, etc. to increase the transfer of knowledge.
    2. Instructors shall provide such equipment (televisions, video recorder/player, computer, projectors, screens, easels, etc.), models, charts, etc. for each class.
    3. Instructor is responsible for confirming with Owner in advance of each class that the classroom will be appropriate for the types of audiovisual equipment to be utilized.
L. Familiarization:
    1. Review catalog, parts lists, drawings, etc. which have been previously provided for the plan files and operation and maintenance manuals.
    2. Check out the installation of the specific equipment items.
    3. Demonstrate the unit and indicate how all parts of the specifications are met.
    4. Answer questions.
M. Safety:
    1. Using material previously provided, review safety references.
    2. Discuss proper precautions around equipment.
N. Operation:
    1. Using material previously provided, review reference literature.
    2. Explain all models of operation (including emergency).
    3. Check out Owner's personnel on proper use of the equipment.
O. Preventive Maintenance:
    1. Using material previously provided, review preventative maintenance lists including:
        a. Reference material.
        b. Daily, weekly, monthly, quarterly, semiannual, and annual jobs.
    2. Demonstrate procedures to perform preventative maintenance jobs.
    3. Show Owner's personnel what to look for as indicators of equipment problems.

4. Facilitate discussion with Owner's personnel as to which preventative maintenance to continue after the warranty period.

P. Corrective Maintenance:
   1. List potential problems including troubleshooting recovery from adverse operating conditions.
   2. Identify, describe, instruct and provide via the transmittal process any special tools required for maintenance.
   3. Describe Recommended measuring instruments and procedures and provide instruction on interpreting alignment measurements as appropriate.
   4. Describe recommended procedures to check/test equipment following a corrective maintenance repair.
   5. Open equipment and demonstrate procedures, where practical.

Q. Parts:
   1. Show how to use previously provided parts list and properly identify parts to be ordered.
   2. Define and check spare parts on hand and identify minimum inventory levels.

R. Local Representatives:
   1. Where to order parts: Name, address, telephone.
   2. Service problems:
      a. Who to call.
      b. How to get emergency help.

S. Original Equipment Manufacturer (OEM) Operation and Maintenance (O&M) Manuals:
   1. Review any other material submitted.
   2. Update material as required.

2.05 VIDEO RECORDING

A. Design-Builder shall retain the services of a commercial video recording service to record each training session. Video materials must be produced by a qualified, professional video production company, unless Design-Builder demonstrates satisfactorily skill of other personnel as acceptable to Owner. Owner shall approve producer of video materials prior to recording any training sessions.
   1. If trainer is required to read a script during video recording, the trainer will have one video recorded session without personnel and the remaining sessions with personnel will be unrecorded.
   2. After recording, the material may be edited and supplemented with professionally produced graphics to provide a permanent record.
   3. Design-Builder shall advise all manufacturers providing training sessions that the material may be video recorded and shall make available such utility services and accommodations as may be required to facilitate the production of the video file.
   4. Video recording shall be integrated into electronic O&M by Design-Builder and linked to the facility BIM model by asset.

B. Include classroom and field instruction with question and answering periods.
C. Owner approval required for producer of video materials.
D. Digital recording shall become the property of the Owner.
E. Audio quality should not degrade during the recording of the field sessions due to background noise, space, distance, or other factors. Trainer will verify that audio quality after the first training session.
F. Trainer shall record the first training session and verify it presents accurately.
G. Video files shall be a file format and delivery medium as directed and approved by Owner.

H. Electronic copies of the other training material shall be tagged per Owner Standards to be provided by the Owner by or Design-Builder
I. Provide two complete sets of video materials fully indexed and catalogued with printed labels stating session content and dates recorded or an indexed video file to each segment of the training.
J. Design-Builder shall provide a written release from all claims to the recorded training material produced.
K. Design-Builder shall submit final training documents, including fully indexed and cataloged recordings of training sessions, in accordance with Section 01019 – Closeout Procedures.
L. All training shall be conducted by individuals knowledgeable in the equipment/system for which they are providing training and shall be experienced in conducting classes. Owner has the right to reject instructors determined to not be suitable for the material, topic, and/or audience and request a suitable instructor.

2.06 ATTENDANCE

A. Trainer shall keep an attendance log of all attendees.
B. Trainer shall have the trainees each sign an attendance form at the beginning and end of the training session.
C. These records shall be provided to the appropriate Division Manager in which the training is being provided.

2.07 TRAINING SCHEDULE

A. Draft Training Schedule for the entire project shall be submitted after the first item requiring training arriving on the site. When approved, the training schedule shall be integrated into the project schedule.
B. List specified equipment and systems that require training services and show:
    1. Respective manufacturer
    2. Estimated dates for installation completion
    3. Estimated training dates
C. Training is a prerequisite for putting equipment into operation. Staged or partial training may be approved by the Owner's Representative.
D. Allow for separate training sessions for maintenance staff and operations staff. Owner will notify the trainer if it is desired to have separate sessions for maintenance and operations staff or have combined sessions.
E. Allow for multiple session for Operations training:
    1. Provide a minimum of three training sessions to accommodate different shifts. One will be for each shift: day, evening, and night on at least two days, or as determined appropriate to meet the Owner's requirements.
    2. Adjust schedule to ensure training of appropriate personnel as deemed necessary by Owner, and to allow full participation by manufacturers' representatives. Adjust schedule for interruptions in operability of equipment,
    3. Coordinate with Section 01320 – Construction Progress Documentation, and Section 01757 – Commissioning.
F. Schedule Owner's staff training within the constraints of their workloads. Those who will participate in this training have existing full-time work assignments, and training is an additional assigned work task, therefore, scheduling is imperative. Owner staff work schedules are variable for operations staff, as treatment facilities are typically operated on an around- the-clock basis.
G. Training sessions will be finalized two weeks prior to the training.

H. Training sessions that are rescheduled after a finalized date will be rescheduled at least two weeks out.
I. Commissioning Manager is responsible for preparing agendas and meeting minutes.

PART 3 – EXECUTION

3.01 TRAINING

A. Training shall be conducted in conjunction with the operational testing and commissioning periods. Classes shall be scheduled such that classroom sessions are interspersed with the instruction in logical sequence. Design-Builder shall arrange to have the training conducted on consecutive days if approved by Owner's Representative. Concurrent classes shall not be allowed.
B. Instructors shall apply adult education best practices, emphasizing learner participation and activity.
C. Unless otherwise agreed by Owner, classes shall be repeated twice for a morning session, afternoon session, and a night session in order to have all three operations shifts trained. Adjust training schedule to ensure training of appropriate personnel deemed necessary by Owner, and to allow full participation by manufactures' representatives. Adjust schedule for interruptions in operability of equipment. Coordinate training efforts with Section 01320 – Construction Progress Documentation and Section 01757 – Commissioning.
D. Approved operation and maintenance manuals for the special equipment shall be provided to the Owner prior to the start of the training. Video recording shall take place concurrently with the training sessions.
E. Pre-startup Training shall be coordinated with Owner's operating personnel and Manufacturers' representatives, and with submission of Operation and Maintenance manuals. Pre-startup Training shall be completed at least 14 calendar days prior to beginning of system startup.
F. Post-startup Training, if required in specifications, shall be furnished and coordinated with Owner's operating personnel by the respective manufacturers' representatives.
G. Trainees will keep training materials and documentation after the session.
H. Operations and maintenance manuals as specified in technical sections:
    1. Provide a minimum of two copies of final Owner-approved operations and maintenance manuals for use during classroom instruction.
    2. Owner reserves the right to delay training for a particular equipment item if the operations and maintenance manuals for that equipment are incomplete, inaccurate, or otherwise not in a format or stage of development for use by the Owner's staff.
    3. No contract extensions or extra costs will be allowed for training delays due to operations and maintenance manual submittal delays.
I. Provide Supplemental documentation handouts to support instruction.
J. The following services shall be provided for each item of equipment or system. Additional services shall be provided when specifically required in individual specification sections.
    1. As a minimum, classroom training for operations personnel will include:
        a. Use of electronic media and drawings.
        b. Discussion of the equipment's specific location in the plant and operational overview.
        c. Purpose and plant function of the equipment.
        d. A working knowledge of the operating theory of the equipment.
        e. Start-up, shutdown, normal operation, emergency operating procedures, including discussion on system integration and electrical interlocks, if any.
        f. Identify and discuss safety items and procedures.

g. Routine preventive maintenance, including specific details on lubrication and maintenance of corrosion protection of the equipment and ancillary components.
h. Operator detection, without test instruments, of specific trouble symptoms.
i. Required equipment exercise procedures and intervals.
j. Routine disassembly and assembly of equipment if applicable (as judged by the Owner on a case-by-case basis) for purposes such as operator inspection of equipment.

2. As a minimum, hands-on equipment training for operations personnel will include:
   a. Identify location of equipment and review the purpose.
   b. Identifying piping and flow options.
   c. Identifying valves and their purpose.
   d. Identifying instrumentation:
      (1) Location of primary element.
      (2) Location of instrument readout.
      (3) Discuss purpose, basic operation, and information interpretation.
   e. Discuss, demonstrate, and perform standard operating procedures and round checks.
   f. Discuss and perform the preventive maintenance activities.
   g. Discuss and perform startup and shutdown procedures including alternative strategies.
   h. Perform the required equipment exercise procedures.
   i. Perform routine disassembly and assembly of equipment if applicable.
   j. Identify and review safety items and perform safety procedures, if feasible.
3. Classroom equipment training for the maintenance and repair personnel will include:
   a. Theory of operation.
   b. Description and function of equipment.
   c. Startup and shutdown procedures.
   d. Normal and major repair procedures.
   e. Equipment inspection and troubleshooting procedures including the use of applicable instruments and the "pass" and "no pass" instrument readings.
   f. Routine and long-term calibration procedures.
   g. Safety procedures.
   h. Preventive maintenance such as lubrication, normal maintenance such as belts, seals, and bearing replacement; and up to major repairs such as replacement of major equipment part (s) with the use of special tools, bridge cranes, welding jigs, etc.
4. Hands-on Equipment training for maintenance and repair personnel shall include:
   a. Locate and identify equipment components.
   b. Review the equipment function and theory of operation.
   c. Review normal repair procedures including corrective maintenance.
   d. Perform startup and shutdown procedures.
   e. Review and perform safety procedures.
   f. Perform Owner approved practice maintenance and repair job(s), including mechanical and electrical adjustments, calibration, and troubleshooting equipment problems.
5. Distribute Training Evaluation Form following each training session.
   a. Training Evaluation Form is included as supplement to this Section.
   b. Return completed Training Evaluation Forms to Owner's designated training coordinator immediately after session is completed.

c. Revise training sessions judged "Unsatisfactory" by a majority of attendees.
d. Conduct training sessions again until a satisfactory rating is achieved at no additional cost to Owner.

6. Post Training Session
   a. Training Course Material: Due 14 days after class completion.
   b. Video Recording tagged and other materials tagged.
   c. Class Attendance Sheet and trainee acknowledgment that they were trained and able to run the equipment.
   d. Training Agenda, Lesson Plan, presentation, handouts
   e. Other audio-visual aids utilized during each training course.
   f. Provide material for all sessions of the class in a single transmittal.
   g. Format: two electronic copies and three hard copies organized in notebooks.

K. Closeout Documentation
   1. Provide Training Documentation including submission to MDNR for operator training credit. Trainer will be required to submit any additional information required by MDNR.
   2. Provide training certification and records of training acceptance by MDNR.

3.02 SUPPLEMENTS

A. Supplements listed below, following "End of Section," are part of this Specification.
   1. Training Evaluation Form.

End of Section

TRAINING EVALUATION FORM

EQUIPMENT/SYSTEM ITEM: _____ VENDOR/MANUFACTURER:_____

DATE:_____NAME OF REPRESENTATIVE: _____

1.	Was representative prepared?	Acceptable	Unacceptable	or	N/A
2.	Was an overview description presented?	Acceptable	Unacceptable	or	N/A
3.	Were specific details presented for system components?	Acceptable	Unacceptable	or	N/A
4.	Were alarm and shutdown conditions clearly presented?	Acceptable	Unacceptable	or	N/A
5.	Were step-by-step procedures for starting, stopping, and troubleshooting presented?	Acceptable	Unacceptable	or	N/A
6.	Were routine/preventative maintenance items clearly identified?	Acceptable	Unacceptable	or	N/A
7.	Was the lubrication schedule (if any) discussed?	Acceptable	Unacceptable	or	N/A
8.	Was the representative able to answer all questions?	Acceptable	Unacceptable	or	N/A
9.	Did the representative agree to research and answer unanswered questions?	Acceptable	Unacceptable	or	N/A
10.	Comments:				

_____

_____

_____

11.	Overall Rating:	Satisfactory	Unsatisfactory

Note:

Sessions judged "Unsatisfactory" by a majority of attendees shall be revised and conducted again until a satisfactory rating is achieved.

SECTION 01735 – Pipe Service Colors

PART 1 – GENERAL

1.01 SUMMARY

A. This Section includes the final color coding of all piping systems associated with Wastewater Facilities.

1.02 DEFINITIONS

A. NPS – Nominal Pipe Size

1.03 REFERENCES

A. American Society of Mechanical Engineers (ASME)
   1. A13.1 – Pipe Markers

1.03 PIPE COATING COLORS

A. All pipe services within Wastewater facilities shall be painted in the color schedules listed herein. Each pipe service may be identified on the pipe by the abbreviation; however, the marker length shall not be smaller. The marker color shall be the same color as the color band.

B. Colors shall be painted before the final completion walkthrough. Colors may be painted after the Substantial Completion walkthrough.

C. Letter heights shall be as follows.

Pipe Nominal Pipe Size	Letter Height	Marker Length
3/4"	1/2"	8"
1"	1/2"	8"
1-1/2"	5/8"	8"
2"	3/4"	8"
3"	1-1/4"	12"
4"	1-1/4"	12"
6"	1-1/4"	12"
8"	2-1/2"	24"
10" and Larger	3-1/2"	32"

Any references to colors listed herein shall be in accordance with the color matching systems listed in the following table.

Color	PMS	Hexadecimal
MAROON	PMS 188C	#76232F
RED	PMS 186C	#CF142B
LIGHT RED	PMS 177C	#FF808B
ORANGE	PMS 151C	#FF8200
YELLOW	PMS 109C	#F7D417
LIGHT GREEN	PMS 354C	#00B140
GREEN	PMS 335C	#007B5F

DARK GREEN	PMS 350C	#2C5234
AQUA	PMS 318C	#88DBDF
BLUE	PMS 285C	#0072CE
DARK BLUE	PMS 288C	#002d72
DARK PURPLE	PMS 259C	#6d2077
WHITE	PMS White	#FFFFFF
LIGHT GRAY	PMS Cool Gray 4	#BBBCBC
DARK GRAY	PMS 430C	#7C878E
LIGHT BROWN	PMS 451C	#9b945f
BROWN	PMS 168C	#73381d
BLACK	PMS Black 6C	#101820

1.06 PIPE SERVICE COLOR CODE SCHEDULE

PIPE COLOR SCHEDULE

ABBREV.	SERVICE	PIPE COLOR	COLOR OF BANDS/MARKERS	LETTER COLORS
AA	AERATION AIR	LIGHT GREEN	(NONE)	BLACK
CA	COMPRESSED AIR / INSTRUMENT AIR	DARK GREEN	(NONE)	WHITE
CE	CENTRATE	DARK PURPLE	(NONE)	WHITE
CHD	CHEMICAL DRAIN	YELLOW	(MATCH CHEM SERVICE)	BLACK
	CITRIC ACID	YELLOW	LIGHT RED	BLACK
CSPD	CHEMICAL SUMP PUMP DISCHARGE	YELLOW	(MATCH CHEM SERVICE)	BLACK
CW	COOLING WATER	BLUE	(NONE)	BLACK
CWR	COOLING WATER RETURN	BLUE	LIGHT GRAY	BLACK
CWS	COOLING WATER SUPPLY	BLUE	DARK GRAY	BLACK
D	DRAIN (SANITARY)	BLACK	(NONE)	WHITE
DG	DIGESTER GAS / BIOGAS	YELLOW	MAROON	BLACK
FE	FINAL EFFLUENT	DARK BLUE	(NONE)	WHITE
	FIRE PROTECTION AND SPRINKLERS	RED	(NONE)	WHITE
FAD	FOUL AIR DUCT	--	--	--
HW	HOT WATER	BLUE	RED	BLACK
HWR	HOT WATER RETURN	BLUE	BLACK	BLACK
HWS	HOT WATER SUPPLY	BLUE	WHITE	BLACK
ML	MIXED LIQUOR	LIGHT BROWN	(NONE)	BLACK
NG	NATURAL GAS	YELLOW	(NONE)	BLACK
NPW	NON-POTABLE WATER	BLUE	(NONE)	RED

OF	OVERFLOW	YELLOW	(MATCH CHEM SERVICE)	BLACK
PAC	POLYALUMINUM CHLORIDE	YELLOW	ORANGE	BLACK
POL / PLS	POLYMER / POLYMER SOLUTION	YELLOW	GREEN	BLACK
PRTP	PRE-THP POLYMER	YELLOW	LIGHT GREEN	BLACK
POTP	POST-THP POLYMER	YELLOW	DARK GREEN	BLACK
PD	PROCESS DRAIN	BLACK	(NONE)	WHITE
PE	PRIMARY EFFLUENT	LIGHT GRAY	(NONE)	BLACK
PD	PUMP DRAIN	BLACK	(NONE)	WHITE
RS	RAW SEWAGE	BLACK	(NONE)	WHITE
RAS/WAS	RETURN/WASTE ACTIVATED SLUDGE	BROWN	(NONE)	WHITE
SAM	SAMPLE LINE	DARK BLUE	BLACK	WHITE
S (G), S (P)	SANITARY SEWER (GRAVITY OR PUMPED)	BLACK	(NONE)	WHITE
SC	SECONDARY SCUM	BROWN	(NONE)	WHITE
SE	SECONDARY EFFLUENT	AQUA	(NONE)	BLACK
SB	SODIUM BISULFITE	YELLOW	WHITE	BLACK
NAOH	SODIUM HYDROXIDE (CAUSTIC SODA)	YELLOW	BLUE	BLACK
SHC	SODIUM HYPOCHLORITE	YELLOW	BLACK	BLACK
STM	STEAM	LIGHT GRAY	RED	BLACK
SS	STORM SEWER / ROOF DRAIN	DARK GRAY	(NONE)	WHITE
H2SO4	SULFURIC ACID	YELLOW	RED	BLACK
THS	THERMALLY HYDROLYZED SLUDGE	BROWN	DARK BLUE	WHITE
V	VENT (CHEMICAL)	YELLOW	(MATCH CHEM SERVICE)	BLACK
VTR	VENT (PLUMBING) / VENT TO ROOF	BLACK	(NONE)	WHITE
W	POTABLE WATER	BLUE	(NONE)	BLACK

A.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01757 - COMMISSIONING

PART 1 – GENERAL

1.01 SUMMARY

A. This Section includes the requirements for each Commissioning phase of the Project equipment, system, subsystems, and/or facility.

1.02 DEFINITIONS

A. Acceptance Standards – The standards set forth in the Technical Specifications that the Project must meet during the performance of the Acceptance Tests.
B. Acceptance Testing – Test(s) occurring following Substantial Completion and preceding Final Completion. Acceptance Testing shall demonstrate the performance of complete Project equipment, systems, and subsystems relative to the Acceptance Standards laid out in this Section.
C. Acceptance Test Plans – The testing protocols, procedures and processes for the performance of the Acceptance Tests prepared and documented by Design-Builder and approved by Owner in accordance with this Specification.
D. Acceptance Test Report – The report and all supporting data provided by Design-Builder to Owner in accordance with this Specification demonstrating that the Acceptance Tests have been conducted, the Acceptance Standards have been demonstrated in order for Final Completion to be achieved.
E. Commissioning - The process of planning, testing, and process start-up of the installation for compliance with contract requirements and demonstrating, through documented verification, that the project has successfully met the Contractual requirements. This involves starting up, operating and maintaining the Work, or specific portions of the Work, in order to test, tune and adjust the Equipment and Materials, systems, subsystems and processes comprising the Work to: (a) achieve stable operating conditions; (b) prepare the Project for Design-Builder's performance of the Acceptance Tests; and (c) conduct and document the results of Acceptance in accordance with the Project Requirements. Commissioning includes training the Owner's staff to operate the facility and transmission of the finalized asset documentation necessary to maintain the equipment and systems in a manner that is easily inputted to the Owner's computerized maintenance management software.
F. Commissioning Phases - The work activities of facility commissioning are grouped into the phases defined in the table below. All Commissioning work shall be complete prior to Final Completion.

Commissioning		
Planning Phase	**Testing and Training Phase**	**Process Start-Up Phase**
Owner Training Plan and Schedule	Source Testing	Process Start-up
Commissioning Plan and Schedule	Owner Training	Process Operational Period (Acceptance Testing)
Source Testing Plans	Installation Testing	Instrumentation and Controls Fine-Tuning
Subsystem Testing Plans	Functional Testing	Closeout Documentation
Process Operational (Acceptance) Test Plans	Process Control and Instrumentation System (PCIS) Testing	

	Closeout Documentation	

G. Component - A basic building block of equipment, subsystems, and systems that requires installation or functional testing but does not have electrical connection or internal electronics. (Examples: filter effluent piping and manual isolation valves). A Component is typical of an asset child or appurtenances.
H. Device - A basic building block of equipment, subsystems, and systems that requires installation or functional testing and does have electrical connections or internal electronics. (Examples: filter level transmitter or water pump pressure transmitter). A Device is typical of an asset child or appurtenances.
I. Equipment - An assembly of component(s) and devices(s) that requires installation or functional testing. (Examples: Pump, motor, VFD, Ozone Generator, UV Disinfection System, etc.). Equipment is typical of an asset child or appurtenances.
J. Facility - A grouping of process areas, systems, subsystems, equipment, components, and devices (Examples: treatment plant, pump station, etc.). Each Facility has a defined number.
K. Factory Acceptance Testing (FAT) – see Source Testing.
L. Functional Testing - Testing performed on a completed subsystem to demonstrate that equipment/system meets manufacturers' calibration and adjustment requirements and other requirements as specified. Functional testing includes operating equipment/system manually in local, manually in remote (or remote manual), and automatically in remote (in remote auto) including fault conditions.
M. Installation Testing - Testing to demonstrate that subsystem component (piping, power, networks, devices, etc.) is ready and meets the project requirements in advance of functional testing. Installation testing also includes manufacturers' certification of installation and other requirements as specified to prepare equipment/system for Functional Testing. Also referred to as Field Acceptance Testing.
N. Instrumentation and Controls Fine-Tuning - Improving the performance of the Instrumentation Process Control system by operating for an extended time period.
O. Manufacturer's Certificate of Source Testing - When applicable, the form is used during Source Testing for the manufacturer to confirm that the applicable source tests have been performed and results conform to the Contract Documents. The form is provided at the end of this Section.
P. Manufacturer's Certificate of Installation and Functionality Compliance - The form is used during Installation Testing and Functional Testing. It is submitted at the end of Functional Testing to confirm that the equipment/system is installed in conformance with the Contract Documents and that it meets the Functional Testing requirements defined in the Contract Documents. The form is provided at the end of this Section.
Q. Owner Training – Training provided to Owner's staff as required by this Section. Owner Training includes Equipment Training, Process Training, and Process Control and Instrumentation System (PCIS) Training.
R. Process Area - A grouping of systems, subsystems, equipment, components, and devices that divide a facility into functional areas. (Examples: Filter Process Area or Chemical Area). Process areas shall always be associated with a unit process or subsystem.
S. Process Operational Period - A period of time after completion of the process start-up set aside for Acceptance Testing to verify facility performance meets the Contract Document requirements. This period may specifically limit other construction activities.
T. Process Start-up Phase - Operating the facility to verify performance meets the Contract Document requirements.
U. Process Start-Up - Activities conducted after the testing and training phase that are necessary to place systems or process areas into operational service.

V. Process Testing Phase – Includes any acclimation period required prior to Acceptance Testing, operating the facility, and conducting Acceptance Testing to verify performance meets the Contract Document requirements, and Instrumentation and Controls Fine Tuning.
W. Product – A system, subsystem or component.
X. Source Testing – Test(s) conducted by the manufacturer at the point of manufacture or assembly to demonstrate that the equipment or systems meet specified performance requirements. Testing may be witnessed by the Design-Builder and/or the Owner. Source Testing is also referred to as Factory Acceptance Testing or FAT.
Y. Standard Operating Procedure (SOP) – Detailed procedures for operating equipment or systems under normal operating conditions.
Z. Standard Instructions- One-page summary of key information from SOPs, typically with troubleshooting and fault conditions removed.
AA. Subsystem - A building block of systems made up from a grouping of components, devices, and equipment that perform a definable function. (Examples: Filter No. 1 Backwash Subsystem, Sedimentation Basin No. 1 Hoseless Sludge Removal Subsystem). These items are typically an asset parent.
BB. System - A grouping of subsystems, equipment, components, and devices that perform a definable function. (Examples: Filter No. 1, Sedimentation Basin). These systems are grouped together into Processes or Functions such as solids handling or disinfection.

1.03 COMMISSIONING MANAGER

A. Designate and provide a Commissioning Manager for this project.
B. Submit summary of the Commissioning Manager's qualifications within 30 days of NTP:
    1. Include description of previous experience as a Commissioning Manager on similar projects for the designated Commissioning Manager with a list of references including phone numbers for review and Owner approval.
C. Commissioning Manager responsibilities include the following:
    1. Lead efforts relating to Commissioning.
    2. Be thoroughly familiar with commissioning requirements in the Contract Documents.
    3. Be regularly engaged and experienced in all aspects of commissioning.
    4. Provide technical instruction for commissioning.
    5. Provide primary interface with Owner for efforts relating to Commissioning of Project facilities.
    6. Coordinate training efforts.
    7. Regularly review project design operability.
    8. Liaison between Owner O&M staff and Design-Builder.
    9. Lead and prepare meeting agendas and meeting minutes for all Commissioning Meetings.
        a. Dedicated Commissioning Meetings shall be held monthly beginning when determined appropriate by Commissioning Manager, but not less than one year prior to the Completion Date.
        b. Dedicated Commissioning Meetings shall be held weekly during Acceptance Testing, at a minimum.
    10. Attend all weekly Coordination Meetings remotely or in person.
    11. Be involved in all criticality, failure modes and effects analysis (FMEA), and maintenance planning meetings.
D. Commissioning Manager onsite:
    1. Planning Phase: As needed to facilitate meeting all Commissioning requirements.
    2. Testing and Training Phase: Full-time.
    3. Process Start-up Phase: Full-time.
E. Designate and provide Commissioning Manager assistants, as needed.

1.04 SERVICES OF MANUFACTURER'S REPRESENTATIVE

A. Qualification of manufacturer's representative as specified in the Contract Documents technical sections include the following:
    1. As specified in Section 01433 – Manufacturer's Field Services.
    2. Competent, experienced technical representative of equipment/system manufacturer for assembly, installation, testing guidance, and training.
    3. Additional qualifications may be specified in the individual sections.
    4. Submit qualifications of the manufacturer's representative no later than 30 days in advance of required observations.
    5. Manufacturer's representative subject to approval by Owner.
    6. No substitute representatives will be allowed until written approval by Owner has been obtained.
B. Completion of manufacturer on-site services: Owner approval required.
C. Manufacturer is responsible for determining the time required to perform the specified services.
    1. Minimum times specified in the Contract Documents are estimates.
    2. No additional costs associated with performing the required services will be approved.
    3. Manufacturer required to schedule services in accordance with Design-Builder's project schedule up to and including making multiple trips to project site when there are separate milestones associated with installation, testing, and/or training of each occurrence of manufacturer's equipment.
D. Design-Builder will be responsible for facilitating the timing of manufacturer's representative for systems and processes that will interact. Owner may require certain representatives to be on site at the same time to streamline troubleshooting and startup.
E. Manufacturer's onsite services as specified in the Contract Documents include the following:
    1. Assistance during the Testing and Training and Process Start-Up Phases of Commissioning.
    2. Provide daily copies of manufacturer's representatives field notes and data to Owner.
    3. Services as specified in Section 01433 – Manufacturer's Field Services.
    4. Other requirements as specified in the Contract Documents.

1.05 PLANNING PHASE

A. Overview of Planning Phase:
    1. Define approach and timing for Commissioning.
B. Owner Training Plan and Schedule:
    1. Complete as specified in Section 01664 – Training.
C. Commissioning Plan and schedule:
    1. Commissioning overview:
        a. Comply with Commissioning Roles and Responsibilities Matrix specified at the end of this Section.
        b. Commissioning Plan shall lay out the overall plan for performing all testing activities required by this Section and other Contract Documents, as applicable.
        c. As subsystem test plans are developed, they shall be incorporated into the overall Commissioning Plan as appendices.
    2. Submittal due date:
        a. Submit Per Exhibit 2.1.1 Phase 1 Scope of Services.
    3. Schedule requirements:
        a. Schedule durations and float for commissioning activities to ensure Work does not fall behind schedule due to complications or delays during commissioning.

b. Time-scaled network diagram detailing the work to take place in the period between 60 calendar days prior to planned initial commissioning of equipment and systems together with supporting narrative.
c. Provide detailed schedule of commissioning activities including durations and sequencing requirements.
    (1) Identify the following activities:
        (a) Testing and Training Phase:
            (i) Source Testing.
            (ii) Owner Training.
            (iii) Installation Testing.
            (iv) Functional Testing.
            (v) Process Control and Instrumentation (PCIS) Testing
        (b) Process Start-Up Phase:
            (i) Process Start-Up.
            (ii) Process Operational Period.
            (iii) Acceptance Testing.
            (iv) Instrumentation and Controls Fine-Tuning.
            (v) Closeout Documentation.
d. Schedule manufacturer's services to avoid conflict with other onsite testing or other manufacturers' on-site services.
e. Verify that conditions necessary to allow successful testing have been met before scheduling services.

D. Source Testing Plans:
1. Source Testing Plans shall be developed by Design-Builder for any equipment for which Source Testing is required.
    a. Source testing requirements as specified in technical sections.
        (1) Non-witnessed: Provide Manufacturer's Certificate of Source Testing.
        (2) Witnessed: One Owner's Representative and o present during testing, unless otherwise specified, and provide Manufacturer's Certificate of Source Testing.
2. Prepared by Design-Builder as a result of discussions and planning emerging from regularly conducted commissioning meetings for source tests as specified in the Contract Documents and as necessary to streamline start-up.
3. Source Testing Plans shall include the following:
    a. Purpose and goals of the test.
    b. Identification of each item of equipment/system, including system designation, location, tag number, control loop identifier, etc.
    c. Description of the pass/fail criteria that will be used.
    d. Listing of pertinent reference documents (Contract Documents and industry standards or sections applicable to the testing).
    e. Complete description, including drawings or photographs, of test stands and/or test apparatus.
    f. Credentials of test personnel.
    g. Descriptions of test equipment to be used, product information, and all appropriate calibration records for the test equipment.
    h. Test set-up procedures.
    i. Detailed step-by-step test procedures.

DRAFT

(1) The level of detail shall be sufficient for any witness with a rudimentary technical aptitude to be able to follow the steps and develop confidence that the tests were being performed as planned.
(2) All steps are significant, and all steps shall be included in the procedures.

j. Sample data logs and data recording forms.
k. Sample computations or analyses with the results in the same format as the final report to demonstrate how data collected will be used to generate final results.
(1) Complete disclosure of the calculation methodologies.
(2) Include a sample for each type of computation required for the test and analysis of the results.
l. Detailed outline of the Source Test report.
m. Sample test reports.
n. Purpose and goals of the test.
o. Identification of each item of equipment/system, including system designation, equipment ID, other asset information per KC Water Asset standards, location, tag number, control loop identifier, etc.
p. Description of the pass/fail criteria that will be used.
q. Listing of pertinent reference documents (Contract Documents, final accepted submittals, and industry standards or sections applicable to the testing).
r. Complete description, including drawings or photographs, of test stands and/or test apparatus.
s. Credentials of test personnel.
t. Descriptions of test equipment to be used, product information, and all appropriate calibration records for the test equipment.
u. Test set-up procedures.
v. Detailed step-by-step test procedures.
(1) The level of detail shall be sufficient for any witness with a rudimentary technical aptitude to be able to follow the steps and develop confidence that the tests were being performed as planned.
(2) All steps are significant, and all steps shall be included in the procedures.
w. Sample data logs and data recording forms.
x. Sample computations or analyses with the results in the same format as the final report to demonstrate how data collected will be used to generate final results.
(1) Complete disclosure of the calculation methodologies.
(2) Include a sample for each type of computation required for the test and analysis of the results.
y. Detailed outline of the Source Test Report.
z. Sample Source Test Report.

4. Submit Source Test Plan and forms as specified in the technical sections.
a. Submit a copy of the Source Test Plan at least 21 days before any scheduled test date.
b. Owner approval of Source Test Plan required prior to beginning source testing.
c. Schedule the testing after approval of the test procedures submittal.
5. Indicate the desired dates for source inspection and testing.
a. Notify Owner of the scheduled tests a minimum of 15 days before the date of the test.

E. Subsystem Testing plans:
1. Provide separate testing plans for each individual subsystem and system that include the following:
a. Approach to testing including procedures, schedule, and recirculation requirements.

DRAFT

b. Test objective: Demonstrate subsystem meets the design requirements as specified in the technical sections.
c. Test descriptions, forms, temporary systems (pumps, piping, etc.), shutdown requirements for existing systems, test forms, test logs, witness forms, and checklists to be used to control and document the required tests.
d. Test forms: Include, but not limited to, the following information:
    (1) Tag and name of equipment/system to be tested.
    (2) Test date.
    (3) Names of persons conducting the test.
    (4) Names of persons witnessing the test, where applicable.
    (5) Test data.
    (6) Applicable project requirements.
    (7) Check offs for each completed test or test step.
    (8) Place for signature of person conducting tests and for the witnessing person, as applicable.
e. Define start-up sequencing of unit processes:
    (1) Include testing of alarms, interlocks, permissives, control circuits, capacities, speeds, flows, pressures, vibrations, sound levels, and other parameters.
    (2) Provide detailed test procedures setting forth step-by-step descriptions of the procedures for systematic testing of equipment/system.
    (3) Demonstrate proper rotation, alignment, speed, flow, pressure, vibration, sound level, adjustments, and calibration.
        (a) Perform initial checks in the presence of and with the assistance of the manufacturer's representative.
    (4) Demonstrate proper operation of each control loop function including mechanical, electrical, alarms, local and remote controls, instrumentation, and other equipment/system functions.
        (a) Generate signals with test equipment/system to simulate operating conditions in each control mode.

2. Owner approval of test plan is required prior to performing test.
    a. Revise and update test plans based on review comments, actual progress, or to accommodate changes in the sequence of activities.
    b. Submit test reports for each phase of testing for each equipment/system.
    c. Owner approval of preceding test reports is required prior to start of next test.
    d. Tests will be rescheduled if test plan is not approved by the required deadline.
        (1) Design-Builder is responsible for any resulting delay.
3. Design-Builder is responsible to reproduce and distribute final test procedures.
    a. Provide three copies for Owner.
4. Tests may commence only after Owner has received approved test plan copies.
5. Submittals:
    a. Submit test plans not less than 90 calendar days prior to planned installation testing of subsystem or system.
    b. Completed Manufacturer's Certificate of Installation and Functionality Compliance.
    c. Test procedures and forms: Provide signed-off copy of test forms and test reports upon completion of the test.
    d. Test reports:

(1) Submit preliminary copies within one day after testing completion.
(2) Submit final copies and report within 14 days after testing completion.

F. Process Operational Test plans:
1. Provide operational test plans that describe in detail the plan for preparing for and conducting Acceptance Tests required to demonstrate performance of the facilities in accordance with the Acceptance Standards for the Project as specified in the Technical Specifications and this Section.
2. The Process Operational Test Plan shall include the following:
a. Facility configuration to be utilized during Acceptance Testing.
b. Staffing Requirements: The specific tasks or activities, both process and non-process related, which are required for successful completion of the test.
c. Internal and external communication protocols for the Process Operational Testing period.
d. Procedures for demonstrating compliance with the performance standards and Acceptance Standards for the Project as specified in the Technical Specifications.
e. A list of all parameters to be monitored and a schedule of monitoring, describing sampling locations, analytical methods, and sampling frequencies at which parameters will be monitored on a continuous or other defined basis.
3. Submittal Timing:
a. Design-Builder shall submit a draft Process Operational Test Plan at least 120 calendar days prior to Acceptance Date.
b. Owner will review the draft Process Operational Test Plan and provide comments to Design-Builder within 20 working days of receipt of the draft.
c. Design-Builder will submit the final Process Operational Test Plan within 20 working days of receipt of Owner's comments.

1.06 TESTING AND TRAINING PHASE

A. Overview of Testing and Training Phase:
1. General:
a. Include specified Source Testing, Owner Training, Installation Testing, Functional Testing, PCIS Testing, Acceptance Testing, and Closeout Documentation required by this Section and the technical sections.
2. Design-Builder responsibilities:
a. Furnish labor, power, chemicals, tools, equipment, instruments, and services required for and incidental to completing commissioning activities in accordance with the approved Commissioning Plan.
b. Prior to testing, verify equipment protective devices and safety devices have been installed, calibrated, and tested.
c. Acceptable tests: Demonstrate the equipment/system performance meets the requirements stated in the Contract Documents.
(1) When the equipment/system fails to meet the specified requirements, perform additional, more detailed, testing to determine the cause, correct, repair, or replace the causative components and repeat the testing that revealed the deficiency.
3. Owner responsibilities: Provide biosolids necessary to perform the test with similar characteristics to those in the contract documents. If deviations occur, Owner and Design-Builder will modify testing requirements.

B. Source testing:

DRAFT

1. Also referred to as factory testing or factory acceptance testing (FAT).
2. Test components, devices, and equipment/system for proper performance at point of manufacture or assembly as specified in the technical sections and Owner-approved Source Test Plan.
3. Notify the Owner in writing when the equipment/system is ready for source inspection and testing.
4. Owner is responsible for costs associated with Owner's representatives witnessing initial Source Tests.
    a. If Source Test is not ready when the witnesses arrive or if the Source Test fails, the witnesses will return home with Design-Builder responsible for costs associated with the trip including costs described below. Design-Builder is responsible for rescheduling the Source Test and witnesses' costs associated with the second trip including costs described below.
        (1) Onsite time: One day at the site plus travel time each direction, unless specified otherwise.
        (2) Transportation costs:
            (a) Travel One day on commercial airline to site including air flight costs.
            (b) Travel One day on commercial airline from site including air flight costs.
            (c) Mid-size rental car or taxi services from hotel to and from the test site plus fuel, tolls, and airport parking at the departing airport.
            (d) International travel: Per-diem rates as established by the US Department of State for the specific location and dates of travel. Travel expenses may include the direct cost of securing passports, visas, language interpreters, document translators, communications, and internet access.
        (3) Hotel costs at a facility with an American Automobile Association three diamond rating or better for single occupancy room per person per day.
        (4) Meal allowance equal to the US Government's published *per diem* rate for the locale.
        (5) Onsite time: one day at the site, unless specified otherwise.
        (6) Only actual costs will be documented and billed.
    b. If Owner elects not to send a witness for source testing, or if Owner is unable to send a witness, Design-Builder shall make provisions for the Owner to be able to witness testing via live-stream video and shall video record all source testing performed. Video recording(s) shall be provided to Owner within 5 business day of completion of a given day's tests.
    c. Fees incurred such as airline reservation change fees, loss of fare due to purchase of nonrefundable tickets, hotel cancellation/rebooking fees, and similar expenses incurred as a result of OSS-requested changes to the inspection schedule after the initial notification shall be borne by Design-Builder.
    d. or Design-Builder is responsible for witnesses' costs associated with retests including costs described above.
5. Design-Builder is responsible for providing fuel, chemicals, and other consumables needed for Source Testing.
6. Source Test Report:
    a. Prepare and submit test results as indicated in the Source Test Report outline submitted with the respective approved Source Testing Plan.
    b. Include collected data in the Source Test Report.
    c. Attach completed Manufacturer's Certificate of Source Testing provided as supplement to this Section, as applicable.
    d. Submit Source Test Reports within seven calendar days of completion of Source Testing of applicable equipment.

DRAFT

C. Procedures Development:
   1. Design-Builder shall develop SOPs, Standard Instructions, and Roundsheets for all new and modified unit processes constructed as part of this Project.
   2. Draft SOPs and Standard Instructions shall be submitted to the Owner for review and comment prior to finalization.
   3. Design-Builder's O&M experts for a given process area of equipment type will be available for on-site meetings to discuss draft SOPs and standard instructions with the Owner. O&M expert will walk through with actual equipment the SOPs in at least twice.
      a. The first walkthrough will be with experienced Owner's operation staff.
      b. The second walkthrough will be with Owner's operations staff with 6 months of less experience with the City.
      c. Comments and refinements from these walkthroughs will be incorporated into the final SOPs, standard instructions, and Roundsheets.
   4. Submittals:
      a. Draft SOPs and Standard Instructions shall be submitted to the Owner for review in accordance with Section OR-01330 Submittal Procedures.
      b. Final SOPs and Standard Instructions shall be submitted as follows:
         (1) Two hardcopies (Standard Instructions shall be laminated).
         (2) One electronic copy of a compiled, bookmarked PDF.
         (3) One electronic copy of each SOP and Standard Instruction document in .docx format.
         (4) SOPs shall be identified and named by asset, in accordance with KC Water's Asset standards.
   5. SOPs:
      a. SOPs shall be developed first and shall be reviewed and approved by the Owner prior to development of draft Standard Instructions.
      b. SOPs shall be drafted and reviewed by the Owner prior to the start of Process Training.
      c. SOPs shall include usual and customary operating conditions as anticipated by the Design-Builder and as designed by the manufacturer and fault conditions.
      d. SOPs shall consist the following sections, at a minimum:
         (1) Startup.
         (2) Shutdown.
         (3) Usual Operations Mode.
         (4) Alternative Operational Modes.
         (5) Fault Conditions and Troubleshooting.
      e. Each Section of the SOPs shall have the following subsections, as applicable at a minimum:
         (1) Purpose.
         (2) Safety (including lockout/tagout and warning notes).
         (3) Actions (Step number, action, and picture or location with a box around the manipulated item).
         (4) Valve table.
         (5) Unit or Setting table (Panels, PLC, and SCADA).
         (6) Shift (Daily) Checklist or Roundsheet.
         (7) Weekly Checklist.
         (8) Recommended Sampling and Testing.
         (9) Recommended performance indicators and anticipated operating ranges to track and optimize process performance.
      f. SOPs and associated Roundsheet shall be revised and finalized based Owner comments and on operator input following completion of Process Training.

DRAFT

6. Standard Instructions: Following finalization of SOPs, Design-Builder shall develop a one-page standard instruction sheet for each system or equipment for which an SOP was developed.
7. Roundsheets: After the drafting of SOPs, Design-Builder's O&M expert and Owner will edit or develop new roundsheets. Roundsheets are used by first line operators to direct and document their work on their duty station throughout their shift. Roundsheets are used to transfer observations and measurements to the City's operations databases.

D. Owner training:
   1. Provide training as specified in Section 01664 – Training.

E. Installation Testing:
   1. Perform subsystem testing according to approved Subsystem Testing Plans.
   2. Initiate the Manufacturer's Certificate of Installation and Functionality Compliance for all equipment.
      a. Manufacturer's Certificate of Installation and Functionality Compliance form is included in this Section.
      b. Manufacturer's Certificate of Installation and Functionality Compliance certifies the equipment meets the following requirements:
         (1) Has been properly installed, adjusted, aligned, and lubricated.
         (2) Is free of any stresses imposed by connecting piping or anchor bolts.
         (3) Is able to be operated as necessary for Functional Testing.
      c. Form shall be submitted after completion of Functional Testing, as specified in this Section.
   3. Coordinate Installation Testing with restrictions and requirements as specified in Section 01140 – Work Restrictions.
   4. Perform coating holiday testing as specified in Section 09960 – High-Performance Coatings.
   5. Perform pressure and leakage testing as specified in individual component Sections.
   6. Perform mechanical equipment Installation Testing: As in individual equipment sections.
      a. Remove rust preventatives and oils applied to protect equipment during construction.
      b. Flush lubrication systems and dispose of flushing oils.
         (1) Recharge lubrication system with lubricant recommended by manufacturer.
      c. Flush fuel system and provide fuel for testing and start-up.
      d. Install and adjust packing, mechanical seals, O-rings, and other seals. Replace defective seals.
      e. Remove temporary supports, bracing, or other foreign objects installed to prevent damage during shipment, storage, and erection.
      f. Check rotating machinery for correct direction of rotation and for freedom of moving parts before connecting driver.
      g. Perform cold alignment and hot alignment to manufacturer's tolerances.
      h. Adjust V-belt tension and variable pitch sheaves.
      i. Inspect hand and motorized valves for proper adjustment.
         (1) Tighten packing glands to ensure no leakage but permit valve stems to rotate without galling.
         (2) Verify valve seats are positioned for proper flow direction.
      j. Tighten leaking flanges or replace flange gasket.
         (1) Inspect screwed joints for leakage.
      k. Install gratings, safety chains, handrails, shaft guards, and sidewalks prior to operational testing.
   7. Electrical devices and subsystems Installation Testing: As specified in Section 16950 - Electrical System Testing and Settings, and the technical sections.
   8. Perform Instrumentation devices and subsystems Installation Testing.
   9. Heating, ventilating, and air conditioning systems Installation Testing:

a. Perform testing of heating, ventilating, and air conditioning equipment, balancing of distribution systems, and adjusting of ductwork accessories.
b. Test hydronic systems, if required by technical sections.

F. Functional Testing:
1. Perform subsystem testing according to approved Subsystem Testing Plan.
2. Notify the Owner five days prior to when the Work is ready for Functional Testing.
a. Perform testing in the presence of the Owner.
3. Determine Functional Testing durations with Owner's input.
a. Durations will vary depending on the availability of water, utilities, and other feeds for testing.
b. Target minimum Functional Test duration: eight hours.
(1) Identify equipment/system that cannot be tested for a minimum of eight hours as specified in technical sections.
4. Perform Functional Testing as specified in technical sections.
a. Perform Functional Testing in addition to the other tests specified in the technical sections.
b. Perform Functional Testing to demonstrate that the component equipment functions as an entire system in accordance with the design requirements.
c. Perform Functional Testing to demonstrate that the unit process has operated in a manner necessary to demonstrate equipment/system functions manually in local, manually in remote (or remote manual), and automatically in remote (in remote auto).
d. Perform testing with Owner-provided water, as confirmed by Owner.
e. Repair or replace parts that operate improperly and retest.
f. Submit testing results as specified in the technical sections to the Owner for approval of Functional Testing results.
5. Provide completed Manufacturer's Certificate of Installation and Functionality Compliance forms for all equipment.
a. Manufacturer's Certificate of Installation and Functionality Compliance form is included in this Section.
b. Manufacturer's Certificate of Installation and Functionality Compliance certifies the equipment/system meets the following requirements:
(1) Is suitable for satisfactory full-time operation under full-load conditions.
(2) Operates within the allowable limits for vibration and noise.
(3) Electrical and instrumentation requirements:
(a) Electrical equipment, instrumentation, and control panels are properly installed, calibrated, and functioning.
(b) Electrical Installation Testing is complete, and test results have been approved by the Engineer.
(i) Noted deficiencies have been corrected.
(ii) Relays, circuit breakers, and other protective devices are set.
(c) Control logic for start-up, shutdown, sequencing, interlocks, control, and emergency shutdown has been tested and is properly functioning.
(d) Motor control is calibrated and tested.

G. Process Control and Instrumentation System (PCIS) testing: In accordance with the requirements of this Section and Section 17950 – SCADA Testing, Calibration, and Commissioning.

H. Closeout documentation:
1. Submittals:
a. Provide records generated during Commissioning Phase of Project.

DRAFT

(1) Required documents include but are not limited to:
  (a) Training documentation.
  (b) Manufacturer's Certificate of Source Testing.
  (c) Manufacturer's Certificate of Installation and Functionality Compliance.
  (d) Daily logs of equipment/system testing identifying tests conducted and outcome.
  (e) Test forms and documentation.
  (f) Functional Testing results.
  (g) Logs of time spent by manufacturer's representatives performing services on the job site.
  (h) Equipment lubrication records.
  (i) Electrical phase, voltage, and amperage measurements.
  (j) Insulation resistance measurements.
  (k) Bearing temperature measurements.
(2) Data sheets of control loop testing including testing and calibration of instrumentation devices and setpoints. Format: two electronic copies and three hardcopies organized in notebooks.
(3) Due date: Prior to Substantial Completion or as indicated in this Section or in Section 01019 – Closeout Procedures..

1.07 PROCESS START-UP PHASE

A. Overview of Process Start-Up Phase:
  1. Operating the facility to verify performance meets the Contract Document requirements.
B. Process Start-Up:
  1. Perform process start-up in the presence of Owner.
  2. Pre-start-up activities:
    a. Commissioning Documentation and Data Review.
    b. Start-Up Go/No-Go Decision Criteria.
    c. Building and Fire Inspection Compliance Check.
    d. Process Start-Up Sequence Review.
      (1) Submit a Process Start-Up plan for review by Owner not less than 90 calendar days prior to planned commencement of process start- up activities.
      (2) Include the following:
        (a) Pre-start-up activities.
        (b) Process Start-Up.
        (c) Process Operational Period.
    e. Description of Temporary Testing Arrangement, if applicable.
    f. Final Process Start-Up Forms and Documentations.
    g. Final Operational (Acceptance) Testing Plan.
  3. Control loop tuning.
    a. Perform control loop tuning during system testing with water to the extent possible.
  4. Process area start-ups.
    a. Process start-up individual process areas comprised of multiple interdependent systems where possible and beneficial to reduce complexity and risk of complete facility testing.
    b. Process area test flows may be limited by upstream and downstream process constraints (i.e., tank and basin volumes) and/or localized recirculation capabilities.
  5. Facility-wide process start-up.

DRAFT

a. Upon approved completion of pre-start-up activities, perform entire facility process start-up.
   (1) Complete control loop tuning during this phase of process start-up.
   (2) Continue process start-up operations until facility meets or exceeds the Contract requirements.
b. Process control systems testing:
   (1) Test complete system instrumentation, controls and PLC, HMI, and LOI programming for the facility.
c. HVAC systems start-up and testing:
   (1) Test complete HVAC system for the facility.
d. Ancillary systems start-up and testing:
   (1) Test complete security system, phone system, fire alarm system, etc. for the facility.
e. Remaining equipment/system tests:
   (1) Conduct remaining specified equipment/system performance tests that could not be performed during the Testing and Training Phase due to inter-system and/or treatment process dependencies.

C. Process Operational Period:
1. Prior to beginning the 60-Day Process Operational Period:
   a. Conformance with treatment standards is required prior to Operational Testing, if applicable.
   b. Correct any outstanding punch list items required to perform Acceptance Testing prior to the start of Acceptance Testing.
2. Duration: 60 calendar days. Duration may be extended if max month loading is not experienced during the 60 days for 3 consecutive days.
3. Owner will be present for process operational period unless such presence is expressly waived in writing.
4. Prove facility conformance with Contract Document requirements by verifying performance meets the Acceptance Standards in this Specification.
5. Design-Builder to provide:
   a. Oversight and support of facility operations through Acceptance Testing.
   b. Specified start-up materials and operating supplies.
   c. Necessary craft of labor assistance, in the event of an emergency equipment failure requiring immediate attention (emergency is defined as a failure of function which precludes the further operation of a critical segment of or the whole of the Work) with a response time of not more than four hours from the time of notification.
   d. Manufacturer's authorized representative to supervise placing equipment/systems in operation and provide guidance during Operational Testing per applicable section.
   e. Necessary manufacturer's representatives and operating supplies for retesting systems that fail to pass the initial Operational Testing due to deficiencies in products of workmanship at no additional cost to Owner.
   f. List of 24-hour "on-call" representative supervisory persons who will monitor the Operational Testing and serve as liaison for Owner.
6. Owner will provide:
   a. Operations personnel to operate facility for duration of Acceptance Testing including all assets previously accepted by the Owner for beneficial use.
7. Within 14 days following Substantial Completion the Design-Builder's Commissioning Manager shall commence and oversee Process Operational Period.
   a. Owner staff will operate the completed Project construction.

DRAFT

b. Entire system shall continuously meet performance requirements and shall operate without fault, failure, or defect for a continuous period.
c. Individual equipment/system failures that are corrected within 24 hours and do not prevent the entire project from continuously satisfying the established operational requirements shall not require the consecutive day test to be restarted unless the failure recurs.
d. Restart the consecutive test period for any of the following conditions:
(1) Any failure of the complete Project construction to meet operational requirements.
(2) When malfunctions or deficiencies cause shutdown or partial operation of the facility, or results in failure of the complete Project construction to meet operational requirements.
(3) Any individual equipment/system failure that meets any of the following conditions:
(a) Requires more than 24 hours to correct.
(b) Recurs within the 24-hour correction period requiring further correction.
(4) Immediately correct defects in material, workmanship, or equipment/system which became evident during Operational Testing.

8. Acceptance Testing Daily Meetings:
a. During Acceptance Testing, daily meetings will be held between the Design-Builder and the Owner.
b. At the meeting, the Design-Builder will provide a report of the previous day's results of the testing including any laboratory analysis data that is available by the time of the daily meeting.
c. The daily reports will be signed off on by the Design-Builder and submitted to the Owner. The Owner will review the daily reports and return to the Design-Builder within 24 hours to provide preliminary approval of the Owner of the previous days' testing based on available data at that time.
9. Acceptance Standards:
a. All Acceptance Standards analysis shall be conducted by an outside certified laboratory or shall be collected by a tested and calibrated online sampler, as applicable.
b. Design-Builder is obligated to achieve the Acceptance Standards set forth in this Specification through Acceptance Testing, as applicable.

D. Closeout documentation (Process Testing Phase):
1. Acceptance Test Report: An Acceptance Test Report shall be submitted to the Owner within 7 days following completion of Acceptance Testing.
2. The Acceptance Test Report shall include:
a. A summary of completed testing and results.
b. A summary of operational issues identified during testing and steps taken to resolve such issues.
c. A list of maintenance items encountered during testing and steps taken to resolve such items.
d. A summary of recommended changes to previously developed SOPs and/or Standard Instructions.
e. All final approved daily reports shall be provided as an appendix to the Acceptance Test Reports.

1.08 INSTRUMENTATION AND CONTROLS FINE-TUNING

A. After the Process Operational Period, test PCIS system for additional 60 days.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

<Acceptance Standards to be defined by Owner and Design-Builder prior to Phase 2 Proposal>

DRAFT

System	Parameters	Acceptance Standards	Sampling Type	Sampling Frequency

End of Section

DRAFT

MANUFACTURER'S CERTIFICATE OF SOURCE TESTING

OWNER_____ EQPT/SYSTEM_____
PROJECT NAME_____ EQPT TAG NO. _____
PROJECT NO._____ EQPT SERIAL NO. _____
SPECIFICATION NO. _____
SPECIFICATION TITLE _____

Comments: _____

_____

_____

_____

_____

I hereby certify Source Testing has been performed on the above-referenced equipment/system as defined in the Contract Documents, and results conform to the Contract Document requirements. Testing data is attached.

Date of Execution:_____, 20____

Manufacturer: _____

Manufacturer's Authorized Representative Name *(print)*: _____

_____
(Authorized Signature)

If applicable, Witness Name *(print)*: _____

_____
(Witness Signature)

DRAFT

MANUFACTURER'S CERTIFICATE OF INSTALLATION AND FUNCTIONALITY COMPLIANCE

OWNER_____ EQPT/SYSTEM_____
PROJECT NAME_____ EQPT TAG NO. _____
PROJECT NO._____ EQPT SERIAL NO. _____
SPECIFICATION NO. _____
SPECIFICATION TITLE _____

I hereby certify that the above-referenced equipment/system has been: (Check Applicable)

- ☐ Installed in accordance with manufacturer's recommendations.
- ☐ Inspected, checked, and adjusted.
- ☐ Serviced with proper initial lubricants.
- ☐ Electrical/instrumentation and mechanical connections meet quality and safety standards.
- ☐ All applicable safety equipment has been properly installed.
- ☐ Functionally tested.

NOTES:
Attach test results with collected data and test report.

Attach written certification report prepared by and signed by the electrical and/or instrumentation subcontractor.

Comments: _____

_____

I, the undersigned manufacturer's representative, hereby certify that I am (i) a duly authorized representative of the manufacturer, (ii) empowered by the manufacturer to inspect, approve, and operate this equipment/system, and (iii) authorized to make recommendations required to ensure that the equipment/system furnished by the manufacturer is complete and operational, except as may be otherwise indicated herein. I further certify that all information contained herein is true and accurate.

Date:_____, 20 ____

Manufacturer: _____

Manufacturer's Authorized Representative Name *(print)*: _____

By Manufacturer's Authorized Representative: _____
(Authorized Signature)

DRAFT

COMMISSIONING ROLES AND RESPONSIBILITIES MATRIX

NO.	TASK	OWNER	DESIGN-BUILDER	OWNER'S ADVISOR
Testing and Training Phase				
Source Testing				
1	Source Testing	Witness	Lead	Witness, Review
Installation Testing				
2	Electrical Conductor Testing	No Action	Lead	Witness
3	Electrical Field Acceptance Tests	No Action	Lead	Witness
4	Instrument Field Calibration	No Action	Lead	Witness
5	Network Installation Testing	Witness	Lead	Witness
6	Loop Testing	Witness	Lead	Witness
7	Pressure Testing	No Action	Lead	Witness
8	Leak Testing	No Action	Lead	Witness
9	Holiday Testing	No Action	Lead	Witness
10	HVAC Testing	No Action	Lead	Witness
11	Motor Electrical Testing	No Action	Lead	Witness
Functional Testing				
12	Network Operational Testing	Witness	Lead	Review
13	Preliminary Run Testing Local/Manual Control	Witness	Lead	Review
14	PCIS Functional Demonstration Testing - Local/Auto Control Testing - Remote/Manual Contact Testing - Alarm Testing - Control Loop Testing	No Action	Lead	Review
15	Subsystem Start-Up and Testing	Witness	Lead	Review
16	Equipment/System Start-Up and Testing	Witness	Lead	Review
17	HVAC Start-Up and Testing	Witness	Lead	Review
18	Corrosion Control Start-Up and Testing	Witness	Lead	Review
19	Wide Area Network Communications Testing	Support	Lead	Witness
20	Manufacturer's Certificate of Installation and Functionality Compliance	No Action	Lead	Witness, Review
Clean Water Facility Testing				
21	Test Water Management Plan Finalization	Support	Lead	Review
22	Clean Water Facility Testing	Witness	Lead	Witness, Review
Process Start-Up Phase				
Process Start-Up				
23	Commissioning Documentation and Data Review	Review	Support	Lead

DRAFT

NO.	TASK	OWNER	DESIGN-BUILDER	OWNER'S ADVISOR
24	Start-Up Go/No-Go Decision Criteria	Lead	Support	Review
25	Building and Fire Inspection Compliance Check	No Action	Lead	Witness
26	HVAC Functionality Check	No Action	Lead	Witness
27	Start-Up Sequence Review	Support	Lead	Review
28	Temporary Testing Arrangement Finalization	Support	Lead	Support
29	Start-Up Forms Finalization	Support	Lead	Support
30	Operation Testing Plan Finalization	Review	Support	Lead
31	Test Water Management Plan Finalization	Support	Lead	Review
32	System Testing	Support	Lead	Witness
33	Control Loop Tuning	Support	Lead	Witness
34	Process Area Start-Ups	Support	Lead	Witness
35	Facility-Wide Start-Up	Support	Lead	Witness
36	Process Control Systems Testing	Support	Lead	Witness
38	HVAC Final Testing, Adjust, and Balancing	Witness	Lead	Witness, Review
39	Develop Standard Operating Procedures	Review & Assist	Support	Lead
40	Develop Roundsheets	Review & Assist	Support	Lead
Process Operational Period				
39	Operational Testing	Support	Lead	Witness, Review
40	Final Testing Reports	Support	Lead	Review
41	Water Quality Testing and Documentation	Support	Lead	Review
Instrumentation and Controls Reliability Phase				
Instrumentation and Controls Reliability Period				
42	As specified in Section 15950 - Testing, Calibration, and Commissioning			

Legend:
Lead: Primarily responsible for organization, coordination, and execution of task work product or result.
Support: Assist the lead with organization, coordination, and execution of task work product or result.
Witness: Observe and document completion of task work product or result.
Review: As necessary to accept task work product result.
No Action: Limited or no involvement.

DRAFT

Exhibit 8.1
Insurance Requirements

A. Design-Builder's Insurance Coverages

Design-Builder shall obtain and maintain the following insurance coverages during the performance of the Work. Policy coverage limits may be achieved through a combination of insurance policies (e.g., primary and/or excess). Owner and all additional insureds identified in Article 5 of the General Conditions of Contract shall be included as additional insureds on a primary, non-contributory basis for the coverages set forth in Paragraphs 2, 3, 4, and 7 below.

1. **Workers' Compensation and Employer's Liability Insurance** with statutory workers' compensation (Coverage A) limits and employer's liability (Coverage B) limits of $1 million bodily injury by accident, each accident, and $1 million bodily injury by disease, each employee. Coverage will be extended, if needed, to cover any claims under the United States Longshore and Harbor Workers' Compensation Act (33 U.S.C. §§ 901-950) and the Jones Act (46 U.S.C. §30104).

2. **Commercial General Liability Insurance** including coverage for premises and operations, independent contractors, personal injury, product and completed operations, explosion, collapse and underground, and broad form contractual liability of limits of $2 million per occurrence and $4 million annual aggregate. Completed operations coverage shall continue to be carried for a period of five (5) years after the Substantial Completion Date.

3. **Automobile Liability Insurance** with a limit of $2 million combined single limit for bodily injury and property damage covering all owned (if any), non-owned, hired, or borrowed vehicles on site or off.

4. **Builder's Risk Insurance** on an "all risks" completed value basis, including permanent and temporary works, site preparation, and foundations. Covered causes of loss shall include, but not be limited to, fire, explosion, collapse, earth movement (including subsidence, sinkhole and collapse), flood, windstorm, theft, collapse, terrorism and vandalism. The Builder's Risk insurance must be project-specific and will cover Owner, Design-Builder and all DB-Related Entities during construction of the Work through the Acceptance Date, with a limit equal to the full value of the Contract Price. Further, the policy shall include extensions of coverage with minimum sub-limits as follows: (a) $10 million for off-site storage and transit; (b) 20% for debris removal and demolition; and (c) $5 million for increased costs of construction, expediting expenses, soft costs (including $2 million for Owner's continuing project administration expenses), professional fees and loss adjustment expenses. The policy also will include replacement cost coverage for the Work, including any buildings, structures, materials, supplies, equipment, machinery, and fixtures that will become a part of the Project. Coverage will include, but not be limited to, the following (provided that commercially reasonably sub-limits will be accepted where typical): right to partial occupancy; London Engineering Group (LEG) 2 type or equivalent coverage for damages resulting from Design-Builder's design error, faulty workmanship, and/or faulty materials, testing, and change in ordinance or law.

Builder's Risk Insurance must be in place before the commencement of construction activities and through the Acceptance Date. Design-Builder shall submit to Owner on or before the Agreement Date: (a) a letter of certification from Design-Builder or Design-Builder's insurance broker confirming that Builder's Risk Insurance compliant with the requirements contained herein will be placed prior to the commencement of construction of the Work; and (b) a specimen Builder's Risk Insurance policy, including all attachments and sub-limits. Upon placement, Design-Builder shall submit a copy of the full Builder's Risk Insurance policy, including all attachments and sub-limits.

5. **Contractor's Equipment** to include "all-risk" insurance covering all risk of physical damage to equipment to be used at the Site by Design-Builder, whether leased, rented, borrowed, or used at the Site, unless covered under the Builder's Risk Insurance policy described above. Such coverage shall have limits equal to the replacement cost of such equipment unless Owner approves lower limits.

6. **Contractor's Pollution Liability Insurance** includes coverage for bodily injury, property damage, cleanup/remediation costs or other amounts which Design-Builder is legally obligated to pay arising out of the Work. Such insurance will have limits of $5 million any one claim and in the aggregate and will remain in full force and effect for the period of the Work and a five (5)-year extended reporting period after the Acceptance Date.

7. **Professional Liability Insurance** covering Design-Builder's negligent acts, errors, or omissions caused by the Work, for $4 million any one claim and in the aggregate. This insurance may be on a "claims-made" basis and, if so, shall have an extended reporting or discovery "tail" period, or be renewed for a period, of 5 years after the Substantial Completion. It shall also have a retroactive date effective before the commencement of any design, and shall not include any exclusionary language relating to joint ventures or partnerships or both.

8. **Cyber Liability Insurance**, if applicable, with limits not less than $2,000,000 per occurrence or claim, $2,000,000 aggregate. Coverage shall be sufficiently broad to respond to the duties and obligations as is undertaken by Design Professional in this agreement and shall include, but not be limited to, claims involving security breach, system failure, data recovery, business interruption, cyber extortion, social engineering, infringement of intellectual property, including but not limited to infringement of copyright, trademark, trade dress, invasion of privacy violations, information theft, damage to or destruction of electronic information, release of private information, and alteration of electronic information. The policy shall provide coverage for breach response costs, regulatory fines and penalties as well as credit monitoring expenses.

B. Insurance to be Maintained by Design Consultants and Subcontractors

Design-Builder will cause all of its Design Consultants and Subcontractors to obtain and maintain the following insurance coverages or be responsible for maintaining such coverages on behalf of each party. Owner and all additional insureds identified in Article 5 of the General Conditions of Contract shall be included as additional insureds on a primary, non-contributory basis for the coverages set forth in Paragraphs 2, 3 and 4 below.

1. **Workers' Compensation and Employer's Liability Insurance** with statutory workers' compensation (Coverage A) limits and employer's liability (Coverage B) limits

of $500,000 bodily injury by accident, each accident, and $500,000 bodily injury by disease, each employee. Coverage will be extended, if needed, to cover any claims under the United States Longshore and Harbor Workers' Compensation Act (33 U.S.C. §§ 901-950) and the Jones Act (46 U.S.C. § 30104).

2. **Commercial General Liability Insurance** including coverage for premises and operations, independent contractors, personal injury, product and completed operations, explosion, collapse and underground, and contractual liability. Limits for Design Consultants and Subcontractors with contracts valued at less than or equal to $1 million shall be $1 million per occurrence and $1 million in the aggregate annually. For those Design Consultants and Subcontractors with contracts valued at greater than $1 million, such coverage shall have limits of $1 million per occurrence and $2 million in the aggregate annually.

3. **Automobile Liability Insurance** with a limit of $1 million combined single limit for bodily injury and property damage covering all owned (if any), non-owned, hired, or borrowed vehicles on site or off. Should Design-Builder implement a CCIP, all Design Consultants and Subcontractors shall nevertheless comply with this requirement.

4. **Umbrella/Excess Liability Insurance** in excess of the underlying limits noted above for employer's liability, commercial general liability, and automobile liability in the amount of $1 million per occurrence and in the aggregate. For contracts valued at more than $1 million, coverage shall be in the amount of $4 million per occurrence and in the aggregate.

Should Design-Builder implement a contractor-controlled insurance program (CCIP) providing compliant insurance for all participants with regard to on-site activities, all Construction Subcontractors enrolled in the CCIP shall still be responsible for procuring and maintaining automobile liability insurance and the other insurance coverages noted above with regard to off- site work. Owner and all additional insureds identified in Article 5 of the General Conditions of Contract shall be included as additional insureds on a primary, non-contributory basis for the applicable insurance coverages set forth in Paragraphs 2, 3 and 4 above.

ATTACHMENT C: Project Background Documents

MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

Michael L. Parson
Governor

Dru Buntin
Director

June 26, 2024

Brent R. Herring, Deputy Director
KC Water- Water and Wastewater Operations
4800 East 63rd Street
Kansas City, MO 64130

RE: Beneficial Use Exemption Request-KC Water Biosolids Ash Ponds Closure Plan, Blue River Wastewater Treatment Plant, Jackson County, Missouri

Dear Brent R. Herring:

This letter is in response to a beneficial use request dated February 28, 2024, and received by the Department of Natural Resources' Waste Management Program (WMP). The letter requested a beneficial use permit exemption for the ash material contents of the KC Water Biosolids Ash North Pond.

The WMP has reviewed the testing information and request. The WMP finds the beneficial use exemption request in accordance with 10 CSR 80-2.020(9)B and hereby approves the beneficial use request with the following conditions:

CONDITIONS:

1. This approval for beneficial use applies only to the ash material from the North Pond described in the beneficial use request described above.

2. Transport and placement of the residual material must be conducted in a manner that protects human health, worker safety and the environment.

3. KC Water Blue River Wastewater Treatment Plant is responsible for ensuring the material is used in a manner that will not result in pollution, a public nuisance, or a health hazard.

4. Within 60 days of completing placement activities, the Statement of Beneficial Use Closure, describing the location, type, quantity, and depth of material used to complete the project, shall be recorded on the property deed of the site and a copy of the Statement of Beneficial Use Closure submitted to the WMP. In the event the beneficial use material must be disturbed in the future, the disturbance must be in accordance with *10 SR 80-2.030(3).*

5. Please note, a land disturbance permit is required from the department's Water Protection Program (WPP) for activities involving land areas greater than one acre. KC Water Blue River Wastewater Treatment Plant is responsible for acquiring and abiding by all requirements of any permits required by the Missouri Department of Natural Resources. Please contact the WPP at 573-751-1300 if you have any questions about permit requirements.

This approval should not be construed as compliance with any existing federal or state laws other than the Missouri Solid Waste Management Law; nor should this be construed as a waiver for any other regulatory requirements. This approval is not to be construed as compliance with any existing local permitting or zoning ordinances; nor does it supersede any local permitting and/or zoning requirements.

The department reserves the right to revoke, suspend, or modify this approval after due notice should KC Water Blue River Wastewater Treatment Plant fail to comply with the state's Solid Waste Management Law and regulations.

If you were adversely affected by this decision, you may be entitled to pursue an appeal before the administrative hearing commission. To appeal, you must file a petition with the administrative hearing commission within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the administrative hearing commission. Any appeal must be directed to:

Administrative Hearing Commission
United States Post Office Building, Third Floor
131 West High Street
P.O. Box 1557
Jefferson City, MO 65102
Telephone: 573-751-2422
Fax: 573-751-5018
Website: www.oa.mo.gov/ahc

If you have any questions concerning this letter, please contact Brian D. Newby, of my staff by e-mail at brian.newby@dnr.mo.gov; by phone at 573-526-3940; or by mail at P.O. Box 176, Jefferson City, MO 65102-0176. Thank you.

Sincerely,

WASTE MANAGEMENT PROGRAM

David Drilling, P.E.
Chief, Engineering Section

Enclosure: Statement of Beneficial Use Closure

c: Sherri Stoner, R.G., Missouri Geological Survey
Michael Parris, Chief, Compliance/Enforcement Section, WMP
Brian Weis, P.E., Burns and McDonnel
Kevin White, P.E., Senior Project Manager, KC Water
Southwest Regional Office

STATEMENT OF BENEFICIAL USE CLOSURE

Pursuant to the Beneficial Use Approval, dated _____, issued to (owner of pit), _____, states that he owns real property which contains a beneficial use solid waste disposal area in _____ County, State of Missouri, and further states the following information to comply with Title 10, CSR 80-2.020(9)(B) of the Code of State Regulations of Missouri and the Beneficial Use Approval for this site:

1. Name of the property owners as it appears on the last recorded property deed: _____.

2. Property deed recorded at: book _____, page_____.

2. Legal description of the property: _____ _____.

3. Location of solid waste beneficial use area within the property: _____ _____.

4. Types of solid waste in the fill area; the solid waste consists of _____ _____.

5. Depth of solid waste and cover:
Average depth of waste is _____ft. The solid waste is covered with _____ft. of soil.

6. A description of the type of vegetation established to prevent erosion, and any continuing site maintenance required. _____ _____

7. Any type of activity that would disturb the cap or the fill material, such as, but not limited to, construction of residences or buildings of any kind, wells, utility lines, or livestock watering systems, requires prior written approval from the Department of Natural Resources' Solid Waste Management Program.

On this _____ day of _____, 20____, before me appeared, _____, to me personally known, and first being duly sworn, state the facts set out in the foregoing instrument are true and acknowledged that they execute said instrument as their free act and deed.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal at my office in the County and State aforesaid, on the day and year first above written.

(Notary seal)

_____
Notary Public

My commission expires:_____

BURNS McDONNELL

KC WATER

BIOSOLIDS ASH PONDS CLOSURE PLAN

BLUE RIVER WASTEWATER TREATMENT PLANT

PROJECT NUMBER 139004

REVISION 0

REVISION DATE: FEBRUARY 22, 2024

CONTENTS

1.0 Introduction 1

1.1 Project Overview 1

1.2 Site Background 1

1.3 Project Background 2

2.0 South Ash Pond Closure 4

2.1 South Ash Pond Construction 4

2.2 Closure Description 4

2.3 Closure Schedule 5

2.4 Closure Visual Inspection 5

3.0 North Ash Pond Closure 7

3.1 North Ash Pond Construction 7

3.2 Closure Description 7

3.3 Beneficial Use Exemption 10 CSR 80-2.020 (9) B 8

3.4 Closure Schedule 13

4.0 Documentation 14

5.0 References 15

FIGURES

APPENDIX A – ASH POND SAMPLING REPORT

APPENDIX B – BLUE VALLEY INDUSTRIAL CORRIDOR SOILS BACKGROUND STUDY REPORT

APPENDIX C – SOUTH POND AS-BUILT DRAWINGS

APPENDIX D – NORTH POND AS-BUILT DRAWINGS

APPENDIX E – NPDES PERMIT

APPENDIX F – GEOTECHNICAL REPORT

APPENDIX G – AUTHORIZATION LETTER



UNCONTROLLED IF PRINTED OR DOWNLOADED FROM INTRANET

List of Abbreviations

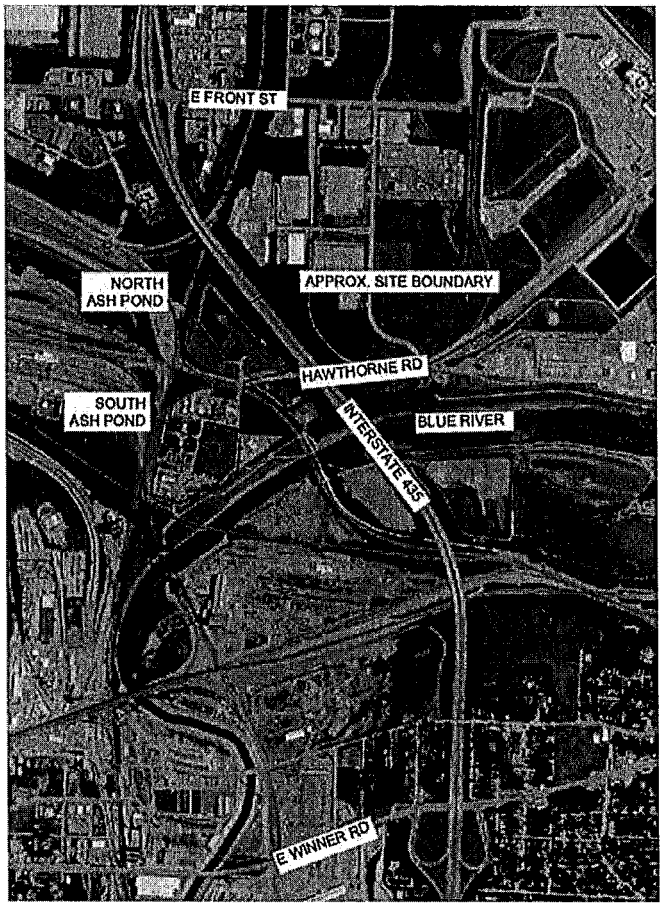
Abbreviation	Term/Phrase/Name
BMP	Best Management Practice
the City	the City of Kansas City, Missouri
CLSM	controlled low-strength material
CSR	Code of State Regulations
EPA	Environmental Protection Agency
GPS	Global Positioning System
KC Water	Kansas City, Missouri Water Services Department
MDNR	Missouri Department of Natural Resources
MGD	million gallons per day
NPDES	National Pollutant Discharge Elimination System
%	percent
RCRA	Resource Conservation and Recovery Act
RSL	Regional Screening Level
SAP	Sampling and Analysis Plan
Site	KC Water's Blue River Wastewater Plant
SWPPP	Stormwater Pollution Prevention Plan
TCLP	toxicity characteristic leaching procedure
WMP	Waste Management Program
WPP	Water Protection Program
WWTP	wastewater treatment plant

1.0 Introduction

1.1 Project Overview

The City of Kansas City, Missouri (the City) Water Services Department (KC Water) has contracted Burns & McDonnell to prepare a Closure Plan for the Blue River Wastewater Treatment Plant (WWTP) (Site) biosolids ash ponds. The WWTP is located at 7300 Hawthorne Rd, Kansas City, Missouri and is situated West of Interstate 435 and north of the Blue River as displayed in **Figure 1**, below.

Figure 1: Blue River WWTP Site Location Map



1.2 Site Background

According to KC Water, the Site was opened in the early 1960's as a primary treatment facility. The Site currently operates under National Pollutant Discharge Elimination System (NPDES) Permit Number MO-0024911, administered through the Missouri Department of Natural Resources (MDNR) Water Protection Program (WPP). As Kansas City's largest WWTP, the Site treats more than half of Kansas City's wastewater and is designed for a maximum flow of 105 million gallons per day (MGD) with an average daily flow of

approximately 70 MGD. The design biosolids production is approximately 23,800 dry tons/year. Biosolids incineration and storage of ash material was authorized by the NPDES permit as a means of managing the material. The incinerated (ash) material was stored on-site in two ponds identified in **Figure 1** as North Ash Pond (8.6 acres) and South Ash Pond (3.8 acres) with a cumulative area of approximately 12.4 acres. It is estimated that approximately 113,000 cubic yards of biosolids ash material is present in South Ash Pond (the older of the two ponds) while approximately 123,000 cubic yards of material is contained in the North Ash Pond (the newer of the two ponds). Recent process modifications on Site have provided alternative means for managing biosolids. The biosolids incineration system has been removed, thus negating the need for future ash material storage.

1.3 Project Background

KC Water initiated the biosolids ash pond closure process in the spring of 2021, as the biosolids incineration system was being decommissioned. An initial meeting with the MDNR Waste Management Program (WMP) was conducted with Burns & McDonnell in November of 2021. During this meeting it was discussed that biosolids ash is generally characterized as an inert, soil-like material and that it was the desire of KC Water to explore the potential to beneficially utilize or reclaim the biosolids ash as fill material if determined to be safe to the environment. This would avoid the considerable cost and emissions associated with excavating and hauling the material to a Subtitle D landfill for disposal. It was also discussed that to further evaluate this option, a material characterization would need to be completed and that the constituents of concern for this material would be the eight metals commonly known as the "Resource Conservation and Recovery Act (RCRA) metals" (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver).

In June of 2022, Burns & McDonnell prepared a Sampling and Analysis Plan (SAP) that provided a means to characterize the material in both ash ponds by performing tests to determine RCRA metals concentrations and leaching potential for all constituents of concern. The SAP presented various thresholds for constituent screening levels, each with an associated level of potential use restriction. After Burns & McDonnell addressed initial comments and resubmitted the SAP on January 12, 2023, the MDNR WMP approved Revision 1 of the SAP on January 30, 2023 (Burns & McDonnell, 2023a).

In March of 2023, Burns & McDonnell conducted the field sampling in general accordance with the SAP. The ash pond sampling activities and results were summarized in the Ash Pond Sampling Report, which was submitted to MDNR on June 6, 2023, also included as Appendix A (Burns & McDonnell, 2023b). Toxicity characteristic leaching potential (TCLP) results for constituents analyzed in all samples were reported as non-detect, which was below both the laboratory method reporting limits and the Environmental Protection Agency (EPA) limits for TCLP established for potentially hazardous waste. The analytical results are summarized as follows:

- South Ash Pond: The SAP established 18 sampling zones at the South Ash Pond. Out of the 18 sampled zones, seven zones in the lower elevations of the pond (older material within the South Pond) had samples with detected lead concentrations over the EPA Industrial Regional Screening Level (RSL) (USEPA, 2023) and the background levels for the Blue Valley Industrial Corridor (US Army Corps of Engineers, 2003)

(Background Study). This Background Study is included in the report as Appendix B. Detected concentrations of cadmium were also noted in exceedance of the EPA Industrial RSL in two of these seven zones. Ash pond samples collected from the upper-most zones of the South Ash Pond (newer material within the south pond) exhibited detected concentrations below the EPA Industrial RSL for all constituents analyzed, except arsenic; however, these upper-most zones were below the arsenic background levels for the Blue Valley Industrial Corridor, per the Background Study.

- North Ash Pond: The SAP established 23 sampling zones at the North Ash Pond. All 23 zones sampled within the North Ash Pond (includes the area designated in the SAP as the "overfill area") exhibited detected concentrations below the EPA Industrial RSLs for all constituents, except arsenic. While all zones tested over the EPA Industrial RSL for arsenic, all were below the background arsenic levels established for the Blue Valley Industrial Corridor, per the Background Study.

The Ash Pond Sampling Report proposed that, based on the constituent levels in the South Ash Pond, this Pond be closed by removing and disposing of all material off-site at a Subtitle D landfill. The North Pond sampling results showed that all materials were either below EPA Industrial Screening levels or if not below EPA Industrial Screening Levels, then below the background soil concentrations of the constituents being tested, per the Background Study. As such, it was proposed that the North Ash Pond material be utilized / reclaimed as fill material to restore the North Ash Pond site.

A meeting was conducted on November 8, 2023, with Burns & McDonnell, KC Water, and the MDNR to discuss the proposed closure activities and development of this Closure Plan. It was agreed that the South Ash Pond would be closed by removal (as proposed) and that the beneficial use / reclamation of the North Ash Pond material would be considered if demonstrated to be in accordance with 10 Code of State Regulations (CSR) 80-2.020 (9) B. The following sections detail the proposed closure activities associated with the Ash Ponds.

2.0 South Ash Pond Closure

2.1 South Ash Pond Construction

Construction of the South Ash Pond was completed in 1973 and spans approximately 3.8 acres. The South Ash Pond As-Built Drawing and Specifications are provided in Appendix C. The South Ash Pond was constructed with two cells labeled in the Drawing as Ash Lagoon 1 (north cell) and Ash Lagoon 2 (south cell), separated by an interior berm. A valve structure north of the pond allowed ash material to be pumped to either cell. The inlet pipes were installed on the northeast corner of the north cell and the middle east side of the south cell. Outlet structures from both cells were located on the west sides of the cells. From the specifications, it appears that native soils were utilized in the construction of the pond embankments and were to be compacted in 8-inch loose lifts to 95 percent (%) of maximum density at optimum moisture content. Unsuitable material including rocks, roots, and other deleterious materials were to be excluded.

Based on current grades and the as-built top of berm, the South Ash Pond has been filled to the top of the berm then subsequently dry-stacked to approximately 10 feet above the top of berm with side slopes generally ranging from 4H:1V to 6H:1V. The South Ash Pond was filled in between the two cells such that one mass of ash material resulted above the top of berms. The top of the stacked material is relatively flat with approximately 1-3% slopes from the middle of the pond to the side slopes. The South Ash Pond was considered closed and presumably did not accept additional material after the North Ash Pond was constructed in 1988. For the past several decades, the South Ash Pond has been maintained with grassy vegetation and kept free of any standing water. Recently the South Ash Pond area was surfaced with gravel and is serving as a temporary construction laydown area for Site projects. It is estimated that the South Pond contains approximately 113,000 cubic yards of material based on volume calculations utilizing a survey conducted on December 7, 2021.

2.2 Closure Description

Due to the elevated levels of lead and cadmium in several zones of the South Ash Pond as described in the Ash Pond Sampling Report (see Appendix A), the pond will be closed by removing all biosolids ash material and disposing of the material at a Subtitle D landfill. Prior to initiating closure, stormwater controls will be implemented to the extent practicable to reduce the amount of stormwater draining to the pond during the closure process. Any surface water collected in the pond will then be pumped or drained and discharged in compliance with the current NPDES Permit for the Site.

The South Ash Pond closure process will include removing or abandoning inlet and outlet structures and piping. If abandonment is utilized, the structures and piping will be filled with controlled low-strength material (CLSM, or "flowable fill"). The gravel surfacing will be removed, stockpiled, and either removed from the Site or reused for current or future projects. Approximately 113,000 cubic yards of biosolids ash material will be excavated and hauled to a Subtitle D Landfill. Any grassy areas remaining will be removed along with the biosolids ash and included in the material hauled to the Subtitle D Landfill. It is expected that a dozer will be utilized to stage material and a backhoe will excavate and place material in

haul trucks that will transport the material to the selected landfill. However, the means and methods of material removal activities are subject to change.

During sampling activities, wet material was encountered in the lower levels of the South Ash Pond, indicating that the pond may normally retain subsurface pore water within the lined area. As such, it is expected that wet ash material will be encountered during removal activities. To mitigate this, KC Water or its Contractor may dewater the pond with an excavated pit and sump pump. Material may also be dried in lined stockpiles during removal activities. Ultimately, the material will be dried to a degree in which no free water separation occurs, and the material can pass a paint filter test to allow for transport off-site. Similar to surface water management, water collected from dewatering activities will be managed and discharged in accordance with the current NPDES Permit for the Site.

Once all ash material has been substantially removed and verified by inspection (discussed in Section 2.4), the existing outlet structures will be restored to allow drainage from the former pond area. The interior berm will be removed, and the material will be used to shape the bottom of the former ponds to drain west to the existing outfall structures. Surface water collected in these outlet structures will be routed to the existing site storm sewer, which is routed to the WWTP headworks for treatment.

A concept grading plan for the south pond is provided as **Figure 2**, attached. To promote the establishment of vegetation, a 4- to 6-inch layer of topsoil will be applied once the area has been brought to plan subgrades. The topsoil may be loosely compacted as a prepared seed bed. Pipe modifications, demolition, grading, and seeding specs will be further defined in the final design of the closure process. The South Ash Pond concept shown in Figure 2 will be a temporary condition. The South Ash Pond area will be utilized by KC Water in the near future to support the Blue River WWTP's Joint Use Plan as required by its' consent decree.

2.3 Closure Schedule

The South Pond Closure is estimated to commence by the fourth quarter of 2024, pending MDNR approval. The following estimated task durations are expected, but are subject to change based on the Contractor's means and methods, coordination with other Site projects, and potentially other factors:

- Mobilization, Clearing, and Demolition: 4 weeks
- Excavation, Hauling, and Disposal: 32 to 40 weeks
- Final Excavation and Inspections: 2 weeks
- South Ash Pond Grading: 2 weeks
- Final Restoration: 2 weeks

In summary, if activities progress as estimated above, the South Ash Pond closure is estimated to span 42 to 50 weeks, which would render the South Ash Pond closed in late 2025 or early 2026.

2.4 Closure Visual Inspection

Upon completion of biosolids removal activities, a qualified professional engineer or professional geologist will perform a visual inspection of the excavated areas to verify that

the biosolids ash materials have been substantially removed from the pond. The ash material is expected to be easily discernable from the clay liner at the bottom of the pond. The biosolids ash is a unique burnt orange color with a coarse consistency while, based on historical borings in the area, the compacted clay liner is expected to be brown or gray in color, has a finer grain consistency, and will result in a smooth/smeared surface when encountered with excavation equipment. Since the ash material did not exhibit leaching properties as evidenced by the non-detect TCLP tests, over-excavation of the liner material is not proposed.

The inspection will be completed using a grid developed to promote adequate visual coverage of the pond's bottom surface. To support the visual inspection, the pond area has been overlaid with a grid measuring 50 feet x 50 feet, as illustrated on **Figure 3**. The inspection will consist of the qualified professional engineer or professional geologist walking through each grid with a Global Positioning System (GPS) unit showing the grid lines loaded onto a Site map. The qualified professional engineer or professional geologist will use the GPS unit as a guide to walk the grid system and visually inspect each grid for evidence of residuals.

If the qualified professional engineer or professional geologist identifies any areas where visual biosolids ash remains, the qualified professional engineer or professional geologist will direct the Contractor to perform additional removal of the biosolid ash material from the pond surface. Upon completion of any additional removal activities, the affected grids will be relocated using the GPS unit and visually re-inspected. This procedure will be repeated until the entire impoundment area passes inspection and the area is substantially free of the biosolids ash material. The qualified professional engineer or professional geologist will provide photo documentation of inspected grids to MDNR within the Closure Report (Section 4.0).

3.0 North Ash Pond Closure

3.1 North Ash Pond Construction

The North Ash Pond spans approximately 8.6 acres and is located across Hawthorne Road to the north of the WWTP. It appears from available sources that construction of the North Pond commenced in 1988. The North Ash Pond As-Built Drawings are provided in Appendix D and include details for a 12-inch bentonite soil liner to be installed on prepared subgrade. The pond inlet pipe was constructed in a peninsula near the middle of the south end of the pond. The pond outlet structure is located at the northwest corner of the pond. The interior of the pond was excavated, and the cut material was used to construct the exterior berms.

The North Ash Pond is partially filled with ash material and retains water in the low-lying areas. Material was pushed into mounds on the east and west of the North Ash Pond in efforts to maintain flow through the pond from the inlet to the outlet structure. Grass vegetation is growing in the material in and around the pond. The North Ash Pond contains approximately 123,000 cubic yards of ash material based on data obtained from surveys conducted on November 29, 2021, and April 5, 2022 (includes the area designated in the SAP as the "overfill area").

3.2 Closure Description

All zones in the North Ash Pond exhibited detected concentrations for constituents of concern below the EPA Industrial RSL, except arsenic. Detected concentrations of arsenic in samples collected from the North Ash Pond were in exceedance of the EPA Industrial RSL but below background soil levels provided in the Background Study.

Arsenic is ubiquitous in soil in many industrial areas whether it be naturally occurring or sourced from anthropogenic origins such as smelting, pesticide application, coal combustion, wood combustion, or waste incineration. Solid-phase arsenic can be mobilized in reducing conditions; however, given the results of the TCLP testing, the biosolids ash material does not appear to be in a reducing environment which renders the arsenic relatively immobile. Given that the detected concentrations of arsenic are below the background soil levels for this area as established in the Background Study and the planned industrial land use of the Site, it is proposed that the North Ash Pond material be approved for beneficial use / site reclamation in accordance with 10 CSR 80-2.020 (9) B.

The North Ash Pond closure will commence with clearing and grubbing (as needed) followed by, or concurrent with, demolition or abandonment of the inlet structures and piping. If abandonment is utilized, the structures and piping will be filled with CLSM. The material in the North Ash Pond will be graded with gentle slopes to provide a pad site that can be beneficially utilized by KC Water. Surface water from most of the reclaimed area would be collected in the existing detention basin on the east side of the site from which an existing storm inlet at the south end of the detention basin will convey runoff to the site stormwater system which is routed to the WWTP headworks for treatment. Surface water from a small portion of the reclaimed area would sheet flow offsite to the south and southwest, consistent with existing drainage patterns. Stormwater and erosion control best management practices

(BMPs) will be implemented during and after construction. The reclaimed area will be graded generally as shown in the conceptual grading plan included as **Figure 4**. Once areas are brought to planned subgrades, a 4- to 6-inch layer of topsoil will be placed over the reclaimed area to promote the establishment of vegetation. The topsoil may be placed loosely as a prepared seed bed. The restored North Ash Pond area may be used for future WWTP infrastructure by KC Water.

The areas to be reclaimed are currently controlled by perimeter fencing and gates, which restricts access by unauthorized individuals. All construction projects and operation and maintenance activities in these areas are overseen by KC Water. It is anticipated that these fences, gates, and access control will be maintained for any future use of these areas. The imported topsoil layer placed over these areas will serve as a barrier to the mass of material and promote the establishment of vegetation to stabilize the areas, making the ash material less susceptible to erosion due to wind or rain. For these reasons and those described further below, the beneficial use of the North Ash Pond material for general fill and grading onsite is believed to meet the criteria established for this exemption.

3.3 Beneficial Use Exemption 10 CSR 80-2.020 (9) B

This section addresses the listed requirements in 10 CSR 80-2.020 (9) B for the beneficial use / reclamation exemption for material that may otherwise be classified as solid waste. The requirements are listed below in italics followed by responses that address the requirements for this project.

1. *A detailed explanation of the beneficial use or reclamation that supports the request.*

   Beneficially utilizing / reclaiming the remaining North Pond ash material (approximately 123,000 cubic yards) onsite in the North Pond area will allow the Site to be graded as a pad site that can be utilized for future WWTP operations or as a project staging area. The removal of this material would leave the Site at a material deficit that would require a similar quantity of fill material to be hauled in from offsite sources (up to 12,300 truckloads). Significant emissions and project cost will be avoided by beneficially utilizing / reclaiming the onsite material. The overall emissions avoided as a result of this beneficial use / reclamation is estimated to be approximately 1,600 tons of carbon dioxide. Cost savings from the beneficial use are estimated to be as much as $15M. The cost savings resulting from this project will ultimately benefit wastewater service ratepayers.

2. *A detailed explanation with supporting documentation identifying the site location, surrounding land use, and site characteristics.*

   The WWTP is located at 7300 Hawthorne Rd, Kansas City, Missouri at the intersection of three different Public Land Survey System Sections. Portions of the Site span Section 36 50N 33W, Section 25 50N 33W, and Section 30 50N 32W, as shown in the Land Use Map shown in Figure 5. The surrounding area is considered an industrial district which is used by various companies and corporations for their industrial and commercial operations. The Site is located in a low lying, relatively flat area that is in a levee protected area. The Site is adjacent to the Blue River (and its associated levee) on the south, Interstate 435 on the east and northeast, and an intermodal facility and railroad corridors on the west. The

parcels of land which are occupied by the North Pond are classified by the City of Kansas City Parcel Viewer system as permanent open space, while the parcels of land occupied by the South Pond are defined as utility land use. The Site has buildings, tanks, basins, and other structures, as well as process piping, roads, pavement, staging areas and other facilities that support the WWTP operation.

3. *An estimate of the quantity of waste needed to complete the project, the length of time required for completing the project and documentation specifying the source of the waste.*

The North Pond has approximately 123,000 cubic yards of biosolids ash material stored and is available for beneficial reuse. All material came from the biosolids incineration process that was permitted by MDNR WPP. The beneficial use project is estimated take place over the course of 8 to 12 weeks, as described in Section 3.4, below. Since the ash ponds were constructed, these ponds were used exclusively for storage of incinerated biosolids ash. To illustrate this, the process flow diagram from the NDPES permit has been included as Appendix E.

4. *A detailed description of the physical and chemical characteristics of the waste, background soils and water quality immediately within and/or adjacent to the project area. The description shall include supporting laboratory test data. The appropriate laboratory tests shall be determined in conjunction with the department, and shall include, at a minimum, Toxicity Characteristic Leaching Procedure (TCLP) testing analyses or modified TCLP testing analyses. Details regarding locations of samples and sampling and testing methods shall be provided. Testing analyses shall be performed on all applicable parameters (organic and/or inorganic substances) which compromise the waste. The detection limits for applicable constituents in the testing analyses shall be consistent with standard laboratory procedures. Sampling and analysis shall be conducted in accordance with U.S. EPA approved standard laboratory methods and procedures.*

The biosolids ash was sampled by Burns & McDonnell in March 2023, and analyzed according to EPA laboratory methods and procedures. Based on a meeting between Burns & McDonnell and MDNR on November 29, 2021, and the subsequently approved SAP, the constituents tested in the samples were arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. TCLP test results for constituents analyzed in all samples were reported as non-detect, which was below both the laboratory method reporting limits and the EPA limits for TCLP established for potentially hazardous waste. Details of the sampling event and analytical results are provided in the Ash Pond Sampling Report (see Appendix A). Information regarding site soil characteristics is provided in the 2019 geotechnical report by Carollo Engineers (Carollo Engineers, Inc., 2019), included as Appendix F.

5. *Verification that the placement of the waste will be kept above the seasonal high groundwater table, unless a variance is obtained from the Water Pollution Control Program (WPCP).*

The beneficial use / reclamation proposes retaining ash material in the North Pond area. From the As-built Drawings, the bottom of the North Pond is approximately elevation 728. Three borings from the 2019 Carollo Geotechnical Report were taken on the north side of the WWTP building, their locations ranging from 400 to 550 feet south of the North Pond (Carollo Engineers, Inc, 2019). Borings B-01, B-03, and B-04 had reported groundwater elevations of 723.1, 723.1, and 717.8, respectively. The geotechnical report is provided in Appendix F for further information on the geotechnical characteristics of this Site. Two borings (B-02 and B-07) located within the WWTP building footprint recorded higher groundwater elevations (located further south than Borings B-01, B-03, and B-04), but these values are thought to be erroneous or are being influenced by a source of water within the building footprint.

6. *A detailed description of the proposed operational procedures for waste removal from the generator, transport, placement, compaction, dust control, erosion control and procedures for protecting the general aesthetic of the site.*

The material in the North Pond will be graded with earth moving equipment in general accordance with the conceptual grading plan shown in Figure 4 to resemble a naturally contoured and aesthetically pleasing landscape.

Water trucks will be used on the haul route and working areas, as needed, to prevent fugitive dust from becoming airborne. Equipment operators will also minimize loading drop height from excavators into haul trucks to minimize the mobilization of airborne particles. During abnormally high winds, excavation and hauling of beneficial reuse material will be halted until conditions improve.

BMPs will be used to provide erosion control during the project. Construction entrances will be used to minimize any mud or sediment that is tracked on paved roads. The North Pond will be graded to drain and restored with grass vegetation or alternatively stabilized with gravel pavement as a project staging area. The Site has an active Stormwater Pollution Prevention Plan (SWPPP) for ongoing operations as part of their current NPDES permit. An additional SWPPP will be developed for construction activities described in previous sections.

7. *Provisions for closing the area-*
   a. *A description of the source, quality, and quantity of cover required; and*

A 4- to 6-inch layer of topsoil will be placed over the ash material in the North and South Ponds to promote vegetative growth and reestablish stabilized conditions. While the ash material itself has historically established and sustained healthy growth of vegetation, the addition of a topsoil layer is an added measure to promote site stabilization.

   b. *A description of the type of vegetation to be established to prevent erosion.*

Native grass vegetation will be planted in the North Pond area to prevent erosion and establish natural drainage patterns.

8. *The exemption request must also include the following:*
   a. *Name of the owner(s) of the property on which the proposed beneficial reuse operation will be located. If the owner differs from the person requesting the exemption, the permit exemption shall include a statement signed by the owner stating his/her awareness of the beneficial use request and his/her approval of the operation;*

The property is owned by the City of Kansas City, Missouri (City). Burns & McDonnell is providing this exemption request on behalf of the City. A letter signed by authorized representatives of the City is included in Appendix G.

   b. *Name of the operator(s) of the proposed operation;*

The City of Kansas City, Missouri (City) is the operator of the facility. The City intends to contract with a local earthwork construction firm to complete the project. The Contractor of the may be selected through a competitive bid process.

   c. *A map showing land use within one thousand feet (1,000') of the proposed operation;*

Figure 5 provides a map showing the surrounding land uses and other information requested above.

   d. *A management plan that describes and includes:*
      i. *Basic site design*

The conceptual design for the beneficial use of the North Pond material is provided in **Figure 4**.

      ii. *Size of buffer zone*

At the North Pond, the distance from the limits of conceptual grading to the nearest property line (at the south end of the North Pond site) is approximately 30 feet. In other areas around the North Pond area, the limits of conceptual grading line is approximately 100 or more feet from the nearest property line.

      iii. *Site drainage control;*

Existing drainage patterns will not significantly change. As with the existing conditions, the proposed grading will direct the majority of surface water runoff to the existing detention basin, which will convey the runoff to the WWTP headworks for treatment. As discussed above, a small area of the North Pond Site will sheet flow offsite to the south and southwest.

      iv. *A list of the waste material to be beneficially reused;*

The waste material to be beneficially reused is the biosolid ash material generated from the incineration process that no longer takes place at the WWTP.

v. Quality and quantity of incoming waste material;

Refer to Section 3.3.4 and **Appendix A** for the analytical data as it relates to the quality of the incoming waste material. The waste material is relatively uniform with silty-sand soil-like properties. All biosolids ash material proposed for beneficial use / reclamation is stored within the North Ash Pond. No additional biosolids ash material is being generated. The quantity of ash material proposed for beneficial use / reclamation is estimated to be 123,000 cubic yards.

vi. Type of technology to be used;

Technologies to be used in this process include earth moving equipment such as excavators and backhoes. Survey equipment will be utilized to confirm planned grading tolerances and extents. Erosion control measures and BMPs will be used to minimize any sediment leaving the Site. Site restoration techniques and technologies will be utilized to restore and stabilize the Site.

vii. Odor and vector control and mitigation procedures;

The beneficial reuse material has no observed odor and is believed to be organically inert so as to not attract vectors. The ponds have been in place with exposed ash material for several decades and no odor or vector issues associated with this material have been observed or documented.

viii. Contingency plan (what steps will be taken to correct any problems that may occur as a result of the operation);

If a problem with this operation occurs, all work will be stopped and the City's Project Manager will be notified immediately. The City will consult with the appropriate entities to assess and remediate the issue immediately.

e. A copy of the application for any applicable Water Pollution Control Program permits or approvals;

The project is located at the WWTP operates under NPDES Permit Number MO-0024911. A permit modification that reflects the process changes to remove the ash ponds will be part of the next permit renewal and issuance (the current permit expires March 31, 2026).

f. A copy of the application for any applicable Air Pollution Control Program permits or approvals;

No Air Pollution Control Program permits or approvals are applicable.

g. Evidence of compliance with local zoning and planning requirements;

The Site includes parcels zoned for Light Industrial Use and parcels zoned for Heavy Industrial-Residential Use. The WWTP is considered to be an industrial operation and will continue to operate as such.

h. Emergency contact phone number(s);

9. The site emergency contacts are Carey D. Robinson, Operations Utility Manager, (816) 513-7243; or Adrian Hall, Manager of Maintenance, (816) 513-7281

a. Final use or disposition of the material to be beneficially reused;

The final use of the material to be beneficially reused will be to act as fill to reclaim the North Pond site. A 4-to 6-inch layer of topsoil will be added to promote establishment of natural vegetation and minimize erosion.

b. A statement indicating what steps will be taken to ensure unacceptable waste is not received and verification that the unloading of waste will be supervised.

Based on the results of the sampling and analysis that was performed, all ash material in the North Pond is relatively uniform and believed to be acceptable for beneficial reuse. The sampling results showed that all materials were either below EPA Industrial Screening levels or if not below EPA Industrial Screening Levels, then below the background soil concentrations of the constituents being tested, per the Background Study. The Ash Pond Sampling Report (see **Appendix A**) gives a detailed description of how the material was tested and determined to be acceptable for beneficial reuse. The City's Contractor and construction oversight personnel will monitor the earth moving activities during the course of the project.

3.4 Closure Schedule

The following estimated task durations are expected but are subject to change based on the Contractor's means and methods, coordination with other Site projects, and potentially other factors:

- Mobilization, Clearing, and Demolition: 4 to 6 weeks
- North Ash Pond Area Grading: 2 to 4 weeks
- Final Restoration: 2 weeks

The North Ash Pond Closure may be completed independently of the South Ash Pond Closure, potentially commencing in late 2024 or early 2025 and spanning 8 to 12 weeks. This scenario puts completion of restoration in early to mid-2025. Alternatively, the North Pond Closure may be completed concurrently with the South Pond grading and restoration in early to mid-2026.

4.0 Documentation

The Project Engineer will keep records of all closure activities described herein and will submit a closure report for the North and South Ash Ponds. The Project Engineer will verify the visual inspection passes when it is concluded that all visual traces of the biosolid ash material have been removed from the South Ash Pond area. When it has been determined that each pond has passed visual inspection and that the biosolid ash material has been removed, the Project Engineer will draft a Certification to be included in the Closure Report.

5.0 References

Burns & McDonnell, 2023a. *Sampling and Analysis Plan for KC Blue River WWTP Ash Pond Closure Plan.* January.

Burns & McDonnell, 2023b. *KC Blue River WWTP Ash Pond Sampling Report.* June.

Carollo Engineers, Inc., 2019. *Final Report of Subsurface Exploration and Geotechnical Engineering Evaluation.* February.

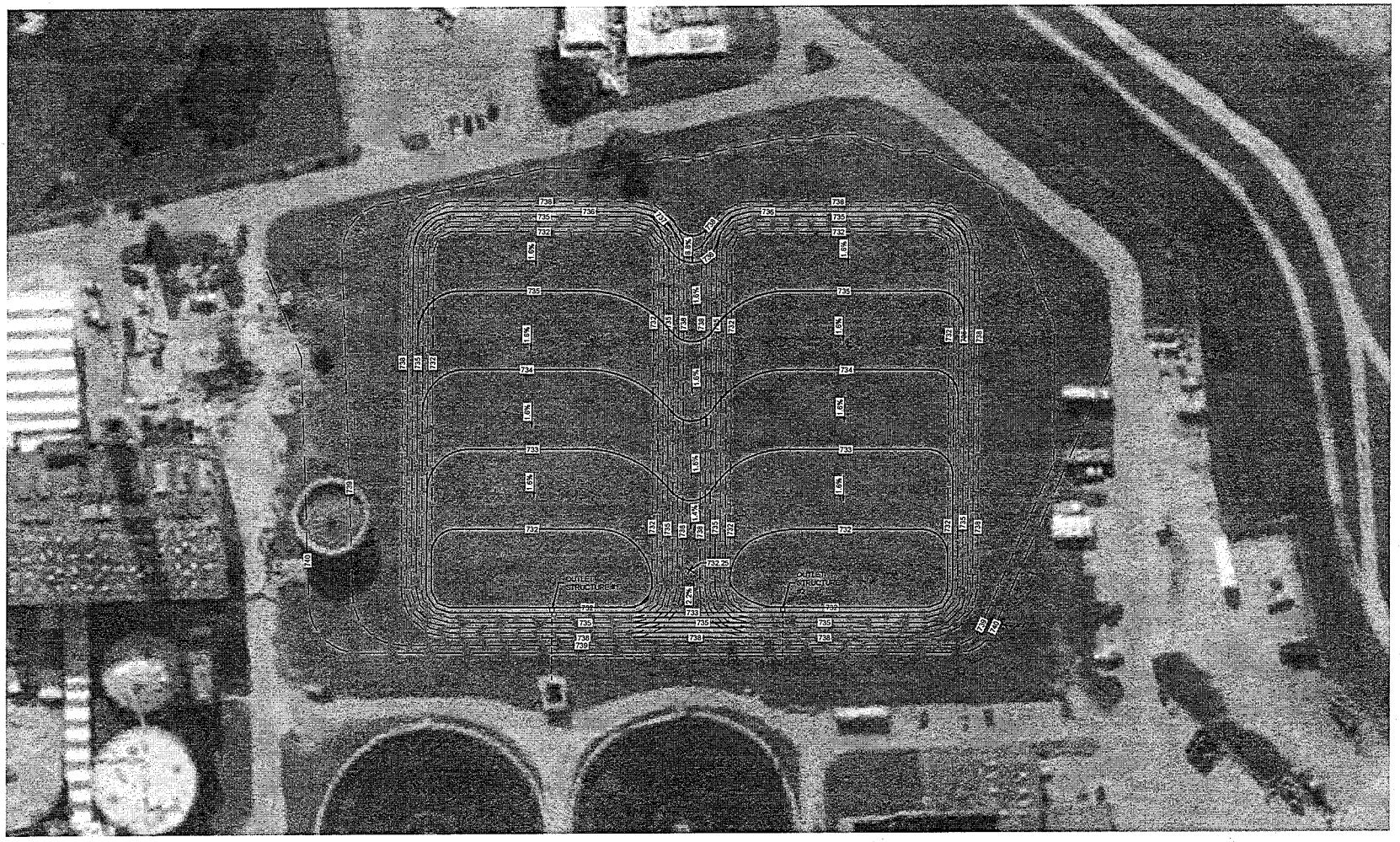
US Army Corps of Engineers, 2003. *Blue Valley Industrial Corridor Soils Background Study Report.* February.

USEPA, 2023. Regional Screening Level (RSL) Summary Table. November.

Revision History Log

Revision	Date Revised	Reason for Revision	Author	Approved By
1	1/19/24		BCW	

FIGURES



SOUTH POND CONCEPTUAL GRADING PLAN

SCALE: 1" = 40'

LEGEND

—735—	APPROXIMATE AS-BUILT MAJOR CONTOUR
—736—	APPROXIMATE AS-BUILT MINOR CONTOUR
—740—	CONCEPTUAL GRADE CONTOUR (MAJOR)
—741—	CONCEPTUAL GRADE CONTOUR (MINOR)

SCALE
40' 0 40' 80'

TREKK
DESIGN GROUP, LLC
1441 E 104th St, Suite 105
Kansas City, MO 64131
Tel (816) 874-4685
Fax (816) 874-4675
MO St. Cert. of Authority: 2002019299

PROFESSIONAL ENGINEER

SOUTH POND CLOSURE - CONCEPTUAL GRADING PLAN

REVISIONS:

MARK	DATE	DESCRIPTION

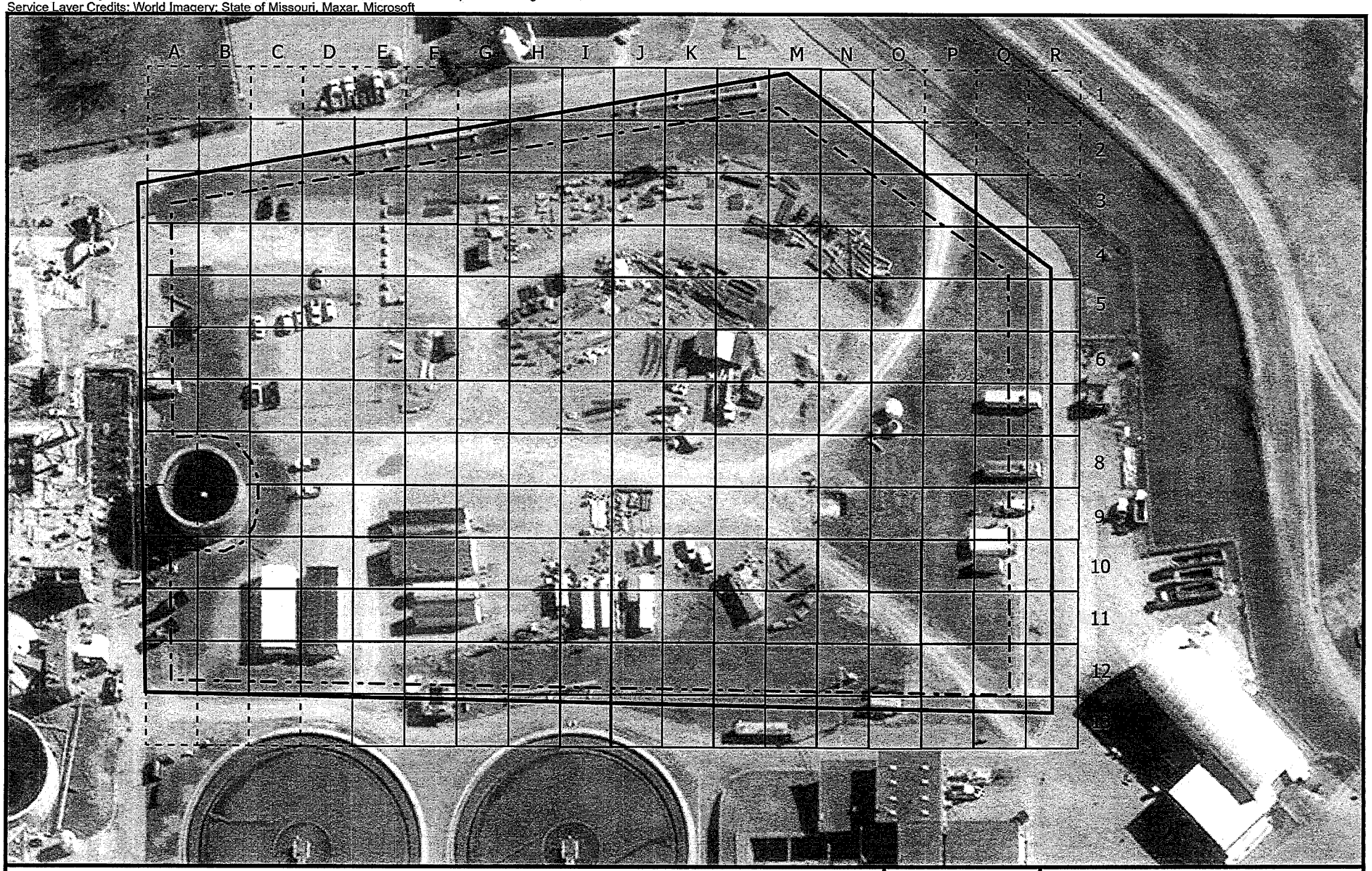
DIGITAL ID: 005-PP-2022-0113
PROJ NO: 2022-0113
SCALE: 1" = 40'
DATE: 2024-02-19
DRAWN BY: RJG
CHECKED BY: ER

SHEET TITLE:
FIGURE 2

SHEET NO.
SHEET 01 OF 01

100% REVIEW

Path: C:\GIS Projects\KC South Ash Pond Closure\KC South Ash Pond Closure.aprx embillings 2/22/2024
Service Layer Credits: World Imagery: State of Missouri, Maxar, Microsoft



LEGEND

- SOUTH POND GRID
- APPROXIMATE EXTENT OF SOUTH POND LINED AREA
- APPROXIMATE EXTENT OF DRY-STACKED MATERIAL

NORTH

80 40 0 80

Scale in Feet

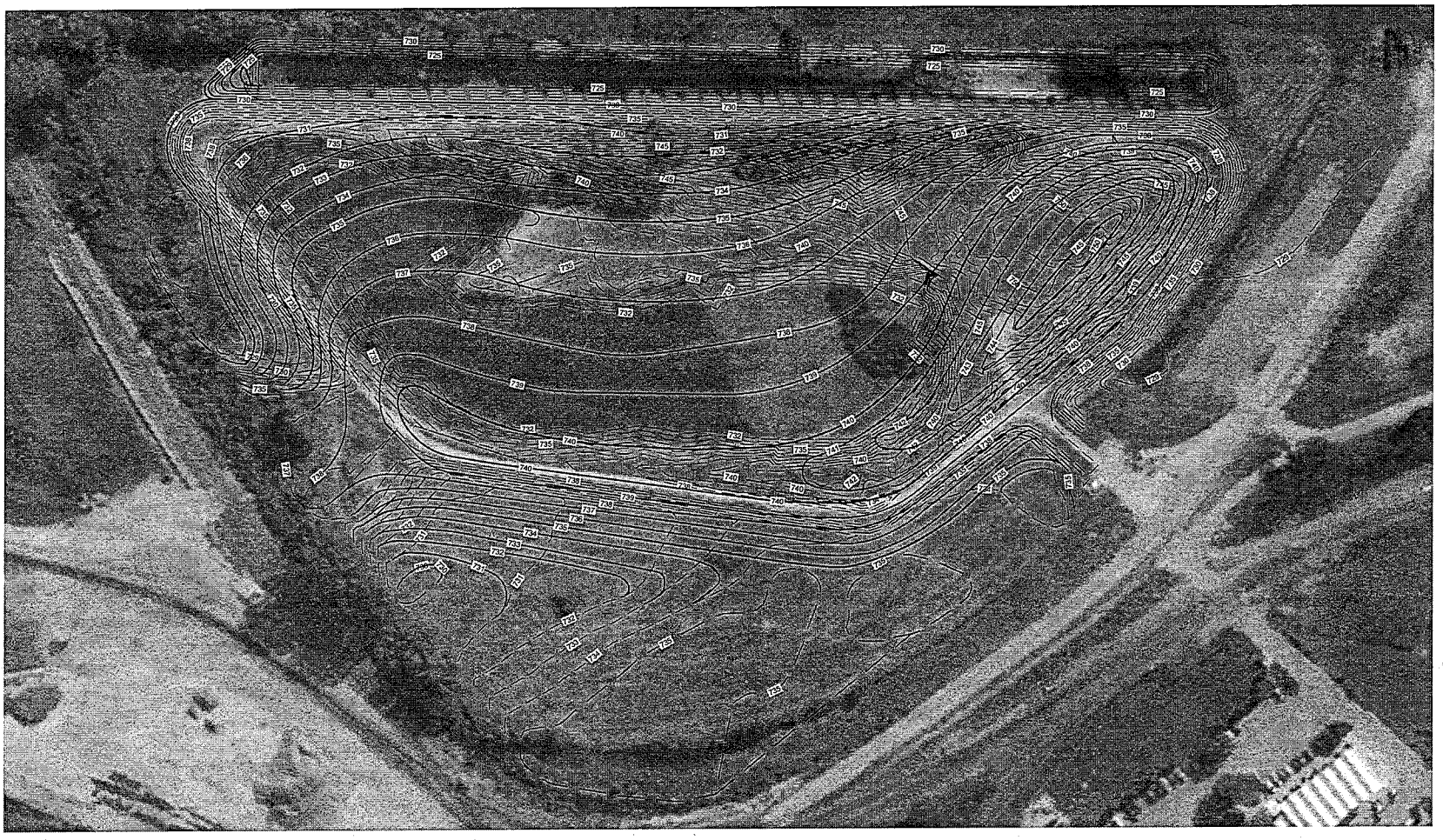
BURNS McDONNELL

FIGURE 3

SOUTH POND
VISUAL INSPECTION GRID
KANSAS CITY, MISSOURI

Source: ESRI, FEMA, KCMO, SPIRE INC., BURNS & MCDONNELL ENGINEERING INC

Issued: 2/22/2024



NORTH POND CONCEPTUAL GRADING PLAN

SCALE: 1" = 60'

LEGEND

- APPROXIMATE AS-BUILT MAJOR CONTOUR
- APPROXIMATE AS-BUILT MINOR CONTOUR
- CONCEPTUAL GRADE CONTOUR (MAJOR)
- CONCEPTUAL GRADE CONTOUR (MINOR)

SCALE

60' 0 60' 120'

TREKK DESIGN GROUP, LLC
1441 E 104th St, Suite 105
Kansas City, MO 64131
Tel (816) 874-4665
Fax (816) 874-4675
MO St. Cert. of Authority: 2002010299

PROFESSIONAL ENGINEER

NORTH POND CLOSURE - CONCEPTUAL GRADING PLAN

REVISIONS:

MARK	DATE	DESCRIPTION

DIGITAL ID: 055-PP-2022-0113
PROJ NO: 2022-0113
SCALE: 1" = 60'
DATE: 2024-02-19
DRAWN BY: R.J.G.
CHECKED BY: E.R.

SHEET TITLE:

FIGURE 4

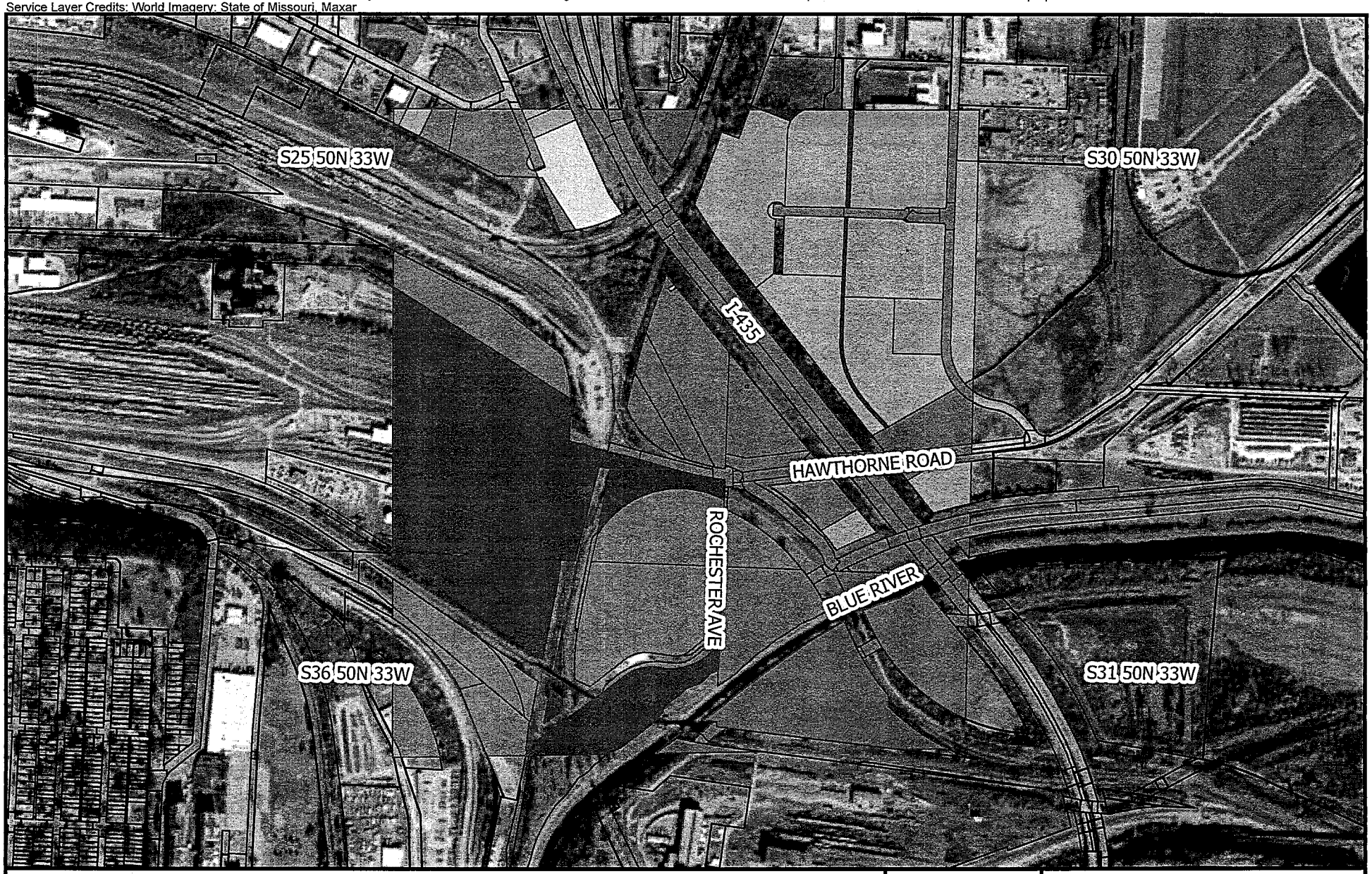
SHEET NO.

SHEET 01 OF 01

100% REVIEW

TOPW
2/19/2024 - 11:19 AM - G:\22-0113 BAD KOH\Water Ash Pond Closure\Design\CA\Civil\Grading\055-pad-0022-0113 North Pond Grading.dwg

Path: C:\Users\arbarber\OneDrive - Burns & McDonnell\Work Projects\KC Ash Pond\Closure Plan Figures\Ash Pond Closure Plan Land Use Map\Ash Pond Closure Plan Land Use Map.aprx arbarber 1/18/2024
Service Layer Credits: World Imagery: State of Missouri, Maxar



LEGEND

- <Null>
- Hotel/ Motel
- Undefined
- Heavy Industry
- Light Industry/ Storage/ Distribution/ Vehicle Sale/ Service
- Utilities

NORTH

800 400 0 800

e in Feet

BURNS McDONNELL

FIGURE 5
LAND USE MAP
KC WATER BLUE RIVER WWTP
KANSAS CITY, MISSOURI

Source: ESRI, FEMA, KCMO, SPIRE INC., BURNS & MCDONNELL ENGINEERING INC

Issued: 1/18/2024

APPENDIX A – ASH POND SAMPLING REPORT

Memorandum

BURNS McDONNELL

Date: June 6, 2023

To: Charlene Fitch, P.E., MDNR Waste Management Program
Brian Newby, MDNR Waste Management Program
David Drilling, P.E., MDNR Waste Management Program

From: Brian Weis, P.E., Burns & McDonnell
Justin Carter, Burns & McDonnell
Alexis Barber, E.I.T., Burns & McDonnell

cc: Brent Herring, KC Water

Subject: KC Blue River WWTP Ash Pond Sampling Report Kansas City, Missouri

Burns & McDonell provides this Sampling and Analysis Report memorandum on behalf of KC Water to the Missouri Department of Natural Resources (MDNR). This memorandum follows the Waste Management Program approval of the Sampling and Analysis Plan, dated January 30, 2023.

EXECUTIVE SUMMARY

Burns & McDonnell completed the ash pond sampling event for the Blue River Wastewater Treatment Plant (WWTP) located in Kansas City, Missouri to fulfill the procedure documented in the *Sampling and Analysis Plan for KC Blue River WWTP Ash Pond Closure Plan* (SAP), Revision 1, dated January 10, 2023.

Incinerated biosolids ash material is impounded in two onsite ponds (North and South), and in an overfill area adjacent to the north pond. The mass of impounded ash material was sectioned into 41 different zones for the purpose of material characterization. The sampling event consisted of collecting 41 ash material samples (one from each zone) plus additional quality assurance (QA)/quality control (QC) samples. Samples were extracted from borings drilled in the approximate locations identified in the SAP Figures 2, 3A, and 3B. Direct-push boring and sampling activities were performed in general accordance with the SAP under the supervision of Burns & McDonnell field personnel.

Ash material samples were submitted to Pace Analytical Services, LLC (Pace) in Lenexa, Kansas for analysis of metals concentrations and leaching characteristics. Results were compared against the screening levels and background levels provided in the SAP. The toxicity characteristic leaching procedure (TCLP) test results for all samples were non-detect, and therefore under the limits established for potentially hazardous waste. All samples in both the North and South Ponds, arsenic was found to be above the established secondary screening level (Environmental Protection Agency [EPA] Industrial Regional Screening Level [RSLs]), but below the background soil levels for the area per the Blue Valley Industrial Corridor Soils Background Study (2003). In the North Pond and North Pond Overfill samples, the remaining

metals concentrations were found to be under the secondary screening levels. Therefore, it is proposed that the North Pond and North Pond Overfill material remain onsite, and the impoundment area be graded in a manner that promotes surface drainage.

Several samples in the South Pond showed lead concentrations over the secondary screening level as well as the background levels from the 2003 Blue Valley Industrial Corridor Soils Background Study. Additionally, two samples had cadmium concentrations over both secondary screening levels and background levels. As this area is planned for expansion of WWTP facilities, it is proposed that material in the South Pond be removed and disposed of as solid waste (closure by removal).

INTRODUCTION

Burns & McDonnell has prepared this *KC Blue River WWTP Ash Pond Sampling Report* to summarize the sampling and analysis event and results and determine if all or part of the material may be utilized as fill material onsite, or at other sites, or must otherwise be classified as solid waste and disposed of accordingly. The SAP established that the constituents of concern for this material are the eight metals commonly known as the "Resource Conservation and Recovery Act metals" (arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver). The SAP also established preliminary and secondary screening levels for the ash material. The preliminary screening levels are the EPA Residential RSL for Chemical Contaminants at Superfund Sites. The secondary screening levels are the EPA Industrial RSL for Chemical Contaminants at Superfund Sites (USEPA, 2023). If analytical results are below the preliminary screening levels, the ash material will be considered clean fill no restrictions on reuse. If any material constituents are above the preliminary screening levels, the results will then be compared to the EPA Industrial Soil RSLs. If all material constituents are below secondary screening levels, the material may be utilized onsite or restricted to use on other industrial sites. If any material constituents are above the secondary screening levels, the material may be evaluated against background concentrations for further restricted use. A summary of the screening levels is provided in the Combined SAP Screening Limits Table, provided in Attachment 1.

SUMMARY OF FIELD ACTIVITIES

The field activities associated with the sampling event took place on March 7th and 8th, 2023. The North Pond and North Pond Overfill area sampling was completed on March 7th and the South Pond sampling was completed on March 8th. The work was completed in general accordance with the procedures and scope of work presented in the SAP. Samples were extracted from borings drilled in the approximate locations and depths identified in the SAP Figures 2, 3A, and 3B. Direct-push boring and sampling activities were performed by a Missouri-licensed drilling contractors in general accordance with the standard operating procedure identified in the SAP and under the supervision of Burns & McDonnell field personnel. At the completion of sampling, boring holes were abandoned and backfilled with bentonite grout per Missouri regulations.

Horizontal control was provided by utilizing a Global Positioning System (GPS) device calibrated to Missouri West State Plane coordinates. By this method, most of the borings were executed within approximately 2 feet of the planned location coordinates. Five borings required

horizontal adjustment to avoid conflicts or unsafe conditions, and in one instance a boring was offset due to excessively wet material in the lower levels of the South Pond. The borings that were offset from the planned location were located in the field with the GPS unit and include the borings for grids F2 of the North Pond, area 2 of the North Overfill Area, and grids E2, C3, and D3 of the South Pond. Figures 2, 3A, and 3B have been updated to show the actual location of these five borings and are provided for reference in Attachment 2. Vertical location control was monitored by visual methods accounting for the topographic surface elevation at the boring location and measuring the length of the probe penetrating the surface to the approximate elevation noted in Table 1 also provides the Sample Identification and Location information for the samples.

Table 1- Sample Identification Information and Location

Sample No.	Pond	Boring Location	Approx. Elevation	Sample I.D
1	South	C2	740	S740C2
2	South	D2	745	S745D2
3	South	D2	740	S740D2
4	South	D2	735	S735D2
5	South	E2	750	S750E2
6	South	E2	745	S745E2
7	South	E2	740	S740E2
8	South	E2	735	S735E2
9	South	F2	740	S740F2
10	South	C3	740	S740C3
11	South	D3	745	S745D3
12	South	D3	740	S740D3
13	South	D3	735	S735D3
14	South	E3	750	S750E3
15	South	E3	745	S745E3
16	South	E3	740	S740E3
17	South	E3	735	S735E3
18	South	F3	740	S740F3
19	North	B2	730	N730B2
20	North	C2	730	N730C2
21	North	D2	735	N735D2
22	North	D2	730	N730D2
23	North	E2	740	N740E2
24	North	E2	735	N735E2
25	North	E2	730	N730E2
26	North	F2	745	N745F2
27	North	F2	740	N740F2
28	North	F2	735	N735F2
29	North	F2	730	N730F2
30	North	G2	745	N745G2
31	North	G2	740	N740G2
32	North	G2	735	N735G2
33	North	G2	730	N730G2
34	North	C3	730	N730C3
35	North	D3	730	N730D3
36	North	E3	730	N730E3
37	North	F3	740	N740F3
38	North	F3	735	N735F3
39	North	F3	730	N730F3
40	North Overfill	1	735	NOF735-1
41	North Overfill	2	735	NOF735-2

SUMMARY OF RESULTS

Ash material samples were submitted to Pace in Lenexa, Kansas for analysis of metals concentrations and leaching characteristics. The TCLP test measures the potential for the material to leach metals to the surrounding environment when exposed to water infiltration. The TCLP regulatory concentration limits for these metals were provided in Table 1 of the SAP and is provided for reference in the Combined SAP Screening Levels Table in Attachment 1.

TCLP test results for all constituents analyzed in all samples were reported as non-detect (below reporting limits), and therefore below the EPA limit for TCLP Screening Levels established for potentially hazardous waste.

A summary of constituent concentration results is provided below.

- Arsenic: Arsenic levels in the all samples at both ponds exceeded preliminary and secondary levels but were below the background threshold value per the Blue Valley Industrial Corridor Soils Background Study (2003), included for reference in Attachment 1.
- Barium: There were two preliminary screening exceedances of barium, both in the South Pond; however, these exceedances were below the secondary screening value.
- Cadmium: There were two samples in the South Pond with cadmium concentrations higher than preliminary, secondary, and background screening levels. All other samples showed cadmium over preliminary, but under secondary screening levels.
- Chromium: There were no samples with chromium exceedances over preliminary screening levels.
- Lead: 14 out of the 21 South Pond samples exceeded preliminary, secondary, and background screening thresholds for lead. There were no samples with lead exceeding preliminary screening thresholds in the North Pond or North Overfill area.
- Selenium: No samples exceeded selenium screening thresholds in either pond.
- Silver: Sample values exceeded preliminary but not secondary threshold values in the North Pond, North Overfill area, and South Pond.
- Mercury: There were no detection of mercury in any of the samples.
- Hexavalent Chromium: There were no detections of hexavalent chromium in any of the samples.

Table 2 below provides of summary of all sample results. The full laboratory reports are provided in Attachment 4.

Table 2- Sample Results

Sample ID:	Arsenic	Barium	Cadmium	Chromium	Lead	Selenium	Silver	Mercury	Chromium, Hexavalent
North Pond:									
N 730E3	4.3	503	1.4	67.3	41.7	ND (1.9) UJ	3.3	ND (0.079)	ND (6.2)
N 730D3	4.7	199	0.76	23.9	25.9	ND (1.5)	6.3	ND (0.056)	ND (5.2)
N 730C3	7.6	472	1.7	55.2	89.1	2.7	30.6	ND (0.002)	ND (5.8)
N 730C2	22.0	947	4.5	149	222	2.4	88.0	ND (0.080)	ND (8.3)
N 730B2	9.1	584	2.2	70.7	122	3	50.3	ND (0.066)	ND (6.8)
N 740F3	7.8	782	2.3	90.8	94.2	ND (2.1)	20.6	ND (0.069)	ND (6.0)
N 740F3-DUP1	7.7	753	2.2	86.0	95.7	ND (2.2)	20.0	ND (0.064)	ND (6.2)
N 735F3	6.2	751	2.0	91.5	76.1	ND (2.2)	7.2	ND (0.072)	ND (6.3)
N 730F3	13.0	776	3.9	117	175	2.5	57.7	ND (0.069)	ND (5.9)
N 745F2	10.8	935	2.9	103	144	2.4	53.0	ND (0.071)	ND (6.2)
N 740F2	5.9	759	1.8	79.7	79.7	ND (1.7)	9.1	ND (0.073)	ND (6.2)
N 735F2	8.7	855	2.9	86.4	130	2.2	41.4	ND (0.08)	ND (6.5)
N 730F2	8.4	1240	2.9	96.1	142	2.6	42.4	ND (0.070)	ND (7.6)
N 745G2	9.5	1050	2.7	105	136	2.3	52.0	ND (0.073)	ND (5.9)
N 740G2	9.1	822	2.5	96.7	113	2.6	34.0	ND (0.065)	ND (6.2)
N 735G2	9.5	829	2.9	101	132	2.3	41.1	ND (0.064)	ND (6.1)
N 730G2	8.0	856	2.6	79.1	118	2.5	40.2	ND (0.069)	ND (6.3)
N 740E2	8.5	940	2.5	103	110	ND (2.3)	26.1	ND (0.071)	ND (6.4)
N 740E2- DUP2	9.2	917	2.6	105	127	ND (1.9)	36.7	ND (0.074)	ND (6.4)
N 735E2	6.5	1180	2.1	103	134	3.4	37.1	ND (0.080)	ND (7.1)
N 730E2	12.3	1070	4.9	185	251	ND (2.6) UJ	84.2	ND (0.077)	ND (7.2)
N 735D2	6.8	987	2.2	96.1	98.9	2.1	26.4	ND (0.078)	ND (6.8)
N 730D2	11.4	794	3.1	105	146	7.7	47.2	ND (0.080)	ND (8.2)
North Overfill:									
NOF 735-2	10.3	959	3.4	123	173	2.6	66.1	ND (0.068)	ND (6.2)
NOF 735-1	11.8	837	3.0	100	153	2.1	49.6	ND (0.079)	ND (6.5)
South Pond:									
S 740C2	9.9	869	7.0	230	1220*	ND (1.8) J-	62.0	ND (0.059)	ND (6.2)
S 740C3	11.6	1090	7.8	453	1810*	ND (2.1)	72.1	ND (0.065)	ND (6.7)
S 740C3- DUP3	12.0	1090	7.9	406	1860*	ND (2.0)	66.0	ND (0.065)	ND (6.9)
S 745D2	8.5	928	5.5	280	587	ND (1.5)	95.6	ND (0.062)	ND (5.7)
S 740D2	7.8	1020	5.0	442	826*	ND (2.0)	130.0	ND (0.085)	ND (6.7)
S 735D2	12.6 J	1010	8.0	350	987*	4.0 J	59.2 J	ND (0.077)	ND (8.5)
S 735D2- DUP4	8.3 J	1160	5.8	467	956*	2.0 J	112 J	ND (0.065)	ND (7.0)

Sample ID:	Arsenic	Barium	Cadmium	Chromium	Lead	Selenium	Silver	Mercury	Chromium, Hexavalent
S 750E2	5.0	753	3.5	245	405	ND (2.1)	111.0	ND (0.075)	ND (6.0)
S 745E2	5.9	1510	4.3	324	539	ND (2.2)	89.4	ND (0.072)	ND (6.1)
S 740E2	7.5	1110	4.8	331	1190*	1.8	91.8	ND (0.060)	ND (6.3)
S 735E2	12.5	1220	8.1	345	1240*	ND (2.3)	45.9	ND (0.088)	ND (8.5)
S 750E3	4.5	741	3.2	252	388	ND (1.5)	129.0	ND (0.056)	ND (5.1)
S 745E3	6.9	993	5.4	364	560	ND (2.0)	127.0	ND (0.067)	ND (6.4)
S 740E3	10.8	1460	7.1	532	1290*	ND (3.0)	153.0	ND (0.088)	ND (9.6)
S 735E3	12.9	2160	14.3*	659	1870*	ND (2.5)	156.0	ND (0.002)	ND (8.9)
S 740F2	7.9	946	10.0* J	467	1310*	ND (2.2)	63.2	ND (0.063)	ND (6.5)
S 740F2- DUP5	7.8	889	6.7 J	450	1180*	ND (1.9)	57.5	ND (0.070)	ND (7.0)
S 740F3	7.8	914	7.1	592	1430*	ND (2.3)	59.5	ND (0.081)	ND (7.8)
S 745D3	7.5	951	4.9	306	624	ND (2.2)	94.9	ND (0.072)	ND (5.7)
S 740D3	7.5	1090	4.6	287	585	ND (2.8)	62.2	ND (0.077)	ND (7.5)
S 735D3	9.0	1200	8.8	238	1000*	ND (2.2)	45.8	ND (0.090)	ND (7.9)

Over Secondary Screening Level
*Over Secondary Screening and Background Levels
All Results in mg/kg
ND (x) Signifies Not Detected at a Reporting Limit of x
UJ- Estimated at the reporting limit
J(+/-)- Estimated Value (Potential High/Low Bias)

Data Validation

In reporting the analytical results, the Pace added data qualifiers (when appropriate) according to their standard operating procedures and/or method requirements. This QC summary is provided in their analytical reports (see Attachment 4).

In addition to the laboratory QC reporting, Burns & McDonnell performed an independent QA/QC review of the laboratory reports. The QA/QC results in association with the samples collected were examined for any method-specific requirements. Data validation was conducted on the data as recommended in EPA's National Functional Guidelines for Inorganic Superfund Methods Data Review (2020). The QA/QC evaluation is provided in Attachment 5 and includes the review of sample and laboratory QC for samples collected and analyzed. No data were rejected as a result of this review. The data are valid for use, as qualified, in reporting the results of this investigation.

CONCLUSIONS

Forty-one soil samples were collected from across the North Pond, North Overfill area, and South Pond. The South Pond Due to the high levels of lead concentrations present in the majority of South Pond samples, it is proposed that the ash material be removed from the South Pond and disposed of at a Subtitle D landfill, or other approved disposal method. The ash material is distinguishable from the clay liner material at the base of the impoundment; therefore, it is

proposed that a visual removal verification procedure be drafted as part of an overall Ash Pond Closure Plan, to facilitate closure by removal of the South Pond. The South Pond area could then be backfilled, graded, and utilized for future WWTP facilities.

The North and North Overfill ash material samples have no lead exceedances over the preliminary screening levels. With the exception of arsenic, no sample constituents in the North Pond or North Overfill areas exceeded the secondary screening levels. While the arsenic concentrations exceeded the secondary screening level (EPA Industrial RSL), the concentrations were all below the arsenic background levels for the Blue Valley Industrial Corridor area per the 2003 study (see Attachment 3). In our experience, investigations from other regional sites have comparable arsenic concentration in the natural soils.

With the understanding that the arsenic concentrations are relatively low and that the material presents no greater risk due to arsenic than that of the in-situ soils of this area, it is proposed that the North Pond and North Overfill area ash material not be classified as solid waste. It is proposed that the North Pond and North Overfill material remain onsite, and the impoundment area be graded in a manner that promotes surface drainage. If fill material is needed to achieve finished grade at the South Pond, it is proposed that the North Pond and/or North Overfill material be transported to the South Pond to be utilized to balance the site. All disturbed areas will be restored with vegetation until such time that further site development for future WWTP facilities occurs.

REFERENCES

Burns & McDonnell, 2023. *Sampling and Analysis Plan for KC Blue River WWTP Ash Pond Closure Plan.* January.

EPA, 2020. *National Functional Guidelines for Inorganic Superfund Methods Data Review.* November.

EPA, 2023. *Regional Screening Levels (RSLs).* May.

US Army Corps of Engineers, 2003. *Blue Valley Industrial Corridor Soils Background Study Report.* February.

We appreciate MDNR's consideration in this matter. If you should have any questions or comments, please contact Brian Weis at (816) 759-2083 or bweis@burnsmcd.com.

Attachments:
Attachment 1: Screening and Background Levels Table
Attachment 2: Updated SAP Figures
Attachment 3: Blue Valley Industrial Corridor Soils Background Study
Attachment 4: Laboratory Results
Attachment 5: QA/QC Evaluation

APPENDIX B – BLUE VALLEY INDUSTRIAL CORRIDOR SOILS BACKGROUND STUDY REPORT

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

BROWNFIELDS
SHOWCASE COMMUNITIES

BLUE VALLEY INDUSTRIAL CORRIDOR SOILS BACKGROUND STUDY REPORT

BROWNFIELDS SHOWCASE PROJECT

FEBRUARY 2003

US Army Corps of Engineers®

Prepared By:
US Army Corps of Engineers
Kansas City District
601 E. 12th Street
Kansas City, Missouri 64106

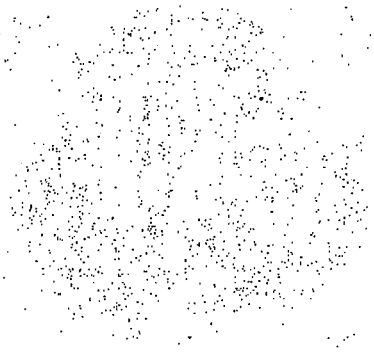




TABLE OF CONTENTS

LIST OF TABLES iii
LIST OF FIGURES iv
LIST OF PLATES iv
LIST OF ACRONYMS AND ABBREVIATIONS v

1.0 INTRODUCTION
1.1 OBJECTIVES 1-1
1.2 REPORT ORGANIZATION 1-1

2.0 PROJECT BACKGROUND
2.1 BLUE VALLEY INDUSTRIAL CORRIDOR RENEWAL 2-1
2.2 REGULATORY INFORMATION 2-1
2.3 STUDY DESIGN AND RATIONALE 2-2
2.3.1 Soils in Blue Valley 2-2
2.3.2 Data Needs 2-3
2.3.2.1 Chemical Analyses 2-3
2.3.2.2 Geotechnical Characteristics 2-4
2.3.3 Sampling Population Size 2-5
2.3.4 Field Sampling Design 2-5
2.4 PLAN DEVELOPMENT AND REVIEW 2-6

3.0 FIELD ACTIVITIES
3.1 INTRODUCTION 3-1
3.2 SAMPLING LOCATIONS 3-1
3.3 SOILS DESCRIPTIONS 3-1
3.4 DRILLING AND SAMPLING 3-2
3.5 QUALITY CONTROL AND ASSURANCE 3-2

4.0 DATA QUALITY EVALUATION
4.1 INTRODUCTION 4-1
4.2 METALS 4-1
4.2.1 Matrix Spikes 4-1
4.2.2 Matrix Spike Duplicates 4-2
4.2.3 Laboratory Control Samples 4-2
4.2.4 Method Blanks 4-2
4.2.5 Data Usability 4-2
4.2.6 Hexavalent Chromium 4-3
4.3 POLYNUCLEAR AROMATIC HYDROCARBONS 4-4
4.3.1 Matrix Spikes 4-4
4.3.2 Method Blanks 4-4
4.3.3 Surrogate Recoveries 4-4

4.2.4 Laboratory Control Samples 4-4
4.2.5 Data Usability 4-4

5.0 ANALYTICAL RESULTS
5.1 METALS 5-1
5.2 POLYNUCLEAR AROMATIC HYDROCARBONS 5-2
5.3 OTHER CHEMICAL ANALYSES 5-2
5.3.1 PH 5-2
5.3.2 Cation Exchange Capacity 5-2
5.3.3 Total Organic Carbon 5-2
5.4 GEOTECHNICAL ANALYSIS 5-3
5.4.1 Dry Bulk Density/Moisture Content 5-3
5.4.2 Sieve Analysis/Soils Classification 5-3

6.0 STATISTICAL EVALUATION
6.1 METHODS 6-1
6.1.1 Frequency of Detection and Censored Data 6-1
6.1.2 Distribution Tests 6-2
6.1.3 Outlier Treatment 6-3
6.1.4 95% UTL 6-4
6.1.5 Nonparametric Upper Bound 6-5
6.2 POPULATION (N) DISTRIBUTIONS 6-5
6.3 RESULTS 6-6
6.3.1 Metals Data Grouped by Association Sampling Interval (n=8) 6-6
6.3.2 Metals Data Grouped by Soil Association (n=24) 6-6
6.3.3 Metals Data Grouped by Sampling Interval (n=24) 6-6
6.3.4 All Metals Data Combined (n=72) 6-7
6.3.5 PAHs Data (n=24) 6-7
6.4 RECOMMENDED BACKGROUND LEVELS 6-8

7.0 SUMMARY AND APPLICATIONS 7-1
7.1 SUMMARY 7-1
7.2 APPLICATIONS 7-1

REFERENCES REF-1

TABLES

FIGURES

PLATE

Appendix A. Reference Soils Descriptions

Appendix B. Field Reports and Documentation
B1. Daily Exploration Reports
B2. Photographs of Sampling Locations
B3. Boring Logs
B4. Chain of Custody Records
B5. Field QA/QC Records

Appendix C. Data Quality Evaluation Tables
C1. Metals Data Qualifiers
C2. PAHs Data Qualifiers

Appendix D. Metals Statistical Analyses Printouts
D1. Data Grouped by Soil Associations and Sampling Intervals (n=8)
D2. Data Grouped by Soil Associations (n=24)
D3. Data Grouped by Sampling Intervals (n=24)
D4. All Metals Data Combined (n=72)

Appendix E. PAH Statistical Analyses Printouts
E1. Surface Soils Data
E2. Subsurface Soils Data (for information purposes only)

LIST OF TABLES

1 Locations Sampled
2 Soils Descriptions and Classifications
3 Metals Results
4 PAHs Results
5 Lab Measured pH Results
6 Cation Exchange Capacity Results
7 Total Organic Carbon Results
8 Dry Bulk Density/Moisture Content Results
9 Metals Results with Outliers Marked
10 Distributions Compared for Association Sampling Intervals and Soil Associations
11 Distributions Compared for Association Sampling Intervals and Sampling Intervals
12 Distributions Compared for All Data Combined, Soil Associations, and Sampling Intervals
13 Background Determined by Association Sampling Intervals
14 Background Determined by Soils Associations
15 Background Determined by Sampling Intervals
16 Background Determined with All Data Combined
17 Background Levels for PAHs in Surface Soil
18 Recommended Background Levels for Metals

19 Comparison of Recommended Background Levels to Health-Based and Groundwater Protective Levels

LIST OF FIGURES

1 General Location Map
2 Blue Valley Renewal Project Area
3 Soils Associations in Blue River Valley

PLATE

1 Sampling Locations

LIST OF ABBREVIATIONS AND ACRONYMS

AML	Analytical Management Laboratory, Inc.
ASTM	American Society for Testing Materials
ATSDR	Agency for Toxic Substance and Disease Registry
bgs	below ground surface
CALM	cleanup levels for Missouri
CEC	cation exchange capacity
CME	Central Mining Equipment
EPA	Environmental Protection Agency
FoD	frequency of detection
ICP	inductive coupled plasma
ID	inside diameter
KCD	Kansas City District
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
MB	method blank
MDNR	Missouri Dept. of Natural Resources
MS	matrix spike
MSD	matrix spike duplicate
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
% R	percent recovery
QA	quality assurance
QAPP	quality assurance project plan
QC	quality control
QCSR	quality control summary report
QL	quantitation limit
RAGS	Risk Assessment Guidance for Superfund
RPD	relative percent difference
SCS	Soil Conservation Service
SIM	selective ion method
STARC	soil target concentration
TAL	target analyte list
TOC	total organic carbon
USACE	US Army Corps of Engineers
USCS	unified soil classification system
USDA	US Department of Agriculture
USEPA	US Environmental Protection Agency
UTL	upper tolerance limit
VCP	Voluntary Cleanup Program

1.0 INTRODUCTION

1.1 STUDY OBJECTIVE

This report presents the results of the background study conducted for the Blue Valley Industrial Urban Renewal Project. The objective of the study was to characterize the chemical and geotechnical characteristics of the native soils surrounding the Renewal Project area for use by property owners and/or developers conducting environmental investigations.

1.2 REPORT ORGANIZATION

Section 2 provides general information on the Blue Valley Brownfields project and on the regulatory setting. The rationale for the study design, including a description of the types or populations of soils in the area, analytical data needs, the number of samples required, and the criteria for selecting sampling locations are explained.

Section 3 describes field activities and the drilling and sampling techniques used.

Section 4 evaluates the analytical data quality.

Section 5 summarizes the analytical results.

Section 6 presents the statistical evaluation of the data. This includes descriptions of the data populations evaluated, the probability plots used to visually inspect the data, Shapiro Wilk and Lilliefors tests used to determine population distributions, outlier tests applied to extreme values, and determination of the upper bounds on concentrations selected to represent background.

Section 7 provides a summary of the study and discusses applications.

* * *

2.0 PROJECT BACKGROUND

2.1 BLUE VALLEY INDUSTRIAL CORRIDOR RENEWAL

The soils background study was conducted for the Blue Valley Industrial Corridor Renewal Project (Renewal Project) located along the Big Blue River in Kansas City, Missouri. The Renewal Project area is generally bounded by: 29th Street, Big Blue River, and I-70 to the north; Coal Mine Road to the south; Van Brunt Boulevard, Railroad Right of Way, and Wheeling Road to the west; and Manchester Trafficway to the east (Figures 1 and 2).

The Renewal Project is funded as a Brownfields Showcase Project and represents a collaborative effort between the City of Kansas City, the US Environmental Protection Agency, the US Army Corps of Engineers, and Missouri State agencies. The primary goal of the Renewal Project is to encourage industrial redevelopment of this area. Because of blighting and suspected chemical contamination due to historical uses, some properties will require environmental studies prior to development. Future environmental studies for development will determine chemical levels in various media (e.g., surface soil, subsurface soil, groundwater) and whether these chemical levels pose a human health risk or a threat to the environment.

2.2 REGULATORY INFORMATION

While federal, state, or local agency regulations apply to some sites in the Renewal Project Area, other sites will enter into the Missouri Department of Natural Resources (MDNR) Voluntary Cleanup Program (VCP). The VCP program's risk-based approach to establishing cleanup is described in Cleanup Levels for Missouri (CALM) (MDNR, 1998 and 2001). The CALM guidance document provides a risk-based tiered approach to determining levels of contamination in soil media and groundwater that might threaten human health or the environment under certain land use conditions.

In a Tier 1 evaluation, data collected at a site are compared to published chemical-specific cleanup goals for soil and groundwater. Cleanup goals fall into three land use scenarios: Scenario A – residential or "unrestricted"; Scenario B – commercial with children present; and Scenario C – industrial. If chemical levels at a site are greater than the published cleanup goals, then a human health or environmental threat may exist. The property owner and/or developer have the option to clean to the published goals or to move on to a higher tier evaluation.

Conducting a Tier 2 evaluation requires prior notice to MDNR VCP and generally involves developing soil target concentrations (STARCs) that are specific to the

site. This is accomplished by replacing the conservative assumptions used in the Tier 1 calculations with site-specific information. These assumptions may relate to source characteristics (e.g., depth and width of contamination in the subsurface) or site geology and hydrology. Thus in a Tier 2, soil physical parameters and aquifer characteristics for a site may be determined and used in developing STARCs. A Tier 2 evaluation also allows studies to determine background concentrations of chemicals in native soil. Should chemical concentrations in site data exceed the developed Tier 2 levels, a Tier 3 evaluation may be pursued pending approval by MDNR. A Tier 3 evaluation requires substantially more effort and may involve the use of computer code fate and transport models or uncertainty analysis.

The soils background information provided in this report is for use by property owners and developers during environmental investigations under CALM or in other regulatory settings.

2.3 STUDY DESIGN AND RATIONALE

2.3.1 Soils in Blue Valley

Based on a review of Soil Survey of Jackson County, Missouri (USDA SCS, 1984), the soil map units listed below are predominant in the Renewal Project area. Figure 3 shows units and associations in the Blue River Valley.

- 10F Snead Rock Outcrop Complex (14-30% slope)
- 30 Keenebec Silt Loam
- 36 Bremer Silt Loam
- 38 Wiota Silt Loam
- 54E Knox Silt Loam (14-20% slope)
- 60C Sibley-Urban Land Complex (5-9% slope)
- 61C Knox-Urban Land Complex (5-9% slope)
- 61D Knox-Urban Land Complex (9-14% slope)
- 65F Snead-Urban Land Complex (9-30% slope)
- 69A Urban Land, Bottom Land (0-3% slope)
- 102 Udifluvents (nearly level)

With limited exceptions, all units within the Blue River valley fall into one of the following established soil associations:

- Knox-Sibley-Urban Association - Urban land and deep, gently sloping to steep, well-drained soils that formed in loess on uplands.

- Snead-Menfro-Oska Association - Moderately deep and deep, gently sloping to steep, well drained and moderately drained soils that formed in loess or residuum from shale and limestone on upland.

- Keenebec-Colo-Bremer Association - Deep, nearly level, moderately well drained and poorly drained soils that formed in alluvium on flood plains and terraces.

One exception is a small area of soil classified in the Higginsville-Sibley-Sharpsburg Association, which is located approximately 2 miles south of the Renewal Project area in the vicinity of the Swope Park amphitheater. This association is also seen to the southeast, but is within another watershed.

The other exception is udifluvents. Udifluvents are fill areas on flood plains that consist of mixtures of silty soil and manmade materials, usually mixed by machinery (USDA SCS, 1984).

The background study was designed to evaluate the chemical and physical properties of the three soil associations listed above, separately, since each association may represent a distinct sample population. As explained in United States Environmental Protection Agency guidance documents (USEPA, 1995a and 1995b) chemical concentrations vary depending on the physical, chemical, and biological processes that effect parent geological material. Grouping the data by association would reduce the variation in distributions and thus, require fewer samples per population. Geotechnical data collection was planned to confirm the physical characteristics of soil samples and confirm that the samples, grouped by association, represented the same/similar population.

Since udifluvents are a mixture of different soils and manmade material, the variation in chemical and physical soil properties was expected to be great and therefore would require a greater number of samples to reduce variability in the datasets. Since including fill as a target population would be costly, it was assumed that if the source of fill is neighboring soil associations, then the ranges of chemical concentrations seen in the three associations sampled would serve to bracket what might be considered background for udifluvent soil. Concentrations in fill that exceed this bracket would less likely be related to background and would more likely be evidence of a site-related release.

2.3.2 Data Needs

2.3.2.1 Chemical Analyses

The study included chemical analyses for the following inorganic constituents following EPA SW-846 Method 6010B/7000: aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, total chromium, cobalt, copper, iron, lead,

magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and zinc.

Hexavalent chromium (Cr^{+6}) is typically less abundant in soil than trivalent chromium (Cr^{+3}), but it is more toxic (ATSDR, 1993; USEPA, 1992a and 1994). When the fraction of hexavalent chromium in a total chromium analysis is unknown, it is often overestimated when developing risk-based cleanup goals so as to be protective. This study planned to determine the typical concentrations of Cr^{+6} found in these soils. Hexavalent chromium was analyzed using EPA Method 3060A/7196A in ten percent of the soil samples collected.

Polynuclear aromatic hydrocarbons (PAHs) were proposed for analysis (in surface soil only) using EPA Method 8270C - selective ion method (SIM) for a lower detection limit. SIM can achieve concentrations in nanograms per kilogram (ng/kg) or parts per trillion. PAHs are ubiquitous in the environment, forming as a result of incomplete combustion. Sources are both natural (e.g., forest fires) and manmade (e.g., fuel burning). Most of the PAHs in soil are believed to result from atmospheric deposition after local and long-range transport (ATSDR, 1995). This is supported by the presence of PAHs in soil of regions that are remote from industrial activity (Thomas, 1986). However, PAH concentrations are documented to be highest in urban areas. Vehicle exhaust, asphalt, emissions from the wearing of tires, asphalt, and materials such as ash, slag, or sewage sludge used as construction fill all add to PAHs in an urban environment. This list, which is taken from ATSDR (1995), is not exhaustive. Although the CALM guidance limits background to naturally occurring chemical levels, other agencies have considered anthropogenic (or manmade) levels for background. For example, *Risk Assessment Guidance for Superfund, Volume 1 – Human Health Evaluation Part A* (RAGS) considers anthropogenic levels that are present due to non-site related sources, such as automobiles and industry, as background (USEPA, 1989a; pg. 4-5). The work plan for this study provided a literature review that supports the characterization of ubiquitous PAH levels in industrialized urban areas as non-site related background.

Other chemical analytes in the design included pH by EPA Method 9045C, cation exchange capacity (CEC) by EPA Method 9081C, and total organic carbon (TOC) by ASTM D2974.

2.3.2.2 Geotechnical Characteristics

Soil geotechnical analyses were planned using the following methods:

- Moisture Content (ASTM D2216)
- Bulk Density (ASTM D2937)

- Sieve Analysis (ASTM D422)
- USDA Classification

Soil physical characteristics would not only confirm that soil samples are grouped by similar populations, but also provide information for use in environmental studies on "media transfer". Media transfer, in this instance, refers to the migration of chemicals from a solid form in soil to either a vapor form in air or a leachate form in groundwater. However, this application of the geotechnical data is limited to environmental projects that are *not* located in udifluvent soil or fill, since moving and mixing can impact soil physical characteristics.

2.3.3 Sample Population Size

A commonly used statistical approach for determining chemical background concentrations is the construction of tolerance intervals (USEPA, 1989b, 1992b, and 2002; MI, 1994; Singh, 1994 and 1999). This statistical technique establishes an upper limit on a distribution of background concentrations. This upper limit then represents the maximum concentration still considered within the normal range of background concentrations for that chemical. If a sample result from an environmental site is compared and found to be greater than the upper-end of the distribution, then the sample is likely site-related and not representative of background.

An upper tolerance limit (UTL) is calculated using the following equation:

$$UTL = x + Ks$$

where:
x is the mean
S is the standard deviation
K is the tolerance factor based on population size (n), confidence, and coverage

USEPA (1989b) recommends using tolerance factors for a 95% confidence and 95% coverage. This means that one is 95% confident that at least 95% of data points (in this case, background chemical concentrations) will be less than the UTL value. Tables of K values calculated for varying levels of confidence and coverage have been published (Lieberman, 1958; Guttman, 1970). Each set of tables includes K values based on sample population sizes (n), beginning with a population size as few as two. It is possible to have few samples and still calculate a meaningful UTL because K adjusts the standard deviation for the uncertainty associated with a smaller population size. Eight is considered by USEPA to be an adequate sample population size for determining UTLs (1989b).

The population size proposed for characterizing background concentrations of metals was therefore a minimum of eight samples per each of three sampling intervals per each of three soil associations. This design allowed an adequate number of samples to test several hypotheses about sample populations. (See later section on statistical evaluation.) Since the predominant source of PAHs in surface soil is likely to be atmospheric deposition and not necessarily related to parent geological material, the 24 surface soil samples were assumed to represent the same population.

2.3.4 Field Sampling Design

A classic or stratified sampling design is often recommended for determining representative concentrations (USEPA, 1992 and 2000; Gilbert, 1987). Stratified random is a design where target populations are divided into regions or strata that are expected to have similar characteristics, as is the case with the soil associations in this study.

The area identified for sampling extends from the Renewal Project area south to Swope Park. Sampling locations and alternatives within each soil association were selected after reviewing the historical aerial photograph inventory from 1936 to 1982 (USEPA, 1990) and after visual inspection in the field. Aerial photograph review was conducted to avoid placing sampling points on property, which may have been historically used for industrial purposes, and/or which may contain fill or other disturbed soils not representative of background conditions. The specific sample point at each of the locations was selected in the field based upon best professional judgment and evidence of minimal anthropogenic impact (e.g., mature trees nearby).

Samples for metals analyses were collected from three intervals in each of the eight borings in each of the three soil associations (72 samples). Sampling intervals were from 0 to 12 inches below ground surface (bgs), 24 to 36 inches bgs, and 48 to 60 inches bgs. PAHs were only analyzed in surface soil samples (a total of 24). Total organic carbon and soil pH were measured in all 72 samples. CEC was analyzed in a third of all samples collected from each soil association.

Shelby tubes were planned in half of all borings at 0-36 inches bgs and at 36-60 inches bgs for sieve analysis, hydrometer (if warranted by particle size), moisture content, and bulk density.

2.4 PLAN DEVELOPMENT AND REVIEW

A conceptual design work plan was submitted for EPA and MDNR review. Following meetings and discussions, the conceptual design was revised to

address comments and then finalized in February 2001. The actual project work plan was developed and submitted for approval in May 2001; it included sampling and analysis, quality assurance, quality control, health and safety, and data evaluation plans. The plan was reviewed and finalized in September 2001. Copies of the project plan are available upon request through the City of Kansas City Brownfields Office.

* * *

3.0 FIELD ACTIVITIES

3.1 INTRODUCTION

During September 2001, USACE-KCD completed sampling for the Blue Valley Soils Background Study in an area extending east of Prospect Street to Raytown Road and south of I-70 to Swope Park. The purpose of the study was to characterize the chemical and geotechnical characteristics of native soils surrounding the Blue Valley Industrial Renewal Project Area for use in future environmental investigations. While field activities were scheduled for completion in two weeks, rainy conditions, site access, and other circumstances caused delays. Some sampling locations were abandoned due to auger refusal or when the core contained a large percentage of asphalt or rubble. Daily Exploration Reports describe weather and site conditions and are provided in Appendix B1.

3.2 SAMPLING LOCATIONS

Thirty Kansas City or Jackson County parcels and right of ways were identified as sampling locations during the work plan development. These included eight primary locations with two alternates for each of three soil associations, the Keenebec-Colo-Bremer Association (KCB), Knox-Sibley-Urban Association (KSU), and the Snead-Menfro-Oska Association (SMO). These sampling sites were staked and utilities were cleared a week prior to mobilization. During field activities, however, site conditions necessitated abandoning several of the locations and the alternatives were not enough. Additional alternative sites were identified and approval coordinated with the city and state. Utilities were cleared again prior to sampling. Table 2 identifies the final locations included in the study. Photographs of each sampling location are provided in Appendix B2.

3.3 SOIL DESCRIPTIONS

Many of the thirty sampling locations showed evidence of past disturbance or soil mixing, with ill-defined horizons and occasional debris (e.g., brick pieces, gravel, glass shards), especially evident in the shallow sampling interval. This was somewhat expected because of the long history of urban use in the area. Generally, soils were described as either silt loam or silty clay loam, with a few exceptions of silty clay. Most samples ranged from medium gray to dark brown in color and some were mottled with black or red. Overall, soils were consistent with the types expected for soils in the target associations. USDA soil descriptions of the undisturbed cores samples (Table 2) compare with soil descriptions found in the County Soil Survey (Appendix A).

3.4 DRILLING AND SAMPLING

Boring logs and chain of custody forms for sampling are provided in Appendices B3 and B4, respectively. A CME-55 Drill rig was used for the study. Soil samples for chemical analyses were collected using a ¾-inch Hollow Stem Auger with a 3 ¼-inch Inner Barrel Sampler. Geotechnical samples were collected using a 3-inch Shelby tube.

A total of 24 borings were drilled successfully and sampled. There were eight borings from each of the three soil associations. Samples were collected for TAL metals, pH, and TOC analyses in each of the sampling intervals, 0-12, 24-36, and 48-60 inches below ground surface (bgs). Samples were collected for PAHs, only in the 0-12 inch sampling interval. Samples for CEC analysis were collected at all three sampling intervals, but only in half of the borings. Hexavalent chromium analysis was requested in 10 percent of the samples.

Samples were collected from the inner barrel sampler. The soil core was divided into the respective intervals and each interval was placed in separate pans. The soil was then homogenized and aliquots jarred for analyses. PAHs were collected prior to homogenization, in the surface sample core. Surface soil samples for TOC analyses were collected adjacent to the boring using a small hand augering device to assure adequate sample volume.

Shelby tubes for geotechnical analyses, including sieve analyses/hydrometer for texture and USDA classification, moisture content, and bulk density, were collected at two sampling intervals (0-36 and 36-72 inches bgs) in half of the borings.

3.5 QUALITY CONTROL AND ASSURANCE

Quality control samples, field replicate samples and MS/MSDs, were collected to meet or exceed the rates recommended in the work plan.

Decontamination procedures were limited. Since the sample never came in contact with the auger, the auger was not contaminated. Soil was removed from the auger with a shovel and brush and the auger was not power washed. The inner barrel sampler and sampling tools were decontaminated with an alconox wash and a de-ionized water rinse.

Oversight for health and safety issues and for drilling and sampling procedures are documented in the quality assurance forms provided in Appendix B5.

* * *

4.0 DATA QUALITY EVALUATION

4.1 INTRODUCTION

Data were evaluated according to USACE and USEPA guidance documents (USACE, 1994, 1997, and 1999; USEPA 1996), as described in the work plan. The following summarizes the data quality evaluations for metals and PAHs, with accompanying tables provided in Appendix C.

All soil samples were analyzed for metals by EPA Method 6010B. If, during the analysis, arsenic or selenium were found at levels below the quantitation limit (QL), the sample was analyzed again using the more sensitive EPA Method 6020A. Only surface soil samples were analyzed for polynuclear aromatic hydrocarbons (PAHs) by EPA Method 8270C SIM.

The following quality control elements were inspected during the evaluation:

- Holding Time
- Matrix Spike (MS)
- Matrix Spike Duplicate (MSD)
- Matrix Duplicate (in absence of MSD)
- Method Blank (MB)
- Laboratory Control Sample (LCS)
- Laboratory Control Sample Duplicate (LCSD)

None of the samples exceeded holding times.

4.2 METALS

4.2.1 Matrix Spikes

For samples qualified as 'J', EPA Method 6020A matrix spikes did not result in meaningful recoveries due to the low level of spike added compared to the amount of analyte already in the sample. With no corrective action for this, 'R' would normally be assigned to the corresponding data. However, the matrix recoveries were acceptable in Method 6010B for the same corresponding samples. Unfortunately, these sample results were already qualified with 'J' since the results fell below the quantitation limit (QL). Even though the results did not fall below the QL for EPA Method 6020A, the results were still qualified since the matrix spike recoveries were not usable. The qualifier 'J', as opposed to 'R', was applied since the results between the two methods were comparable and at least one of the methods did not indicate matrix effects.

4.2.2 Matrix Spike Duplicates

Rationale applied for matrix spike duplicate is exactly the same as for matrix spike. The purpose of the matrix spike duplicate is to measure the precision of recovery for the analyte spiked into the soil. The unusable MSD recovery in EPA Method 6020A also resulted in an unusable precision measurement, the relative percent difference (RPD). As before, the MSD and RPD were unusable for EPA Method 6020A and consideration was given to the success of the MSD recoveries and RPD found from EPA Method 6010B.

4.2.3 Laboratory Control Samples

The laboratory control sample results for both methods in all batches were acceptable.

4.2.4 Method Blanks

Method blanks were uncontaminated.

4.2.5 Data Usability

Data were qualified according to strict application of the guidance. However, since these results are used in statistical applications for background studies, the actual reliability of the qualified metals was inferred by observing where these concentrations fell within the range of the entire dataset. In other words, if data preliminarily qualified with 'R' fell within the range of detected concentrations and did not represent outliers, then the data were considered as 'J' qualified and used in the statistical evaluations.

There are some difficulties in applying quality control measures designed for contaminants and/or trace amounts of naturally occurring substances to naturally occurring substances that are present in high concentrations, i.e., to the major elements in soil. Due to a number of field and laboratory-related factors, the applicability and interpretation of MS/MSD results for soils is one such difficulty. Both USACE and USEPA guidances indicate that MS/MSD are not appropriate for high-concentration metals (i.e., major elements) in soils. USACE (2001; App. I, Sec. 10.2.3.1) indicates that it is not necessary to perform matrix spikes for Al, Ca, Na, K, Mg, Fe, Mn in soil since "the native concentrations of these low-toxicity metals are relatively high". USEPA (1996; Ch. 1, Sec. 4.4.3) indicates that when the concentration of an analyte in the sample is greater than 0.1% (1000 mg/kg), spiking is not necessary. These guidances recognize that spike recovery studies are considered inappropriate for elements present at concentrations greater than 1000 mg/kg.

Among the factors affecting MS/MSD are the small analytical aliquot size and the nature of the material. The sample aliquot for soil analysis by ICP is only 1.25 grams. Due to the inherent heterogeneity of geologic materials, a 1.25-gram aliquot may not be representative of an 8-oz. jar sample, and may be quite different from other aliquots taken from the same jar. The field homogenization procedure conducted during sampling decreases compositional variability, but does not completely eliminate it. To

eliminate heterogeneity requires laboratory preparation in which the soil is dried and pulverized to a 200-mesh prior to taking the analytical aliquot. This extensive sample preparation is not typically conducted on environmental samples. Therefore, the aliquots taken for MS/MSD have an associated degree of uncertainty.

Spiking analytes that occur at high levels in the matrix has associated analytical difficulties. To be useful, the spike must be resolvable from background. In the case of major elements present at percent-range concentrations, a spike that is high enough to be resolved from the native concentration will exceed the linear range of the instrument, requiring that analysis be performed at dilution. Since ICP is a multi-element method, dilution to bring high-concentration analytes into range may affect quantitation of low-concentration analytes. High concentrations may also affect the functioning of the analytical instrument and cause cross-contamination of other samples.

MS/MSD results were reported for major elements because the same stock spiking solution was used for both the LCS and MS/MSD (USACE laboratory validation requirement). Results outside criteria indicate a possible matrix effect and were coded 'J'. These data were determined usable for the purposes of the study, which is to characterize background ranges for a number of metals.

4.2.6 Hexavalent Chromium

Hexavalent chromium (Cr^{+6}) is an oxidized species that can readily be reduced to trivalent chromium (Cr^{+3}) under normal soil pH and redox conditions by soil components such as organic matter, ferrous iron, and sulfide. For this reason, low to zero percent recoveries for MS/MSD do not indicate a method QC failure, and are acceptable under the method QC criteria.

The laboratory ran 3 MS/MSD per batch for a total of 9, a rate of 33% (only 10% is normally required). The additional QC was requested since soil chemistry changes with depth and with soil type.

Of the 9 MS/MSD runs, 4 MS/MSD had 0% recoveries, 3 MS/MSD had low recoveries in the range 3.6-49.7%, and 2 MS/MSD had recoveries in the range 75-76.6% (which are within the standard acceptance criteria of 75-125% for total metals).

The zero and low percent recoveries likely mean that the soils are reducing in nature, and do not support the presence of Cr^{+6}; therefore, total Cr in these soils is Cr^{+3}. All MS/MSD from the 0-12 inch bgs sampling interval (and also some from deeper intervals) had zero percent recoveries. The surface soil interval typically contains the greatest amount of organic matter, which is probably the primary natural reductant for Cr^{+6}.

MS/MSD recoveries from the 24-36 and 48-60 inch sampling intervals ranged from 0% to 76.6%, indicating that the soils in general have a high reducing capacity that is not favorable to Cr^{+6}. Again, total Cr in these soils is Cr^{+3}.

4.3 POLYNUCLEAR AROMATIC HYDROCARBONS

4.3.1 Matrix Spikes

Most of the PAH analytes did not meet matrix spike criteria in batch 1222. (See Appendix C for complete list.) Corrective actions were performed on these analytes resulting in matrix spike recoveries within criteria except for benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, fluoranthene, chrysene, and pyrene. These compounds were qualified with a 'J'. Phenanthrene was underspiked in both spike attempts, hence the corrective action was inappropriate; however, due to the high amount contained in the sample, a high spike amount would have been difficult to achieve, therefore this analyte was also 'J' qualified. There were no MS/MSD results for sample 22 KCB 0-12". All results in this sample were preliminarily qualified as 'R'.

4.3.2 Method Blanks

Method blanks were free of contamination.

4.3.3 Surrogate Recoveries

All surrogate recoveries were within criteria.

4.3.4 Laboratory Control Samples

Recoveries for LCS were within criteria; however, the RPD between the LCS and LCSD in batch 1223 was 31.51% and 33.85% for fluoranthene and pyrene, respectively. The criterion is 30%. The LCSD is not a requirement for this analytical method; however, since this QC was reported and was outside criteria, a qualifier was assigned. Since the guidance does not address this element, there is no requirement to reject the data. A 'J' qualifier therefore was assigned to these chemicals in samples 1KSU 0-12", its duplicate 1AKSU 0-12", and 20 SMO 0-12".

4.3. 5 Data Usability

As with the metals data, organic data were qualified according to strict application of the guidance. However, as with metals data, the actual reliability of the qualified data may be inferred by observing where these concentrations fall within the entire dataset. The 'R' qualifier was assigned to data in 22 KCB 0-12" since there were no MS/MSD for this sample. However, this is considered a contractual problem and not necessarily a technical problem. Other MS/MSD indicated that the analytical system was working for other samples analyzed from similar matrices. Since results for this sample fell within the ranges of detected concentrations from other samples, the data were considered as 'J' qualified and used in the statistical applications.

* * *

5.0 ANALYTICAL RESULTS

5.1 METALS

Metals were analyzed using EPA Method 6010. Arsenic and selenium were analyzed twice in many of the soil samples, the second time using EPA Method 6020. Hexavalent chromium was analyzed by EPA Method 3060A/7196A. Table 3 presents the qualified, analytical results expressed in mailgrams per kilogram (mg/kg or parts per million). Replicate sample results were averaged with this value presented in Table 3. Note that for nondetects, the table shows the surrogate value used in the statistical evaluations, which was a concentration at half the method detection limit.

The range of detected concentrations and the frequencies of detection (FODs) are shown in the statistical summary tables found in Appendix D. Sets of summary tables are presented in the appendix, arranged by the various data groups evaluated (i.e., by soil association, by sampling depth, by sampling depth within each association, and grouped by all samples combined). These populations are discussed later in Section 6. The population sizes shown in the appendix tables are after outliers have been removed to achieve either a normal or lognormal distribution.

Aluminum, arsenic, barium, calcium, cobalt, copper, lead, magnesium, manganese, sodium and zinc were detected in all 72 samples. Chromium VI and silver were not detected in any of the samples. Metals found in less than 50 percent of the samples are considered nonparametric and included antimony, selenium, and thallium. While mercury was nonparametric in the KCB and KSU soils associations, it was detected at 75 percent in SMO soils.

5.2 POLYNUCLEAR AROMATIC HYDROCARBONS

PAHs were analyzed in 24 surface soil samples, following USEPA Method 8270C - selective ion method (SIM). Table 4 presents the analytical results. The range of detected concentrations and FODs are shown in the statistical summary tables in Appendix E.

All PAHs were detected in some samples. Acenaphthylene was detected in only one sample; acenaphthene, anthracene, fluorene, and naphthalene were detected in less than 50 percent of the samples. These PAHs represent nonparametric distributions. The remaining PAHs were detected in greater than 79% of the surface soil samples and included: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,I)perylene, benzo(k)fluoranthene, dibenz(a,h)anthracene, fluoranthene, indeno(1,23-c,d)pyrene, phenanthrene, and pyrene.

The PAH concentrations are expressed as ng/kg (nanograms per kilogram) in the data summaries. The range of concentrations for benzo(a)pyrene, as an example, was 1,675

to 464,348 ng/kg. Converted to micrograms per kilogram, or parts per billion, this range would be 1.675 to 464.348 ug/kg or ppb.

Although not in the work plan, the laboratory analyzed 7 subsurface soil samples for PAHs. The results are provided in Appendix E for information purposes and are not included in the background calculations discussed Section 6. Phenanthrene was found in all of the subsurface samples; however, most PAHs were not detected or detected at low frequencies. Generally, if detected in the subsurface soils, PAHs were at lower concentrations than found at the surface.

5.3 OTHER CHEMICAL ANALYSES

5.3.1 pH

Soil pH was determined in the laboratory for all 72 samples, following EPA Method 9045C. Table 5 summarizes the results. The pH of all soils ranged from a minimum of 5.28 to a maximum of 8.44. Averages for all soils, calculated for each sampling interval within each soil association, were 6.01 to 6.84, with no discernible trends by interval or by association.

5.3.2 Cation Exchange Capacity

CEC was determined in half of the samples collected, using by EPA Method 9081C. Table 6 summarizes the results. CEC for KCB, KSU, and SMO soils averaged 16.1, 14.5, and 18.9, respectively. CEC is the capacity of cations on soil to interchange with cations in soil solution. The unit of milliequivalents per 100 grams of soil represents the electrical charge of the soil that can attract cations. Clay and organic matter usually provide most of the exchange sites in soil.

5.3.3 Total Organic Carbon

TOC was analyzed using ASTM Method D2974 in samples collected at two intervals within each of the 24 borings, for a total of 48 analyses. TOC is expressed as mg/kg and often converted to a unitless fraction organic carbon (FOC) or expressed as a percent. Organic carbon contents in soils are expressed as percents in Table 7. Shallow samples (0-12 in bgs) ranged from a minimum FOC of 0.0011 to a maximum of 0.0116. The averages for KCB, KSU, SMO were 0.0043, 0.0032, and 0.0054, respectively. Samples collected from 24 to 36 in bgs ranged in carbon content from 0.002 to 0.0092, with averages for KSB, KSU, and SMO at 0.0055, 0.0045, and 0.0044, respectively. Samples from 46 to 60 in bgs ranged from 0.0008 to 0.0123, and averages for KSB, KSU, and SMO were 0.0049, 0.0037, and 0.0057, respectively. The TOC results for surface soils were lower than expected, since concentrations tend to be higher at the surface and then decrease with depth. The similarity in organic carbon content across depths supports the idea that soils in the areas sampled may have been previously disturbed.

5.4 GEOTECHNICAL ANALYSES

5.4.1 Dry Bulk Density/Moisture Content

Shelby tube samples were taken at two depths in 12 borings and submitted for bulk density analyses following ASTM Method D2937. Moisture content was determined using ATSM Method D2216. Table 8 summarizes the results by sample and by soils associations. Measured bulk densities ranged from 1.583 to 1.699 grams per cubic centimeter. Bulk densities at 36-60 in bgs were slightly greater than those measured from 0-36 in bgs in all three soil associations.

5.4.2 Sieve Analysis/Soils Classification

Sieve analysis, by ASTM Method D422, was performed on the 24 Shelby tube samples submitted. Hydrometer tests were determined by the geotechnical laboratory to not be necessary, based on the clay content of the soils. USDA soil classifications were determined. Table 2, referenced in Section 4, provides descriptions and the classifications for the soil samples.

* * *

6.0 STATISTICAL EVALUATION

6.1 METHOD

The methodology used to determine background concentrations follows recommendations from the following USEPA publications: *Determination of Background Concentrations of Inorganics in Soils and Sediments at Hazardous Waste Sites* (1995a), *Establishing Background Levels* (1995b), *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Interim Final Guidance and its Addendum* (1989b and 1992b), *Final Guidance for Characterizing Background Chemicals in Soil at CERCLA Sites* (2002), and other publications (MI, 1994; Hardin & Gilbert, 1993; Singh, 1994 and 1999).

As discussed in Section 2.3, a 95 percent upper tolerance limit (UTL) is a commonly used statistical approach for determining chemical background concentrations. This statistical technique establishes an upper limit on a distribution of concentrations, which then represents the maximum concentration considered to be from the distribution. If data from an environmental site is compared and found to be greater than the upper bound of the distribution, the data is considered to be above background and likely site-related.

As with many statistical tests, the 95% UTL is only valid for populations that are parametric with normal or lognormal distributions. Therefore, the first step in determining background was to determine population distributions. Datasets not testing normal or lognormal are nonparametric and their statistical treatment is described later.

6.1.1 Frequency of Detection and Censored Data

Prior to testing distributions for the various populations, each chemical-specific dataset was reviewed to determine whether it was "censored". Censored data refers to nondetect results for some of the samples within the population being evaluated (Gilbert, 1987). Treatment of censored data followed USEPA recommendations (1989 and 2002):

If less than 15% of the data were censored (i.e., nondetect), then the nondetect observations were assigned a surrogate value of half the method detection limit prior to testing the distribution for normality or lognormality.

If greater than 15% but less than 50% of the observations in a population were nondetect, a value of half the method detection limit was assigned the nondetects. Then the distribution of the "detects only" data and the "censored and detects" data (i.e., all observations) were both tested for normality and lognormality.

If greater than 50% of the observations in a population were censored, then the population was assumed to be nonparametric and treated as described in Section 6.1.5.

6.1.2 Distribution Tests

Depending on the size of the dataset, two techniques were employed. For datasets with less than 50 samples, the Shapiro Wilk W test was used. The calculation for the W test is:

$$W = \frac{1}{d}\left[\sum_{i=1}^{k} a_i (x_{n+1} - x_i)\right]^2$$

and:

$$d = \sum_{i=1}^{n} (x_i - \bar{x})^2$$

$k = n/2$ *if n is even,* $k = (n-1)/2$ *if n is odd*

and:

n	=	the number of samples in the dataset
x	=	the mean of the data set
a_i	=	coefficients a1, a2,...ak from table (Gilbert, 1987)

The resulting W is compared to a tabulated value of $W_{0.05}$ for n samples. For a calculated value of W greater than the tabulated value, the data are assumed to be normal. Calculated values of W less than the tabulated values indicate that the data are not normally distributed. If not, then the Shapiro Wilk W test is used on the log-transformed data to determine whether the data follow a lognormal distribution.

For datasets larger than 50 (for this project, all metals data combined for a chemical-specific population size of n=72), the Lilliefors test was used. The Lilliefors Test is a modification to the Kolmogorov-Smirnov (K-S) test for normality (USEPA, 2000). The K-S test is based on the maximum difference between the cumulative distribution of the dataset and a hypothesized normal cumulative distribution. If the difference is significant as compared to the tabulated critical value, then the data is not normal. While the K-S test assumes the mean and standard deviation of the normal distribution are known prior to testing, the Lilliefors modification accounts for what is usually the case, i.e., that the mean and standard deviation are not known prior to testing and must instead be estimated from the data. If the data do not test normal using the Lilliefors test, it is reapplied on log-transformed data to determine whether the data follow a lognormal distribution.

The USEPA software program ProUCL Version 2.1, released by Lockheed Martin Environmental Services, is designed to determine 95% upper confidence limits (UCLs) for risk assessment calculations, but also includes algorithms for the Shapiro Wilk and Lilliefors distribution tests. The software was used to perform the Lilliefors test and to confirm the Shapiro Wilk W results.

6.1.3 Outlier Treatment

Some populations did not test normal or lognormal. In these instances, outlier tests were applied, and if confirmed, the outliers were removed from the dataset and the distribution retested. Outliers are defined as "an observation that does not conform to the pattern established by other observations" (Hunt, 1981). Outliers can be one or more of either the minimum or maximum chemical concentrations detected.

Several statistical treatment options for outliers were applied. The Discordance Outlier Test is considered a standard practice by ASTM (1994) and cited in several USEPA guidances (1989b, 1992b, and 2000). The procedure is described in the following manner:

1. Observations are ordered and denoted by $x_1 \ldots x_n$, with x_n assigned to the largest observation.

2. Mean (x), and standard deviation (s) are calculated for the data.

3. The statistic T_n is determined by:

$$T_n = (x_n - x)/s$$

4. T_n is then compared to the tabulated critical value given for the sample size, and if T_n exceeds the 5% critical value for population size n, then this is evidence that x_n is a statistical outlier.

Another standardized practice for testing outliers was applied (ASTM, 1984; Grubbs, 1969). This test evaluates the two maximum or two minimum detections at once to determine if both are outliers and masking each other. This procedure is based on the ratio of the sum of the squares. For testing the two maximum values as outliers, the sum of squares is determined with the two maximum values omitted, and then the sum of squares is determined including the two values. This ratio is then compared to a tabulated lower 5% significance level for the population size n. If the ratio is less than the critical value, it is significant and indicates outliers. The procedure is performed in a similar way for testing the two minimum values.

The Studentized Range Test was the third outlier test used for some populations (ASTM, 1984; USEPA, 2000). This test compares the range of the concentrations

detected to the standard deviation, with the ratio, w/s, then compared to tabulated critical values:

$$w/s = (x_n - x_1)/s$$

The most basic and reliable tool used to determine outliers was visual inspection of the plotted data. The USEPA Pro-UCL Software provides quantile-quantile (Q-Q) plots, which displays the entire distribution of data, ranging from the lowest to highest value. The vertical axis is the measured concentration, and the horizontal axis, in this application, is the percentile of the theoretical normal distribution. This Q-Q plot is also known as a normal probability plot (USEPA, 2000 and 2002). If the data follow a normal distribution, the plot forms a straight line with a slope of one, regardless of the selected scales. The scales for the concentration axes may be either both linear or both logarithmic, for testing normal or lognormal distributions. Data points deviating from the line represent outliers.

6.1.4 95 % UTL

The upper tolerance limit (UTL) was calculated using the following equation:

$$UTL = x + Ks$$

where:
x is the mean
S is the standard deviation
K is the tolerance factor based on population size (n), confidence, and coverage.

USEPA (1989c) recommends using tolerance factors for a 95% confidence and 95% coverage. This means that one is 95% confident that at least 95% of data points (in this case, background chemical concentrations) will be less than the UTL value. Tables of K values calculated for varying levels of confidence and coverage have been published (Lieberman, 1958; Guttman, 1970).

For datasets that are small, the lognormal 95% UTL may not be robust. Therefore, if the 95% UTL was greater than four times the median of the background distribution, four times the median was considered representative of background. This check on reasonableness of a lognormal UTL has been used by Washington State Department of Ecology, as described by Hardin and Gilbert (1993).

For censored data sets, where both the "censored and detects" data and the "detects only" data tested either normal or lognormal, the correlation coefficient (r) of the plots for the "censored and detects" data and for the "detects only" data were calculated and

compared. If the value of r was greater for the "censored and detects" data plot, then the Cohen's Adjustment (USEPA, 1992b) was applied to correct the mean and standard deviation before calculating the 95% UTL. If the value of r is greater for the "detects only" data plot, then the Aitchison's Adjustment (USEPA, 1992b) to the mean and standard deviation was made.

6.1.5 Nonparametric Upper Bound

For data sets that were neither normal nor lognormal, and for data sets that had greater than 50% nondetects, the upper bound was assumed equal to the maximum detected concentration (Guttman, 1970).

6.2 POPULATION (N) DISTRIBUTIONS

The design of the study allowed for the metals data to be tested for normal or lognormal distributions grouped a number of ways. The data were tested in the following groups: sampling intervals within soil associations (i.e., 9 datasets of n=8 samples for each metal); soil associations (3 datasets of n=24 samples for each metal); and sampling intervals (3 datasets of n=24 samples for each metal). The fourth group tested was all data combined to see if all samples come from the same population (i.e., 1 dataset of n=72 samples for each metal).

All metals datasets were treated as described in Section 6.1. Appendix D presents the statistical evaluations with subdivisions (i.e., D1, D2, D3, and D4) for each group listed above. Each sub-appendix contains the statistical summary tables and Q-Q plots showing distributions and outliers.

Table 9 shows which of the metals results were identified as outliers and removed from any of the datasets. Since outliers were not consistently from the same sample, none of the samples were considered contaminated or excluded from the background evaluation. If outliers existed, in most cases less than 10 percent of the samples within a dataset were removed to achieve normal or lognormal distributions. In a few cases (e.g., calcium, sodium), it was necessary to remove up to 30 percent of samples to achieve normal or lognormal distributions. The exact number of outliers removed for any population can be determined from the column "samples in distribution" given in the appendix summary tables.

Tables 10, 11, and 12 compare the distributions for the various datasets tested. Table 10 shows the distributions of association sampling intervals (n=8) compared to the distributions of the soil associations (n=24). Table 11 shows the distributions of association sampling intervals (n=8) this time compared to the distributions of the sampling intervals (n=24). Table 12 shows the distributions of the soils associations and the sampling intervals (each n=24) compared to the distributions for all data combined (n=72).

For PAHs, the 24 surface soil samples were assumed to represent one population, since atmospheric deposition is ubiquitous. Appendix E presents the statistical summary tables and Q-Q plots showing distributions and outliers. (Note that the appendix also includes the additional subsurface soil analytical results provided by the lab, for information purposes, since this data is not summarized elsewhere in the report.)

6.3 RESULTS

6.3.1 Metals Background Determined by Association Sampling Interval (n=8)

Metals grouped by sampling intervals within each soil association tested normal, lognormal, or both, with a few exceptions. Antimony and selenium were consistently nonparametric because of the low frequencies of detection (FOD), and mercury and thallium in some populations. When detected between 50-85%, the better distribution for mercury and thallium was usually the 'detects only' data. Most distributions were achieved without outlier removal. With the exception of thallium in KSU 0-12", it was only necessary to remove one outlier to achieve either normal or lognormal distributions. Hexavalent chromium and silver were not detected in any of the samples. Statistical results are in Appendix D1 with Table 13 summarizing background levels for the tested populations.

6.3.2 Metals Background Determined by Associations (n=24)

Metals in the KCB soil association tested normal, lognormal, or both (N/L), with the exceptions of antimony, mercury, selenium, and thallium with low FOD. Sodium required removal of the 7 outliers (29% of the data) to achieve a lognormal distribution.

Metals in the KSU soil association tested normal and/or lognormal, with the exceptions of antimony, mercury, and selenium with low FOD. Thallium tested N/L with the nondetects (or censored data) removed.

Metals in the SMO soil association tested normal and/or lognormal, with the exceptions of antimony, selenium, and thallium with low FOD. Mercury tested normal with the censored data removed. Calcium required removal of 25% of the data to achieve a lognormal distribution.

Statistical results are shown in Appendix D2 and Table 14 summarizes background levels for metals within the 3 soil associations.

6.3.3 Metals Background Determined by Sampling Interval (n=24)

Metals in the 0-12 inch sampling interval tested normal and/or lognormal with the exceptions of antimony and selenium with low FOD. Distributions presented for mercury and thallium are with censored data removed.

Metals in the 24-36 inch sampling interval tested normal and/or lognormal with the exceptions of antimony, selenium, and thallium with low FOD. Mercury was N/L using 'detects only' data.

Metals in the 48-60 inch sampling interval tested normal and/or lognormal with the exceptions of antimony, mercury, and selenium with low FOD. Thallium tested N/L by using the 'detects only' data.

Statistical results are in Appendix D3 and Table 15 summarizes background levels for metals within the 3 sampling intervals.

6.3.4 Metals Background Determined Using All Samples Combined

Metals for all samples combined tested normal and/or lognormal with the exceptions of antimony, selenium, and thallium with low FOD. Mercury tested lognormal based on 'detects only' data.

Statistical results are in Appendix D4 and Table 16 summarizes metals background levels determined using all samples combined.

6.3.5 PAH Background (n=24)

PAHs tested lognormal with the exceptions of acenaphthene, acenaphthylene, anthracene, fluorene, and naphthalene because of low FOD. Benzo(a)anthracene, benzo(g,h,i)perylene, dibenz(a,h)anthracene, fluoranthene, and indeno(1,2,3-cd)pyrene were lognormal with the censored data removed. None of the PAHs tested normal which may be due, in part, to sample location relative to atmospheric source or to the impact of terrain on deposition.

Appendix E provides the statistical results and Table 17 summarizes the background levels.

6.4 RECOMMENDED BACKGROUND LEVELS

6.4.1 Metals

Table 18 summarizes the recommended background concentrations for metals in the Blue Valley Industrial Corridor. The recommended background concentrations are the maximum calculated background concentrations for any of the populations evaluated. Note that the maximum detected concentration was the recommended background value only when the dataset was nonparametric. Also, while 4 times the median was the recommended value for some metals datasets, none of the maximum background levels shown are based on 4 times the median. Therefore, the recommended background levels for soils in the Blue Valley Industrial Corridor, except for metals that have nonparametric distributions, is the high-end of the range of calculated 95% UTL values. This is reasonable for sites located in fill areas in the floodplain or areas where

the terrain has been substantially altered, since in either case, it is possible for soil to represent a mixture of any of the populations evaluated. It is not recommended to simply use the calculated 95% UTL for 'all samples combined' (n=72) because the 95% UTL for other populations, in instances, are greater.

6.4.2 PAHs

The recommended background concentrations for PAHs in surface soil in the Blue Valley Industrial Corridor are shown in Table 17.

* * *

7.0 SUMMARY AND APPLICATIONS

7.1 STUDY SUMMARY

The native soils in the Renewal Project area were sampled and background determined for various sample populations: KCB, KSU, and SMO soil associations; 0-12, 24-36 and 46-60 inch sampling intervals; and for the three sampling intervals within each of the three soil associations; and for all soil samples combined. Any of these soil populations (i.e., soil mixtures) could exist in the Renewal Project Area as a result of historical regrading or cut and fill operations.

The 95% upper tolerance limit (UTL) approach is one of the options provided in the USEPA background guidance document, which was recently finalized (2002). An upper bound or 95% UTL of concentrations that could reasonably be considered background was determined for each metal, within each sampling population.

Background for populations testing normal or lognormal was the 95% UTL, unless the 95% UTL for a metal exceeded its maximum detected concentration. If this occurred, the 95% UTL was compared to 4 times the median concentration and the smaller of these two values was used. This provides a conservative check on the reasonableness of the calculated UTL (Hardin and Gilbert, 1993). Background for each population not testing normal or lognormal (i.e., nonparametric) was the maximum detected concentration. Antimony and selenium were nonparametric in all populations evaluated, while mercury and thallium were nonparametric in some. Hexavalent chromium and silver were not detected in any of the samples.

The calculated background levels for each metal were compiled and considered to 'bracket' possible combinations of mixed, native soils in the area. Thus the upper-end of the range is the reasonable, maximum background level recommended for use.

Other soil properties were characterized including: pH, total organic carbon, cation exchange capacity, dry bulk density, and classification. This information was compiled based on sampling intervals within each of the three soil associations. The purpose of this information was twofold, for confirming soil sample groupings and, to a limited extent, for use in environmental studies.

7.2 APPLICATIONS

The calculated background levels for PAHs and metals in soil (Tables 16 and 17) are intended for use in environmental studies conducted in the Blue Valley Industrial Urban Renewal Project area. The pH, CEC, and TOC information compiled in Tables 5 through 7 and, to a limited extent, the bulk densities compiled in Table 8 are available for use. Soils located in the flood plain or in areas of mostly fill may exhibit different physical properties. Confirmation sampling for similarity may be required.

REFERENCES

American Society for Testing and Materials (ASTM), 1994. *Standard Practice for Dealing with Outlying Observations.* Designation E 178-94.

Agency for Toxic Substances and Disease Registry (ATSDR), 1993. *Toxicological Profile for Chromium.* U.S. Department of Commerce.

Agency for Toxic Substances and Disease Registry (ATSDR), 1995. *Toxicological Profile for Polycyclic Aromatic Hydrocarbons (PAHs).* U.S. Department of Commerce.

Economic Development Corporation of Kansas City, Missouri (EDC), 1998. *Blue Valley Industrial Urban Renewal Project.* Prepared for City Counsel, Plans, and Zoning Commission; Redevelopment Coordinating Committee; Land Clearance for Redevelopment Authority. July.

Gilbert, Richard O., 1987. *Statistical Methods for Environmental Pollution Monitoring.* Van Nostrand Reinhold Company, New York.

Grubbs, F.E., 1969. *Procedures for Detecting Outlying Observations in Samples.* Technometrics, 11:1-21.

Guttman, I., 1970. *Statistical Tolerance Regions, Classical and Bayesian.* Hafner Publishing Company, Darien, Connecticut.

Hardin, J. W. and Gilbert, R.O., 1993. *Comparing Statistical Tests for Detecting Soil Contamination Greater Than Background.* Batelle, Pacific Northwest Laboratory.

Lieberman, G. F., 1958. *Tables for One-Sided Statistical Tolerance Limits. Industrial Quality Control.* v. IV, no. 10.

Michigan Department of Environmental Quality (MI), 1994. *Guidance Document: Verification of Soil Remediation, Revision 1.* Waste Management Division, Environmental Response Division. April.

Missouri Department of Natural Resources (MDNR), 1998. *Cleanup Levels for Missouri (CALM).* Voluntary Cleanup Program.

Missouri Department of Natural Resources (MDNR), 2001. *Update to Cleanup Levels for Missouri (CALM).* Voluntary Cleanup Program.

Singh, Anita, Ashok Singh, and George Flatman, 1994. *Estimation of Background Levels of Contaminants.* Mathematical Geology, v. 26, no. 3.

Singh, Anita, 1999. *Statistics in Environmental Applications.* Lockheed Martin Environmental Services, Las Vegas, Nevada. Presented at EPA Region VII-Sponsored Workshop, April 5, 2000.

Thomas, W., 1986. *Accumulation of Airborne Pollutants by Arctic Plants and Soil.* Oxford Pergamon Press, 1986. Water Science and Technology. v. 18, no. 2, p. 47-57.

United States Army Corps of Engineers (USACE), 1994. *Validation of Analytical Chemistry Laboratories.* USACE Engineer Manual EM 200-1-1.

United States Army Corps of Engineers (USACE), 1996. *Chemical Data Quality Management for Hazardous, Toxic, Radioactive Waste Remedial Activities:* USACE Engineer Regulation ER 1110-1-263.

United States Army Corps of Engineers (USACE), 1997. *Chemical Quality Assurance:* USACE Engineer Manual EM 200-1-6.

United States Army Corps of Engineers (USACE), 1999. *CENWK-EC-EF Data Quality Evaluation Guidance.* USACE Kansas City District.

United States Army Corps of Engineers (USACE), 2001. *Blue Valley Industrial Corridor Soil Background Study Work Plan.* USACE Kansas City District. September.

United States Department of Agriculture, Soil Conservation Service (USDA SCS), 1984. *Soil Survey of Jackson County, Missouri.* September.

United States Environmental Protection Agency (USEPA), 1979. *Methods for Chemical Analysis of Water and Wastes:* EPA 600/4-79-20.

United States Environmental Protection Agency (USEPA), 1989a. *Risk Assessment Guidance for Superfund, Volume 1 – Human Health Evaluation Part A (RAGS).* EPA/540/1-89/002. December.

United States Environmental Protection Agency (USEPA), 1989b. *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Interim Final.* EPA/530/SW-89-026. February.

United States Environmental Protection Agency (USEPA), 1990. *Aerial Photographic Site Inventory of the Blue River Study Area, Kansas City, Missouri.* Environmental Monitoring Systems Laboratory. TS-PIC-89429/90429. January.

United States Environmental Protection Agency (USEPA), 1992. *Guidance for Data Useability in Risk Assessment, Part A.* PB92-963356.

United States Environmental Protection Agency (USEPA), 1992a. *Ground Water Issue Paper: Behavior of Metals in Soils.* Robert S. Kerr Environmental Research Laboratory. Office of Research and Development. EPA/625/6-89/022. October.

United States Environmental Protection Agency (USEPA), 1992b. *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Addendum to Interim Final Guidance.* June.

United States Environmental Protection Agency (USEPA), 1993. *Data Quality Objectives Process for Superfund.* EPA 540/R-93-071.

United States Environmental Protection Agency (USEPA), 1994. *Ground Water Issue Paper: Natural Attenuation of Hexavalent Chromium in Ground Water and Soil.* Office of Research and Development. EPA/625/6-89/022. October.

United States Environmental Protection Agency (USEPA), 1995a. *Engineering Forum Issue Paper: Determination of Background Concentrations of Inorganics in Soils and Sediments at Hazardous Waste Sites.* R.P. Breckenridge and A.B. Crokkett. EPA/540/S-96/500. December.

United States Environmental Protection Agency (USEPA), 1995b. *Establishing Background Levels.* OSWER Directive 9285.7-19FS. EPA/540/F-94/030. September.

United States Environmental Protection Agency (USEPA), 1996. *Test Methods for Evaluating Solid Waste.* EPA SW-846 Update III.

United States Environmental Protection Agency (USEPA), 2000. *Guidance for Data Quality Assessment, Practical Methods for Data Analysis, EPA QA/G-9, QA97 QA00 Update.* EPA/600/R-96/084. July.

United States Environmental Protection Agency (USEPA), 2002. *Guidance for Characterizing Background Chemicals In Soil at CERCLA Sites.* EPA/540/R-01/003. September.

* * *

TABLES

Table 1
Locations Sampled
Blue Valley Soils Background Study Report
Brownfields Showcase Project

Number	Soil	Address
1*	KSU	ROW (Indiana and Linwood)
2	SMO	ROW (W of Van Brunt, near 32nd)
3	SMO	4701 E. Linwood Blvd. (Linwood Park)
4*	KSU	Oak Park
7	SMO	4201 E. 38th St (Seven Oaks Park)
8	KSU	3730 Vineyard Rd
9	KSU	5231 E 39th St
10	KSU	4108 Jackson (Cleveland Park)
11	SMO	4108 Jackson (Cleveland Park)
12	SMO	4250 Van Brunt Blvd. (Vineyard Park)
14	SMO	ROW (E of Van Brunt, N of Clary)
15	KCB	ROW (W of Van Brunt, S of 45th)
17	KSU	ROW (W of Elmwood, S of school)
19	KCB	2901 E Emanuel Cleaver II Blvd
20*	SMO	Brooklyn Park
21	KCB	4725 Coal Mine Rd.
22	KCB	Coal Mine Rd. (Municipal Farm)
24	KCB	5518 Hardesty
25	KSU	ROW (S of 55th, near Myrtle)
26	KSU	ROW (W of Elmwood, S of 56th Ter.)
27	SMO	4020 E. 58th St.
28	KCB	6700 Zoo Dr. (Swope Park)
29	KCB	6700 Zoo Dr. (Swope Park)
30	KCB	6700 Zoo Dr. (Swope Park)

Notes:
Locations are shown on Plate 1.
Asterisks indicate work plan locations that were moved (with KC approval) due to field difficulties.
A total of 24 locations were sampled, eight from each soil association.
Skipped sequential numbers indicate an alternative sampling location that was not selected.

Soil Assocations
KCB = Keenebec-Colo-Bremer
KSU = Knox -Sibley-Urban
SMO = Sibley-Menfro-Oska

Table 2
Soils Descriptions and Classifications
Blue Valley Soils Background Study Report
Brownfields Showcase Project

ID	Assoc.	Unit	Description & USDA Soil Classification (0-36 in bgs)	Description & USDA Soil Classification (36-60 in bgs)
15	KCB	36	Dark brown SILT LOAM with trace of organics	Dark brown SILTY CLAY LOAM with organics
19	KCB	36	Brown SILT LOAM with trace of organics	Dark brown SILT LOAM with trace of organics
21	KCB	30		
22	KCB	38	Brown-mottled gray-speckled black & reddish brown SILTY CLAY LOAM	Brown-mottled grayish brown speckled reddish brown & black SILTY CLAY LOAM
24	KCB	36	Dark brown SILTY CLAY LOAM with organics	Brown-mottled gray-speckled reddish brown SILTY CLAY LOAM w/trace of organics
28	KCB	36		
29	KCB	36		
30	KCB	36	Dark brown SILTY CLAY LOAM	Dark brown SILTY CLAY
1	KSU	61D		
4	KSU	60C	Brown-speckled reddish brown SILTY CLAY w/iron stains	Olive brown-spotted white CLAY w/weathered shale
8	KSU	61D	Brown-spotted black SILTY CLAY LOAM w/trace of organics	Brown-mottled reddish brown spotted black SILTY CLAY LOAM w/iron stains
9	KSU	61C		
10	KSU	60C	Brown-speckled black SILTY CLAY LOAM w/organics	Dark brown SILTY CLAY LOAM with organics
17	KSU	60C	Brown SILTY CLAY with organics	Brown-mottled reddish brown SILT LOAM w/organics
25	KSU	60C		
26	KSU	60C		
2	SMO	65F	Brown-speckled black SILTY CLAY LOAM w/trace of organics	Brown-mottled olive brown spotted white CLAY LOAM w/trace of caliche
3	SMO	65F	Brown-spotted gray-speckled reddish brown SILTY CLAY LOAM w/organics & iron stains	Dark brown SILT LOAM
7	SMO	65F		
11	SMO	65F	Brown-speckled black & reddish brown SILTY CLAY LOAM w/iron stains	Well graded GRAVEL with clay & sand (USDA class material)
12	SMO	65F		
14	SMO	65F	Reddish brown SILTY CLAY LOAM w/organics	Reddish brown-speckled black SILTY CLAY LOAM
20	SMO	65F		
27	SMO	65F		

Notes:
USDA Classifications are shown capitalized.
Sampling locations are shown on Plate 1.
Two intervals at half of the sampling locations were submitted for sieve analysis (ASTM D422).

Soil Associations
KCB = Keenebec-Colo-Bremer
KSU = Knox-Sibley-Urban
SMO = Sibley-Menfro-Oska

Soil Map Units
30 = Kennebec Silt Loam
36 = Bremer Silt Loam
38 = Wiota Silt Loam
60C = Sibley Urban (5-9% slope)
61C = Knox Urban (5-9% slope)
61D = Knox Urban (9-14% slope)
65F = Snead Urban (9-30% slope)

Table 3
Metals Results (mg/kg)
Blue Valley Soils Background Study Report
Brownfields Showcase Project

Sample ID	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium
15 KCB 0-12	8179	*0.97 U*	4.7 J	206	0.652	0.539	3671
15 KCB 24-36	8676	*1 U*	4.5 J	184	0.652	0.607	3455
15 KCB 48-60	10.7 J	*0.945 U*	5.19 J	5.18	*0.0235 U*	*0.1405 U*	924
19 KCB 0-12	6450	*1.045 U*	12.3	164	0.543	0.956	3633
19 KCB 24-36	5700	*1.01 U*	3.86 J	165	0.477 J	0.532	2998
19 KCB 48-60	5130	2.92 J	2.56 J	184	0.502	0.551	2850
21 KCB 0-12	7171	*0.97 U*	4.84	142	0.6165	0.439 J	3928
21 KCB 24-36	12756	*0.965 U*	12.76	192	0.7205	0.377 J	4186
21 KCB 48-60	6012	*0.93 U*	3.73	155.5	0.5855 J	0.6	3206
22 KCB 0-12	12231 J	*0.975 U*	10.6	147	0.743	0.457	3512
22 KCB 24-36	16336 J	2.69 J	5.4 J	199	1.19	0.786	4136
22 KCB 48-60	11652 J	*0.965 U*	5.44 J	172	0.865	0.61	4154
24 KCB 0-12	5029	2.13 J	2.8	139	0.441 J	0.473 J	2166
24 KCB 24-36	7473	*0.965 U*	4.62	122	0.616	0.365 J	3165
24 KCB 48-60	7620	*0.92 U*	5.12	140	0.709	0.43 J	3704
28 KCB 0-12	12021 J	*0.94 U*	4.13 J	139	0.934	6.16	31777
28 KCB 24-36	7229 J	0.935 U	4.62 J	161	0.579	0.834	3510
28 KCB 48-60	13417 J	*0.975 U*	7.58 J	256	0.95	0.424 J	5152
29 KCB 0-12	6889 J	*0.9875 U*	3.79	176	0.635	0.583	3188
29 KCB 24-36	4303 J	*0.965 U*	2.38 J	167	0.449 J	0.548	2169
29 KCB 48-60	4569 J	*0.97 U*	2.69 J	117	0.449 J	0.315 J	2416
30 KCB 0-12	6169	*0.985 U*	2.37	145	0.578	0.375 J	3221
30 KCB 24-36	7239	*0.95 U*	4.54	135	0.663	0.366 J	3593
30 KCB 48-60	5740	*0.965 U*	6.41	98.4	0.612	0.442 J	3424
1 KSU 0-12	5426	*2.7425 U*	11.705	104.5	0.4315 J	1.154	46924
1 KSU 24-36	6304	*2.015 U*	3.315	102.65	0.4035 J	*0.737 U*	2616
1 KSU 48-60	5116	*1.005 U*	3.905	100.55	0.368 J	*0.1375 U*	2537
4 KSU 0-12	15481	*0.995 U*	1.93	238	1.17	*0.302 U*	6392
4 KSU 24-36	14681	*0.955 U*	0.647	196	0.744 J	*0.293 U*	11948
4 KSU 48-60	8930	*0.96 U*	1.02	59.8	0.526	*0.139 U*	32493
8 KSU 0-12	6729	*0.935 U*	7.85	164	0.555	1.11	6100
8 KSU 24-36	7764	*0.99 U*	6.26 J	115	0.691	0.365 J	3585
8 KSU 48-60	8919	*0.9075 U*	6.24 J	168	0.838	0.474 J	3879
9 KSU 0-12	11898 J	*1.955 U*	5.88 J	278	0.829	0.439 J	4892
9 KSU 24-36	8420 J	*0.94 U*	5.12 J	259	0.754	0.694	4141
9 KSU 48-60	13383 J	*0.995 U*	4.81 J	259	1.14	0.654	4273
10 KSU 0-12	11851	*0.91 U*	8.77	216	0.734	0.48	3809
10 KSU 24-36	12477	*0.955 U*	12.9	250	0.706	0.585	6665
10 KSU 48-60	14529	*0.945 U*	8.94	261	0.83	0.478	4869
17 KSU 0-12	8746	*1.015 U*	8.81 J	133	0.516	*0.144 U*	3069
17 KSU 24-36	8922	*0.92 U*	7.79 J	182	0.619	0.444 J	3305
17 KSU 48-60	9894	*0.925 U*	5.69 J	96.4	0.653	0.476 J	3044
25 KSU 0-12	12658 J	*0.96 U*	5.13	238	0.8965	0.4715	3957
25 KSU 24-36	17605 J	*1 U*	7.78	278.5	0.9775	0.3775 J	3497
25 KSU 48-60	15768 J	*0.955 U*	4.615	301	1.195	0.487 J	5890
26 KSU 0-12	9151	*0.955 U*	6.3	166	0.595	0.741	5321
26 KSU 24-36	16000	1.93 J	9.65	252	0.859	0.527	3822
26 KSU 48-60	13809	*1.015 U*	8.44	251	0.775	0.372 J	3655
2 SMO 0-12	11281	*1.015 U*	4.97 J	198	1.02	0.359 J	4892
2 SMO 24-36	13271	*1.025 U*	7.36 J	77.6 J	1.405 J	1.05 J	29854
2 SMO 48-60	11823	*1.035 U*	4.01 J	70.3 J	1.165	0.758 J	62280
3 SMO 0-12	7960	*0.99 U*	5.32 J	204	0.664	0.917	4969
3 SMO 24-36	7790	3.93 J	5.54 J	189	0.645	0.502	4113
3 SMO 48-60	9506	*0.89 U*	10.6 J	160	0.616	0.331 J	3602
7 SMO 0-12	6588	*0.85 U*	10.8	200	0.536	0.897	4361
7 SMO 24-36	16978	*5.05 U*	13.6	210	0.937	0.474 J	3879
7 SMO 48-60	12960	*3.715 U*	10.1	457	0.732	0.565	3568
11 SMO 0-12	15801	*0.945 U*	18	202	0.909	0.574	3941
11 SMO 24-36	14121	2.5 J	7.94	341	1.24 J	4.41	15125
11 SMO 48-60	16735	*4.955 U*	14.7	343	1.33	2.37	6684
12 SMO 0-12	16867	*1.885 U*	6.14	373	1.2	0.735 J	4309
12 SMO 24-36	13238	*0.915 U*	5.57	176	1.05	0.777 J	4139
12 SMO 48-60	10332	*0.96 U*	4.99	237	0.925 J	0.937 J	5482
14 SMO 0-12	7154	*1.015 U*	4.835 J	152.5	0.647	0.3295 J	2447
14 SMO 24-36	7333	*3.4475 U*	4.51 J	109.65	0.6325	0.274 J	2225
14 SMO 48-60	9204	*0.985 U*	12.2	111.25	0.826	*0.14 U*	3091
20 SMO 0-12	5976	*1.01 U*	12.3	95.8	0.388 J	*0.127 U*	2510
20 SMO 24-36	8878	*1.995 U*	8.05	139	0.843	*0.1435 U*	37483
20 SMO 48-60	8473	*2.056 U*	1.01	45.4	0.52	*0.138 U*	20250
27 SMO 0-12	4175	*0.9325 U*	11.2 J	191	0.462 J	11.6	172030
27 SMO 24-36	10377	*0.92 U*	6.98 J	196	0.826	0.426 J	4774
27 SMO 48-60	11327	*1.005 U*	6.74 J	189	0.82	0.323 J	4273

Notes: 'J' means concentration is estimated. 'U' means the analyte was not detected.
Underlined qualifiers were assigned during QC review.
Italics show concentrations at half the detection limit for 'U' qualified data.
Hexavalent chromium and silver were analyzed, but not detected in any samples.

Table 3
Metals Results (mg/kg)
Blue Valley Soils Background Study Report
Brownfields Showcase Project

Sample ID	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese
15 KCB 0-12	12.3	8.59	15.1	13405 J	14.2	1756	737
15 KCB 24-36	12.6	10.6	14.5	14006 J	15.7	1946	792
15 KCB 48-60	*0.2345* U	0.2345 U	*0.2345* U	*2.345* UJ	*1.17* U	90.6 J	1.12 J
19 KCB 0-12	10.7	8.82	14.7	13153 J	39.6	1694	740
19 KCB 24-36	9.14	8.51	11.2	11822 J	12.9	1633	692
19 KCB 48-60	8.45	8.37	12	10696 J	11.1	1549	932
21 KCB 0-12	10.2	8.81	11.7	11634 J	21.9	1510	527
21 KCB 24-36	16	11.8	19.4	22118 J	19.4	2818	588
21 KCB 48-60	8.12	7.17	10.4	17664 J	16.3	1676	663
22 KCB 0-12	18.1	10.8	19.4	20260 J	18.3	2874	646 J
22 KCB 24-36	22	17.1	21.3	25445 J	19	3567	1146 J
22 KCB 48-60	17.9	12.3	17.2	20587 J	15.4	3278	911 J
24 KCB 0-12	9.1	10.5	10	9538 J	14.9	1289	769
24 KCB 24-36	12.1	8.37	12.6	14127 J	15.4	1760	435
24 KCB 48-60	12	9.54	13	14374 J	14.6	2151	625
28 KCB 0-12	25.6	13.1	30.7	22108 J	37.2	3670	895 J
28 KCB 24-36	12.7	11.4	12.8	13048 J	15.1	1688	1101 J
28 KCB 48-60	19.3	15.6	21.3	23470 J	19.9	2814	817 J
29 KCB 0-12	11.7	9.56	13.1	12996 J	20.3	1862	785 J
29 KCB 24-36	7.74	7.08	9.46	8262 J	12.2	1187	613 J
29 KCB 48-60	7.4	7.01	9.13	9033 J	8.59	1300	524 J
30 KCB 0-12	10.9	8.8	14.8	12127 J	13.3 J	1705	748
30 KCB 24-36	13.5	8.77	14.7	14827 J	12.8	2052	368
30 KCB 48-60	10.6	8.14	11.5	11873 J	11.6	1754	593
1 KSU 0-12	7.82	5.9	12.5	11040 J	41.2	2269	382
1 KSU 24-36	8.52	5.84	8.19	9188 J	8.6 J	2049	401
1 KSU 48-60	6.66	5.7	8.2	8182 J	7.52 J	1862	450
4 KSU 0-12	26.1	10.7	14.2	27086 J	10.3 J	4775	793
4 KSU 24-36	28.3	11.7	6.98	24040 J	7.25 J	5864	351
4 KSU 48-60	18.5	9.63	19.4	13234 J	3.39 J	4250	185
8 KSU 0-12	10.3	8.95	16.7	13318 J	102	1720	669 J
8 KSU 24-36	13.6	6.73	13.3	14872 J	12	2377	408 J
8 KSU 48-60	13.6	10.8	15.2	18646 J	13.1	2469	762 J
9 KSU 0-12	16.5	9.07	14.5	17319 J	12.1	2164	536 J
9 KSU 24-36	12.4	21.5	12.1	15058 J	26.9	1478	1602 J
9 KSU 48-60	17.5	17.4	15.2	18569 J	17.3	2001	1187 J
10 KSU 0-12	14.6	11.1	16.5	19620 J	51	2751	916 J
10 KSU 24-36	14.3	11	15.8	19382 J	20.9	2566	717 J
10 KSU 48-60	16.7	13	19.8	22088 J	25.1	3078	612 J
17 KSU 0-12	8.9	8.7	14.1	13401 J	11	1978	536
17 KSU 24-36	10.8	8.9	15.2	14878 J	12.2	2731	862
17 KSU 48-60	12.1	10.3	13.8	15262 J	11.9	2981	772
25 KSU 0-12	18.4	14.7	13.1	14986	14.2	2323	796 J
25 KSU 24-36	17.5	6.62	13.3	24718	11.97	2375	719 J
25 KSU 48-60	23.3	10.1	13.9	23566	10.23 J	4392	1132 J
26 KSU 0-12	12.5	12.2	12.8	15021	16.4	1924	896 J
26 KSU 24-36	16.6	14.1	18.7	22700	30	3290	1074 J
26 KSU 48-60	15.5	9.88	19.1	20476	15.6	3360	697 J
2 SMO 0-12	22.2	9.96	15.9	17200 J	24.7	3376	617
2 SMO 24-36	24.9	14.7 J	30.8	33070 J	14.2 J	5197	1347
2 SMO 48-60	16.7	14.1	17.9	25948 J	12.3 J	5278	958
3 SMO 0-12	13.7	9.59	20.4	18968 J	65.5	2103	744
3 SMO 24-36	10.7	8.94	12.4	13395 J	12.4	2067	685
3 SMO 48-60	9.25	10.2	16.5	15305 J	15.7	2425	974
7 SMO 0-12	11.8	11.6	14.8	14013 J	18.5	1831	1002 J
7 SMO 24-36	19.8	13.5	22.1	26783 J	36.9	4514	908 J
7 SMO 48-60	14.5	17.3	19.3	20405 J	19.8	3680	1499 J
11 SMO 0-12	25.2	18.5	22.4	25208 J	33.8	2956	636 J
11 SMO 24-36	23.1	15 J	21.2	48073 J	15.3 J	5004	3276
11 SMO 48-60	29.9	25.7	29.5	36887 J	30.1	5061	1583 J
12 SMO 0-12	20.5	14.4	18.9	27572	25.1	3064	1191 J
12 SMO 24-36	20.3	10.2	16.3	26612	26.7	2778	954 J
12 SMO 48-60	17.7	11.6	18.5	31433	35.1	3311	1244 J
14 SMO 0-12	11.3	10	12.2	13956 J	13.7	1843	865 J
14 SMO 24-36	9.58	7.85	9.32	13002 J	12.7	1403	593 J
14 SMO 48-60	19.7	10.8	12.6	15280 J	15.3	1462	525 J
20 SMO 0-12	7.91	4.82	8.35	9355 J	8.8	1996	304
20 SMO 24-36	11.9	14.5	17	14869 J	20.3	3166	336
20 SMO 48-60	16.6	10.6	13.2	12488 J	3.54	4135	173
27 SMO 0-12	11.5	4.54 J	17.2	9136 J	288	3034	364
27 SMO 24-36	13.2	9.95	13.4	17420 J	20.3	1398	676
27 SMO 48-60	13.5	10.9	12.7	18335 J	17.4	1639	790

Notes: 'J' means concentration is estimated. 'U' means the analyte was not detected.
Underlined qualifiers were assigned during QC review.
Italics show concentrations at half the detection limit for 'U' qualified data.
Hexavalent chromium and silver were analyzed, but not detected in any samples.

Table 3
Metals Results (mg/kg)
Blue Valley Soils Background Study Report
Brownfields Showcase Project

Sample ID	Mercury	Nickel	Potassium	Selenium	Sodium	Thallium	Vanadium	Zinc
15 KCB 0-12	*0.0255 U*	16.9	1197	*0.0975 U*	43.9 J	*0.85 U*	24.5	56.9
15 KCB 24-36	*0.025 U*	19.6	1204	*0.0925 U*	52.2 J	*0.81 U*	25	51.7
15 KCB 48-60	*0.024 U*	*0.352 U*	*58.5 U*	*0.095 U*	38.8 J	*0.82 U*	*0.164 U*	*0.117 U*
19 KCB 0-12	0.084 J	18.6	1804	*0.101 U*	32.3 J	*0.875 U*	20.7	87.4
19 KCB 24-36	*0.026 U*	15.1	939	*0.097 U*	32.8 J	*0.855 U*	19.6	41.6
19 KCB 48-60	*0.026 U*	16.7	1233	*0.098 U*	34.7 J	*0.855 U*	16.7	41.2
21 KCB 0-12	0.05 J	15.2	946	*0.094 UJ*	397 J	*0.83 U*	20.2	40.8
21 KCB 24-36	0.074 J	20.3	1036	*0.101 UJ*	449 J	*0.89 U*	28.8	59.4
21 KCB 48-60	0.054 J	17.4	1170	*0.0965 J*	525	0.87 U	17.2	49.9
22 KCB 0-12	*0.028 U*	19.3	2103	0.242 J	59.3 J	3.84 J	29.8	60.5
22 KCB 24-36	0.065 J	29.6	2311	0.174 J	83.7 J	*0.845 U*	35.6	78.6
22 KCB 48-60	*0.0265 U*	28.9	1940	0.091 J	101 J	*0.845 U*	28.6	68.1
24 KCB 0-12	0.075	14.3	1100	*0.0995 UJ*	415 J	*0.885 U*	14.3	37.2
24 KCB 24-36	*0.0245 U*	15	1370	*0.0945 U*	383 J	*0.825 U*	21.6	39.7
24 KCB 48-60	*0.025 U*	19.3	1434	*0.097 U*	447 J	*0.85 U*	20.1	45.2
28 KCB 0-12	0.067 J	64	1413	*0.101 U*	75 J	8.88 J	44.3	415
28 KCB 24-36	*0.0255 U*	21.3	1228	*0.096 U*	37.6 J	5.43 J	21.6	58.2
28 KCB 48-60	*0.0235 U*	24	1667	*0.0995 U*	66.3 J	8.52 J	36.5	63.8
29 KCB 0-12	0.056 J	19.1	1686	*0.0975 U*	26 J	3.05 J	18.5	53.5
29 KCB 24-36	0.051 J	15.1	1145	*0.0915 U*	22.2 J	4.94 J	11.1	44.9
29 KCB 48-60	*0.025 U*	14.9	1141	*0.0945 U*	16.6 J	1.79 J	11.3	33.8
30 KCB 0-12	*0.026 U*	18	1478	*0.0965 U*	401 J	*0.845 U*	15.8	46.9
30 KCB 24-36	*0.0245 U*	17.6	1579	*0.094 U*	358 J	*0.82 U*	20.9	46.9
30 KCB 48-60	*0.0245 U*	17.6	1225	*0.096 U*	330 J	*0.845 U*	16.4	38.2
1 KSU 0-12	0.08	14.5	518	*0.0925 U*	81.2 J	4.86 J	14.2	182
1 KSU 24-36	*0.024 U*	13.6	1253	*0.0905 U*	86.4 J	*0.8 U*	15.6	32.3
1 KSU 48-60	*0.022 U*	13	1203	*0.0895 U*	66.9 J	*0.81 U*	12.7	29.7
4 KSU 0-12	*0.025 U*	42.1	951	*0.101 U*	754 J	6.35 J	24.4	57.2
4 KSU 24-36	*0.024 U*	56.2	1850	*0.098 U*	717 J	*1.71 U*	17.1	78.7
4 KSU 48-60	*0.0245 U*	41.4	737	*2.705 UJ*	412 J	2.935 J	11.4	50.3
8 KSU 0-12	0.124	16.5	1460	0.248 J	28.7 J	2.82 J	21.7	127
8 KSU 24-36	0.077	18.5	1341	*0.0935 U*	84.2 J	3.33 J	21.5	38.9
8 KSU 48-60	0.081	22	765	*0.095 U*	99.1 J	4.55 J	25.1	44.4
9 KSU 0-12	*0.026 U*	20.9	1262	*0.1 U*	55.1 J	4.12 J	28.1	41.1
9 KSU 24-36	*0.0265 U*	22.4	641	*0.101 U*	45.1 J	6.11 J	28.5	35.3
9 KSU 48-60	*0.0255 U*	26	895	*0.1 U*	149 J	7.47 J	31.7	33.6
10 KSU 0-12	0.075 J	21.9	1259	0.248	42.4 J	3.05 J	29.8	72.7
10 KSU 24-36	0.077 J	21.1	748	0.202	43.2 J	3.72 J	27.7	66.1
10 KSU 48-60	0.11	22.7	1219	0.237	46.5 J	*0.84 U*	32.6	79.7
17 KSU 0-12	*0.0245 U*	15.1	1354	*0.096 U*	353 J	*0.84 U*	18	40.5
17 KSU 24-36	*0.0235 U*	18.9	635	*0.096 U*	484	4.39 J	21.4	48.3
17 KSU 48-60	*0.025 U*	20.3	1076	*0.097 U*	121 J	3.29 J	24.1	47.5
25 KSU 0-12	*0.025 U*	29.5	733	*0.009 U*	80 J	3 J	26.5	45.4
25 KSU 24-36	*0.026 U*	28.1	947	*0.0095 U*	114 J	2.2 J	36.4	42.7
25 KSU 48-60	*0.025 U*	53.3	1636	*0.0095 U*	221 J	2.5 J	24.1	56.6
26 KSU 0-12	0.058 J	20.5	875	0.124	157 J	*0.87 U*	26.3	80.1
26 KSU 24-36	0.074 J	32	1097	0.158	336 J	2.36 J	32.8	64.6
26 KSU 48-60	0.073 J	29.8	1178	0.091	305 J	*0.89 U*	28.6	62.4
2 SMO 0-12	*0.045 U*	28.7	1117	*0.1005 U*	497	2.2 J	23.1	51.1
2 SMO 24-36	*0.026 U*	55.9	1568	*0.1045 U*	2422	*3.25 U*	21.9 J	117
2 SMO 48-60	*0.026 U*	55.9	2339	*0.0985 U*	2195	5 J	16.2	98.8
3 SMO 0-12	0.097 J	20	1691	*0.1035 U*	41.4 J	*0.90 U*	24	107
3 SMO 24-36	0.051 J	16.2	1063	*0.095 U*	54.2 J	*0.83 U*	19	40.7
3 SMO 48-60	0.067 J	12.8	546	*0.098 U*	77.6 J	3.74 J	22	44.1
7 SMO 0-12	0.077 J	36.3	699	0.276	28.6 J	*0.91 U*	20.3	84.3
7 SMO 24-36	0.074 J	27.6	*375 U*	0.174	141 J	*0.88 U*	36.9	80.9
7 SMO 48-60	0.068 J	28.2	1108 J	0.21	195 J	4.52 J	28	65.1
11 SMO 0-12	0.076 J	33.6	619	0.316	62.8 J	3.67 J	39.9	96.5
11 SMO 24-36	*0.026 U*	83	1311	0.158	166 J	*4.34 U*	22.6 J	78
11 SMO 48-60	0.094 J	100	1266	0.418	123 J	4.21 J	30.8	101
12 SMO 0-12	0.091 J	35.8	910 J	*0.0095 U*	121 J	*1.64 U*	39.7	65.9
12 SMO 24-36	0.073 J	38.5	530 J	*0.0095 U*	224 J	4.34 J	27.9	54.7
12 SMO 48-60	0.052 J	53.1	1251	0.156	418 J	*1.80 U*	16.2	70.2
14 SMO 0-12	0.072 J	16.9	988	*0.0895 U*	85 J	1.92 J	24.5	35.2
14 SMO 24-36	0.086 J	12.8	1189	*0.0915 U*	56.4 J	3.77 J	24.7	28.8
14 SMO 48-60	0.081 J	14.7	582	*0.0935 U*	71.9 J	4.96 J	31	30.1
20 SMO 0-12	*0.02 U*	12.1	1145	*0.0855 U*	64.3 J	*0.74 U*	15.1	31.8
20 SMO 24-36	0.109	45.6	1541	*0.0955 U*	46.2 J	*1.755 UJ*	11.5	47
20 SMO 48-60	*0.021 U*	42.1	918 J	*0.0915 U*	405 J	*0.81 U*	9.8	49.9
27 SMO 0-12	0.076 J	14.4	669	*7.55 U*	80.9 J	*4.40 U*	12.3 J	1155
27 SMO 24-36	0.084 J	16.3	979	*0.1015 U*	30.6 J	*0.89 U*	29.7	55.8
27 SMO 48-60	0.062 J	16.8	964	*0.1015 U*	29.7 J	*4.77 J*	30.2	43.8

Notes: 'J' means concentration is estimated. 'U' means the analyte was not detected.
Underlined qualifiers were assigned during QC review.
Italics show concentrations at half the detection limit for 'U' qualified data.
Hexavalent chromium and silver were analyzed, but not detected in any samples.

Table 4

PAHs Results (ng/kg)

Blue Valley Soils Background Study Report

Brownfields Showcase Project

Sample ID	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene
15 KCB 0-12	496 J	*258.5 U*	986 J	10362	11353	13657	10052	10818
19 KCB 0-12	*239.5 U*	*264 U*	2888 J	25957	28861	29708	21943	25137
21 KCB 0-12	228	*252 U*	*462 U*	*758 U*	*660 U*	1345 J	*581.5 U*	*732.5 U*
22 KCB 0-12	*249 U*	*274.5 U*	*504 U*	2334 JJ	1675 J	3416 JJ	2036 JJ	2832 JJ
24 KCB 0-12	*239.5 U*	*264.5 U*	*485.5 U*	4879 J	4709 J	6817 J	5813 J	4734 J
28 KCB 0-12	*239 U*	*263.5 U*	1650 J	2118 J	2003 J	2660 J	2535 J	2526 J
29 KCB 0-12	*233.5 U*	*257.5 U*	*472.5 U*	2581	2787 J	3954 J	3303 J	3194 J
30 KCB 0-12	*228.5 U*	*252 U*	2588 J	15687	17664	20669	16259	14310
1 KSU 0-12	174299	*10985.5 U*	165289 J	29904	464348	460676	449134	223870
4 KSU 0-12	*243.5 U*	*269 U*	*493.5 U*	2023 J	5810 J	4394 J	24279	5469 J
8 KSU 0-12	*242 U*	*267 U*	*490.5 U*	*818 U*	6493 J	5935 JJ	33448 J	6353 JJ
9 KSU 0-12	1810	*261.5 U*	6619 J	19682	23779	21794	83736	14632
10 KSU 0-12	*234 U*	*258 U*	3834 J	15862	14298	23202	16713	14298
17 KSU 0-12	*227.5 U*	*251 U*	*461 U*	1563 J	*658.5 U*	1933 J	1238 J	*742 U*
25 KSU 0-12	*242.5 U*	*247 U*	5372 J	37264	37680	43294	27048	27966
26 KSU 0-12	8469	*258 U*	17611	*790 U*	48527	52478	38425	37504
2 SMO 0-12	*242 U*	*267.5 U*	*490.5 U*	3928 J	2912 J	4106 J	2858 J	3300
3 SMO 0-12	*250 U*	*275.5 U*	*506 U*	2979 J	2623 J	4109 J	3071 J	3499
7 SMO 0-12	*249 U*	*275 U*	6779 J	*840 U*	49374	61214	41419	35314
11 SMO 0-12	*237 U*	*261.5 U*	*480.5 U*	10717	8166	12282	10542	6783 J
12 SMO 0-12	*222.5 U*	*245 U*	*450.5 U*	*750 U*	*643.5 U*	*643.5 U*	*575.5 U*	*725 U*
14 SMO 0-12	*213.5 U*	*235 U*	*432.5 U*	*720 U*	*617.5 U*	*617.5 U*	*552.5 U*	*696 U*
20 SMO 0-12	*206.5 U*	1001 J	2744 J	11232	11754	13472	17166	10250
27 SMO 0-12	*241.5 U*	*266.5 U*	10024	54267	48017	44738 J	46844 J	43561 J

Notes: 'J' means concentration is estimated. 'U' means the analyte was not detected.
Underlined qualifiers were assigned during QC review.
Italics show concentrations at half the detection limit for U qualified data.

Table 4
PAHs Results (ng/kg)
Blue Valley Soils Background Study Report
Brownfields Showcase Project

Sample ID	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene
15 KCB 0-12	14068	2864 J	23739	*353.5* U	10825	1768 J	9702	19583
19 KCB 0-12	32164	6109 J	49335	741	24555	2112 J	15893	44302
21 KCB 0-12	*539* U	*347* U	*628.5* U	*344.5* U	*903.5* U	*399* U	*485.5* U	*385* U
22 KCB 0-12	2409 JJ	*384* U	1897 JJ	*376* U	*1000* U	*435.5* U	1146 JJ	2924 JJ
24 KCB 0-12	6498 J	*370* U	11610	*362* U	5086 J	*419.5* U	5459 J	8862
28 KCB 0-12	2577 J	*371* U	2746 J	*361* U	2701 J	*418.5* U	1499 J	2565 J
29 KCB 0-12	3698 J	2301 J	4997 J	*352.5* U	3421 J	*408.5* U	2370 J	4328 J
30 KCB 0-12	19476	4695 J	33227	*345* U	16792	1116 J	10931	26904
1 KSU 0-12	686842	214031	1335751 J	150161	423303	78697 J	922137	1155417 J
4 KSU 0-12	2201 J	20919	1916 J	*368* U	23826	*426.5* U	*518.5* U	1989 J
8 KSU 0-12	2157 JJ	34008	*677.5* U	1231	37938	2935 J	1244 J	1521 JJ
9 KSU 0-12	25947	9377	48184	1556	23016	1894 J	23480	37079
10 KSU 0-12	19092	8037 J	41092	*353.5* U	14802	*409.5* U	20703	28257
17 KSU 0-12	1702 J	*351.5*	1995 J	*343.5* U	*915* U	*398* U	*484.5* U	1092 J
25 KSU 0-12	45897	7939	92018	*338* U	30688	*392* U	15499	67367
26 KSU 0-12	58287	15858	122318	5475	38993	4475 J	79355	96472
2 SMO 0-12	4348 J	*373.5* U	6330 J	*365.5* U	2631 J	*423.5* U	2465 J	4409 J
3 SMO 0-12	3988 J	*386* U	6261 J	*377.5* U	3159 J	*437.5* U	2807 J	4914 J
7 SMO 0-12	53771	11089	101996	1737	42333	3501 J	42303	79562
11 SMO 0-12	15507	3579 J	16430	*358.5* U	7841 J	2257 J	4974 J	21668
12 SMO 0-12	*525.5* U	*343* U	*621.5* U	*336* U	*894* U	*389* U	1832 J	*375.5* U
14 SMO 0-12	*504* U	*329.5* U	*597* U	*322* U	*858.5* U	*373* U	*454* U	*360* U
20 SMO 0-12	14206	8470	29022 J	1031	14396	1953 J	15238	21426 J
27 SMO 0-12	87710 J	13655	90992 J	*364.5* U	35784	25189 J	144228	118029 J

Notes: 'J' means concentration is estimated. 'U' means the analyte was not detected.
Underlined qualifiers were assigned during QC review.
Italics show concentrations at half the detection limit for U qualified data.

Table 5
Lab Measured pH Results
Blue Valley Soils Background Study Report
Brownfields Showcase Project

Sample ID	Soil Association	Depth bgs (inches)	pH	Hydrogen Ions
15	KCB	0-12	6.71	1.95E-07
19	KCB	0-12	6.79	1.62E-07
21	KCB	0-12	6.68	2.09E-07
22	KCB	0-12	6.87	1.35E-07
24	KCB	0-12	6.69	2.04E-07
28	KCB	0-12	7.6	2.51E-08
29	KCB	0-12	6.89	1.29E-07
30	KCB	0-12	6.97	1.07E-07
Average in KCB Soils 0-12 in. bgs				**6.84**
15	KCB	24-36	6.06	8.71E-07
19	KCB	24-36	6.9	1.26E-07
21	KCB	24-36	6.97	1.07E-07
22	KCB	24-36	5.31	4.90E-06
24	KCB	24-36	6.51	3.09E-07
28	KCB	24-36	7.3	5.01E-08
29	KCB	24-36	6.6	2.51E-07
30	KCB	24-36	6.36	4.37E-07
Average in KCB Soils 12-24 in. bgs				**6.05**
15	KCB	48-60	5.96	1.10E-06
19	KCB	48-60	6.64	2.29E-07
21	KCB	48-60	7.23	5.89E-08
24	KCB	48-60	6.54	2.88E-07
28	KCB	48-60	7.38	4.17E-08
29	KCB	48-60	6.34	4.57E-07
30	KCB	48-60	6.32	4.79E-07
Average in KCB Soils 48-60 in. bgs				**6.42**

Notes:
Soil pH was analyzed using EPA Method SW846-9045C.
Replicate samples were averaged.

Table 5
Lab Measured pH Results
Blue Valley Soils Background Study Report
Brownfields Showcase Project

Sample ID	Soil Association	Depth bgs (inches)	pH	Hydrogen Ions
1	KSU	0-12	7	1.00E-07
4	KSU	0-12	6.7	2.00E-07
8	KSU	0-12	7.48	3.31E-08
9	KSU	0-12	7.41	3.89E-08
10	KSU	0-12	6.44	3.63E-07
17	KSU	0-12	7.66	2.19E-08
25	KSU	0-12	5.72	1.91E-06
26	KSU	0-12	7.22	6.03E-08
Average in KSU Soils 0-12 in. bgs				**6.47**
1	KSU	24-36	7.61	2.45E-08
4	KSU	24-36	8.28	5.25E-09
8	KSU	24-36	7.4	3.98E-08
9	KSU	24-36	7.43	3.72E-08
10	KSU	24-36	7.47	3.39E-08
17	KSU	24-36	5.28	5.25E-06
25	KSU	24-36	6.17	6.76E-07
26	KSU	24-36	7.05	8.91E-08
Average in KSU Soils 24-36 in. bgs				**6.11**
1	KSU	48-60	7.71	1.95E-08
4	KSU	48-60	8.44	3.63E-09
8	KSU	48-60	6.72	1.91E-07
9	KSU	48-60	7.6	2.51E-08
10	KSU	48-60	7.04	9.12E-08
17	KSU	48-60	6.29	5.13E-07
25	KSU	48-60	6.07	8.51E-07
26	KSU	48-60	6.72	1.91E-07
Average in KSU Soils 48-60 in. bgs				**6.63**

Notes:
Soil pH was analyzed using EPA Method SW846-9045C.
Replicate samples were averaged.

Table 5
Lab Measured pH Results
Blue Valley Soils Background Study Report
Brownfields Showcase Project

Sample ID	Soil Association	Depth bgs (inches)	pH	Hydrogen Ions
2	SMO	0-12	7.76	1.74E-08
3	SMO	0-12	6.73	1.86E-07
7	SMO	0-12	6.44	3.63E-07
11	SMO	0-12	6.29	5.13E-07
12	SMO	0-12	6.29	5.13E-07
14	SMO	0-12	6.41	3.89E-07
20	SMO	0-12	6.77	1.70E-07
27	SMO	0-12	7.4	3.98E-08
Average in SMO Soils 0-12 in. bgs				**6.56**
2	SMO	24-36	7.54	2.88E-08
3	SMO	24-36	7.63	2.34E-08
7	SMO	24-36	5.28	5.25E-06
11	SMO	24-36	7.45	3.55E-08
12	SMO	24-36	6.04	9.12E-07
14	SMO	24-36	5.83	1.48E-06
20	SMO	24-36	8.01	9.77E-09
27	SMO	24-36	7.48	3.31E-08
Average in SMO Soils 24-36 in. bgs				**6.01**
2	SMO	48-60	7.71	1.95E-08
3	SMO	48-60	7.13	7.41E-08
7	SMO	48-60	5.94	1.15E-06
11	SMO	48-60	7.05	8.91E-08
12	SMO	48-60	7.24	5.75E-08
14	SMO	48-60	5.97	1.07E-06
20	SMO	48-60	8.26	5.50E-09
27	SMO	48-60	7.43	3.72E-08
Average in SMO Soils 48-60 in. bgs				**6.50**

Notes:
Soil pH was analyzed using EPA Method SW846-9045C.
Replicate samples were averaged.

Table 6
Cation Exchange Capacity Results
Blue Valley Soils Background Study Report
Brownfields Showcase Project

Sample ID	Soil Association	Depth bgs (inches)	Percent Moisture	Cation Exchange Capacity (wet wt basis) mequiv/100
15	KCB	0-12	17.5%	18.3
15	KCB	24-36	13.8%	20.3
15	KCB	48-60	15.4%	16.2
24	KCB	0-12	21.7%	9.65
24	KCB	24-36	15.1%	16.9
24	KCB	48-60	16.6%	15
			KCB Average	16.1
4	KSU	0-12	19.6%	22.3
4	KSU	24-36	14.4%	18.1
4	KSU	48-60	14.3%	9.13
10	KSU	0-12	17.1%	13.9
10	KSU	24-36	16.8%	15.5
10	KSU	48-60	15.9%	16
17	KSU	0-12	16.7%	14
17	KSU	24-36	16.9%	11.9
17	KSU	48-60	17.1%	9.74
			KSU Average	14.5
2	SMO	0-12	21.0%	17.3
2	SMO	24-36	31.3%	23.7
2	SMO	48-60	19.3%	16.6
3	SMO	0-12	18.9%	17.3
3	SMO	24-36	16.8%	17.7
3	SMO	48-60	13.9%	19.7
11	SMO	0-12	15.8%	18.6
11	SMO	24-36	23.1%	19.6
11	SMO	48-60	20.0%	19.7
			SMO Average	18.9

Notes:
Cation Exchange Capacity (CEC) was analyzed using EPA Method 9081C.
Replicate samples were averaged.

Table 7
Total Organic Carbon Results
Blue Valley Soils Background Study Report
Brownfields Showcase Project

Sample ID	Soil Association	Depth bgs (inches)	Total Organic Carbon (mg/kg)	Total Organic Carbon (as percent)
15	KCB	0-12	1789	0.18%
19	KCB	0-12	7368	0.74%
21	KCB	0-12	3787	0.38%
22	KCB	0-12	1920	0.19%
24	KCB	0-12	3123	0.31%
28	KCB	0-12	3208	0.32%
29	KCB	0-12	5803	0.58%
30	KCB	0-12	7020	0.70%
				0.43%
1	KSU	0-12	3292	0.33%
4	KSU	0-12	1722	0.17%
8	KSU	0-12	8574	0.86%
9	KSU	0-12	3936	0.39%
10	KSU	0-12	1407	0.14%
17	KSU	0-12	3558	0.36%
25	KSU	0-12	1473	0.15%
26	KSU	0-12	1739	0.17%
				0.32%
2	SMO	0-12	6310	0.63%
3	SMO	0-12	1147	0.11%
7	SMO	0-12	8716	0.87%
11	SMO	0-12	4595	0.46%
12	SMO	0-12	1257	0.13%
14	SMO	0-12	4909	0.49%
20	SMO	0-12	4993	0.50%
27	SMO	0-12	11599	1.16%
				0.54%
Average in Soils 0-12 in. bgs				**0.43%**

Notes:
Total Organic Carbon (TOC) was analyzed using ASTM Method D2974.
Replicate samples were averaged.

Table 7
Total Organic Carbon Results
Blue Valley Soils Background Study Report
Brownfields Showcase Project

Sample ID	Soil Association	Depth bgs (inches)	Total Organic Carbon (mg/kg)	Total Organic Carbon (as percent)
15	KCB	24-36	4362	0.44%
19	KCB	24-36	9233	0.92%
21	KCB	24-36	3943	0.39%
22	KCB	24-36	4085	0.41%
24	KCB	24-36	8075	0.81%
28	KCB	24-36	5504	0.55%
29	KCB	24-36	2716	0.27%
30	KCB	24-36	5713	0.57%
				0.55%
1	KSU	24-36	7039	0.70%
4	KSU	24-36	3588	0.36%
8	KSU	24-36	6444	0.64%
9	KSU	24-36	3690	0.37%
10	KSU	24-36	2859	0.29%
17	KSU	24-36	7892	0.79%
25	KSU	24-36	1382	0.14%
26	KSU	24-36	3461	0.35%
				0.45%
2	SMO	24-36	7528	0.75%
3	SMO	24-36	4830	0.48%
11	SMO	24-36	230	0.02%
12	SMO	24-36	573	0.06%
14	SMO	24-36	4328	0.43%
20	SMO	24-36	6808	0.68%
27	SMO	24-36	6742	0.67%
				0.44%
Average in Soils 24-36 in. bgs				**0.49%**

Notes:
Total Organic Carbon (TOC) was analyzed using ASTM Method D2974.
Replicate samples were averaged.

Table 7
Total Organic Carbon Results
Blue Valley Soils Background Study Report
Brownfields Showcase Project

Sample ID	Soil Association	Depth bgs (inches)	Total Organic Carbon (mg/kg)	Total Organic Carbon (as percent)
15	KCB	48-60	5434	0.54%
19	KCB	48-60	970	0.10%
21	KCB	48-60	4919	0.49%
22	KCB	48-60	3604	0.36%
24	KCB	48-60	6017	0.60%
28	KCB	48-60	6777	0.68%
29	KCB	48-60	5658	0.57%
30	KCB	48-60	5821	0.58%
				0.49%
4	KSU	48-60	2171	0.22%
8	KSU	48-60	2670	0.27%
9	KSU	48-60	3961	0.40%
10	KSU	48-60	3101	0.31%
17	KSU	48-60	10223	1.02%
25	KSU	48-60	1859	0.19%
26	KSU	48-60	1685	0.17%
				0.37%
2	SMO	48-60	7468	0.75%
3	SMO	48-60	4271	0.43%
7	SMO	48-60	523	0.05%
11	SMO	48-60	3309	0.33%
12	SMO	48-60	808	0.08%
14	SMO	48-60	9131	0.91%
20	SMO	48-60	7923	0.79%
27	SMO	48-60	12317	1.23%
				0.57%
Average in Soils 48-60 in. bgs				**0.48%**

Notes:
Total Organic Carbon (TOC) was analyzed using ASTM Method D2974.
Replicate samples were averaged.

Table 8
Dry Bulk Density/ Moisture Content Results
Blue Valley Soils Background Study Report
Brownfields Showcase Project

Sample ID	Soil Association	Depth bgs (inches)	Moisture Content (percent)	Dry Unit Weight (pcf)	Dry Unit Weight (g/cm^3)
15	KCB	0-36	24.2	97.0	1.554
19	KCB	0-36	22.8	98.9	1.584
22	KCB	0-36	22.6	103.7	1.660
24	KCB	0-36	18.9	102.4	1.640
30	KCB	0-36	21.5	106.4	1.704
Average in KCB Soils 0-36 in. bgs					**1.629**
15	KCB	36-60	18.3	102.2	1.637
19	KCB	36-60	22.5	104.8	1.679
22	KCB	36-60	18.5	107.8	1.727
24	KCB	36-60	20.4	101.0	1.618
30	KCB	36-60	18.1	113.5	1.818
Average in KCB Soils 36-60 in. bgs					**1.696**
4	KSU	0-36	30.3	97.6	1.563
8	KSU	0-36	26.7	96.9	1.552
10	KSU	0-36	23.8	101.9	1.632
17	KSU	0-36	19.1	98.9	1.584
Average in KSU Soils 0-36 in. bgs					**1.583**
4	KSU	36-60	17.0	113.8	1.823
8	KSU	36-60	20.6	104.8	1.679
10	KSU	36-60	18.1	107.5	1.722
17	KSU	36-60	20.3	98.2	1.573
Average in KSU Soils 36-60 in. bgs					**1.699**
2	SMO	0-36	28.2	96.9	1.552
3	SMO	0-36	18.7	107.4	1.720
11	SMO	0-36	29.2	95.0	1.522
14	SMO	0-36	16.6	107.0	1.714
Average in SMO Soils 0-36 in. bgs					**1.627**
2	SMO	36-60	22.0	110.7	1.773
3	SMO	36-60	15.7	91.3	1.462
11	SMO	36-60	21.3	104.7	1.677
14	SMO	36-60	17.0	111.2	1.781
Average in SMO Soils 36-60 in. bgs					**1.674**

Notes:
Soil Bulk Density was analyzed using ASTM Method D2937.
Replicate samples were averaged.

Table 10
Distributions Compared for Association Sampling Intervals (n=8) and Soil Associations (n=24)
Blue Valley Soils Background Study
Brownfields Showcase Project

Metal	KCB*	0-12" KCB	24-36" KCB	48-60" KCB	KSU*	0-12" KSU	24-36" KSU	48-60" KSU	SMO*	SMO 0-12"	SMO 24-36"	SMO 48-60"
Aluminum	Normal	N/L	N/L	N/L	N/L	N/L	N/L	N/L	N/L	N/L	N/L	N/L
Antimony	Nonparametric	Nonparametric	Nonparametric	-	Nonparametric	-	-	Nonparametric	Nonparametric	Nonparametric	-	-
Arsenic	Lognormal	Lognormal	Normal	N/L	Normal	N/L	N/L	N/L	N/L	N/L	N/L	N/L
Barium	Normal	N/L	N/L	Normal	Normal	N/L	N/L	N/L	Lognormal	Lognormal	N/L	N/L
Beryllium	Normal	N/L	N/L	N/L	N/L	N/L	N/L	N/L	N/L	N/L	N/L	N/L
Cadmium	Normal	Lognormal	N/L	Normal	Normal	N/L	N/L	Normal	Lognormal	N/L	N/L	N/L
Calcium	Normal	Normal	N/L	N/L	Normal	N/L	Lognormal	N/L	Lognormal	N/L	Lognormal	Lognormal
Chromium	Normal	Lognormal	N/L	Normal	Normal	N/L	N/L	N/L	N/L	N/L	N/L	N/L
Chromium VI	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	Lognormal	Lognormal	N/L	Normal	N/L	N/L	N/L	N/L	N/L	N/L	N/L	Lognormal
Copper	Normal	N/L	N/L	Normal	Normal	N/L	N/L	N/L	Normal	N/L	N/L	N/L
Iron	Normal	N/L	N/L	Normal	Normal	N/L	N/L	N/L	N/L	N/L	N/L	N/L
Lead	Normal	Lognormal	N/L	Normal	Lognormal	N/L	N/L	N/L	Lognormal	N/L	N/L	N/L
Magnesium	Lognormal	Lognormal	N/L	Normal	Lognormal	Lognormal	Lognormal	N/L	N/L	N/L	N/L	N/L
Manganese	Normal	N/L	N/L	N/L	N/L	N/L	N/L	N/L	N/L	N/L	N/L	N/L
Mercury	Lognormal	N/L	Nonparametric	Nonparametric	Nonparametric	N/L	Nonparametric	Nonparametric	Normal	Normal	N/L	N/L
Nickel	Nonparametric	N/L	N/L	Normal	Lognormal	N/L	N/L	N/L	Lognormal	N/L	N/L	N/L
Potassium	Normal	N/L	N/L	Normal	Normal	N/L	N/L	N/L	N/L	N/L	N/L	N/L
Selenium	Nonparametric	Nonparametric	Nonparametric	Nonparametric	Nonparametric	Nonparametric	Nonparametric	Nonparametric	Nonparametric	Nonparametric	Nonparametric	Nonparametric
Silver	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	Lognormal	Lognormal	Lognormal	Lognormal	Lognormal	Lognormal	Lognormal	Lognormal	Lognormal	Lognormal	Lognormal	Lognormal
Thallium	Nonparametric	Nonparametric	Nonparametric	Nonparametric	N/L	N/L	N/L	N/L	Nonparametric	Nonparametric	Nonparametric	N/L
Vanadium	Normal	N/L	N/L	Normal	Normal	N/L	N/L	Normal	Normal	N/L	N/L	Normal
Zinc	Normal	N/L	N/L	Normal	Lognormal	N/L	N/L	N/L	N/L	N/L	N/L	N/L

Notes:
N/L means dataset tests both normal and lognormal; dataset statistically evaluated as a normal distribution.
Population size is initial sampling population and is not adjusted for outliers removed.
Asterisks indicate populations that are n=24. Other populations shown in table are n=8.
Dashes indicate populations in which a metal was nondetect.

KCB = Kennebec Colo Bremer Soil Association
KSU = Knox Sibley Urban Soil Association
SMO = Snead Menfro Oska Soil Association

Table 11
Distributions Compared for Association Sampling Intervals (n=8) and Sampling Intervals (n=24)
Blue Valley Soils Background Study
Brownfields Showcase Project

Metal	0-12 in *	0-12" KCB	0-12" KSU	SMO 0-12"	24-36 in *	24-36" KCB	24-36" KSU	SMO 24-36"	48-60 in *	48-60" KCB	48-60" KSU	SMO 48-60"
Aluminum	Normal	N/L	N/L	N/L	Normal	N/L	N/L	N/L	Normal	N/L	N/L	N/L
Antimony	Nonparametric	Nonparametric	-	Nonparametric	Nonparametric	Nonparametric	-	-	Nonparametric	-	Nonparametric	-
Arsenic	N/L	Lognormal	N/L	N/L	Normal	Normal	N/L	N/L	N/L	N/L	N/L	N/L
Barium	N/L	N/L	N/L	Lognormal	N/L	N/L	N/L	N/L	Normal	Normal	N/L	N/L
Beryllium	N/L	N/L	N/L	N/L	N/L	N/L	N/L	N/L	Normal	N/L	N/L	N/L
Cadmium	N/L	Lognormal	N/L	N/L	N/L	N/L	N/L	N/L	Normal	Normal	Normal	N/L
Calcium	Lognormal	Normal	N/L	N/L	Loghormal	N/L	Lognormal	Lognormal	Normal	N/L	N/L	Lognormal
Chromium	Lognormal	Lognormal	N/L	N/L	Normal	N/L	N/L	N/L	Normal	Normal	N/L	N/L
Chromium VI	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	Normal	Lognormal	N/L	N/L	Normal	N/L	N/L	N/L	Normal	Normal	N/L	Lognormal
Copper	Normal	N/L	N/L	N/L	N/L	N/L	N/L	N/L	Normal	Normal	N/L	N/L
Iron	Normal	N/L	N/L	N/L	N/L	N/L	N/L	N/L	Normal	Normal	N/L	N/L
Lead	Lognormal	Lognormal	N/L	N/L	N/L	N/L	N/L	N/L	Normal	Normal	N/L	N/L
Magnesium	N/L	Lognormal	Lognormal	N/L	Lognormal	N/L	Lognormal	N/L	Normal	Normal	N/L	N/L
Manganese	N/L	N/L	N/L	N/L	Normal	N/L	N/L	N/L	Normal	N/L	N/L	N/L
Mercury	N/L	N/L	N/L	Normal	N/L	Nonparametric	Nonparametric	N/L	Nonparametric	Nonparametric	Nonparametric	N/L
Nickel	Lognormal	N/L	N/L	N/L	Lognormal	N/L	N/L	N/L	Lognormal	Normal	N/L	N/L
Potassium	Normal	N/L	N/L	N/L	Normal	N/L	N/L	N/L	Normal	Normal	N/L	N/L
Selenium	Nonparametric	Nonparametric	Nonparametric	Nonparametric	Nonparametric	Nonparametric	Nonparametric	Nonparametric	Nonparametric	Nonparametric	Nonparametric	Nonparametric
Silver	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	Lognormal	Lognormal	Lognormal	Lognormal	Lognormal	Lognormal	Lognormal	Lognormal	Lognormal	Lognormal	Lognormal	Lognormal
Thallium	Lognormal	Nonparametric	N/L	Nonparametric	Nonparametric	Nonparametric	N/L	Nonparametric	N/L	Nonparametric	N/L	N/L
Vanadium	Normal	N/L	N/L	N/L	Normal	N/L	N/L	N/L	Normal	Normal	Normal	Normal
Zinc	Lognormal	N/L	N/L	N/L	N/L	N/L	N/L	N/L	Normal	Normal	N/L	N/L

Notes:
N/L means dataset tests both normal and lognormal; dataset statistically evaluated as a normal distribution.
Population size is based on original sampling population and is not adjusted for outliers removed.
Asterisks indicates populations that are n=24. Other populations shown in table are n=8.
Dashes indicate populations in which a metal was nondetect.

KCB = Kennebec Colo Bremer Soil Association
KSU = Knox Sibley Urban Soil Association
SMO = Snead Menfro Oska Soil Association

Table 12
Distributions Compared for All Data Combined, Soil Associations, and Sampling Intervals
Blue Valley Soils Background Study
Brownfields Showcase Project

Metal	All Samples Combined*	Soils Associations			Sampling Intervals		
		KCB	KSU	SMO	0-12 in	24-36 in	48-60 in
Aluminum	Lognormal	Normal	N/L	N/L	Normal	Normal	Normal
Antimony	Nonparametric	Nonparametric	Nonparametric	Nonparametric	Nonparametric	Nonparametric	Nonparametric
Arsenic	Normal	Lognormal	Normal	N/L	N/L	Normal	N/L
Barium	Normal	Normal	Normal	Lognormal	N/L	N/L	Normal
Beryllium	Normal	Normal	N/L	N/L	N/L	N/L	Normal
Cadmium	Normal	Normal	Normal	Lognormal	N/L	N/L	Normal
Calcium	Lognormal	Normal	Normal	Lognormal	Lognormal	Lognormal	Normal
Chromium	Lognormal	Normal	Normal	N/L	Lognormal	Normal	Normal
Chromium VI	-	-	-	-	-	-	-
Cobalt	N/L	Lognormal	N/L	N/L	Normal	Normal	Normal
Copper	Lognormal	Normal	Normal	Normal	Normal	N/L	Normal
Iron	Lognormal	Normal	Normal	N/L	Normal	N/L	Normal
Lead	Lognormal	Normal	Lognormal	Lognormal	Lognormal	N/L	Normal
Magnesium	Lognormal	Lognormal	Lognormal	N/L	N/L	Lognormal	Normal
Manganese	Normal	Normal	N/L	N/L	N/L	Normal	Normal
Mercury	Lognormal	Nonparametric	Nonparametric	Normal	N/L	N/L	Nonparametric
Nickel	Lognormal	Lognormal	Lognormal	Lognormal	Lognormal	Lognormal	Lognormal
Potassium	Normal	Normal	Normal	N/L	Normal	Normal	Normal
Selenium	Nonparametric	Nonparametric	Nonparametric	Nonparametric	Nonparametric	Nonparametric	Nonparametric
Silver	-	-	-	-	-	-	-
Sodium	Nonparametric	Lognormal	Lognormal	Lognormal	Lognormal	Lognormal	Lognormal
Thallium	Nonparametric	Nonparametric	N/L	Nonparametric	Lognormal	Nonparametric	N/L
Vanadium	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Zinc	Lognormal	Normal	Lognormal	N/L	Lognormal	N/L	Normal

Notes:
N/L means dataset tests both normal and lognormal; dataset statistically evaluated as a normal distribution.
Population size is based on original sampling population and is not adjusted for outliers removed.
Asterisk indicates population is n=72. Other populations shown in table are n=24.
Dashes indicate populations in which a metal was nondetect.

KCB = Kennebec Colo Bremer Soil Association
KSU = Knox Sibley Urban Soil Association
SMO = Snead Menfro Oska Soil Association

Table 13
Background Determined by Association Sampling Intervals
Blue Valley Soils Background Study Report
Brownfields Showcase Project

Metal	KCB 0-12in	KCB 24-36in	KCB 48-60in	KSU 0-12in	KSU 24-36in	KSU 48-60in	SMO 0-12in	SMO 24-36in	SMO 48-60in
Aluminum	16589	21288	20165	20855	25030	22884	24441	22429	19739
Antimony	2.92	2.63	-	-	-	1.93	2.92	-	-
Arsenic	17.7	15.3	10.4	16.4	18.7	13.5	24.2	16.3	22.8
Barium	192	251	373	382	419	482	628	433	650
Beryllium	1.11	0.93	1.50	1.49	1.26	1.69	1.64	1.82	1.73
Cadmium	2.02	1.14	0.940	1.77	0.986	0.977	1.59	1.56	1.50
Calcium	5286	5469	7213	8986	14814	7843	7470	17826	17092
Chromium	38.8	27.1	29.9	33.5	35.6	31.1	35.4	35.8	36.4
Chromium VI	-	-	-	-	-	-	-	-	-
Cobalt	15.6	20.5	22.7	18.6	27.3	21.4	25.2	21.1	23.1
Copper	24.3	27.3	31.4	19.4	24.3	28	22.5	39.4	35.2
Iron	28405	33296	36963	32481	35622	33633	38531	62941	49557
Lead	77.2	24.0	26	56.8	35.3	34.3	92.5	31.6	53.0
Magnesium	5818	4500	4918	6494	9373	6047	4565	8146	7996
Manganese	1074	1626	1274	1303	2109	1777	1680	1878	2491
Mercury	0.124	0.074	0.054	0.229	0.077	0.110	0.149	0.176	0.126
Nickel	24	34.8	43.7	52.0	43.2	69.8	56.6	113.5	134
Potassium	2699	2737	2988	2508	1924	2009	3307	1944	1964
Selenium	0.242	0.174	0.091	0.248	0.202	0.237	0.316	0.174	0.418
Silver	-	-	-	-	-	-	-	-	-
Sodium	269	272	335	322	401	540	290	395	636
Thallium	8.88	5.43	8.52	9.23	8.43	15.7	3.67	4.34	6.34
Vanadium	54.5	45.8	53.0	40.6	48.8	49.1	57.3	48.4	49.1
Zinc	111	93.2	109	240	105	102	168	152	146

Notes:
Units are mg/kg.
Initial population size was n=8.
Outliers were removed, as necessary, to achieve a parametric distribution.
Dashes indicate populations in which a metal was nondetect.

Table 14
Background Determined by Soil Associations
Blue Valley Soils Background Study Report
Brownfields Showcase Project

Metal	KCB	KSU	SMO
Aluminum	16154	19403	19172
Antimony	2.92	1.93	3.93
Arsenic	13.9	13.5	17.5
Barium	240	360	599
Beryllium	1.14	1.27	1.49
Cadmium	0.93	0.831	3.94
Calcium	5288	5020	8113
Chromium	24.8	27.9	30.0
Chromium VI	-	-	-
Cobalt	16.9	17.0	19.5
Copper	27.3	21.7	29.9
Iron	27629	28935	38015
Lead	25.3	79.5	132
Magnesium	3865	5797	5985
Manganese	1244	1455	1703
Mercury	0.084	0.124	0.115
Nickel	27.1	60.2	114
Potassium	2262	1843	2083
Selenium	0.242	0.248	0.418
Silver	-	-	-
Sodium	176	426	1263
Thallium	8.88	7.45	5.00
Vanadium	43.0	39.7	43.4
Zinc	84.5	148	126

Notes:
Units are mg/kg.
Initial population size was n=24.
Outliers were removed, as necessary, to achieve a parametric distribution.
Dashes indicate populations in which a metal was nondetect.

Table 15
Background Determined by Sampling Intervals
Blue Valley Soils Background Study Report
Brownfields Showcase Project

Metal	0-12 in	24-36 in	48-60 in
Aluminum	17624	19695	19102
Antimony	3.93	2.63	1.93
Arsenic	16.4	14.0	13.9
Barium	279	325	420
Beryllium	1.22	1.36	1.42
Cadmium	1.25	1.02	0.923
Calcium	14723	6580	6906
Chromium	31.9	28.0	28.7
Chromium VI	-	-	-
Cobalt	17.2	19.7	19.2
Copper	26.1	23.9	27.9
Iron	28323	32893	35510
Lead	87.6	26.8	33.8
Magnesium	3743	6825	5723
Manganese	1190	2267	1670
Mercury	0.123	0.117	0.110
Nickel	45.9	62.5	71.5
Potassium	2438	1710	2011
Selenium	0.316	0.202	0.418
Silver	-	-	-
Sodium	254	1900	1962
Thallium	8.24	6.11	9.63
Vanadium	43.2	40.6	42.6
Zinc	179	89.1	103

Notes:
Units are mg/kg.
Initial population size was n=24.
Outliers were removed, as necessary, to achieve a parametric distribution.
Dashes indicate populations in which a metal was nondetect.

Table 16
Background with All Samples Combined
Blue Valley Soils Background Study Report
Brownfields Showcase Project

Metal	Background Value
Aluminum	19617
Antimony	3.93
Arsenic	10.7
Barium	316
Beryllium	1.25
Cadmium	1.15
Calcium	7582
Chromium	28.6
Chromium VI	-
Cobalt	18.2
Copper	25.8
Iron	29143
Lead	53.6
Magnesium	5161
Manganese	1372
Mercury	0.118
Nickel	66.8
Potassium	1955
Selenium	5.41
Silver	-
Sodium	2422
Thallium	8.88
Vanadium	39.4
Zinc	137

Notes:
Units are mg/kg.
Initial population size was n=72.
Outliers were removed, as necessary, to achieve a parametric distribution.
Dashes indicate populations in which a metal was nondetect.

Table 17
Background Levels for PAHs in Surface Soil
Blue Valley Soils Background Study

PAH	Frequency of Detection	Distribution	Minimum Detection	Maximum Detection	4X Median	95% UTL	Recommended Background Level
Acenaphthene	21%	Nonparametric	228	174,299			174,299
Acenaphthylene	4%	Nonparametric		1,001			1,001
Anthracene	46%	Nonparametric	986	165,289			165,289
Benzo(a)anthracene	71%	Lognormal	1,563	54,267	41,448	122,306	41,448
Benzo(a)pyrene	83%	Lognormal	1,675	464,348	29,126	386,434	386,434
Benzo(b)fluoranthene	92%	Lognormal	1,345	460,676	36,601	364,051	364,051
Benzo(g,h,i)perylene	88%	Lognormal	1,238	449,134	66,852	408,732	408,732
Benzo(k)fluoranthene	83%	Lognormal	2,526	223,870		223,574	223,574
Chrysene	88%	Lognormal	1,702	686,842	38,244	564,691	564,691
Dibenz(a,h)anthracene	63%	Lognormal	2,301	214,031	33,880	178,409	178,409
Fluoranthene	83%	Lognormal	1,897	1,335,751	104,992	1,270,926	1,270,926
Fluorene	29%	Nonparametric	741	150,161			150,161
Indeno(1,2,3-cd)pyrene	79%	Lognormal	2,631	423,303	67,168	323,322	323,322
Naphthalene	46%	Nonparametric	1,116	78,697			78,697
Phenanthrene	83%	Lognormal	1,146	922,137	20,843	596,343	596,343
Pyrene	88%	Lognormal	1,092	1,155,417	52,695	1,219,290	52,695

Notes:
Units are ng/kg (nanogram per kilogram).
Initial population size was n=24.

Table 18
Recommended Background Levels for Metals
Blue Valley Soils Background Study Report
Brownfields Showcase Project

Metal	Frequency of Detection	Minimum Detection	Maximum Detection	Minimum Calculated Background Level	Maximum Calculated Background Level	Recommended Background Level
Aluminum	100%	4,175	20,059	16,154	25,030	25,030
Antimony	8%	1.93	3.93	-	-	3.93
Arsenic	100%	0.647	18	10.4	24	24
Barium	100%	5.18	457	192	650	650
Beryllium	99%	0.368	1.43	0.93	1.82	1.82
Cadmium	85%	0.274	11.6	0.831	3.94	3.94
Calcium	100%	924	172,030	5,020	17,826	17,826
Chromium	99%	6.66	29.9	24.8	38.8	38.8
Chromium VI	0%	-	-	-	-	-
Cobalt	99%	4.54	25.7	15.6	27.3	27.3
Copper	99%	8.19	30.8	19.4	39.4	39.4
Iron	99%	8,182	48,073	27,629	62,941	62,941
Lead	99%	3.39	288	24.0	132	132
Magnesium	100%	1,187	6,198	3,743	9,373	9,373
Manganese	100%	1.12	3,276	1,074	2,491	2,491
Mercury	51%	0.050	0.124	0.054	0.229	0.229
Nickel	99%	12.1	100	24	134	134
Potassium	97%	518	2,339	1,710	3,307	3,307
Selenium	25%	0.091	5.41	-	-	5.41
Silver	0%	-	-	-	-	-
Sodium	100%	16.6	2,422	175.6	1,962	1,962
Thallium	47%	1.79	8.92	3.67	15.7	15.7
Vanadium	99%	9.8	44.3	39.4	57.3	57.3
Zinc	99%	28.8	1155	84.46	240	240

Notes:
Units are mg/kg.
The range of background levels shown are based on background as determined for the following populations:
- Data combined by soil associations, KCB, KSU, SMO (ie., 3 datasets w/ 24 samples each).
- Data combined by sample depth, 0-12in., 24-36in., and 48-60in. (3 datasets w/ 24 samples each).
- Data combined by sample depth within each soil association (9 datasets w/ 8 samples each).

Calculated background levels shown do not include maximum detected concentrations.
Frequencies of detection and the ranges of detected concentrations are for n=72.
Minimum and maximum detections that tested as outliers for some populations were removed prior to statistical evaluation.
Some minimum detected concentrations shown represent 1/2 the detection limit (DL) for nondetects.

Table 19
Comparison of Recommended Background Levels to Health-Based and Groundwater Protective Levels
Blue Valley Soils Background Study Report
Brownfields Showcase Project

Metal	Recommended Background Level	USEPA Region 9 PRG		MDNR CALM				USEPA SSL	
		Residential	Industrial	Scenario A	Scenario B	Scenario C	C_{leach}	DAF 20	DAF 1
Aluminum	25030	76000	100000	-	-	-	-	-	-
Antimony	3.93	31	410	85	120	300	-	5	0.3
Arsenic	24	22 (noncancer)	230(noncancer)	11	11	14	-	-	-
		0.39 (cancer)	1.6 (cancer)	-	-	-	-	-	-
Barium	650	5400	67000	14000	20000	51000	1700	1600	82
Beryllium	1.82	150	1900	0.05	0.07	0.2	130	63	3
Cadmium	3.94	37	450	110	150	380	11	8	0.4
Calcium *	17826	-	-	-	-	-	-	-	-
Chromium III	38.8	100000	100000	2100	3000	4500	38	-	-
Chromium VI	-	30	64	-	-	-	-	38	2
Cobalt	27.3	900	1900	-	-	-	-	-	-
Copper	39.4	3100	41000	1100	3100	4700	-	-	-
Iron	62941	23000	100000	-	-	-	-	-	-
Lead	132	400	750	260 ~~210~~	260 ~~210~~	260 ~~210~~	-	-	-
Magnesium *	9373	-	-	-	-	-	-	-	-
Manganese	2491	1800	18000	3700	5200	11000	-	-	-
Mercury	0.229	-	-	0.6	0.8	1	3.2	-	-
Nickel	134	1600	20000	4800	6700	17000	170	130	7
Potassium *	3307	-	-	-	-	-	-	-	-
Selenium	5.14	390	5100	300	410	970	4.3	5	0.3
Silver	-	390	5100	140	200	450	26	34	2
Sodium *	1962	-	-	-	-	-	-	-	-
Thallium	15.7	5.2	67	17	24	61	2.8	-	-
Vanadium	57.3	550	7200	1500	2100	5300	-	6000	300
Zinc	240	23000	100000	38000	53000	130000	3000	12000	620

Note:
All units are mg/kg.
Asterisks indicate metals that are essential nutrients.

Table 18
Recommended Background Levels for Metals
Blue Valley Soils Background Study Report
Brownfields Showcase Project

Metal	Frequency of Detection	Minimum Detection	Maximum Detection	Minimum Calculated Background Level	Maximum Calculated Background Level	Recommended Background Level
Aluminum	100%	4,175	20,059	16,154	25,030	25,030
Antimony	8%	1.93	3.93	1.93	2.92	2.92
Arsenic	100%	0.647	18	10.4	24	24
Barium	100%	5.18	457	192	650	650
Beryllium	99%	0.368	1.43	0.93	1.82	1.82
Cadmium	85%	0.274	11.6	0.831	3.94	3.94
Calcium	100%	924	172,030	5,020	17,826	17,826
Chromium	99%	6.66	29.9	24.8	38.8	38.8
Chromium VI	0%	-	-	-	-	-
Cobalt	99%	4.54	25.7	15.6	27.3	27.3
Copper	99%	8.19	30.8	19.4	39.4	39.4
Iron	99%	8,182	48,073	27,629	62,941	62,941
Lead	99%	3.39	288	24.0	132	132
Magnesium	100%	1,187	6,198	3,743	9,373	9,373
Manganese	100%	1.12	3,276	1,074	2,491	2,491
Mercury	51%	0.050	0.124	0.054	0.229	0.229
Nickel	99%	12.1	100	24	134	134
Potassium	97%	518	2,339	1,710	3,307	3,307
Selenium	25%	0.091	5.41	0.202	0.418	0.418
Silver	0%	-	-	-	-	-
Sodium	100%	16.6	2,422	175.6	1,962	1,962
Thallium	47%	1.79	8.92	3.67	15.7	15.7
Vanadium	99%	9.8	44.3	39.4	57.3	57.3
Zinc	99%	28.8	1155	84.46	240	240

Notes:
Units are mg/kg.
The range of background levels shown are based on background as determined for the following populations:
- Data combined by soil associations, KCB, KSU, SMO (ie., 3 datasets w/ 24 samples each).
- Data combined by sample depth, 0-12in., 24-36in., and 48-60in. (3 datasets w/ 24 samples each).
- Data combined by sample depth within each soil association (9 datasets w/ 8 samples each).

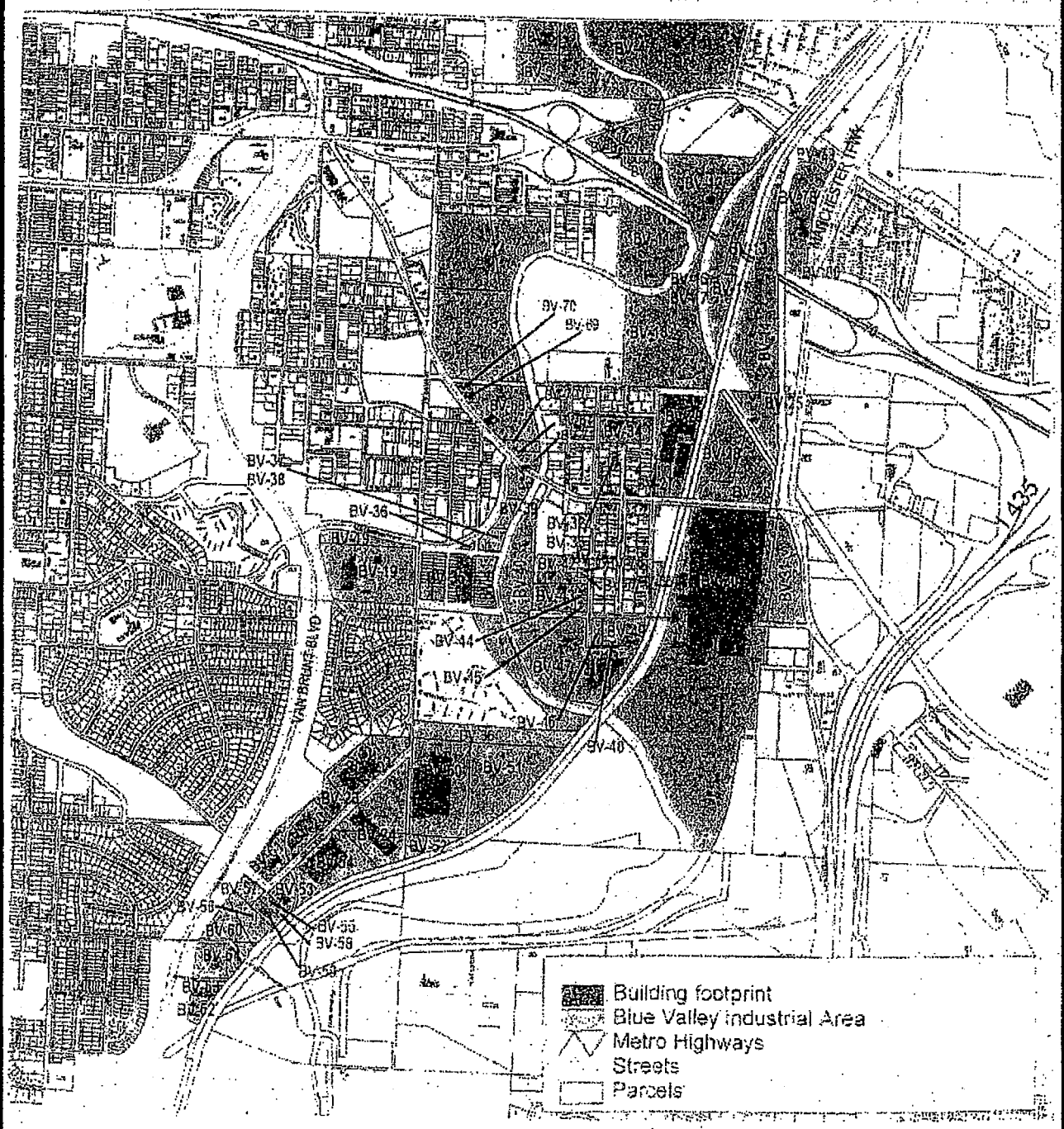
Calculated background levels shown do not include any based on maximum detected concentrations.
Frequencies of detection and the ranges of detected concentrations are for n=72.
Minimum/maximum detections that tested as outliers for some populations were removed prior to statistical evaluation.
Some minimum detected concentrations shown represent 1/2 the detection limit (DL) for nondetects.

Table 19
Comparison of Recommended Background Levels to Health-Based and Groundwater Protective Levels
Blue Valley Soils Background Study Report
Brownfields Showcase Project

Metal	Recommended Background Level	USEPA Region 9 PRG		MDNR CALM				USEPA SSL	
		Residential	Industrial	Scenario A	Scenario B	Scenario C	C_{leach}	DAF 20	DAF 1
Aluminum	25030	76000	100000	-	-	-	-	-	-
Antimony	2.92	31	410	85	120	300	-	5	0.3
Arsenic	24	22 (noncancer)	230(noncancer)	11	11	14	-	-	-
		0.39 (cancer)	1.6 (cancer)	-	-	-	-	-	-
Barium	650	5400	67000	14000	20000	51000	1700	1600	82
Beryllium	1.82	150	1900	0.05	0.07	0.2	130	63	3
Cadmium	3.94	37	450	110	150	380	11	8	0.4
Calcium *	17826	-	-	-	-	-	-	-	-
Chromium III	38.8	100000	100000	2100	3000	4500	38	-	-
Chromium VI	-	30	64	-	-	-	-	38	2
Cobalt	27.3	900	1900	-	-	-	-	-	-
Copper	39.4	3100	41000	1100	3100	4700	-	-	-
Iron	62941	23000	100000	-	-	-	-	-	-
Lead	132	400	750	210	210	210	-	-	-
Magnesium *	9373	-	-	-	-	-	-	-	-
Manganese	2491	1800	18000	3700	5200	11000	-	-	-
Mercury	0.229	-	-	0.6	0.8	1	3.2	-	-
Nickel	134	1600	20000	4800	6700	17000	170	130	7
Potassium *	3307	-	-	-	-	-	-	-	-
Selenium	0.418	390	5100	300	410	970	4.3	5	0.3
Silver	-	390	5100	140	200	450	26	34	2
Sodium *	1962	-	-	-	-	-	-	-	-
Thallium	15.7	5.2	67	17	24	61	2.8	-	-
Vanadium	57.3	550	7200	1500	2100	5300	-	6000	300
Zinc	240	23000	100000	38000	53000	130000	3000	12000	620

Note:
All units are mg/kg.
Asterisks indicate metals that are essential nutrients.

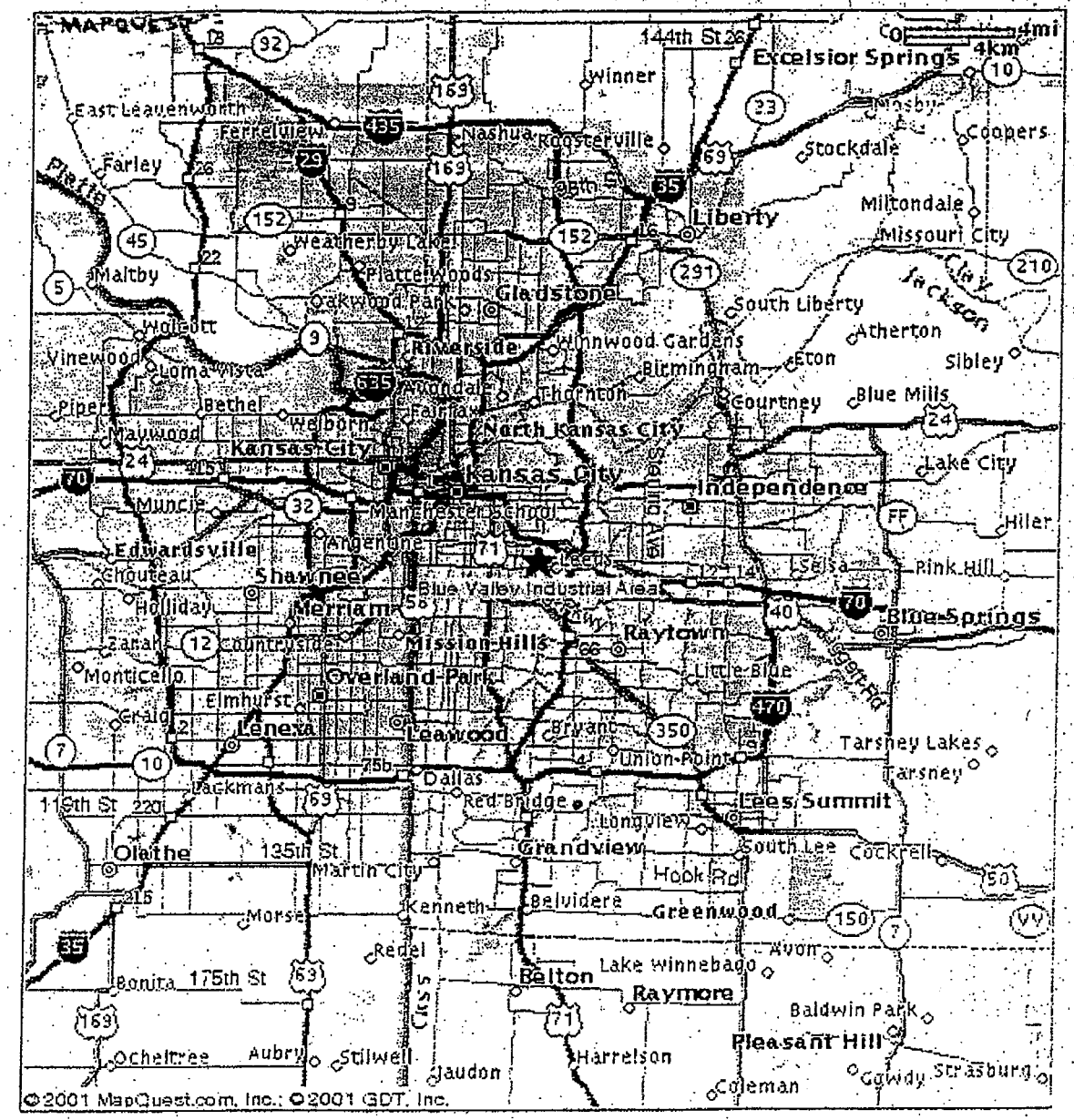
FIGURES



from: EDC, 1998

MAP NOT TO SCALE

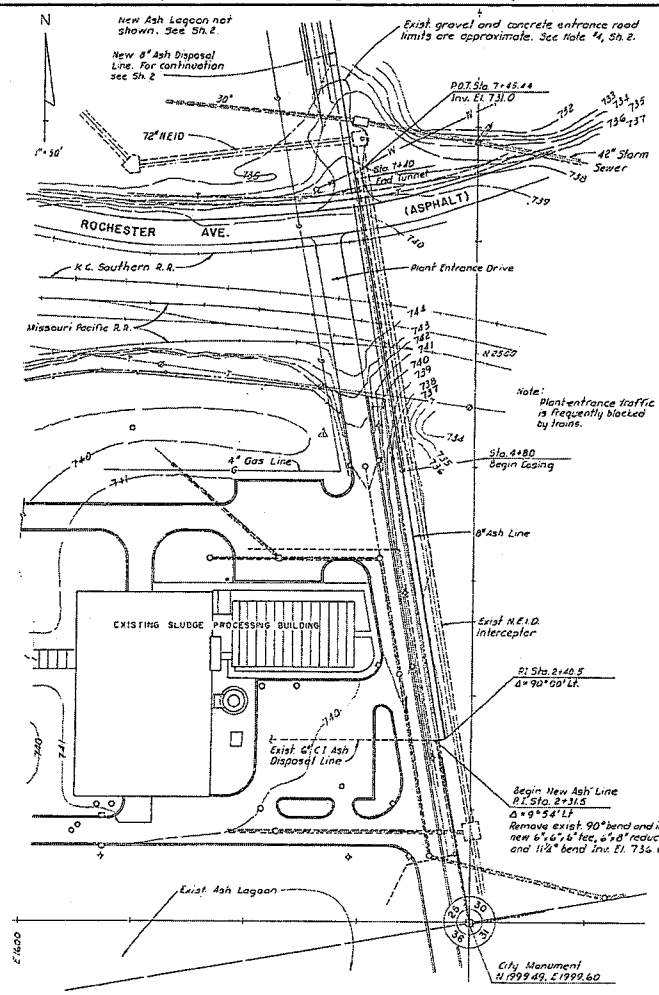
Figure 2
Blue Valley Renewal Project Area
Soils Background Study Report
Brownfields Showcase Project



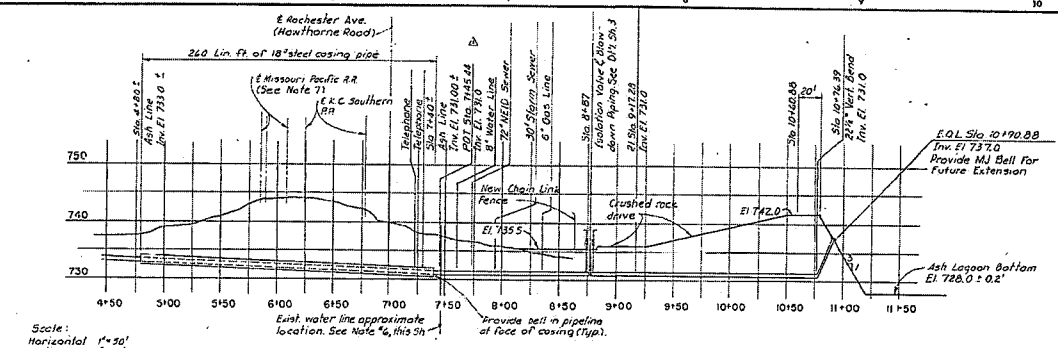
from; 2001 Mapquest.com

MAP NOT TO SCALE

Figure 1
General Location Map
Blue Valley Soils Background Study Report
Brownfields Showcase Project



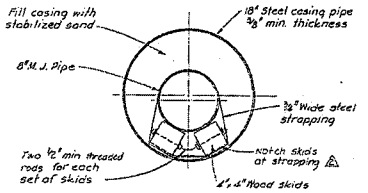
SITE PLAN



CASING PIPE & PARTIAL ASH LINE PROFILE

LEGEND

- Telephone or power pole and guy anchor
- 712 Exist. ground contour
- 712 Finish grade contour
- Buildings, structures
- Chain link security fence
- Exist. manhole
- Fire hydrant
- Street light pole
- Centerline
- Property line
- Exist. sewer or ash line smaller than 21"
- Exist. sewer 21" and larger
- New ash line
- T P Telephone or power lines
- T Telephone (Underground)
- G Gas (Natural)
- W Water (Underground)
- Earth or ground
- Crushed rock surface
- New concrete
- 1/10 Section number or detail letter. Sheet designation on which section or detail appears or where section is cut or detail is noted.



CASING PIPE SECTION

Notes:

1. Provide 8" thick masonry plug at each end of casing.
2. Wood skids shall be pressure treated with creosote, pentachlorophenol, or salt type preservative in accordance with AWPA C2. Cut surfaces shall be given two heavy brush coats of the same preservative.
3. Stabilized sand shall consist of at least 282 pounds of portland cement for each cubic yard of sand. Use only enough water to produce an easily handled mixture, and blow stabilized sand into casing to fill all voids.
4. Provide pipe bell of or no more than 12" outside each end of casing.
5. Ash line will have restrained joints. See Schedule Sh. 2.
6. Contractor shall field locate exist. water line prior to installation of casing pipe and ash line. Plan elevations shall be lowered, Sta. 4+80 ± to Sta. 10+76 ±, if necessary to clear exist. water line.
7. Prior to entering the property of the Missouri Pacific Railroad Co. the Contractor shall notify Mr. R.D. Nora, Superintendent, at (816) 245-2341.

SECTION IX

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
5/9/88	General revisions	2	RVJ	ACP	ACP
4/13/87	General revision	1	TAT	DCB	ACP

DESIGNED E.M.J.
DETAILED W.J.D.
CHECKED A.C.P.
APPROVED K.C. Jones
DATE May 29, 1987

Black & Veatch
Engineers - Architects
Kansas City, Missouri

PROJECT NO. 12171.331

KANSAS CITY, MISSOURI
POLLUTION CONTROL DEPARTMENT

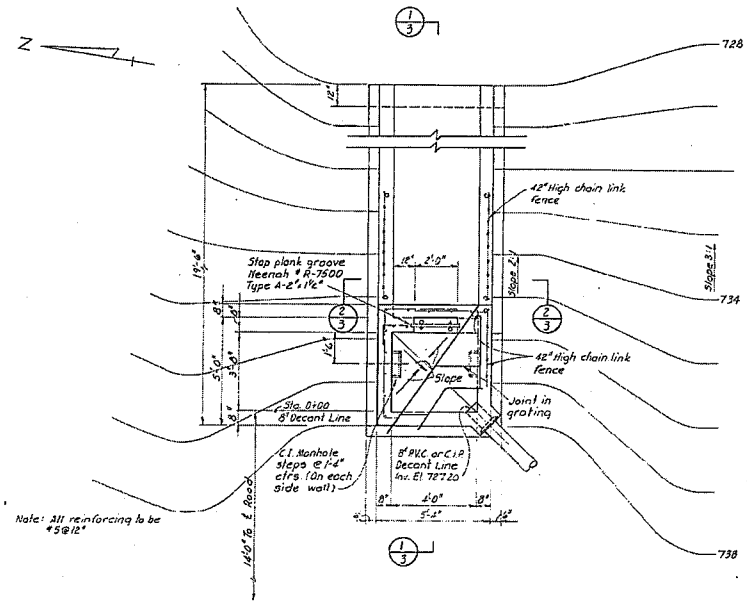
SITE PLAN AND DETAILS

P.C.D. CONTRACT 120

SHEET 1 OF 3

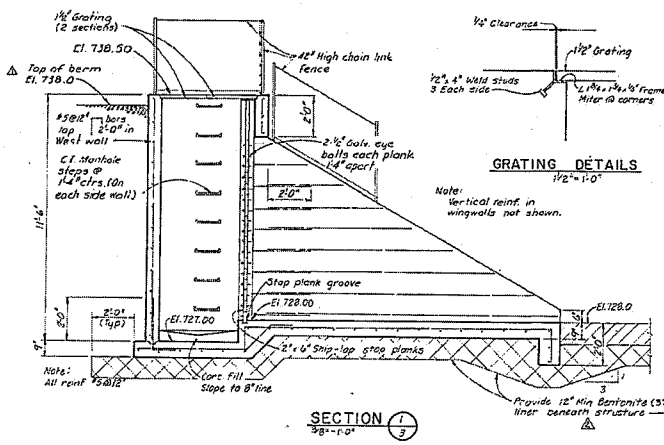
MICROFILMED 062.27

APPENDIX C – SOUTH POND AS-BUILT DRAWINGS

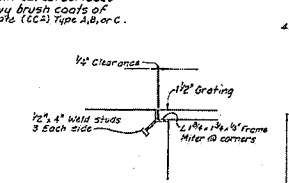


PLAN AND SECTIONAL PLAN
LAGOON OUTLET STRUCTURE
3/8"=1'-0"

Note: Stop planks to be Southern Pine, No.2, pressure treated with non-water soluble preservative in accordance with APWA C2. Cut surfaces shall be given two heavy brush coats of chromated copper arsenate (CCA) Type A, B, or C.

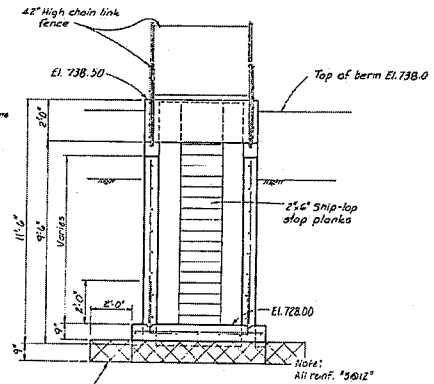


SECTION 1/3
3/8"=1'-0"

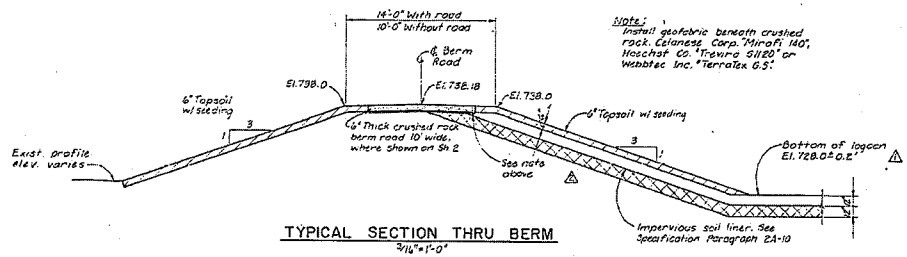


GRATING DETAILS
1½"=1'-0"

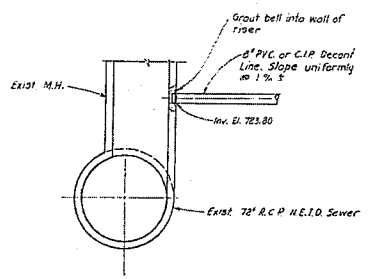
Note: Vertical reinf. in wingwalls not shown.



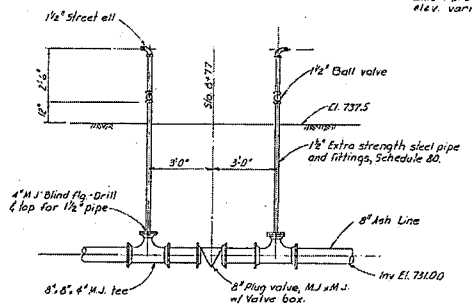
SECTION 2/3
3/8"=1'-0"



TYPICAL SECTION THRU BERM
3/16"=1'-0"

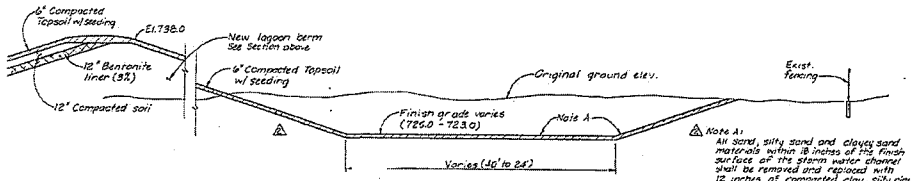


CONNECTION DETAIL
N.T.S.



Notes: 1. Paint steel pipe, bolts & harness joints w/1 coat coal tar paint.
2. Restrain pipe joints.

ISOLATION VALVE AND BLOW-DOWN PIPING STA. 8+87
N.T.S.



TYPICAL SECTION THRU STORMWATER CHANNEL
1/8"=1'-0"

SECTION IX 1062.29

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
5/9/88	General revisions	2	RVL	ACP	ACP
4/13/87	General revision	1	TAF	SCB	ACP

DESIGNED ACP-CWK
DETAILED W.J.O.
CHECKED A.C.P.
APPROVED [signature]
DATE May 20, 1987

Black & Veatch
Engineers - Architects
Kansas City, Missouri

PROJECT NO. 12171.331

KANSAS CITY, MISSOURI
POLLUTION CONTROL DEPARTMENT

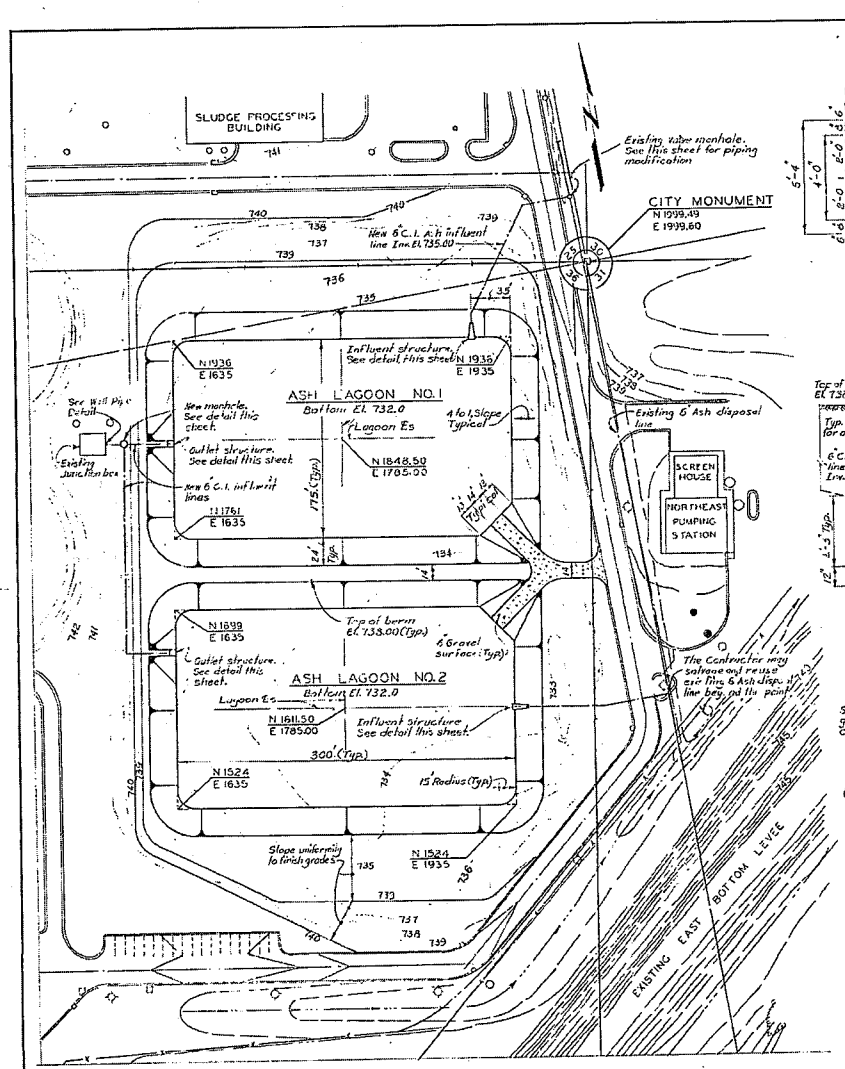
EFFLUENT STRUCTURE AND MISCELLANEOUS DETAILS

LLOYD WAYNE MILLER NUMBER 6933 STATE OF MISSOURI

P.C.D. CONTRACT 120

SHEET 3 OF 3

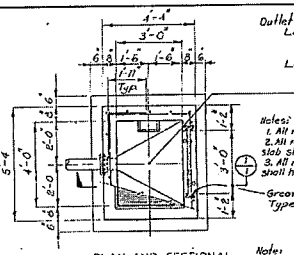
MICROFILMED 1062.29



PLAN
Scale 1" = 50'

LEGEND
Existing contour
Finished contour

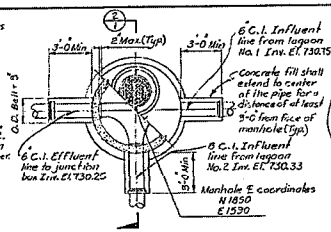
Notes:
1. The Contractor may salvage and reuse the abandoned 6" C.I.P. ash line beyond the influent to Ash Lagoon No. 2. The salvaged pipe may be used for influent or effluent piping.
2. Provide plug in end of existing pipe.



Outlet structures ℄ coordinates
Lagoon No. 1
N 1850.00
E 1632.63
Lagoon No. 2
N 1659.00
E 1632.83

Notes:
1. All reinforcing bars are #5912.
2. All reinforcing bars in bottom slab shall have minimum of 3" cover.
3. All reinforcing bars in walls shall have minimum of 2" cover.

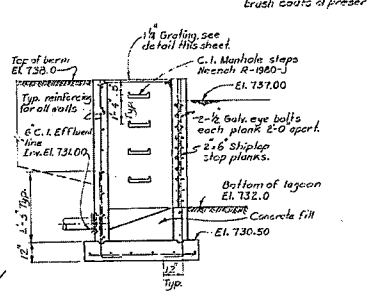
PLAN AND SECTIONAL PLAN



PLAN AND SECTIONAL PLAN

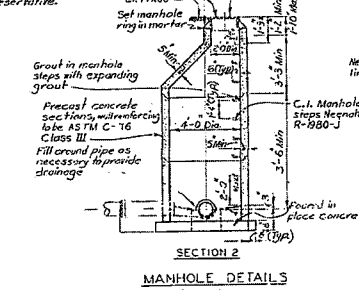
Notes:
Stop planks to be Southern pine, No. 2, pressure treated with non-water soluble preservative in accordance with AWPA C2. Cut surfaces shall be given two heavy brush coats of preservative.

Notes:
Any material excavated beneath pipe entering or leaving manhole shall be replaced with concrete.



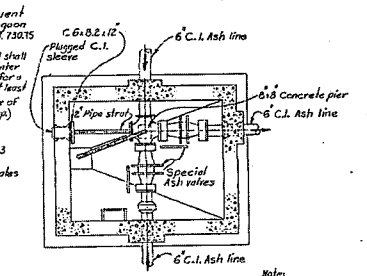
SECTION 1

OUTLET STRUCTURE
Scale: ⅜" = 1'-0"
See this sheet.



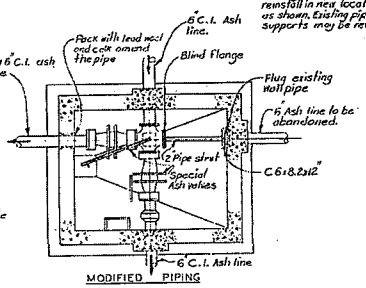
SECTION 2

MANHOLE DETAILS
No Scale
See this sheet



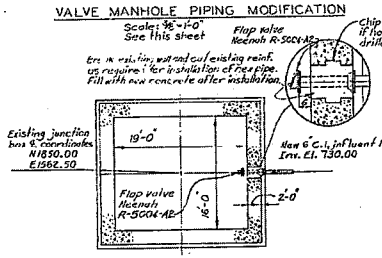
EXISTING PIPING

Note:
Contractor shall remove existing ash valve and reinstall in new location as shown. Existing pipe and supports may be reused.

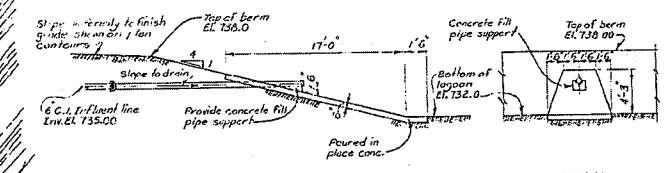


MODIFIED PIPING

VALVE MANHOLE PIPING MODIFICATION
Scale: ⅜" = 1'-0"
See this sheet



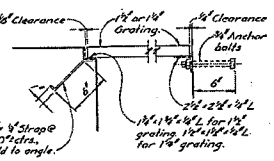
WALL PIPE DETAIL
Scale: ⅜" = 1'-0"
See this sheet



SECTION

ELEVATION

INFLUENT STRUCTURE DETAIL
Scale: 3/16" = 1'-0"
See this sheet.



GRATING DETAILS
Scale: 1½" = 1'-0"

NO.	DATE	REVISIONS	BY	CK'D
7273		Conform to construction records	GVD	ACP

KANSAS CITY, MISSOURI
POLLUTION CONTROL DEPARTMENT

BIG BLUE PLANT
ASH LAGOONS

RECEIVED JUL 6 1973 POLLUTION CONTROL

BLACK & VEATCH
CONSULTING ENGINEERS, KANSAS CITY, MO.

P.C.D. CONTRACT 7E

DESIGNED MAA DRAWN MAA CHECKED ACP APPROVED DATE

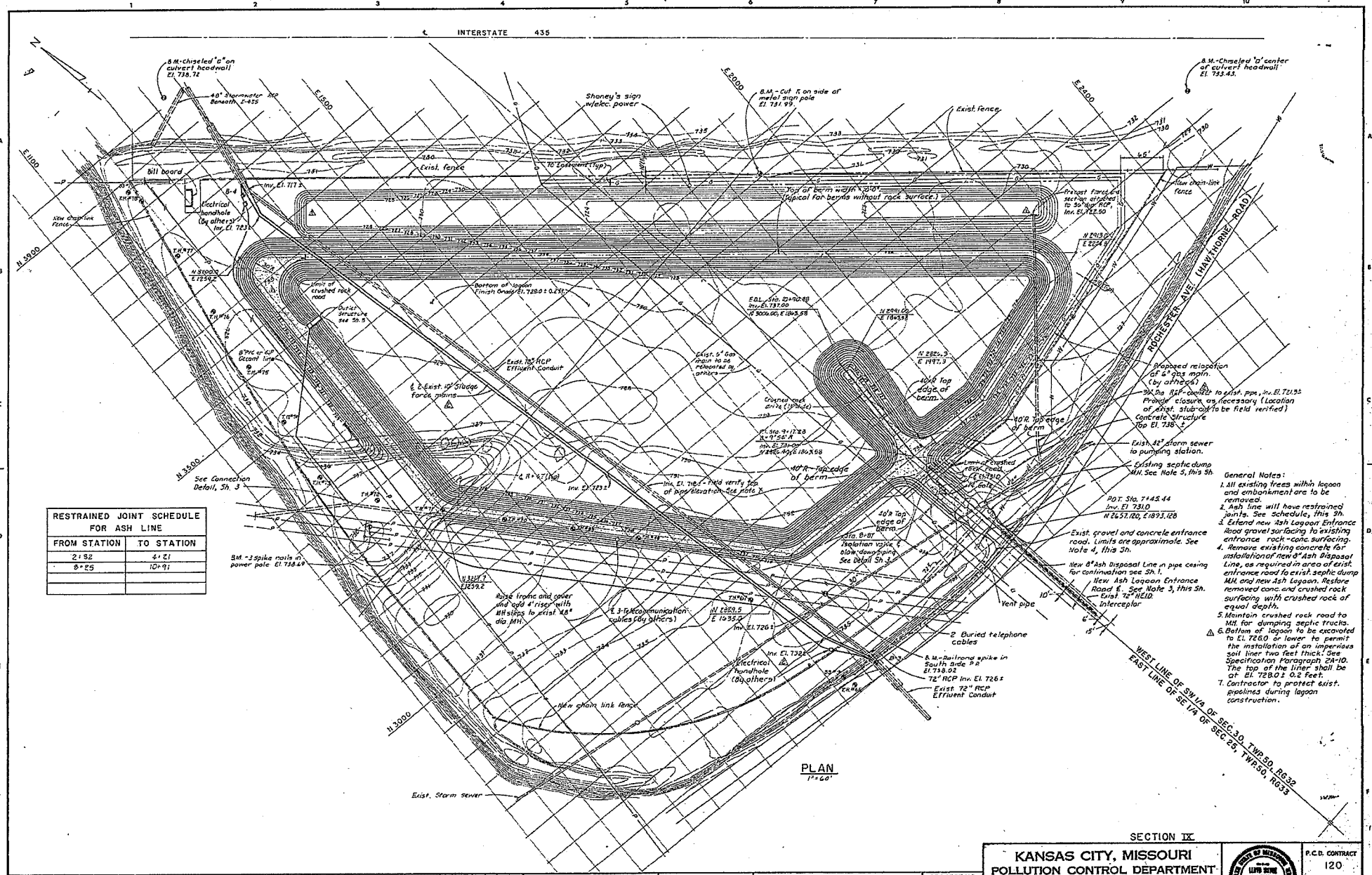
SHEET 1 OF 1

21.04A

21.04A

MICROFILMED 1062.29

APPENDIX D – NORTH POND AS-BUILT DRAWINGS



RESTRAINED JOINT SCHEDULE FOR ASH LINE	
FROM STATION	TO STATION
2+82	4+21
8+25	10+91

NO.	DATE	REVISIONS AND RECORD OF ISSUE	BY	CK	APP
2	5/9/88	General revisions	RVJ	ACP	ACP
1	4/13/87	General revisions	TAY	SCB	ACP

DESIGNED E.M.J., S.C.B.
DETAILED W.J.D., T.A.Y.
CHECKED A.C.P.
APPROVED
DATE May 22, 1987

Black & Veatch
Engineers - Architects
Kansas City, Missouri

PROJECT NO. 12171.331

SECTION IX

KANSAS CITY, MISSOURI
POLLUTION CONTROL DEPARTMENT

NEW ASH LAGOON PLAN

P.C.D. CONTRACT 120

SHEET 2 OF 3

General Notes:
1. All existing trees within lagoon and embankment are to be removed.
2. Ash line will have restrained joints. See schedule, this Sh.
3. Extend new Ash Lagoon Entrance Road gravel surfacing to existing entrance rock-conc. surfacing.
4. Remove existing concrete for installation of new 8" Ash Disposal Line, as required in area of exist. entrance road to exist. septic dump MH. and new Ash Lagoon. Restore removed conc. and crushed rock surfacing with crushed rock of equal depth.
5. Maintain crushed rock road to MH. for dumping septic trucks.
6. Bottom of lagoon to be excavated to El. 728.0 or lower to permit the installation of an impervious soil liner two feet thick. See Specification Paragraph 2A-10. The top of the liner shall be at El. 728.0 ± 0.2 feet.
7. Contractor to protect exist. pipelines during lagoon construction.

MICROFILMED 06 2.29

APPENDIX E – NPDES PERMIT

STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

MISSOURI STATE OPERATING PERMIT

In compliance with the Missouri Clean Water Law (Chapter 644 RSMo, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92nd Congress) as amended,

Permit No.	MO-0024911
Owner:	City of Kansas City
Address:	4800 East 63rd Street, Kansas City, MO 64130
Continuing Authority:	Same as above
Address:	Same as above
Facility Name:	KC Blue River WWTP
Facility Address:	7300 Hawthorne Road, Kansas City, MO 64120
Legal Description:	See Page 2
UTM Coordinates:	See Page 2
Receiving Stream:	See Page 2
First Classified Stream and ID:	See Page 2
USGS Basin & Sub-watershed No.:	See Page 2

is authorized to discharge from the facility described herein, in accordance with the effluent limitations and monitoring requirements as set forth herein:

FACILITY DESCRIPTION

See Page 2

This permit authorizes only wastewater and stormwater discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; it does not apply to other regulated areas.

April 1, 2021
Effective Date

Edward B. Galbraith, Director, Division of Environmental Quality

March 31, 2026
Expiration Date

Chris Wieberg, Director, Water Protection Program

FACILITY DESCRIPTION (continued):

Outfall #001 – POTW
The use or operation of this facility shall be by or under the supervision of a Certified "A" Operator.
Rock box filter unit / 6 automatic bar screens / 6 aerated grit chambers / 4 hydro cyclone-type grit removal units / 4 primary clarifiers / 4 plastic media covered trickling filters with air handling systems / 4 final clarifiers / effluent pump station / chlorination / dechlorination / 2 sludge holding tanks / 2 anaerobic sludge digesters / 3 dissolved air flotation units / 2 belt presses / 1 sludge incinerator / ash storage lagoon / sludge/biosolids are incinerated, stabilized, landfilled, or land applied

Design population equivalent is 850,000.
Design flow is 105 million gallons per day.
Actual flow is 73.4 million gallons per day.
Design sludge production is 23,800 dry tons/year.

Legal Description:	Sec. 15, T50N, R32W, Jackson County
UTM Coordinates:	X=371700, Y=4333636
Receiving Stream:	Missouri River (P)
First Classified Stream and ID:	Missouri River (P) (356) 303(d) List
USGS Basin & Sub-watershed No.:	(10300101-0301)

Outfalls #002, #003, and #004 – previous stormwater outfalls. All stormwater outfalls are now covered by Section **D. Special Condition #20.**

Outfall #005 – Discharges from this outfall is no longer authorized, and shall be subject to 40 CFR 122.41(m) and reported according to 40 CFR 122.41(m)(3)(i) & (ii).

Permitted Feature INF – Influent Monitoring Location – Headworks – Samples are to be collected from the sampling locations for the two influent lines into the plant. Samples are collected from each influent location and are averaged together. See influent averaging requirements on Page 5 (**Note 3**).

NEID influent sampling location:

Legal Description:	Sec. 31, T50N, R32W, Jackson County
UTM Coordinates:	X=370759, Y=4330975

Blue River influent sampling location:

Legal Description:	Sec. 36, T50N, R33W, Jackson County
UTM Coordinates:	X=370481, Y=4330819

CSO Locations 006-100: See Section **F. COMBINED SEWER SYSTEM OVERFLOW LOCATIONS** on pages 12-16 of the permit for the list of the CSO locations, UTM coordinates, legal descriptions, and stream information.

OUTFALL #001	TABLE A-1. FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

The permittee is authorized to discharge from outfall number(s) as specified in the application for this permit. The final effluent limitations in **Table A-1** shall become effective on **April 1, 2021** and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Limit Set: M						
Flow	MGD	*		*	once/day	24 hr. total
Biochemical Oxygen Demand$_5$	mg/L		60	40	once/weekday***	composite**
Total Suspended Solids	mg/L		60	40	once/weekday***	composite**
E. coli **(Note 1, Page 5)**	#/100mL		1,030	206	once/week	grab
Ammonia as N (Jan – May)	mg/L	*		*	once/weekday***	composite**
Ammonia as N (June)	mg/L	58.1		36.4	once/weekday***	composite**
Ammonia as N (July)	mg/L	66.7		32.1	once/weekday***	composite**
Ammonia as N (August)	mg/L	71.6		37.5	once/weekday***	composite**
Ammonia as N (Sep – Dec)	mg/L	*		*	once/weekday***	composite**
Total Residual Chlorine **(Note 2, Page 5)**	µg/L	< 130		< 130	once/week	grab
Total Phosphorus	mg/L	*		*	once/month	composite**
Total Kjeldahl Nitrogen	mg/L	*		*	once/month	composite**
Nitrite + Nitrate	mg/L	*		*	once/month	composite**

EFFLUENT PARAMETER(S)	UNITS	MINIMUM		MAXIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
pH – Units****	SU	6.0		9.0	once/weekday***	grab

EFFLUENT PARAMETER(S)	UNITS	MONTHLY AVERAGE MINIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
Biochemical Oxygen Demand$_5$ – Percent Removal **(Note 3, Page 5)**	%	65	once/month	calculated
Total Suspended Solids – Percent Removal **(Note 3, Page 5)**	%	65	once/month	calculated

MONITORING REPORTS SHALL BE SUBMITTED **MONTHLY**; THE FIRST REPORT IS DUE MAY 28, 2021. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

* Monitoring requirement only.

** A 24-hour composite sample is composed of 48 aliquots (subsamples) collected at 30 minute intervals by an automatic sampling device.

*** Once each weekday means: Monday, Tuesday, Wednesday, Thursday & Friday, except for the nine Federal legal holidays (New Years, Martin Luther King Day, Presidents Day, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving, and Christmas)

**** pH is measured in pH units and is not to be averaged.

OUTFALL #001	TABLE A-2. FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

The permittee is authorized to discharge from outfall number(s) as specified in the application for this permit. The final effluent limitations in **Table A-2** shall become effective on **April 1, 2021** and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Limit Set: Q						
Cadmium, Total Recoverable	µg/L	*		*	once/quarter *****	composite**
Copper, Total Recoverable	µg/L	*		*	once/quarter *****	composite**
Cyanide, amenable to chlorination	µg/L	*		*	once/quarter *****	grab
Oil & Grease	mg/L	*		*	once/quarter *****	grab
Phenol	µg/L	*		*	once/quarter *****	grab

MONITORING REPORTS SHALL BE SUBMITTED **QUARTERLY**; THE FIRST REPORT IS DUE JULY 28, 2021.

* Monitoring requirement only.
** A 24-hour composite sample is composed of 48 aliquots (subsamples) collected at 30 minute intervals by an automatic sampling device.
***** See table below for quarterly sampling requirements.

Quarterly Minimum Sampling Requirements			
Quarter	**Months**	**Quarterly Effluent Parameters**	**Report is Due**
First	January, February, March	Sample at least once during any month of the quarter	April 28th
Second	April, May, June	Sample at least once during any month of the quarter	July 28th
Third	July, August, September	Sample at least once during any month of the quarter	October 28th
Fourth	October, November, December	Sample at least once during any month of the quarter	January 28th

Note 1 – Effluent limitations and monitoring requirements for *E. coli* are applicable only during the recreational season from April 1 through October 31. The Monthly Average Limit for *E. coli* is expressed as a geometric mean. The Weekly Average for *E. coli* will be expressed as a geometric mean if more than one (1) sample is collected during a calendar week (Sunday through Saturday).

Note 2 – This permit contains a Total Residual Chlorine (TRC) limit.

(a) The Water Quality Based Effluent Limit for Total Residual Chlorine was calculated to be **53 µg/L** (daily maximum limit) and **36 µg/L** (monthly average limit). These limits are below the minimum quantification level (ML) of the most common and practical EPA approved CLTRC methods. The Department has determined the current acceptable ML for total residual chlorine to be 130 µg/L when using the DPD Colorimetric Method #4500 – CL G. from Standard Methods for the Examination of Waters and Wastewater. The permittee will conduct analyses in accordance with this method, or equivalent, and report actual analytical values. The minimum quantification level does not authorize the discharge of chlorine in excess of the effluent limits stated in the permit. Measured values greater than or equal to the minimum quantification level of 130 µg/L will be considered violations of the permit and values less than the minimum quantification level of 130 µg/L will be considered to be in compliance with the permit limitation.

(b) Disinfection is required during the recreational season from April 1 through October 31. Do not chlorinate during the non-recreational months and an actual analysis for TRC is not necessary.

(c) Do not chemically de-chlorinate **if it is not needed to meet the limits in your permit.**

(d) If no chlorine was used in a given sampling period, an actual analysis for TRC is not necessary. Simply report as "AG – Conditional Monitoring Not Required This Period" for TRC in the eDMR system.

PERMITTED FEATURE INF	TABLE B-1. INFLUENT MONITORING REQUIREMENTS

The monitoring requirements in **Table B-1** shall become effective on **April 1, 2021** and remain in effect until expiration of the permit. The influent wastewater shall be monitored by the permittee as specified below:

PARAMETER(S)	UNITS	MONITORING REQUIREMENTS				
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Limit Set: IM						
Biochemical Oxygen Demand$_5$ (**Note 3**)	mg/L			*	once/weekday***	composite**
Total Suspended Solids (**Note 3**)	mg/L			*	once/weekday***	composite**
Ammonia as N	mg/L	*		*	once/month	composite**
Total Phosphorus	mg/L	*		*	once/month	composite**
Total Kjeldahl Nitrogen	mg/L	*		*	once/month	composite**
Nitrite + Nitrate	mg/L	*		*	once/month	composite**

MONITORING REPORTS SHALL BE SUBMITTED **MONTHLY**; THE FIRST REPORT IS DUE MAY 28, 2021.

* Monitoring requirement only.

** A 24-hour composite sample is composed of 48 aliquots (subsamples) collected at 30 minute intervals by an automatic sampling device.

*** Once each weekday means: Monday, Tuesday, Wednesday, Thursday & Friday, except for the nine Federal legal holidays (New Years, Martin Luther King Day, Presidents Day, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving and Christmas)

Note 3 – Influent sampling for BOD_5 and TSS is not required when the facility does not discharge effluent during the reporting period. Samples are to be collected prior to any treatment process. Influent concentrations (C) will be calculated as a flow (Q) weighted average between the NEID and Blue River (BR) influent sampling locations using the following formula: $[(Q_{NEID} \times C_{NEID}) + (Q_{BR} \times C_{BR})]/(Q_{NEID} + Q_{BR})$. Influent and effluent samples are to be taken during the same month. The Average Influent and Average Effluent values are to be calculated by adding the respective values together and dividing by the number of samples taken during the month. Calculate Percent Removal by using the following formula: [(Average Influent –Average Effluent) / Average Influent] x 100% = Percent Removal. Influent samples are to be collected as a 24-hour composite sample, composed of 48 aliquots (subsamples) collected at 30 minute intervals by an automatic sampling device. Percent removal requirements apply only during dry weather. When calculating percent removal efficiencies, the City may exclude influent and effluent data from the percent removal calculations on corresponding days when rainfall exceeds 0.1 inches or snow melt is occurring in the KC Blue River WWTP's sewer collection system service area.

C. STANDARD CONDITIONS

In addition to specified conditions stated herein, this permit is subject to the attached Parts I, II, & III standard conditions dated August 1, 2014, May 1, 2013, and August 1, 2019, and hereby incorporated as though fully set forth herein. The permittee is required to conduct biosolids testing frequency in accordance with the monitoring frequency of Table C-1 below. Table C-1 supersedes the requirements in Standard Conditions Part III, Section J – Monitoring Frequency Table 5.

Table C-1: Monitoring Frequency (See † and Ω)	
Metals, Pathogens and Vectors, Phosphorus, Total Potassium	Nitrogen TKN, Nitrogen PAN[1]
6/year	1/month

1. Calculate plant available nitrogen (PAN) when either of the following occurs:
   - when biosolids are greater than 50,000 mg/kg TN; or
   - when biosolids are land applied at an application rate greater than two dry tons per acre per year.

† - Total Solids: A grab sample of biosolids shall be tested once per day during land application periods for percent total solids. This data shall be used to calculate the dry tons of biosolids applied per acre.

Ω - This table is not applicable for incineration and permit holders that landfill their sludge/biosolids.

D. SPECIAL CONDITIONS

1. Electronic Discharge Monitoring Report (eDMR) Submission System. Per 40 CFR Part 127 National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, reporting of effluent monitoring data and any report required by the permit (unless specifically directed otherwise by the permit) shall be submitted by the permittee via an electronic system to ensure timely, complete, accurate, and nationally consistent set of data about the NPDES program.
   (a) eDMR Registration Requirements. The permittee must register with the Department's eDMR system through the Missouri Gateway for Environmental Management (MoGEM) before the first report is due. Registration and other information regarding MoGEM can be found at https://dnr.mo.gov/mogem. Information about the eDMR system can be found at https://dnr.mo.gov/env/wpp/edmr.htm. The first user shall register as an Organization Official and the association to the facility must be approved by the Department. Regarding Standard Conditions Part I, Section B, #7, the eDMR system is currently the only Department approved reporting method for this permit unless a waiver is granted by the Department. See paragraph (c) below.
   (b) Electronic Submissions. To access the eDMR system, use the following link in your web browser: https://apps5.mo.gov/mogems/welcome.action. If you experience difficulties with using the eDMR system you may contact edmr@dnr.mo.gov or call 855-789-3889 or 573-526-2082 for assistance.
   (c) Waivers from Electronic Reporting. The permittee must electronically submit compliance monitoring data and reports unless a waiver is granted by the Department in compliance with 40 CFR Part 127. Only permittees with an approved waiver request may submit monitoring data and reports on paper to the Department for the period that the approved electronic reporting waiver is effective. The permittee may obtain an electronic reporting waiver by first submitting an eDMR Waiver Request Form: http://dnr.mo.gov/forms/780-2692-f.pdf. The Department will either approve or deny this electronic reporting waiver request within 120 calendar days.

2. The full implementation of this operating permit, which includes implementation of any applicable schedules of compliance, shall constitute compliance with all applicable federal and state statutes and regulations in accordance with §644.051.16, RSMo, and the Clean Water Act (CWA) section 402(k); however, this permit may be reopened and modified, or alternatively revoked and reissued:
   (a) To comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) of the CWA, if the effluent standard or limitation so issued or approved:
      (1) contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
      (2) controls any pollutant not limited in the permit.
   (b) To incorporate an approved pretreatment program or modification thereto pursuant to 40 CFR 403.8(c) or 40 CFR 403.18(e), respectively.

3. The permittee shall comply with any applicable requirements listed in 10 CSR 20-9, unless the facility has received written notification that the Department has approved a modification to the requirements. The monitoring frequencies contained in this permit shall not be construed by the permittee as a modification of the monitoring frequencies listed in 10 CSR 20-9. To request a modification of the operational control testing requirements listed in 10 CSR 20-9, the permittee shall submit a permit modification application and fee to the Department requesting a deviation from the operational control monitoring requirements. Upon approval of the request, the Department will modify the permit.
   (a) The facility is approved for the following modified monitoring frequency:
      (1) Total Residual Chlorine analyses of the effluent shall be performed weekly during the recreational season per note 2 on Page 4, in accordance with the measurement frequency outlined in Table A-1 on Page 3.

4. Reporting of Non-Detects:
   (a) An analysis conducted by the permittee or their contracted laboratory shall be conducted in such a way that the precision and accuracy of the analyzed result can be enumerated.
   (b) The permittee shall not report a sample result as "Non-Detect" without also reporting the detection limit of the test. Reporting as "Non Detect" without also including the detection limit will be considered failure to report, which is a violation of this permit.
   (c) The permittee shall provide the "Non-Detect" sample result using the less than sign and the minimum detection limit (e.g. <10).
   (d) Where the permit contains a Minimum Level (ML) and the permittee is granted authority in the permit to report zero in lieu of the < ML for a specified parameter (conventional, priority pollutants, metals, etc.), then zero (0) is to be reported for that parameter.
   (e) See Standard Conditions Part I, Section A, #4 regarding proper detection limits used for sample analysis.
   (f) When a parameter is not detected above ML, the permittee must report the data qualifier signifying less than ML for that parameter (e.g., < 50 µg/L, if the ML for the parameter is 50 µg/L). For reporting an average based on a mix of values detected and not detected, assign a value of "0" for all non-detects for that reporting period and report the average of all the results.

D. SPECIAL CONDITIONS (continued)

5. All outfalls must be clearly marked in the field.

6. Report as no-discharge when a discharge does not occur during the report period.

7. It is a violation of the Missouri Clean Water Law to fail to pay fees associated with this permit (644.055 RSMo).

8. The permittee has developed a comprehensive program for maintenance and repair of the collection system. The permittee's program is consistent with the US EPA's Guide for Evaluating Capacity, Management, Operation, And Maintenance Plan Performance Criteria (CMOM) Programs at Sanitary Sewer Collection Systems (Document number EPA 305-B-05-002). The permittee shall continue to implement the CMOM Program in accordance with the federal consent decree entered in the matter of the *United States v. The City of Kansas City, Missouri, 4:10-cv-0497*, including any amendment thereto. The permittee shall continue to submit an Annual Report to the Department on the same date it submits the report to the EPA.

9. Bypasses are not authorized at this facility unless they meet the criteria in 40 CFR 122.41(m). If a bypass occurs, the permittee shall report in accordance to 40 CFR 122.41(m)(3), and with Standard Condition Part I, Section B, subsection 2. Bypasses are to be reported to the Kansas City Regional Office during normal business hours or by using the online Sanitary Sewer Overflow/Facility Bypass Application located at: https://dnr.mo.gov/mogem/ or the Environmental Emergency Response spill-line at 573-634-2436 outside of normal business hours. Once an electronic reporting system compliant with 40 CFR Part 127, the National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, is available all bypasses must be reported electronically via the new system. Blending, which is the practice of combining a partially-treated wastewater process stream with a fully-treated wastewater process stream prior to discharge, is not considered a form of bypass. If the permittee wishes to utilize blending, the permittee shall file an application to modify this permit to facilitate the inclusion of appropriate monitoring conditions.

10. The facility must be sufficiently secured to restrict entry by children, livestock and unauthorized persons as well as to protect the facility from vandalism.

11. An Operation and Maintenance (O & M) manual shall be maintained by the permittee and made available to the operator. The O & M manual shall include key operating procedures and a brief summary of the operation of the facility.

12. An all-weather access road to the treatment facility shall be maintained.

13. The outfall sewer shall be protected and maintained against the effects of floodwater, ice, or other hazards as to reasonably insure its structural stability, freedom from stoppage, and that a sample of the effluent can be obtained at a point after the final treatment process and before the discharge mixes with the receiving waters.

14. The ash storage lagoon shall be operated and maintained to ensure its structural integrity, which includes maintaining adequate freeboard and keeping the berms free of deep-rooted vegetation, animal dens, or other potential sources of damage.

15. The facility shall ensure that adequate provisions are provided to prevent or minimize surface water intrusion into the ash storage lagoon and to divert stormwater runoff around the ash storage lagoon and protect embankments from erosion.

16. The permittee shall perform a minimum of four whole effluent toxicity tests in the four and one-half year period prior to the next permit renewal application. The four tests shall consist of two chronic toxicity tests and two acute toxicity tests in accordance with Special Conditions #17 and #18.

17. Acute Whole Effluent Toxicity (WET) tests shall be conducted as follows:
    (a) Freshwater Species and Test Methods: Species and short-term test methods for estimating the acute toxicity of NPDES effluents are found in the most recent edition of *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms* (EPA/821/R-02/012; Table IA, 40 CFR Part 136). The permittee shall concurrently conduct 48-hour, static, non-renewal toxicity tests with the following species:
        i. The fathead minnow, *Pimephales promelas* (Acute Toxicity EPA Test Method 2000.0).
        ii. The daphnid, *Ceriodaphnia dubia* (Acute Toxicity EPA Test Method 2002.0).
    (b) Chemical and physical analysis of the upstream control sample and effluent sample shall occur immediately upon being received by the laboratory, prior to any manipulation of the effluent sample beyond preservation methods consistent with federal guidelines for WET testing that are required to stabilize the sample during shipping. Where upstream receiving water is not available or known to be toxic, other approved control water may be used.
    (c) Test conditions must meet all test acceptability criteria required by the EPA Method used in the analysis.
    (d) The laboratory shall not chemically dechlorinate the sample.
    (e) The Allowable Effluent Concentration (AEC) is 36%; the dilution series is: 60%, 48%, 36%, 24%, and 12%.

D. SPECIAL CONDITIONS (continued)

(f) All chemical and physical analysis of the effluent sample performed in conjunction with the WET test shall be performed at the 100% effluent concentration.

(g) The facility must submit a full laboratory report for all toxicity testing. The report must include a quantification of acute toxic units ($TU_a = 100/LC_{50}$) reported according to the test methods manual chapter on report preparation and test review. The Lethal Concentration 50 Percent (LC_{50}) is the effluent concentration that would cause death in 50 percent of the test organisms at a specific time.

18. Chronic Whole Effluent Toxicity (WET) tests shall be conducted as follows:

(a) Freshwater Species and Test Methods: Species and short-term test methods for estimating the chronic toxicity of NPDES effluents are found in the most recent edition of *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA/821/R-02/013; Table IA, 40 CFR Part 136).* The permittee shall concurrently conduct 7-day, static renewal toxicity tests with the following species:
- The fathead minnow, *Pimephales promelas* (Survival and Growth Test Method 1000.0).
- The daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0).

(b) Chemical and physical analysis of the upstream control sample and effluent sample shall occur immediately upon being received by the laboratory, prior to any manipulation of the effluent sample beyond preservation methods consistent with federal guidelines for WET testing that are required to stabilize the sample during shipping. Where upstream receiving water is not available or known to be toxic, other approved control water may be used.

(c) Test conditions must meet all test acceptability criteria required by the EPA Method used in the analysis.

(d) The laboratory shall not chemically dechlorinate the sample.

(e) The Allowable Effluent Concentration (AEC) is 3%, the dilution series is: 12%, 6%, 3%, 1.5%, and 0.75%.

(f) All chemical and physical analysis of the effluent sample performed in conjunction with the WET test shall be performed at the 100% effluent concentration.

(g) The facility must submit a full laboratory report for all toxicity testing. The report must include a quantification of chronic toxic units ($TU_c = 100/IC_{25}$) reported according to the *Methods for Measuring the Chronic Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms* chapter on report preparation and test review. The 25 percent Inhibition Effect Concentration (IC_{25}) is the toxic or effluent concentration that would cause 25 percent reduction in mean young per female or in growth for the test populations.

19. Expanded Effluent Testing

Permittee must sample and analyze for the pollutants listed in Form B2 – Application for Operating Permit for Facilities That Receive Primarily Domestic Waste And Have A Design Flow More Than 100,000 Gallons Per Day (MO-780-1805 dated 02-19), Part D – Expanded Effluent Testing Data, #18 and additionally, Total Recoverable Barium, Total Recoverable Boron, Chloride, Total Recoverable Cobalt, and Sulfate. The permittee shall provide this data with the permit renewal application. A minimum of three samples taken within four and one-half years prior to the date of the permit application must be provided. Samples must be representative of the seasonal variation in the discharge from each outfall. Approved and sufficiently sensitive testing methods listed in 40 CFR 136.3 must be utilized. A method is "sufficiently sensitive" when; 1) The method minimum level is at or below the level of the applicable water quality criterion for the measured pollutant or pollutant parameter; or 2) the method minimum level is above the applicable water quality criterion, but the amount of the pollutant or pollutant parameter in a facility's discharge is high enough that the method detects and quantifies the level of the pollutant or pollutant parameter in the discharge; or 3) the method has the lowest minimum level of the analytical methods approved under 40 CFR part 136. These methods are also required for parameters listed as monitoring only, as the data collected may be used to determine if numeric limitations need to be established.

20. Stormwater Pollution Prevention Plan (SWPPP): A SWPPP must be implemented upon permit issuance. Through implementation of the SWPPP, the permittee shall minimize the release of pollutants in stormwater from the facility to the waters of the state. The SWPPP shall be developed in consultation with the concepts and methods described in the following document: Developing Your Stormwater Pollution Prevention Plan, A Guide for Industrial Operators, (Document number EPA 833-B-09-002) published by the United States Environmental Protection Agency (USEPA) in June 2015.

(a) The SWPPP must identify any stormwater outfall from the facility and Best Management Practices (BMPs) used to prevent or reduce the discharge of contaminants in stormwater. The stormwater outfalls shall either be marked in the field or clearly marked on a map and maintained with the SWPPP.

(b) The SWPPP must include a schedule and procedures for a once per month routine site inspection.

(1) The monthly routine inspection shall be documented in a brief written report, which shall include:
- i. The person(s) conducting the inspection.
- ii. The inspection date and time.
- iii. Weather information for the day of the inspection.
- iv. Precipitation information for the entire period since the last inspection.

D. SPECIAL CONDITIONS (continued)

v. Description of the discharges observed, including visual quality of the discharges (sheen, turbid, etc.).
vi. Condition of BMPs
vii. If BMPs were replaced or repaired.
viii. Observations and evaluations of BMP effectiveness.

(2) Any deficiency observed during the routine inspection must be corrected within seven (7) days and the actions taken to correct the deficiencies shall be included with the written report.
(3) The routine inspection reports must be kept onsite with the SWPPP and maintained for a period of five (5) years.
(4) The routine inspection reports shall be made available to Department personnel upon request.

(c) The SWPPP must include a schedule and procedures for a once per year comprehensive site inspection.
(1) The annual comprehensive inspection shall be documented in a written report, which shall include:
i. The person(s) conducting the inspection.
ii. The inspection date and time.
iii. Findings from the areas of your facility that were examined;
iv. All observations relating to the implementation of your control measures including:
1. Previously unidentified discharges from the site,
2. Previously unidentified pollutants in existing discharges,
3. Evidence of, or the potential for, pollutants entering the drainage system;
4. Evidence of pollutants discharging to receiving waters at all facility outfall(s), and the condition of and around the outfall, and
5. Additional control measures needed to address any conditions requiring corrective action identified during the inspection.
v. Any required revisions to the SWPPP resulting from the inspection;
vi. Any incidence of noncompliance observed or a certification stating that the facility is in compliance with Special Condition D. 21.

(2) Any deficiency observed during the comprehensive inspection must be corrected within seven (7) days and the actions taken to correct the deficiencies shall be included with the written report.
(3) The comprehensive inspection reports must be kept onsite with the SWPPP and maintained for a period of five (5) years
(4) The comprehensive inspection reports shall be made available to Department personnel upon request.

(d) The SWPPP must be kept on-site and should not be sent to the Department unless specifically requested.
(e) The SWPPP must be reviewed and updated at a minimum once per permit cycle, as site conditions or control measures change.

21. The permittee shall select, install, use, operate, and maintain the Best Management Practices prescribed in the SWPPP.

(a) Permittee shall adhere to the following minimum Best Management Practices (BMPs):
(1) Minimize the exposure of industrial material storage areas, loading and unloading areas, dumpsters and other disposal areas, maintenance activities, and fueling operations to rain, snow, snowmelt, and runoff, by locating industrial materials and activities inside or protecting them with storm resistant coverings, if warranted and practicable.
(2) Provide good housekeeping practices on the site to prevent potential pollution sources from coming into contact with stormwater and provide collection facilities and arrange for proper disposal of waste products, including sludge.
(3) Implement a maintenance program to ensure that the structural control measures and industrial equipment is kept in good operating condition and to prevent or minimize leaks and other releases of pollutants.
(4) Prevent or minimize the spillage or leaks of fluids, oil, grease, fuel, etc. from equipment and vehicle maintenance, equipment and vehicle cleaning, or activities.
(5) Provide sediment and erosion control sufficient to prevent or control sediment loss off of the property. This could include the use of straw bales, silt fences, or sediment basins, if needed.
(6) Provide stormwater runoff controls to divert, infiltrate, reuse, contain, or otherwise minimize pollutants in the stormwater discharge.
(7) Enclose or cover storage piles of salt or piles containing salt, used for deicing or other commercial or industrial purposes.
(8) Provide training to all employees who; work in areas where industrial materials or activities are exposed to stormwater, are responsible for stormwater inspections, are members of the Pollution Prevention Team. Training must cover the specific control measures and monitoring, inspection, planning, reporting and documentation requirements of this permit. Training is recommended annually for any applicable staff and whenever a new employee is hired who meets the description above.
(9) Eliminate and prevent unauthorized non-stormwater discharges at the facility.
(10) Minimize generation of dust and off-site tracking of raw, final, or waste materials by implementing appropriate control measures.

D. SPECIAL CONDITIONS (continued)

22. Pretreatment: The permittee shall implement and enforce its approved pretreatment program in accordance with the requirements of 10 CSR 20-6.100. The approved pretreatment program is hereby incorporated by reference.
    (a) The permittee shall submit to the Department via the Electronic Discharge Monitoring Report (eDMR) Submission System on or before March 31st of each year a report briefly describing its pretreatment activities during the previous calendar year. At a minimum, the report shall include the following:
        (1) An updated list of the Permittee's Industrial Users, including their names and addresses, or a list of deletions and additions keyed to a previously submitted list. The Permittee shall provide a brief explanation of each deletion. This list shall identify which Industrial Users are subject to categorical pretreatment Standards and specify which Standards are applicable to each Industrial User. The list shall indicate which Industrial Users are subject to local standards that are more stringent than the categorical Pretreatment Standards. The Permittee shall also list the Industrial Users that are subject only to local Requirements;
        (2) A summary of the status of Industrial User compliance over the reporting period;
        (3) A summary of compliance and enforcement activities (including inspections) conducted by the Permittee during the reporting period; and
        (4) Any other relevant information requested by the Department.
    (b) The permittee is currently working to complete a technical local limit evaluation.
        (1) Submit a status report on the progress of the sampling, the IWS, and the technical analysis with the assistance of a consultant on or before **December 1, 2021**;
        (2) Provide by email all draft local limit analyses using the EPA Region 7 Local Limit Analysis Spreadsheet on or before **June 1, 2022** (a stagger submittal of each WWTF's analysis is preferred);
        (3) Submit a draft final formal report of the detailed technical development of local limits and program modification with ordinance revision (with city council endorsement of draft final submission) as needed for potential public notice (see formal submission process below) on or before **December 1, 2022**;
        (4) Submit the City Council's formal adoption of the revision to the Code of Ordinances on or before **June 1, 2023**.
    (c) Please contact the Department's pretreatment coordinator for further guidance. Should revision of local limits be deemed necessary, it is recommended that revisions follow the US Environmental Protection Agency's guidance document *Local Limits Development Guidance.* EPA833-R04-002A. July 2004.

23. The permittee shall update their pretreatment program to incorporate the requirements of 10 CSR 20-6.100, effective October 30, 2012, which adopted the 2005 "Streamlining" revisions to the federal pretreatment rule, 40 CFR 403. This update to city code will include at the minimum the "required streamlining" 40 CFR 403 rule updates.

    The permittee shall submit the draft final revision to the pretreatment program along with the draft final revisions to the city code to the Department by **October 1, 2021**, for review and approval. After draft review, the formal submission of the program modification will follow the requirements of 40 CFR 403.18. The permittee shall immediately implement the finalized updates to the pretreatment program and adopt the revised city code no later than **6 months** after Department approval of the changes. The permittee shall submit notification of city code adoption to the Department no later than **7 months** after Department approval.

24. Sewer Extension Authority Supervised Program

    The Department approved the Sewer Extension Authority Supervised Program for the City of Kansas City to regulate and approve construction of sanitary sewers and pump stations, which are tributary to this wastewater treatment facility on December 19, 2019. The City of Kansas City shall act as the continuing authority for the operation, maintenance, and modernization of the constructed collection system. This approval may be modified or revoked by the Department if the wastewater collection, transportation, or treatment facilities reach their design capacity, if the treatment facility falls into chronic noncompliance with the permit, or if the permittee fails to follow the terms and conditions of the submitted and approved program.

    This permit may be reopened and modified or alternatively revoked and reissued to incorporate new or modified conditions to the Sewer Extension Authority Supervised Program, if information indicates changes are necessary to assure compliance with Missouri's Clean Water Law and associated regulations. When any of the above mentioned conditions occur, the permittee will be notified prior to any modifications of this permit condition. Plans and specifications for all projects which include a proposed sanitary sewer overflow must be submitted to the Department to provide record information for location and size of the sanitary sewer overflow.

D. SPECIAL CONDITIONS (continued)

An annual report on the Sewer Extension Authority Supervised Program must be submitted by **April 30th** of each year to the Missouri Department of Natural Resources' Water Protection Program's Engineering Section. Please see **Appendix – Sewer Extension Authority Supervised Program Reauthorization Letter** for applicable conditions.

The Department's Water Protection Program's Engineering Section will reevaluate the City's Sewer Extension Authority Supervised Program for reauthorization when they file an application for permit renewal to determine if it is current, complete, and meets the requirements of 10 CSR 20-8 Minimum Design Standards. Once the Sewer Extension Authority Supervised Program is reauthorized or denied, this condition will be updated accordingly.

25. Biosolids Land Application Management Plan: The City shall develop a Biosolids Land Application Management Plan (Plan) and submit the Plan to the Department for review by **(October 1, 2021)**. Upon approval by the Department, the City shall implement the Plan.

It is recommended that the City use Chapter 8.9 Biosolids Disposal on Land, of the Wastewater Guidelines and Standards Document dated February 2019 (https://dnr.mo.gov/pubs/docs/pub2754.pdf), as guidance to complete the Plan. The Plan shall also address temporary biosolids storage/stockpiling and necessary Best Management Practices needed to ensure proper short term storage/stockpiling of biosolids and the prevention of contaminated runoff from the storage areas. The Plan shall be updated each time a new field is added for application. The City shall review the Biosolids Land Application Management Plan annually to determine if updates are necessary.

E. COMBINED SEWER SYSTEM OVERFLOW

1. Combined Sewer System
   (a) *Combined Sewer Overflow Authorized.* The permittee is authorized to discharge from the Combined Sewer Overflow (CSO) locations listed on Page 12 of this permit and additional CSO overflow locations within the boundaries of the permittee's jurisdiction identified after the effective date of this permit.

   (b) *Nine Minimum Controls Plan.* The permittee has developed a Nine Minimum Control (NMC) Plan consistent with the U.S. EPA Combined Sewer Overflow (CSO) Policy dated April, 19, 1994. The permittee shall implement its NMC Plan in accordance with the federal consent decree entered in the matter of the *United States v. The City of Kansas City, Missouri, 4:10-cv-0497*, including any amendment thereto. The permittee's NMC Plan meets the following technology-based requirements:

   - Control 1 – Proper operation and regular maintenance programs for the sewer system and CSO outfalls;
   - Control 2 – Maximization use of the collection system for storage;
   - Control 3 – Review and modification of pretreatment requirements to ensure that CSO impacts are minimized;
   - Control 4 – Maximization of flow to the POTW for treatment;
   - Control 5 – Elimination of CSOs during dry weather;
   - Control 6 – Control of solid and floatable materials in CSOs;
   - Control 7 – Pollution prevention programs to reduce contaminants in CSOs;
   - Control 8 – Public notification to ensure that the public receives adequate notification of CSO occurrences and CSO impacts; and
   - Control 9 – Monitoring to effectively characterize CSO impacts and the efficacy of CSO controls.

   (c) Long Term Control Plan. The permittee submitted a Long-Term Control Plan (LTCP) on January 30, 2009, that is consistent with the U.S. EPA CSO Policy dated April 19, 1994, (59 FR 18688) and 10 CSR 20-7.015(10). The LTCP was approved by the Department on April 14, 2010. Pursuant to its approved work plans, the LTCP is included in the permittee's Overflow Control Plan (OCP) and incorporated into the federal consent decree entered in the matter of the *United States v. The City of Kansas City, Missouri, 4:10-cv-0497* in the US District Court for the Western District of Missouri on September 27, 2010. The consent decree has been subsequently amended. Any modifications or amendments to such consent decree are hereby incorporated into this permit.

   (d) Reporting. The permittee shall continue to submit an Annual Report as required by the federal consent decree entered in the matter of the *United States v. The City of Kansas City, Missouri, 4:10-cv-0497*, including any amendment thereto, that describes the permittee's efforts to demonstrate compliance with the Nine Minimum Controls plan performance criteria and its efforts to implement the LTCP through the consent decree for the previous calendar year. The permittee shall submit the Annual Report to the Department on the same date it submits the report to EPA.

F. COMBINED SEWER SYSTEM OVERFLOW LOCATIONS

CSO Permitted Feature No.	Description	UTM Coordinates	Legal Description	Receiving Water	First Classified Stream & ID	USGS Basin & Sub-watershed No.
006	51st St. and Ward Pkwy	X=361362; Y=4321938	Sec. 31, T49N, R33W	Brush Creek	Brush Creek (3986) 303(d)	10300101-0105
007	50th Terr. and Brush Creek	X=361394; Y=4322025	Sec. 30, T49N, R33W	Brush Creek	Brush Creek (3986) 303(d)	10300101-0105
008	Ward Pkwy and Westwood Rd	X=361430; y=4322126	Sec. 30, T49N, R33W	Brush Creek	Brush Creek (3986) 303(d)	10300101-0105
009	Ward Pkwy and Westwood Rd	X=361430; y=4322126	Sec. 30, T49N, R33W	Brush Creek	Brush Creek (3986) 303(d)	10300101-0105
010	50th and Brush Creek	X=361479; Y=4322154	Sec. 30, T49N, R33W	Brush Creek	Brush Creek (3986) 303(d)	10300101-0105
011	Roanoke and Brush Creek	X=361803; Y=4322375	Sec. 30, T49N, R33W	Brush Creek	Brush Creek (3986) 303(d)	10300101-0105
012	Roanoke and Brush Creek	X=361810 Y=4322329	Sec. 30, T49N, R33W	Brush Creek	Brush Creek (3986) 303(d)	10300101-0105
013	Ward Pkwy and Wornall	X=362231; Y=4322447	Sec. 29, T49N, R33W	Brush Creek	Brush Creek (3986) 303(d)	10300101-0105
014	Ward Pkwy and Wornall	X=362260; Y=4322436	Sec. 29, T49N, R33W	Brush Creek	Brush Creek (3986) 303(d)	10300101-0105
015	Wyandotte St and Ward Pkwy	X=362479; Y=4322477	Sec. 29, T49N, R33W	Brush Creek	Brush Creek (3986) 303(d)	10300101-0105
016	Main St. and Brush Creek	X=362641; Y=4322442	Sec. 29, T49N, R33W	Brush Creek	Brush Creek (3986) 303(d)	10300101-0105
017	49th St and Volker Blvd	X=362925; Y=4322336	Sec. 29, T49N, R33W	Brush Creek	Brush Creek (3986) 303(d)	10300101-0105
018	Volker Blvd and Troost Ave	X=363742; Y=4322191	Sec. 29, T49N, R33W	Brush Creek	Brush Creek (3986) 303(d)	10300101-0105
019	Volker Blvd and Troost Ave	X=363869; Y=4322170	Sec. 28, T49N, R33W	Brush Creek	Brush Creek (3986) 303(d)	10300101-0105
020	Volker Blvd and The Paseo	X=364230; Y=4322377	Sec. 28, T49N, R33W	Brush Creek	Brush Creek (3986) 303(d)	10300101-0105
021	Volker Blvd and The Paseo	X=364318; Y=4322508	Sec. 28, T49N, R33W	Brush Creek	Brush Creek (3986) 303(d)	10300101-0105
#22 eliminated						
023	47th and Woodland	X=364698; Y=4322713	Sec. 28, T49N, R33W	Brush Creek	Brush Creek (3986) 303(d)	10300101-0105

*MND= Metropolitan No-Discharge Stream per 10 CSR 20-7.031(6) and Table F

F. COMBINED SEWER SYSTEM OVERFLOW LOCATIONS (continued)

CSO Permitted Feature No.	Description	UTM Coordinates	Legal Description	Receiving Water	First Classified Stream & ID	USGS Basin & Sub-watershed No.
024	Frontage Rd and Emanuel Cleaver II Blvd	X=365042; Y=4322619	Sec. 28, T49N, R33W	Brush Creek	Brush Creek (3986) 303(d)	10300101-0105
025	Emanuel Cleaver II Blvd and Prospect Ave	X=365445; Y=4322433	Sec. 28, T49N, R33W	Brush Creek	Brush Creek (3986) 303(d)	10300101-0105
026	Swope Pkwy and Agnes Ave	X=365925; Y=4322234	Sec. 27, T49N, R33W	Brush Creek	Brush Creek (3986) 303(d)	10300101-0105
027	45th and Mersington	X=366810; Y=4322746	Sec. 27, T49N, R33W	Tributary to Brush Creek	Brush Creek (3986) 303(d)	10300101-0105
028	46th and Myrtle Ave	X=366990; Y=4322562	Sec. 27, T49N, R33W	Tributary to Brush Creek	Brush Creek (3986) 303(d)	10300101-0105
029	Volker Blvd and Oak St	X=363080; Y=4322288	Sec. 29, T49N, R33W	Brush Creek	Brush Creek (3986) 303(d)	10300101-0105
030	Volker Blvd and Oak St	X=363080; Y=4322288	Sec. 29, T49N, R33W	Brush Creek	Brush Creek (3986) 303(d)	10300101-0105
031	I-435 and Blue River	X=371064; Y=4330984	Sec. 31, T50N, R32W	Blue River	Blue River (417) 303(d), MND*	10300101-0106
032	St. John Ave and Bennington Ave	X=369882; Y=4330426	Sec. 36, T50N, R33W	Blue River	Blue River (417) 303(d), MND*	10300101-01
033	Wilson and Bennington	X=370335; Y=4330076	Sec. 36, T50N, R33W	Blue River	Blue River (417) 303(d), MND*	10300101-0106
034	8th St. at Blue River	X=370449; Y=4329122	Sec. 01, T49N, R33W	Blue River	Blue River (417) 303(d), MND*	10300101-0106
035 eliminated						
036	18th St and Crystal Ave	X=370448; Y= 4327537	Sec. 12, T49N, R33W	Blue River	Blue River (418) 303(d), MND*	10300101-0106
037	35th and Blue River	X=369087; Y=4324737	Sec. 13, T49N, R33W	Blue River	Blue River (418) 303(d), MND*	10300101-0106
038 eliminated						
039	35th Street and Blue River	X=369045; Y=4324671	Sec. 24, T49N, R33W	Blue River	Blue River (418) 303(d), MND*	10300101-0106
040	Lawn Ave and Vineyard Dr	X=367486; Y=4323533	Sec. 23, T49N, R33W	Tributary to Blue River	Tributary to Blue River (C) (3960)	10300101-0106
041	40th and Cleveland	X=366768; Y=4323732	Sec. 22, T49N, R33W	Tributary to Blue River	Blue River (418) 303(d), MND*	10300101-0106
042 eliminated						

*MND= Metropolitan No-Discharge Stream per 10 CSR 20-7.031(6) and Table F

F. COMBINED SEWER SYSTEM OVERFLOW LOCATIONS (continued)

CSO Permitted Feature No.	Description	UTM Coordinates	Legal Description	Receiving Water	First Classified Stream & ID	USGS Basin & Sub-watershed No.
043	40th and Cleveland	X=366794; Y=4323729	Sec. 22, T49N, R33W	Tributary to Blue River	Blue River (418) 303(d), MND*	10300101-0106
044	41st and Myrtle	X=366891; Y=4323622	Sec. 22, T49N, R33W	Tributary to Blue River	Blue River (418) 303(d), MND*	10300101-0106
045	41st and Myrtle	X=366951; Y=4323594	Sec. 22, T49N, R33W	Tributary to Blue River	Blue River (418) 303(d), MND*	10300101-0106
046	41st and Norton	X= 367053; Y= 4323577	Sec. 22, T49N, R33W	Tributary to Blue River	Blue River (418) 303(d), MND*	10300101-0106
047	41st and Jackson	X=367156; Y=4323532	Sec. 23, T49N, R33W	Tributary to Blue River	Blue River (418) 303(d), MND*	10300101-0106
048	45th and Chelsea Ave	X=367837; Y=4322685	Sec. 26, T49N, R33W	Blue River	Blue River (418) 303(d), MND*	10300101-0106
049 eliminated						
050	Spruce Ave and Towers Rd	X=367255; Y=4323547	Sec. 23, T49N, R33W	Tributary to Blue River	Blue River (418) 303(d), MND*	10300101-0106
051	Wilson Rd and Blue River	X=370775; Y=4329734	Sec. 31, T50N, R32W	Blue River	Blue River (417) 303(d), MND*	10300101-0106
052	Truman Rd and Blue River	X=370799; Y=4328198	Sec. 06, T49N, R32W	Blue River	Blue River (418) 303(d), MND*	10300101-0106
053 eliminated						
054	18th St and White Ave	X=369235; Y=4327688	Sec. 12, T49N, R33W	Tributary to Blue River	Blue River (418) 303(d), MND*	10300101-0106
055	I-70 and White Ave	X=369055; Y=4325674	Sec. 13, T49N, R33W	Tributary to Blue River	Blue River (418) 303(d), MND*	10300101-0106
056	55th St. and Lister Ave	X=367611; Y=4320726	Sec. 35, T49N, R33W	Tributary to Blue River	Blue River (418) 303(d), MND*	10300101-0105
057	76th and Indiana	X=365914; Y=4316618	Sec. 15, T48N, R33W	Tributary to Blue River	Blue River (419) 303(d), MND*	10300101-0105
058	83rd St and McGee	X=362536; Y=4315408	Sec. 20, T48N, R33W	Tributary to Blue River	Blue River (419) 303(d), MND*	10300101-0105
059	85th and Tracy	X=363674; Y=4314833	Sec. 21, T48N, R33W	Tributary to Blue River	Blue River (419) 303(d), MND*	10300101-0105
060	58th St and Cypress Ave	X=367169; Y=4320208	Sec. 35, T49N, R33W	Tributary to Blue River	Blue River (418) 303(d), MND*	10300101-0105
061	58th and Elmwood	X=367308; Y=4320144	Sec. 35, T49N, R33W	Tributary to Blue River	Blue River (418) 303(d), MND*	10300101-0105

*MND= Metropolitan No-Discharge Stream per 10 CSR 20-7.031(6) and Table F

F. COMBINED SEWER SYSTEM OVERFLOW LOCATIONS (continued)

CSO Permitted Feature No.	Description	UTM Coordinates	Legal Description	Receiving Water	First Classified Stream & ID	USGS Basin & Sub-watershed No.
062	Yates Dr and Starlight Rd	X=367460; Y=4319093	Sec. 02, T48N, R33W	Tributary to Blue River	Blue River (419) 303(d), MND*	10300101-0105
063	70th and Cleveland	X=366410; Y=4317933	Sec. 10, T48N, R33W	Tributary to Blue River	Tributary to Blue River (C) (3960)	10300101-0105
064	Gregory Blvd and Myrtle Ave	X=366593; Y=4317690	Sec. 10, T48N, R33W	Tributary to Blue River	Tributary to Blue River (C) (3960)	10300101-0105
065	83rd and Troost Ave	X=363423; Y=4315433	Sec. 17, T48N, R33W	Tributary to Blue River	Tributary to Blue River (C) (3960)	10300101-0105
066 eliminated						
067	Pico St and Main St	X=362251; Y=4315381	Sec. 20, T48N, R33W	Tributary to Blue River	Blue River (419) 303(d), MND*	10300101-0105
068	87th and Wayne Ave	X=363990; Y=4314550	Sec. 21, T48N, R33W	Tributary to Blue River	Blue River (419) 303(d), MND*	10300101-0105
069	77th and Prospect	X=365121; Y=4316323	Sec. 15, T48N, R33W	Tributary to Blue River	Tributary to Blue River (C) (3960)	10300101-0105
070 eliminated						
071 eliminated						
072	Hwy 9 at MO River	X=363403; Y=4330727	Sec. 32, T50N, R33W	Missouri River	Missouri River (356) 303(d)	10300101-0301
073	West of Grand Ave and Lydia Ave	X=363977; Y=4331035	Sec. 32, T50N, R33W	Missouri River	Missouri River (356) 303(d)	10300101-0301
074	North of Grand Ave and Lydia Avenue	X=364422; Y=4331269	Sec. 33, T50N, R33W	Missouri River	Missouri River (356) 303(d)	10300101-0301
075	West of Front St and N. Kansas Ave	X=365968; Y=4332067	Sec. 28, T50N, R33W	Missouri River	Missouri River (356) 303(d)	10300101-0301
076 eliminated						
077	Hwy 9 at MO River	X=363593; Y=4330826	Sec. 32, T50N, R33W	Missouri River	Missouri River (356) 303(d)	10300101-0301
078 eliminated						
079	51st and Indiana	X=366270; Y=4321635	Sec. 27, T49N, R33W	Mill Creek	Mill Creek (4066) 303(d)	10300101-0105
080 eliminated						

*MND= Metropolitan No-Discharge Stream per 10 CSR 20-7.031(6) and Table F

F. COMBINED SEWER SYSTEM OVERFLOW LOCATIONS (continued)

CSO Permitted Feature No.	Description	UTM Coordinates	Legal Description	Receiving Water	First Classified Stream & ID	USGS Basin & Sub-watershed No.
081	53rd and Walrond	X=365996; Y=4321158	Sec. 34, T49N, R33W	Tributary to Mill Creek	Mill Creek (4066) 303(d)	10300101-0105
082	55th and College Ave	X=366005; Y=4320858	Sec. 34, T49N, R33W	Mill Creek	Mill Creek (4066) 303(d)	10300101-0105
083	57th and Bellefontaine Ave	X=365904; Y=4320446	Sec. 34, T49N, R33W	Mill Creek	Mill Creek (4066) 303(d)	10300101-0105
084 eliminated						
085	59th and Chestnut Ave	X=365524; Y=4320104	Sec. 34, T49N, R33W	Mill Creek	Mill Creek (4066) 303(d)	10300101-0105
086	South of 59th and Chestnut Ave	X=365505; Y=4319994	Sec. 03, T48N, R33W	Mill Creek	Mill Creek (4066) 303(d)	10300101-0105
087 eliminated						
088 eliminated						
089	Northeast of Park Ave and 62nd St	X=365051; Y=4319654	Sec. 04, T48N, R33W	Mill Creek	Mill Creek (4066) 303(d)	10300101-0105
090	63rd and Woodland	X=364561; Y=4319435	Sec. 04, T48N, R33W	Mill Creek	Mill Creek (4066) 303(d)	10300101-0105
091	NW of 58th Terr and Bellefontaine	X=365782; Y=4320214	Sec. 34, T49N, R33W	Mill Creek	Mill Creek (4066) 303(d)	10300101-0105
092	Gregory Blvd and Tracy Ave	X=363773; Y=4317822	Sec. 09, T48N, R33W	Tributary to Mill Creek	Mill Creek (4066) 303(d)	10300101-0105
093	Gregory Blvd and Tracy Ave	X=363804; Y=4317799	Sec. 09, T48N, R33W	Tributary to Mill Creek	Mill Creek (4066) 303(d)	10300101-0105
094	69th St and Lydia Ave	X=363981; Y=4318120	Sec. 09, T48N, R33W	Mill Creek	Mill Creek (4066) 303(d)	10300101-0105
095	67th and Flora Ave	X=364127; Y=4318552	Sec. 09, T48N, R33W	Tributary to Mill Creek	Mill Creek (4066) 303(d)	10300101-0105
096	68th St and Woodland Ave	X=364368; Y=4318375	Sec. 09, T48N, R33W	Tributary to Mill Creek	Mill Creek (4066) 303(d)	10300101-0105
097	66th Terrace and Flora	X=364161; Y=4318687	Sec. 04, T48N, R33W	Mill Creek	Mill Creek (4066) 303(d)	10300101-0105
098	66th Terrace and Flora	X=364161; Y=4318687	Sec. 04, T48N, R33W	Mill Creek	Mill Creek (4066) 303(d)	10300101-0105
099	56th and Bellefontaine	X=365955; Y=4320640	Sec. 34, T49N, R33W	Mill Creek	Mill Creek (4066) 303(d)	10300101-0105
100	7300 Hawthorne Road	X=370641; Y=4330732	Sec. 36, T50N, R33W	Blue River	Blue River (417) 303(d), MND*	10300101-0106

*MND= Metropolitan No-Discharge Stream per 10 CSR 20-7.031(6) and Table F

G. NOTICE OF RIGHT TO APPEAL

If you were adversely affected by this decision, you may be entitled to pursue an appeal before the administrative hearing commission (AHC) pursuant to Sections 621.250 and 644.051.6 RSMo. To appeal, you must file a petition with the AHC within thirty days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC. Any appeal should be directed to:

Administrative Hearing Commission
U.S. Post Office Building, Third Floor
131 West High Street, P.O. Box 1557
Jefferson City, MO 65102-1557
Phone: 573-751-2422
Fax: 573-751-5018
Website: https://ahc.mo.gov

MISSOURI DEPARTMENT OF NATURAL RESOURCES
FACT SHEET
FOR THE PURPOSE OF RENEWAL
OF
MO-0024911
KC BLUE RIVER WWTP

The Federal Water Pollution Control Act ("Clean Water Act" Section 402 Public Law 92-500 as amended) established the National Pollutant Discharge Elimination System (NPDES) permit program. This program regulates the discharge of pollutants from point sources into the waters of the United States, and the release of stormwater from certain point sources. All such discharges are unlawful without a permit (Section 301 of the "Clean Water Act"). After a permit is obtained, a discharge not in compliance with all permit terms and conditions is unlawful. Missouri State Operating Permits (MSOPs) are issued by the Director of the Missouri Department of Natural Resources (Department) under an approved program, operating in accordance with federal and state laws (Federal "Clean Water Act" and "Missouri Clean Water Law" Section 644 as amended). MSOPs are issued for a period of five (5) years unless otherwise specified.

As per [40 CFR Part 124.8(a)] and [10 CSR 20-6.020(1)(A)2.], a Factsheet shall be prepared to give pertinent information regarding the applicable regulations, rationale for the development of effluent limitations and conditions, and the public participation process for the Missouri State Operating Permit (operating permit) listed below.

A Factsheet is not an enforceable part of an operating permit.

This Factsheet is for a Major facility.

Part I – Facility Information

Facility Type: POTW

Facility Description: Rock box filter unit / 6 automatic bar screens / 6 aerated grit chambers / 4 hydro cyclone-type grit removal units / 4 primary clarifiers / 4 plastic media covered trickling filters with air handling systems / 4 final clarifiers / effluent pump station / chlorination / dechlorination / 2 sludge holding tanks / 2 anaerobic sludge digesters / 3 dissolved air flotation units / 2 belt presses / 1 sludge incinerator / ash storage lagoon / sludge/biosolids are incinerated, stabilized, landfilled, or land applied

Have any changes occurred at this facility or in the receiving water body that affects effluent limit derivation?
✓ No.

Application Date: 05/23/2016
Expiration Date: 11/15/2016

OUTFALL(S) TABLE:

OUTFALL	DESIGN FLOW (CFS)	TREATMENT LEVEL	EFFLUENT TYPE
#001	162.75	Equivalent to Secondary	Domestic

Facility Performance History:
The wastewater treatment plant was last inspected by the Department on April 24, 2012. The conditions of the facility at the time of inspection were found to be satisfactory. The wastewater treatment plant was inspected by the EPA on March 7-10, 2017. The report noted effluent limit exceedances for multiple parameters in 2014, 2015, and 2016, failure to properly maintain the facility, failing to meet final effluent limits from samples collected during the inspection for BOD_5 and TSS. The City responded to the EPA's Notice of Potential National Pollution Discharge Elimination System (NPDES) Permit Violations (NOPV), which EPA found that it addressed the items cited in the NOPV.

The facility failed to meet final effluent limits for BOD_5 on the October and November 2015, February, March, and November 2016, and February and March 2017 Discharge Monitoring Reports (DMRs). The facility failed to meet final effluent limits for Cadmium on the September and December 2019 DMRs (recent review of these data indicates that the reported samples were actually non-detect). The facility failed to meet final effluent limits for Cyanide on the December 2015 and August 2018 DMRs. The facility failed to meet final effluent limits for Ammonia on the August 2015, August 2016, and on the May, June, and July 2018 DMRs. The facility failed to meet final effluent limits for pH on the February 2016 DMR. The facility failed to meet final effluent limits for TSS on the June, July, and November 2015, April and November 2016, February and March 2017, December 2018, March, May, and June 2019, and January and February 2020 DMRs.

Comments:
Changes in this permit for Outfall #001 include the addition of Total Kjeldahl Nitrogen, the addition of monitoring for Barium, Boron, Chloride, Cobalt, and Sulfate in the Expanded Effluent Test for the next permit renewal application, the revision of the frequency for flow to daily, the revision of the frequency for *E. coli* to once per week, the revision of the final effluent limits for Ammonia, the revision of monitoring frequency for Total Phosphorus and Nitrate + Nitrites from quarterly to monthly, the revision of pH limits, the revision to the final limits for Total Residual Chlorine, and the removal of Temperature, the removal of final effluent limits for Oil & Grease, Cyanide, Cadmium, Copper, and Phenol and change to monitoring only, the reduction in monitoring frequency to once per quarter for Oil & Grease, and the removal of Fluoride, Hardness, Total Nitrogen, Arsenic, Chromium III, Chromium VI, Lead, Manganese Mercury, Nickel, Thallium, Zinc, and TTO. Changes in this permit for Permitted Feature INF include the addition of Ammonia, Total Kjeldahl Nitrogen, Nitrate + Nitrite, and Total Phosphorus. Permitted Features 002, #003, and #004 were removed from the permit as all stormwater outfalls are now covered by Section **D. Special Condition #20.** See Part VI of the Fact Sheet for further information regarding the addition, revision, and removal of effluent and influent parameters. Special conditions were updated to include the addition of inflow and infiltration reporting requirements, reporting of Non-detects, bypass reporting requirements, pretreatment requirements, and the Electronic Discharge Monitoring Report (eDMR) Submission System.

Part II – Operator Certification Requirements

✓ This facility is required to have a certified operator.

As per [10 CSR 20-6.010(8) Terms and Conditions of a Permit], the permittee shall operate and maintain facilities to comply with the Missouri Clean Water Law and applicable permit conditions and regulations. Operators at regulated wastewater treatment facilities shall be certified in accordance with [10 CSR 20-9.020(2)] and any other applicable state law or regulation. As per [10 CSR 20-9.020(2)(A)], requirements for operation by certified personnel shall apply to all wastewater treatment systems, if applicable, as listed below:

Owned or operated by or for a

- ☒ - Municipalities
- ☐ - County
- ☐ - Public Sewer District
- ☐ - State agency
- ☐ - Public Water Supply Districts
- ☐ - Private Sewer Company regulated by the Public Service Commission

Each of the above entities are only applicable if they have a Population Equivalent greater than two hundred (200).

This facility currently requires a chief operator with an (A) Certification Level. Please see **Appendix - Classification Worksheet.** Modifications made to the wastewater treatment facility may cause the classification to be modified.

Operator's Name: Brent Herring
Certification Number: 15178
Certification Level: WW-A

The listing of the operator above only signifies that staff drafting this operating permit have reviewed appropriate Department records and determined that the name listed on the operating permit application has the correct and applicable Certification Level.

Part III – Operational Control Testing Requirements

Missouri Clean Water Commission regulation 10 CSR 20-9.010 requires certain publicly owned treatment works and privately owned facilities regulated by the Public Service Commission to conduct internal operational control monitoring to further ensure proper operation of the facility and to be a safeguard or early warning for potential plant upsets that could affect effluent quality. This requirement is only applicable if the publicly owned treatment works and privately owned facilities regulated by the Public Service Commission has a Population Equivalent greater than two hundred (200).

10 CSR 20-9.010(3) allows the Department to modify the monitoring frequency required in the rule based upon the Department's judgement of monitoring needs for process control at the specified facility.

✓ As per [10 CSR 20-9.010(4))], the facility is required to conduct operational monitoring. These operational monitoring reports are to be submitted to the Department along with the MSOP discharge monitoring reports.

- The facility is a mechanical plant and is required to conduct operational control monitoring as follows:

Operational Monitoring Parameter	Frequency
Precipitation	Daily (M-F)
Flow – Influent or Effluent	Daily (M-F)
pH – Influent	Daily (M-F)
pH – Anaerobic Digester	Daily (M-F)
Temperature –Anaerobic Digester	Daily (M-F)
Total Residual Chlorine (effluent)	Weekly§

§ The facility is approved for the following modified monitoring frequency:
- Total Residual Chlorine analyses of the effluent shall be performed weekly during the recreational season per Note 2 on Page 4 of the permit, in accordance with the measurement frequency outlined in Table A-1 on Page 3 of the permit.

Part IV – Receiving Stream Information

RECEIVING STREAM(S) TABLE: OUTFALL #001

WATER-BODY NAME	CLASS	WBID	DESIGNATED USES*	12-DIGIT HUC	DISTANCE TO CLASSIFIED SEGMENT (MI)
Missouri River	P	356	AQL, WBC-B, SCR, HHP, IRR, LWW, DWS, IND	10300101-0301	0

*As per 10 CSR 20-7.031 Missouri Water Quality Standards, the Department defines the Clean Water Commission's water quality objectives in terms of "water uses to be maintained and the criteria to protect those uses." The receiving stream and 1st classified receiving stream's beneficial water uses to be maintained are in the receiving stream table in accordance with [10 CSR 20-7.031(1)(C)].

Uses found in the receiving streams table, above:

10 CSR 20-7.031(1)(C)1.:
AQL = Protection of aquatic life (Current narrative use(s) are defined to ensure the protection and propagation of fish shellfish and wildlife, which is further subcategorized as: WWH = Warm Water Habitat; **CDF** = Cold-water fishery (Current narrative use is cold-water habitat.); **CLF** = Cool-water fishery (Current narrative use is cool-water habitat); EAH = Ephemeral Aquatic Habitat; MAH = Modified Aquatic Habitat; LAH = Limited Aquatic Habitat. This permit uses AQL effluent limitations in 10 CSR 20-7.031 Table A for all habitat designations unless otherwise specified.)

10 CSR 20-7.031(1)(C)2.: Recreation in and on the water
WBC = Whole Body Contact recreation where the entire body is capable of being submerged;
WBC-A = Whole body contact recreation that supports swimming uses and has public access;
WBC-B = Whole body contact recreation that supports swimming;
SCR = Secondary Contact Recreation (like fishing, wading, and boating).

10 CSR 20-7.031(1)(C)3. to 7.:
HHP (formerly HHF) = Human Health Protection as it relates to the consumption of fish;
IRR = Irrigation for use on crops utilized for human or livestock consumption;
LWW = Livestock and wildlife watering (Current narrative use is defined as LWP = Livestock and Wildlife Protection);
DWS = Drinking Water Supply;
IND = Industrial water supply

10 CSR 20-7.031(1)(C)8-11.: Wetlands (10 CSR 20-7.031 Table A currently does not have corresponding habitat use criteria for these defined uses)
WSA = Storm- and flood-water storage and attenuation; WHP = Habitat for resident and migratory wildlife species; WRC = Recreational, cultural, educational, scientific, and natural aesthetic values and uses; WHC = Hydrologic cycle maintenance.

10 CSR 20-7.031(6): **GRW** = Groundwater

RECEIVING STREAM(S) LOW-FLOW VALUES:

RECEIVING STREAM	LOW-FLOW VALUES (CFS)*		
	1Q10	7Q10	30Q10
Missouri River (P)	18,002.9	19,042.7	20,362.1

* A mixing zone study was conducted by the U.S. EPA on February 13-14, 2008. The Mixing Zones and Zone of Initial Dilution flow values were calculated by the Department's Watershed Protection Section on June 24, 2020, using data from USGS Gauge 06893000. The Mixing Zone and Zone of Initial Dilutions flows were used to develop final effluent limits in this permit.

MIXING CONSIDERATIONS

MIXING CONSIDERATIONS TABLE:

MIXING ZONE (CFS)* [10 CSR 20-7.031(5)(A)4.B.(II)(a)]			ZONE OF INITIAL DILUTION (CFS)* [10 CSR 20-7.031(5)(A)4.B.(II)(b)]		
1Q10	7Q10	30Q10	1Q10	7Q10	30Q10
4,890.02	4,890.02	4,890.02	292.43	292.43	292.43

* A mixing zone study was conducted by the U.S. EPA on February 13-14, 2008. The Mixing Zones and Zone of Initial Dilution flow values were calculated by the Department's Watershed Protection Section on June 24, 2020, using data from USGS Gauge 06893000. The Mixing Zone and Zone of Initial Dilutions flows were used to develop final effluent limits in this permit.

RECEIVING STREAM MONITORING REQUIREMENTS:
No receiving water monitoring requirements recommended at this time.

Receiving Water Body's Water Quality
Currently, the Department has not conducted a stream survey for this waterbody. When a stream survey is conducted, more information may be available about the receiving stream.

Part V – Rationale and Derivation of Effluent Limitations & Permit Conditions

ALTERNATIVE EVALUATIONS FOR NEW FACILITIES:
As per [10 CSR 20-7.015(4)(A)], discharges to losing streams shall be permitted only after other alternatives including land application, discharges to a gaining stream, and connection to a regional wastewater treatment facility have been evaluated and determined to be unacceptable for environmental and/or economic reasons.

✓ The facility does not discharge to a Losing Stream as defined by [10 CSR 20-2.010(40)] & [10 CSR 20-7.031(1)(O)], or is an existing facility.

ANTI-BACKSLIDING:
A provision in the Federal Regulations [CWA §303(d)(4); CWA §402(o); 40 CFR Part 122.44(l)] that requires a reissued permit to be as stringent as the previous permit with some exceptions.

✓ Limitations in this operating permit for the reissuance of this permit conform to the anti-backsliding provisions of Section 402(o) of the Clean Water Act, and 40 CFR Part 122.44.

- Information is available which was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) and which would have justified the application of a less stringent effluent limitation at the time of permit issuance.

  - **Ammonia as N**. Effluent limitations were re-calculated for Ammonia. The Department previously followed the 2007 Ammonia Guidance method for derivation of ammonia limits. However, the EPA's Technical Support Document for Water Quality-based Toxic Controls (TSD) establishes other alternatives to limit derivation. The Department has determined that the approach established in Section 5.4.2 of the TSD, which allows for direct application of both the acute and chronic wasteload allocations (WLA) as permit limits for toxic pollutants, is more appropriate limit derivation approach. Using this method for a discharge to a waterbody where mixing is not allowed, the criterion continuous concentration (CCC) and the criterion maximum concentration (CMC) will equal the chronic and acute WLA respectively. The WLAs are then applied as effluent limits, per Section 5.4.2 of the TSD, where the CMC is the Daily Maximum and the CCC is the Monthly Average. The direct application of both acute and chronic criteria as WLA is also applicable for facilities that discharge into receiving waterbodies with mixing considerations. The CCC and CMC will need to be calculated into WLA with mixing considerations using the mass-balance equation. The newly established limitations are still protective of water quality.

- **Total Residual Chlorine (TRC)**. Effluent limitations were re-calculated for TRC based on new information derived from discharge monitoring reports and on the current Missouri Water Quality Standards for TRC. The newly established limitations are still protective of water quality.

- ***E. coli***. The previous permit contained once per weekday sampling frequencies. This permit contains weekly sampling frequencies as required by 10 CSR 20-7.015(9)(D)7.A. The permit is still protective of water quality.

- **Cyanide**. As a result of a Reasonable Potential Analysis, it was determined that there is no reasonable potential to cause an excursion of water quality standard for Cyanide in the receiving stream. Therefore, final effluent limits for Cyanide have been removed and monitoring only is required to collect data over the permit cycle so this determination can be reassessed during the next renewal. The permit is still protective of water quality.

- **Total Recoverable Cadmium**. As a result of a Reasonable Potential Analysis, it was determined that there is no reasonable potential to cause an excursion of water quality standard for Cadmium in the receiving stream. Therefore, final effluent limits for Cadmium have been removed and monitoring only is required to collect data over the permit cycle so this determination can be reassessed during the next renewal. The permit is still protective of water quality.

- **Total Recoverable Copper**. As a result of a Reasonable Potential Analysis, it was determined that there is no reasonable potential to cause an excursion of water quality standard for Copper in the receiving stream. Therefore, final effluent limits for Copper have been removed and monitoring only is required to collect data over the permit cycle so this determination can be reassessed during the next renewal. The permit is still protective of water quality.

- **Phenol**. As a result of a Reasonable Potential Analysis, it was determined that there is no reasonable potential to cause an excursion of water quality standard for Phenol in the receiving stream. Therefore, final effluent limits for Phenol have been removed and monitoring only is required to collect data over the permit cycle so this determination can be reassessed during the next renewal. The permit is still protective of water quality.

- **Oil and Grease**. The previous permit had final effluent limits of 15 mg/L as a daily maximum and 10 mg/L as a monthly average. During the drafting of this permit, the permit writer reviewed DMR data submitted by the permittee. Additionally, no evidence of an excursion of the water quality standard has been observed by the department in the past and the facility has not disclosed any other information related to the characteristics of the discharge on their permit application which has the potential to cause or contribute to an excursion of the water quality standard. As a result, monitoring requirements have been included in this permit to determine if the discharge has the reasonable potential to cause or contribute to an excursion of the water quality standard. Data will be reviewed at renewal to reassess this determination. The monitoring frequency was also reduced to quarterly. The permit is still protective of water quality.

- **pH**. The previous permit contained final effluent limits of 6.5-9.0 SU. However, the permit writer has determined that final effluent limits of 6.0-9.0 SU are protective of the water quality standard [10 CSR 20-7.031(5)(E)], due to the buffering capacity of the mixing zone.

- **Temperature**. The Department has concluded that domestic wastewater treatment facilities have no reasonable potential to exceed Water Quality Standards for temperature. Due to the fact that this facility will have a minimal effect on temperature this parameter has been removed from the permit.

- **Fluoride, Arsenic, Chromium III, Chromium VI, Lead, Mercury, Nickel, Thallium, and Zinc**. As a result of a Reasonable Potential Analysis, it was determined that there is no reasonable potential to cause an excursion of water quality standards for • Fluoride, Arsenic, Chromium III, Chromium VI, Lead, Mercury, Nickel, Thallium, and Zinc in the receiving stream. Therefore, monitoring requirements have been removed. This determination will be reassessed at renewal. Please see **Appendix – RPA Results** for more information.

- **Manganese**. Manganese was removed as the receiving stream does not have Water Quality Standards for Groundwater.

- **Hardness**. Hardness was removed as effluent hardness is not applicable to calculate effluent limits.

- **Total Nitrogen**. Total Nitrogen was removed and replaced with Total Kjeldahl Nitrogen

- **Total Toxic Organics (TTO)**. The previous permit contained annual sampling and reporting frequencies. This permit removes TTO. Monitoring for TTOs was established for certain Categorical Industrial Users discharging to POTWs, including but not limited to, Metal Finishing (40 CFR 433). The previous permit contained a requirement to sample and report TTOs once per year. A review of the TTO results shows compliance in accordance with 40 CFR 413.14(f). Due to consistency in compliance, the monitoring requirement for TTOs was removed. Toxicity in the effluent will be

sampled for with the Acute and Chronic WET tests. The permit is still protective of water quality and this determination will be reassessed at the time of renewal.

✓ The Department determines that technical mistakes or mistaken interpretations of law were made in issuing the permit under section 402(a)(1)(b).

- **General Criteria**. The previous permit contained a special condition which described a specific set of prohibitions related to general criteria found in 10 CSR 20-7.031(4). In order to comply with 40 CFR 122.44(d)(1), the permit writer has conducted reasonable potential determinations for each general criterion and established numeric effluent limitations where reasonable potential exists. While the removal of the previous permit special condition creates the appearance of backsliding, since this permit establishes numeric limitations where reasonable potential to cause or contribute to an excursion of the general criteria exists the permit maintains sufficient effluent limitations and monitoring requirements in order to protect water quality, this permit is equally protective as compared to the previous permit. Therefore, given this new information, and the fact that the previous permit special condition was not consistent with 40 CFR 122.44(d)(1), an error occurred in the establishment of the general criteria as a special condition of the previous permit. Please see Part VI – Effluent Limits Determination for more information regarding the reasonable potential determinations for each general criterion related to this facility.

ANTIDEGRADATION:
In accordance with Missouri's Water Quality Standard [10 CSR 20-7.031(3)], for domestic wastewater discharge with new, altered, or expanding discharges, the Department is to document by means of Antidegradation Review that the use of a water body's available assimilative capacity is justified. In accordance with Missouri's water quality regulations for antidegradation [10 CSR 20-7.031(3)], degradation may be justified by documenting the socio-economic importance of a discharge after determining the necessity of the discharge. Facilities must submit the antidegradation review request to the Department prior to establishing, altering, or expanding discharges. See http://dnr.mo.gov/env/wpp/permits/antideg-implementation.htm

✓ No degradation proposed and no further review necessary. Facility did not apply for authorization to increase pollutant loading or to add additional pollutants to their discharge.

For stormwater discharges, the stormwater BMP chosen for the facility, through the antidegradation analysis performed by the facility must be implemented and maintained at the facility. Failure to implement and maintain the chosen BMP alternative is a permit violation; see SWPPP.

✓ The facility must review and maintain stormwater BMPs as appropriate.

AREA-WIDE WASTE TREATMENT MANAGEMENT & CONTINUING AUTHORITY:
As per [10 CSR 20-6.010(2)(C)], …An applicant may utilize a lower preference continuing authority by submitting, as part of the application, when a higher level authority is available, must submit information to the Department for review and approval, provided it does not conflict with any area-wide management plan approved under section 208 of the Federal Clean Water Act or any other regional sewage service and treatment plan approved for higher preference authority by the Department.

BIOSOLIDS & SEWAGE SLUDGE:
Biosolids are solid materials resulting from domestic wastewater treatment that meet federal and state criteria for beneficial uses (i.e. fertilizer). Sewage sludge is solids, semi-solids, or liquid residue generated during the treatment of domestic sewage in a treatment works; including but not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment process; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screening generated during preliminary treatment of domestic sewage in a treatment works.

✓ Permittee is authorized to incinerate, landfill, or land apply, including transportation of biosolids to a land application site in accordance with Standard Conditions III. The City owns the primary land application site known as the Birmingham Land Application Site, located near the Birmingham Wastewater Treatment Plan. The City may also use contractor services to land apply at alternative sites.

COMPLIANCE AND ENFORCEMENT:
Enforcement is the action taken by the Water Protection Program (WPP) to bring an entity into compliance with the Missouri Clean Water Law, its implementing regulations, and/or any terms and conditions of an operating permit. The primary purpose of the enforcement activity in the WPP is to resolve violations and return the entity to compliance.

✓ The facility is not currently under Water Protection Program enforcement action.

ELECTRONIC DISCHARGE MONITORING REPORT (EDMR) SUBMISSION SYSTEM:

The U.S. Environmental Protection Agency (EPA) promulgated a final rule on October 22, 2015, to modernize Clean Water Act reporting for municipalities, industries, and other facilities by converting to an electronic data reporting system. This final rule requires regulated entities and state and federal regulators to use information technology to electronically report data required by the National Pollutant Discharge Elimination System (NPDES) permit program instead of filing paper reports. To comply with the federal rule, the Department is requiring all permittees to begin submitting discharge monitoring data and reports online. In an effort to aid facilities in the reporting of applicable information electronically, the Department has created several new forms including operational control monitoring forms and an I&I location and reduction form. These forms are optional and found on the Department's website at the following locations:

Operational Monitoring Lagoon: http://dnr.mo.gov/forms/780-2801-f.pdf
Operational Monitoring Mechanical: http://dnr.mo.gov/forms/780-2800-f.pdf
I&I Report: http://dnr.mo.gov/forms/780-2690-f.pdf

Per 40 CFR 127.15 and 127.24, permitted facilities may request a temporary waiver for up to 5 years or a permanent waiver from electronic reporting from the Department. To obtain an electronic reporting waiver, a permittee must first submit an eDMR Waiver Request Form: http://dnr.mo.gov/forms/780-2692-f.pdf. Each facility must make a request. If a single entity owns or operates more than one facility, then the entity must submit a separate request for each facility based on its specific circumstances. An approved waiver is non-transferable.

The Department must review and notify the facility within 120 calendar days of receipt if the waiver request has been approved or rejected [40 CFR 124.27(a)]. During the Department review period as well as after a waiver is granted, the facility must continue submitting a hard-copy of any reports required by their permit. The Department will enter data submitted in hard-copy from those facilities allowed to do so and electronically submit the data to the EPA on behalf of the facility.

✓ The permittee/facility is currently using the eDMR data reporting system.

NUMERIC LAKE NUTRIENT CRITERIA

✓ This facility does not discharge into a lake watershed where numeric lake nutrient criteria are applicable.

PRETREATMENT PROGRAM:

The reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to or in lieu of discharging or otherwise introducing such pollutants into a Publicly Owned Treatment Works [40 CFR Part 403.3(q)].

Pretreatment programs are required at any POTW (or combination of POTW operated by the same authority) and/or municipality with a total design flow greater than 5.0 MGD and receiving industrial wastes that interfere with or pass through the treatment works or are otherwise subject to the pretreatment standards. Pretreatment programs can also be required at POTWs/municipals with a design flow less than 5.0 MGD if needed to prevent interference with operations or pass through.

Several special conditions pertaining to the permittee's pretreatment program may be included in the permit, and are as follows:

- Implementation and enforcement of the program,
- Annual pretreatment report submittal,
- Submittal of list of industrial users,
- Technical evaluation of need to establish local limitations, and
- Submittal of the results of the evaluation

✓ This permittee has an approved pretreatment program in accordance with the requirements of [40 CFR Part 403] and [10 CSR 20-6.100] and is expected to implement and enforce its approved program.

REASONABLE POTENTIAL ANALYSIS (RPA):

Federal regulation [40 CFR Part 122.44(d)(1)(i)] requires effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause or contribute to an in-stream excursion above narrative or numeric water quality standard.

In accordance with [40 CFR Part 122.44(d)(1)(iii)] if the permit writer determines that any given pollutant has the reasonable potential to cause, or contribute to an in-stream excursion above the WQS, the permit must contain effluent limits for that pollutant.

✓ An RPA was conducted on appropriate parameters. Please see **APPENDIX – RPA RESULTS.**

REMOVAL EFFICIENCY:
Removal efficiency is a method by which the Federal Regulations define Secondary Treatment and Equivalent to Secondary Treatment, which applies to Biochemical Oxygen Demand 5-day (BOD_5) and Total Suspended Solids (TSS) for Publicly Owned Treatment Works (POTWs)/municipals.

✓ Equivalent to Secondary Treatment is 65% removal [40 CFR Part 133.105(a)(3) & (b)(3)], however per 40 CFR part 133.103(a), percent removal requirements apply only during dry weather. When calculating percent removal efficiencies, the City may exclude influent data on corresponding days when rainfall exceeds 0.1 inches or snow melt is occurring.

SANITARY SEWER OVERFLOWS (SSO) AND INFLOW AND INFILTRATION (I&I):
Sanitary Sewer Overflows (SSOs) are defined as untreated sewage releases and are considered bypassing under state regulation [10 CSR 20-2.010(12)] and should not be confused with the federal definition of bypass. SSOs result from a variety of causes including blockages, line breaks, and sewer defects that can either allow wastewater to backup within the collection system during dry weather conditions or allow excess stormwater and groundwater to enter and overload the collection system during wet weather conditions. SSOs can also result from lapses in sewer system operation and maintenance, inadequate sewer design and construction, power failures, and vandalism. SSOs include overflows out of manholes, cleanouts, broken pipes, and other into waters of the state and onto city streets, sidewalks, and other terrestrial locations.

Inflow and Infiltration (I&I) is defined as unwanted intrusion of stormwater or groundwater into a collection system. This can occur from points of direct connection such as sump pumps, roof drain downspouts, foundation drains, and storm drain cross-connections or through cracks, holes, joint failures, faulty line connections, damaged manholes, and other openings in the collection system itself. I&I results from a variety of causes including line breaks, improperly sealed connections, cracks caused by soil erosion/settling, penetration of vegetative roots, and other sewer defects. In addition, excess stormwater and groundwater entering the collection system from line breaks and sewer defects have the potential to negatively impact the treatment facility.

Missouri RSMo §644.026.1.(13) mandates that the Department issue permits for discharges of water contaminants into the waters of this state, and also for the operation of sewer systems. Such permit conditions shall ensure compliance with all requirements as established by sections 644.006 to 644.141. Standard Conditions Part I, referenced in the permit, contains provisions requiring proper operation and maintenance of all facilities and systems of treatment and control. Missouri RSMo §644.026.1.(15) instructs the Department to require proper maintenance and operation of treatment facilities and sewer systems and proper disposal of residual waste from all such facilities. To ensure that public health and the environment are protected, any noncompliance which may endanger public health or the environment must be reported to the Department within 24 hours of the time the permittee becomes aware of the noncompliance. Standard Conditions Part I, referenced in the permit, contains the reporting requirements for the permittee when bypasses and upsets occur.

✓ The permittee has developed and is currently implementing a program for maintenance and repair of the collection system. The permittee shall continue to submit annual reports by March 31st as required by the federal consent decree entered in the matter of United States vs. City of Kansas City, Missouri, No. 4:10-CV-0497.

SCHEDULE OF COMPLIANCE (SOC):
Per 644.051.4 RSMo, a permit may be issued with a Schedule of Compliance (SOC) to provide time for a facility to come into compliance with new state or federal effluent regulations, water quality standards, or other requirements. Such a schedule is not allowed if the facility is already in compliance with the new requirement, or if prohibited by other statute or regulation. A SOC includes an enforceable sequence of interim requirements (actions, operations, or milestone events) leading to compliance with the Missouri Clean Water Law, its implementing regulations, and/or the terms and conditions of an operating permit. *See also* Section 502(17) of the Clean Water Act, and 40 CFR §122.2. For new effluent limitations, the permit may include interim monitoring for the specific parameter to demonstrate the facility is not already in compliance with the new requirement. Per 40 CFR § 122.47(a)(1), 10 CSR 20-7.031(11), and 10 CSR 20-7.015(9), compliance must occur as soon as possible. If the permit provides a schedule for meeting new water quality based effluent limits, a SOC must include an enforceable, final effluent limitation in the permit even if the SOC extends beyond the life of the permit.

✓ This permit does not contain an SOC.

SEWER EXTENSION AUTHORITY SUPERVISED PROGRAM:
In accordance with [10 CSR 20-6.010(6)(A)], the Department may grant approval of a permittee's Sewer Extension Authority Supervised Program. These approved permittees regulate and approve construction of sanitary sewers and pump stations, which are tributary to this wastewater treatment facility. The permittee shall act as the continuing authority for the operation, maintenance, and modernization of the constructed collection system. See http://dnr.mo.gov/env/wpp/permits/sewer-extension.htm.

✓ The permittee's Sewer Extension Authority Supervised Program has been reauthorized. Please see **Appendix – Sewer Extension Authority Supervised Program Reauthorization Letter** for applicable conditions.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

In accordance with 40 CFR 122.44(k) *Best Management Practices (BMPs)* to control or abate the discharge of pollutants when: (1) Authorized under section 304(e) of the Clean Water Act (CWA) for the control of toxic pollutants and hazardous substances from ancillary industrial activities: (2) Authorized under section 402(p) of the CWA for the control of stormwater discharges; (3) Numeric effluent limitations are infeasible; or (4) the practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA.

In accordance with the EPA's *Developing Your Stormwater Pollution Prevention Plan, A Guide for Industrial Operators*, (Document number EPA 833-B-09-002) [published by the United States Environmental Protection Agency (USEPA) in June 2015], BMPs are measures or practices used to reduce the amount of pollution entering (regarding this operating permit) waters of the state. BMPs may take the form of a process, activity, or physical structure.

Additionally, in accordance with the Stormwater Management, a SWPPP is a series of steps and activities to (1) identify sources of pollution or contamination, and (2) select and carry out actions which prevent or control the pollution of stormwater discharges. The purpose of a SWPPP is to comply with all applicable stormwater regulations by creating an adaptive management plan to control and mitigate stream pollution from stormwater runoff. Developing a SWPPP provides opportunities to employ appropriate BMPs to minimize the risk of pollutants being discharged during storm events. The following paragraph outlines the general steps the permittee should take to determine which BMPs will work to achieve the benchmark values or limits in the permit. This section is not intended to be all encompassing or restrict the use of any physical BMP or operational and maintenance procedure assisting in pollution control. Additional steps or revisions to the SWPPP may be required to meet the requirements of the permit.

Areas which should be included in the SWPPP are identified in 40 CFR 122.26(b)(14). Once the potential sources of stormwater pollution have been identified, a plan should be formulated to best control the amount of pollutant being released and discharged by each activity or source. This should include, but is not limited to, minimizing exposure to stormwater, good housekeeping measures, proper facility and equipment maintenance, spill prevention and response, vehicle traffic control, and proper materials handling. Once a plan has been developed the facility will employ the control measures determined to be adequate to achieve the benchmark values discussed above. The facility will conduct monitoring and inspections of the BMPs to ensure they are working properly and re-evaluate any BMP not achieving compliance with permitting requirements. For example, if sample results from an outfall show values of TSS above the benchmark value, the BMP being employed is deficient in controlling stormwater pollution. Corrective action should be taken to repair, improve, or replace the failing BMP. This internal evaluation is required at least once per month but should be continued more frequently if BMPs continue to fail. If failures do occur, continue this trial and error process until appropriate BMPs have been established.

For new, altered, or expanded stormwater discharges, the SWPPP shall identify reasonable and effective BMPs while accounting for environmental impacts of varying control methods. The antidegradation analysis must document why no discharge or no exposure options are not feasible. The selection and documentation of appropriate control measures shall serve as an alternative analysis of technology and fulfill the requirements of antidegradation [10 CSR 20-7.031(3)]. For further guidance, consult the antidegradation implementation procedure (http://dnr.mo.gov/env/wpp/docs/AIP050212.pdf).

Alternative Analysis (AA) evaluation of the BMPs is a structured evaluation of BMPs that are reasonable and cost effective. The AA evaluation should include practices that are designed to be: 1) non-degrading; 2) less degrading; or 3) degrading water quality. The glossary of AIP defines these three terms. The chosen BMP will be the most reasonable and effective management strategy while ensuring the highest statutory and regulatory requirements are achieved and the highest quality water attainable for the facility is discharged. The AA evaluation must demonstrate why "no discharge" or "no exposure" is not a feasible alternative at the facility. This structured analysis of BMPs serves as the antidegradation review, fulfilling the requirements of 10 CSR 20-7.031(3) Water Quality Standards and *Antidegradation Implementation Procedure* (AIP), Section II.B.

If parameter-specific numeric exceedances continue to occur and the permittee feels there are no practicable or cost-effective BMPs which will sufficiently reduce a pollutant concentration in the discharge to the benchmark values established in the permit, the permittee can submit a request to re-evaluate the benchmark values. This request needs to include 1) a detailed explanation of why the facility is unable to comply with the permit conditions and unable to establish BMPs to achieve the benchmark values; 2) financial data of the company and documentation of cost associated with BMPs for review and 3) the SWPPP, which should contain adequate documentation of BMPs employed, failed BMPs, corrective actions, and all other required information. This will allow the Department to conduct a cost analysis on control measures and actions taken by the facility to determine cost-effectiveness of BMPs. The request shall be submitted in the form of an operating permit modification; the application is found at: http://dnr.mo.gov/forms/index.html.

- ✓ 10 CSR 20-6.200 and 40 CFR 122.26(b)(14)(ix) includes treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated to the disposal of sewage sludge that is located within the confines of the facility, with a design flow of 1.0 MGD or more, or are required to have an approved pretreatment program under 40 CFR part 403, as an industrial activity in which permit coverage is required. In lieu of requiring sampling in the site-specific permit, the facility is required to develop and implement a Stormwater Pollution Prevention Plan (SWPPP).

A facility can apply for conditional exclusion for "no exposure" of industrial activities and materials to stormwater by submitting a permit modification via Form B2 (http://dnr.mo.gov/forms/780-1805-f.pdf) appropriate application filing fees and a completed No Exposure Certification for Exclusion from NPDES Stormwater Permitting under Missouri Clean Water Law (https://dnr.mo.gov/forms/780-2828-f.pdf) to the Department's Water Protection Program, Operating Permits Section. Upon approval of the No Exposure Certification, the permit will be modified and the Special Condition to develop and implement a SWPPP will be removed.

VARIANCE:
As per the Missouri Clean Water Law § 644.061.4, variances shall be granted for such period of time and under such terms and conditions as shall be specified by the commission in its order. The variance may be extended by affirmative action of the commission. In no event shall the variance be granted for a period of time greater than is reasonably necessary for complying with the Missouri Clean Water Law §§644.006 to 644.141 or any standard, rule or regulation promulgated pursuant to Missouri Clean Water Law §§644.006 to 644.141.

✓ This operating permit is not drafted under premises of a petition for variance.

WASTELOAD ALLOCATIONS (WLA) FOR LIMITS:
As per [10 CSR 20-2.010(86)], the amount of pollutant each discharger is allowed by the Department to release into a given stream after the Department has determined total amount of pollutant that may be discharged into that stream without endangering its water quality.

✓ Wasteload allocations were calculated where applicable using water quality criteria or water quality model results and the dilution equation below:

$$Ce = \frac{(Qe + Qs)C - (Qs \times Cs)}{(Qe)}$$ (EPA/505/2-90-001, Section 4.5.5)

Where C = downstream concentration Ce = effluent concentration
Cs = upstream concentration Qe = effluent flow
Qs = upstream flow

Chronic wasteload allocations were determined using applicable chronic water quality criteria (CCC: criteria continuous concentration) and stream volume of flow at the edge of the mixing zone (MZ). Acute wasteload allocations were determined using applicable water quality criteria (CMC: criteria maximum concentration) and stream volume of flow at the edge of the zone of initial dilution (ZID).

Water quality based maximum daily and average monthly effluent limitations were calculated using methods and procedures outlined in USEPA's "Technical Support Document For Water Quality-based Toxics Control" (EPA/505/2-90-001).

Number of Samples "n":
Additionally, in accordance with the TSD for water quality-based permitting, effluent quality is determined by the underlying distribution of daily values, which is determined by the Long Term Average (LTA) associated with a particular Wasteload Allocation (WLA) and by the Coefficient of Variation (CV) of the effluent concentrations. Increasing or decreasing the monitoring frequency does not affect this underlying distribution or treatment performance, which should be, at a minimum, be targeted to comply with the values dictated by the WLA. Therefore, it is recommended that the actual planned frequency of monitoring normally be used to determine the value of "n" for calculating the AML. However, in situations where monitoring frequency is once per month or less, a higher value for "n" must be assumed for AML derivation purposes. Thus, the statistical procedure being employed using an assumed number of samples is "n = 4" at a minimum. For Total Ammonia as Nitrogen, "n = 30" is used.

WLA MODELING:
There are two general types of effluent limitations, technology-based effluent limits (TBELs) and water quality based effluent limits (WQBELs). If TBELs do not provide adequate protection for the receiving waters, then WQBEL must be used.

✓ A WLA study was either not submitted or determined not applicable by Department staff.

WHOLE EFFLUENT TOXICITY (WET) TEST:
A WET test is a quantifiable method of determining if a discharge from a facility may be causing toxicity to aquatic life by itself, in combination with or through synergistic responses when mixed with receiving stream water.

Under the federal Clean Water Act (CWA) §101(a)(3), requiring WET testing is reasonably appropriate for site-specific Missouri State Operating Permits for discharges to waters of the state issued under the National Pollutant Discharge Elimination System (NPDES). WET testing is also required by 40 CFR 122.44(d)(1). WET testing ensures that the provisions in the 10 CSR 20-6.010(8)(A) and the Water Quality Standards 10 CSR 20-7.031(4)(D),(F),(G),(J)2.A & B are being met. Under [10 CSR 20-6.010(8)(B)], the Department may require other terms and conditions that it deems necessary to assure compliance with the Clean

Water Act and related regulations of the Missouri Clean Water Commission. In addition the following MCWL apply: §§§644.051.3 requires the Department to set permit conditions that comply with the MCWL and CWA; 644.051.4 specifically references toxicity as an item we must consider in writing permits (along with water quality-based effluent limits, pretreatment, etc…); and 644.051.5 is the basic authority to require testing conditions. WET test will be required by facilities meeting the following criteria:

- ☒ Facility is a designated Major.
- ☐ Facility continuously or routinely exceeds its design flow.
- ☐ Facility that exceeds its design population equivalent (PE) for BOD_5 whether or not its design flow is being exceeded.
- ☐ Facility (whether primarily domestic or industrial) that alters its production process throughout the year.
- ☐ Facility handles large quantities of toxic substances, or substances that are toxic in large amounts.
- ☒ Facility has Water Quality-based Effluent Limitations for toxic substances (other than NH_3)
- ☒ Facility is a municipality with a Design Flow ≥ 22,500 gpd.
- ☐ Other – please justify.

✓ The permittee is required to conduct WET test for this facility.

40 CFR 122.41(M) - BYPASSES:

The federal Clean Water Act (CWA), Section 402 prohibits wastewater dischargers from "bypassing" untreated or partially treated sewage (wastewater) beyond the headworks. A bypass is defined as an intentional diversion of waste streams from any portion of a treatment facility, [40 CFR 122.41(m)(1)(i)]. Additionally, Missouri regulation 10 CSR 20-7.015(9)(G) states a bypass means the intentional diversion of waste streams from any portion of a treatment facility, except in the case of blending, to waters of the state. Only under exceptional and specified limitations do the federal regulations allow for a facility to bypass some or all of the flow from its treatment process. Bypasses are prohibited by the CWA unless a permittee can meet all of the criteria listed in 40 CFR 122.41(m)(4)(i)(A), (B), & (C). Any bypasses from this facility are subject to the reporting required in 40 CFR 122.41(l)(6) and per Missouri's Standard Conditions I, Section B, part 2.b. Additionally, Anticipated Bypasses include bypasses from peak flow basins or similar devices designed for peak wet weather flows.

✓ Bypasses occur or have occurred at this facility.

- Outfall #005 is no longer authorized to discharge as it is a Bypass..

303(d) LIST & TOTAL MAXIMUM DAILY LOAD (TMDL):

Section 303(d) of the federal Clean Water Act requires that each state identify waters that are not meeting water quality standards and for which adequate water pollution controls have not been required. Water quality standards protect such beneficial uses of water as whole body contact (such as swimming), maintaining fish and other aquatic life, and providing drinking water for people, livestock and wildlife. The 303(d) list helps state and federal agencies keep track of waters that are impaired but not addressed by normal water pollution control programs.

A TMDL is a calculation of the maximum amount of a given pollutant that a body of water can absorb before its water quality is affected. If a water body is determined to be impaired as listed on the 303(d) list, then a watershed management plan will be developed that shall include the TMDL calculation

✓ This facility discharges to a 303(d) listed stream. The Missouri River is listed on the 2018 Missouri 303(d) List for *E. coli*.

- It is unknown at this time if the facility is a source of the above listed pollutant or considered to contribute to the impairment of the Missouri River. Once a TMDL is developed, the permit may be modified to include WLAs from the TMDL.

✓ This facility discharges to a stream with an EPA approved TMDL. The TMDL for the Missouri River was approved by the EPA on November 3, 2006. The pollutants of concern were Chlordane and Polychlorinated Biphenyls. The TMDL discusses that there are no Missouri facilities which discharge either directly to the Missouri River, or a tributary to, that have a potential to discharge detectable amounts of PCBs or chlordane. Therefore, the KC Blue River WWTP is not considered a source of the pollutants of concern.

Part VI – Effluent Limits Determination

OUTFALL #001 – MAIN FACILITY OUTFALL

Effluent limitations derived and established in the below Effluent Limitations Table are based on current operations of the facility. Future permit action due to facility modification may contain new operating permit terms and conditions that supersede the terms and conditions, including effluent limitations, of this operating permit.

EFFLUENT LIMITATIONS TABLE:

PARAMETER	Unit	Basis for Limits	Daily Maximum	Weekly Average	Monthly Average	Previous Permit Limit	Sampling Frequency	Reporting Frequency	Sample Type ****
Flow	MGD	1	*		*	*/*	1/day	monthly	T
BOD_5	mg/L	1		60	40	60/40	1/weekday	monthly	C
TSS	mg/L	1		60	40	60/40	1/weekday	monthly	C
*Escherichia coli***	#/100mL	1, 3		1,030	206	1,030/206	1/month	monthly	G
Ammonia as N (January)	mg/L	2, 3	*		*	70.1/27.1	1/weekday	monthly	C
Ammonia as N (February)	mg/L	2, 3	*		*	70.1/27.1	1/weekday	monthly	C
Ammonia as N (March)	mg/L	2, 3	*		*	70.1/27.1	1/weekday	monthly	C
Ammonia as N (April)	mg/L	2, 3	*		*	45.1/17.3	1/weekday	monthly	C
Ammonia as N (May)	mg/L	2, 3	*		*	45.1/17.3	1/weekday	monthly	C
Ammonia as N (June)	mg/L	2, 3	58.1		36.4	45.1/17.3	1/weekday	monthly	C
Ammonia as N (July)	mg/L	2, 3	66.7		32.1	45.1/17.3	1/weekday	monthly	C
Ammonia as N (August)	mg/L	2, 3	71.6		37.5	45.1/17.3	1/weekday	monthly	C
Ammonia as N (September)	mg/L	2, 3	*		*	45.1/17.3	1/weekday	monthly	C
Ammonia as N (October)	mg/L	2, 3	*		*	70.1/27.1	1/weekday	monthly	C
Ammonia as N (November)	mg/L	2, 3	*		*	70.1/27.1	1/weekday	monthly	C
Ammonia as N (December)	mg/L	2, 3	*		*	70.1/27.1	1/weekday	monthly	C
Chlorine, Total Residual	µg/L	1, 3	< 130		< 130	<130/<130	1/week	monthly	G
Total Phosphorus	mg/L	1	*		*	*/*	1/month	monthly	C
Total Kjeldahl Nitrogen	mg/L	1	*		*	***	1/month	monthly	C
Nitrite + Nitrate	mg/L	1	*		*	*/*	1/month	monthly	C
Acute Whole Effluent Toxicity	TUa	1, 9	*			% survival	2 acute and 2 chronic for next permit renewal		C
Chronic Whole Effluent Toxicity	TUc	1, 9	*			***			C

PARAMETER	Unit	Basis for Limits	Minimum		Maximum	Previous Permit Limit	Sampling Frequency	Reporting Frequency	Sample Type
pH	SU	1	6.0		9.0	6.5-9.0	1/weekday	monthly	G

PARAMETER	Unit	Basis for Limits	Daily Minimum		Monthly Avg. Min	Previous Permit Limit	Sampling Frequency	Reporting Frequency	Sample Type
BOD_5 Percent Removal	%	1			65	65	1/month	monthly	M
TSS Percent Removal	%	1			65	65	1/month	monthly	M

* - Monitoring requirement only.
** - #/100mL; the Monthly Average for *E. coli* is a geometric mean.
*** - Parameter not previously established in previous state operating permit.

**** - C = 24-hour composite
G = Grab
T = 24-hr. total
E = 24-hr. estimate
M = Measured/calculated

Basis for Limitations Codes:

1. State or Federal Regulation/Law
2. Water Quality Standard (includes RPA)
3. Water Quality Based Effluent Limits
4. Antidegradation Review
5. Antidegradation Policy
6. Water Quality Model
7. Best Professional Judgment
8. TMDL or Permit in lieu of TMDL
9. WET Test Policy
10. Multiple Discharger Variance
11. Nutrient Criteria Implementation Plan

PARAMETER	Unit	Basis for Limits	Daily Maximum	Weekly Average	Monthly Average	Previous Permit Limit	Sampling Frequency	Reporting Frequency	Sample Type ****
Cadmium, TR	µg/L	7	*		*	5.2/2.9	1/quarter	quarterly	G
Copper, TR	µg/L	7	*		*	88/39	1/quarter	quarterly	G
Cyanide, ATC	µg/L	7	*		*	44.8/19.3	1/quarter	quarterly	G
Oil & Grease	mg/L	7	*		*	15/10	1/quarter	quarterly	G
Phenol	µg/L	7	*		*	458/100	1/quarter	quarterly	G

* - Monitoring requirement only.
** - #/100mL; the Monthly Average for *E. coli* is a geometric mean.
*** - Parameter not previously established in previous state operating permit.

**** - C = 24-hour composite
G = Grab
T = 24-hr. total
E = 24-hr. estimate
M = Measured/calculated

Basis for Limitations Codes:

1. State or Federal Regulation/Law
2. Water Quality Standard (includes RPA)
3. Water Quality Based Effluent Limits
4. Antidegradation Review
5. Antidegradation Policy
6. Water Quality Model
7. Best Professional Judgment
8. TMDL or Permit in lieu of TMDL
9. WET Test Policy
10. Multiple Discharger Variance
11. Nutrient Criteria Implementation Plan

OUTFALL #001 – DERIVATION AND DISCUSSION OF LIMITS:

- **Flow**. In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to assure compliance with permitted effluent limitations. If the permittee is unable to obtain effluent flow, then it is the responsibility of the permittee to inform the Department, which may require the submittal of an operating permit modification.

- **Biochemical Oxygen Demand (BOD_5)**. Operating permit retains 60 mg/L as a Weekly Average and 40 mg/L as a Monthly Average from the previous permit. Effluent limits were established in accordance with 10 CSR 20-7.015(2)(A)3.D., which allows the Department to set more stringent effluent limits based on the facilities performance. This limit was found to have been established in the 1994 permit.

- **Total Suspended Solids (TSS)**. Operating permit retains 60 mg/L as a Weekly Average and 40 mg/L as a Monthly Average from the previous permit. Effluent limits were established in accordance with 10 CSR 20-7.015(2)(A)3.D., which allows the Department to set more stringent effluent limits based on the facilities performance. This limit was found to have been established in the 1994 permit.

- ***Escherichia coli (E. coli)***. Monthly average of 206 per 100 mL as a geometric mean and Weekly Average of 1,030 per 100 mL as a geometric mean during the recreational season (April 1 – October 31), for discharges within two miles upstream of segments or lakes with Whole Body Contact Recreation (B) designated use of the receiving stream, as per 10 CSR 20-7.015(9)(B). An effluent limit for both monthly average and weekly average is required by 40 CFR 122.45(d). The Geometric Mean is calculated by multiplying all of the data points and then taking the nth root of this product, where n = # of samples collected. For example: Five *E. coli* samples were collected with results of 1, 4, 6, 10, and 5 (#/100mL). Geometric Mean = 5^{th} root of (1)(4)(6)(10)(5) = 5^{th} root of 1,200 = 4.1 #/100mL.

- **Total Ammonia Nitrogen**. Early Life Stages Present Total Ammonia Nitrogen criteria apply [10 CSR 20-7.031(5)(B)7.C. & Table B3]. Background total ammonia nitrogen = 0.01 mg/L.

  The Department previously followed the 2007 Ammonia Guidance method for derivation of ammonia limits. However, the EPA's Technical Support Document for Water Quality-based Toxic Controls (TSD) establishes other alternatives to limit derivation. The Department has determined that the approach established in Section 5.4.2 of the TSD, which allows for direct application of both the acute and chronic wasteload allocations (WLA) as permit limits for toxic pollutants, is more appropriate limit derivation approach. Using this method for a discharge to a waterbody where mixing is not allowed, the criterion continuous concentration (CCC) and the criterion maximum concentration (CMC) will equal the chronic and acute WLA respectively. The WLAs are then applied as effluent limits, per Section 5.4.2 of the TSD, where the CMC is the Daily Maximum and the CCC is the Monthly Average. The direct application of both acute and chronic criteria as WLA is also applicable for facilities that discharge into receiving waterbodies with mixing considerations. The CCC and CMC will need to be calculated into WLA with mixing considerations using the mass-balance equation:

$$Ce = \frac{(Qe + Qs)C - (Qs \times Cs)}{(Qe)}$$

Where C = downstream concentration
Ce = effluent concentration
Cs = upstream concentration
Qe = effluent flow
Qs = upstream flow

In the event that mixing considerations derive an AML less stringent than the MDL, the AML and MDL will be equal and based on the MDL.

Month	Temp (°C)*	pH (SU)*	Total Ammonia Nitrogen CCC (mg/L)	Total Ammonia Nitrogen CMC (mg/L)
January	2.3	7.4	2.7	22.7
February	2.7	7.4	2.7	23.0
March	9.1	7.4	2.8	24.4
April	15.8	7.4	2.3	21.9
May	20.3	7.5	1.9	21.0
June	26.0	7.5	1.2	20.8
July	28.8	7.4	1.0	23.9
August	28.1	7.3	1.2	25.6
September	23.5	7.3	1.5	25.7
October	16.1	7.3	2.4	26.8
November	10.3	7.3	2.9	26.3
December	4.0	7.4	2.7	21.9

* Calculated Zone of Initial Dilution and Mixing Zone pH values using the DESCON model to develop mixed pH values to use for calculating limits. Ecoregion data (Western Corn Belt Plains) and effluent data were used to calculate limits.

January – May, September – December: Monitoring requirement only. This data will be used during the next permit renewal

June
Chronic WLA: Ce = ((162.75 + 4890.02042)1.2 – (4890.02042 * 0.01)) / 162.75
Ce = 36.4

Acute WLA: Ce = ((162.75 + 292.42647)20.8 – (292.42647 * 0.01)) / 292.42647
Ce = 58.1

AML = WLAc = 36.4 mg/L
MDL = WLAa = 58.1 mg/L

July
Chronic WLA: Ce = ((162.75 + 4890.02042)1 – (4890.02042 * 0.01)) / 162.75
Ce = 32.1

Acute WLA: Ce = ((162.75 + 292.42647)23.9 – (292.42647 * 0.01)) / 292.42647
Ce = 66.7

AML = WLAc = 32.1 mg/L
MDL = WLAa = 66.7 mg/L

August
Chronic WLA: Ce = ((162.75 + 4890.02042)1.2 – (4890.02042 * 0.01)) / 162.75
Ce = 37.5

Acute WLA: Ce = ((162.75 + 292.42647)25.6 – (292.42647 * 0.01)) / 292.42647
Ce = 71.6

AML = WLAc = 37.5 mg/L
MDL = WLAa = 71.6 mg/L

- **Oil & Grease**. Monitoring requirement only. This data will be reviewed during the next permit renewal.

- **Total Residual Chlorine (TRC)**. Warm-water Protection of Aquatic Life CCC = 11 µg/L, CMC = 19 µg/L [10 CSR 20-7.031, Table A]. Background TRC = 0.0 µg/L.

  Chronic WLA: $C_e = ((162.75 + 4{,}890.02)11 - (4{,}890.02 * 0.0))/162.75$
  $C_e = 341.51$ µg/L

  Acute WLA: $C_e = ((162.75 + 292.43)19 - (292.43 * 0.0))/162.75$
  $C_e = 53.14$ µg/L

  $LTA_c = 341.51\ (0.72861) = 248.83$ µg/L [CV = 0.28, 99th Percentile]
  $LTA_a = 53.14\ (0.546) = 29.0$ µg/L [CV = 0.28, 99th Percentile]

  Use most protective number of LTA_c or LTA_a.

  MDL = 29.0 (1.83) = **53** µg/L [CV = 0.28, 99th Percentile]
  AML = 29.0 (1.25) = **36** µg/L [CV = 0.28, 95th Percentile, n = 4]

  The Water Quality Based Effluent Limit for Total Residual Chlorine was calculated to be 53 µg/L (daily maximum limit) and 26 µg/L (monthly average limit). These limits are below the minimum quantification level (ML) of the most common and practical EPA approved CLTRC methods. The Department has determined the current acceptable ML for total residual chlorine to be 130 µg/L when using the DPD Colorimetric Method #4500 – CL G. from Standard Methods for the Examination of Waters and Wastewater. The permittee will conduct analyses in accordance with this method, or equivalent, and report actual analytical values. Measured values greater than or equal to the minimum quantification level of 130 µg/L will be considered violations of the permit and values less than the minimum quantification level of 130 µg/L will be considered to be in compliance with the permit limitation.

- **Total Phosphorus and Total Nitrogen (Speciated)**. Effluent monitoring for Total Phosphorus, Total Kjeldahl Nitrogen, and Nitrite + Nitrate are required per 10 CSR 20-7.015(9)(D)8.

- **pH**. 6.0-9.0 SU. pH limitations [10 CSR 20-7.015] are protective of the water quality standard [10 CSR 20-7.031(5)(E)], due to the assimilative capacity of the receiving stream.

- **Phenol**. Monitoring requirement only. This data will be reviewed during the next permit renewal.

- **Cyanide, Amenable to Chlorination**. Monitoring only requirements have been included in this permit. An RPA was conducted based on the current WQS and determined that there is no reasonable potential to violate the water quality standard for Cyanide, please see **Appendix – RPA Results.** This determination will be reassessed at the time of renewal.

- **Biochemical Oxygen Demand (BOD_5) Percent Removal**. In accordance with 40 CFR Part 133, removal efficiency is a method by which the Federal Regulations define Secondary Treatment and Equivalent to Secondary Treatment, which applies to BOD_5 and TSS for Publicly Owned Treatment Works (POTWs)/municipals. This facility is required to meet 65% removal efficiency for BOD_5.

- **Total Suspended Solids (TSS) Percent Removal**. In accordance with 40 CFR Part 133, removal efficiency is a method by which the Federal Regulations define Secondary Treatment and Equivalent to Secondary Treatment, which applies to BOD_5 and TSS for Publicly Owned Treatment Works (POTWs)/municipals. This facility is required to meet 65% removal efficiency for TSS.

Metals

Effluent limitations for total recoverable metals were developed using methods and procedures outlined in the "Technical Support Document for Water Quality-based Toxic Controls" (EPA/505/2-90-001) and "The Metals Translator: Guidance For Calculating a Total Recoverable Permit Limit from a Dissolved Criterion" (EPA 823-B-96-007). General warm-water fishery criteria apply. Ecoregion water hardness for Western Corn Belt Plains (EDU - Central Plains/Blackwater/Lamine) of 252 mg/L is used in the calculation below. This value represents the 50th percentile (median) for all watersheds in-stream hardness values through the Ecoregion.

Due to the absence of contemporaneous effluent and instream data for total recoverable metals, dissolved metals, hardness, and total suspended solids with which to calculate metals translators, partitioning between the dissolved and absorbed phases was assumed to be minimal (Section 5.7.3, EPA/505/2-90-001). Freshwater criteria conversion factors for dissolved metals were used as the metals translator as recommended in guidance (Section 1.3, 1.5.3, and Table 1, EPA 823-B-96-007). If concurrent site-specific data for total recoverable metals, dissolved metals, hardness, and total suspended solids are provided to the Department, partitioning evaluations may be considered and site-specific translators developed.

- **Cadmium, Total Recoverable**. Monitoring only requirements have been included in this permit. An RPA was conducted based on the current WQS and determined that there is no reasonable potential to violate the water quality standard for Cadmium, please see **Appendix – RPA Results.** This determination will be reassessed at the time of renewal.

- **Copper, Total Recoverable**. Monitoring only requirements have been included in this permit. An RPA was conducted based on the current WQS and determined that there is no reasonable potential to violate the water quality standard for Copper, please see **Appendix – RPA Results.** This determination will be reassessed at the time of renewal.

Whole Effluent Toxicity

- **Acute Whole Effluent Toxicity**. Monitoring requirement only. Monitoring is required to determine if reasonable potential exists for this facility's discharge to exceed water quality standards.
  - Classified P with other than default Mixing Considerations, the AEC% is determined as follows:

    Acute AEC% = $\{[(\text{design flow}_{cfs} + \text{ZID}_{7Q10}) / \text{design flow}_{cfs}]^{-1}\} \times 100 = \#\#\%$
    Acute AEC% = $\{[(162.75 + 292.43) / 162.75]^{-1}\} \times 100 = 36\%$

- **Chronic Whole Effluent Toxicity**. Monitoring requirement only. Monitoring is required to determine if reasonable potential exists for this facility's discharge to exceed water quality standards.

  - Classified P with other than default Mixing Considerations, the AEC% is determined as follows:

    Chronic AEC% = $\{[(\text{design flow}_{cfs} + \text{MZ}_{7Q10}) / \text{design flow}_{cfs}]^{-1}\} \times 100 = \#\#\%$
    Chronic AEC% = $\{[(162.75 + 4{,}890.02) / 162.75]^{-1}\} \times 100 = 3\%$

- **Total Recoverable Barium, Total Recoverable Boron, Chloride, Total Recoverable Cobalt, and Sulfate**. These parameters are added to the Expanded Effluent Test list that the facility conducts as part of the permit renewal application. These parameters were added as the facility receives landfill leachate and also receives industrial wastewater from industries that have the potential to contain these pollutants. The data will be reviewed at the next permit renewal to determine if a reasonable potential exists to violate water quality standards.

Parameters Removed.

- **Total Toxic Organics (TTO).** The previous permit contained a requirement to sample and report TTOs once per permit cycle. A review of the TTO results shows compliance in accordance with 40 CFR 413.14(f). Due to consistency in compliance, the monitoring requirement for TTOs was removed.

- **Fluoride, Arsenic, Chromium III, Chromium VI, Lead, Mercury, Nickel, Thallium, Zinc**. The previous permit contained a monitoring only requirement for these parameters. These parameters were removed as the permit writer did not observe a reasonable potential to violate Water Quality Standards for these parameters. The permit is still protective of water quality.

- **Hardness**. Hardness was removed as effluent hardness is not applicable to calculate effluent limits.

- **Total Nitrogen**. Total Nitrogen was removed and replaced with Total Kjeldahl Nitrogen

- **Manganese**. Manganese was removed as the receiving stream does not have Water Quality Standards for Groundwater.

Sampling Frequency Justification: Sampling and Reporting Frequency was retained from previous permit, except for Flow which was increased from once per weekday to daily, Total Phosphorus and Nitrate + Nitrite was increased from quarterly to monthly, and Oil & Grease was decreased from monthly to quarterly. The increase for Flow is due to the facility having flows that are impacted by rainfall events due to the CSO system, and that the facility is staffed year-round and has a flow monitoring device that records flow daily. Total Phosphorus and Nitrate + Nitrite frequencies are increased per 10 CSR 20-7.015(9)(D)8. The decrease for Oil & Grease was that the facility has been consistently meeting the limits and the permit writer did not observe a reasonable potential to violate Water Quality Standards. Weekly sampling is required for *E. coli*, per 10 CSR 20-7.015(9)(D)7.A.

WET Test Sampling Frequency Justification. WET Testing schedules and intervals are established in accordance with the Department's Permit Manual; Section 5.2 *Effluent Limits / WET Testing for Compliance Bio-monitoring.* It is recommended that WET testing be conducted during the period of lowest stream flow.

Acute and Chronic Whole Effluent Toxicity – The permittee shall perform a minimum of four whole effluent toxicity tests in the four and one-half year period prior to the next permit renewal application. The four tests shall consist of two chronic toxicity tests and two acute toxicity tests.

Sampling Type Justification: As per 10 CSR 20-7.015, samples collected for mechanical plants shall be a 24 hour composite sample. Grab samples, however, must be collected for pH, *E. coli*, TRC, Oil & Grease, and Cyanide, in accordance with recommended analytical methods. For further information on sampling and testing methods please review 10 CSR 20-7.015(9)(D) 2.

PERMITTED FEATURE INF – INFLUENT MONITORING
The monitoring requirements established in the below Monitoring Requirements Table are based on current operations of the facility. Future permit action due to facility modification may contain new operating permit terms and conditions that supersede the terms and conditions, including the monitoring requirements listed in this table.

INFLUENT MONITORING TABLE:

PARAMETER	Unit	Basis for Limits	Daily Maximum	Weekly Average	Monthly Average	Previous Permit Limit	Sampling Frequency	Reporting Frequency	Sample Type ****
BOD_5	mg/L	1			*	*	1/weekday	monthly	C
TSS	mg/L	1			*	*	1/weekday	monthly	C
Ammonia as N	mg/L	1	*		*	***	1/month	monthly	C
Total Phosphorus	mg/L	1	*		*	***	1/month	monthly	C
Total Kjeldahl Nitrogen	mg/L	1	*		*	***	1/month	monthly	C
Nitrite + Nitrate	mg/L	1	*		*	***	1/month	monthly	C

* - Monitoring requirement only.
*** - Parameter not previously established in previous state operating permit.
**** - C = Composite
G = Grab

Basis for Limitations Codes:
1. State or Federal Regulation/Law
2. Water Quality Standard (includes RPA)
3. Water Quality Based Effluent Limits
4. Antidegradation Review
5. Antidegradation Policy
6. Water Quality Model
7. Best Professional Judgment
8. TMDL or Permit in lieu of TMDL
9. WET Test Policy
10. Multiple Discharger Variance
11. Nutrient Criteria Implementation Plan

Influent Parameters

- **Biochemical Oxygen Demand (BOD_5) and Total Suspended Solids (TSS)**. An influent sample is required to determine the removal efficiency. In accordance with 40 CFR Part 133, removal efficiency is a method by which the Federal Regulations define Secondary Treatment and Equivalent to Secondary Treatment, which applies to BOD_5 and TSS for Publicly Owned Treatment Works (POTWs)/municipals.

- **Total Phosphorus, Total Kjeldahl Nitrogen, Nitrite + Nitrate, and Ammonia**. Influent monitoring for Total Phosphorus, Total Kjeldahl Nitrogen, Nitrite + Nitrate, and Ammonia required per 10 CSR 20-7.015(9)(D)8.

Sampling Frequency Justification: The sampling and reporting frequencies for Total Phosphorus and Total Kjeldahl Nitrogen, Nitrite + Nitrate, and Ammonia parameters were established to match the required sampling frequency of these parameters in the effluent, per [10 CSR 20-7.015(9)(D)8.]. The sampling and reporting frequencies for influent $CBOD_5$ and TSS have been established to match the required sampling frequency of the $CBOD_5$ and TSS percent removal requirement for Outfall #001.

Sampling Type Justification: Sample types for influent parameters were established to match the required sampling type of these parameters in the effluent. Samples should be analyzed as soon as possible after collection and/or properly preserved according to method requirements.

OUTFALL #001 – GENERAL CRITERIA CONSIDERATIONS:
In accordance with 40 CFR 122.44(d)(1), effluent limitations shall be placed into the permit for those pollutants which have been determined to cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality. The rule further states that pollutants which have been determined to cause, have the reasonable potential to cause, or contribute to an excursion above a narrative criterion within an applicable State water quality standard, the permit shall contain a numeric effluent limitation to protect that narrative criterion. In order to comply with this regulation, the permit writer will complete reasonable potential determinations on whether the discharge will violate any of the general criteria listed in 10 CSR 20-7.031(4). These specific requirements are listed below followed by derivation and discussion (the lettering matches that of the rule itself, under 10 CSR 20-7.031(4)). It should also be noted that Section 644.076.1, RSMo as well as Section D – Administrative Requirements of Standard Conditions Part I of this permit states that it shall be unlawful for any person to cause or permit any discharge of water contaminants from any water contaminant or point source located in Missouri that is in violation of sections 644.006 to 644.141 of the Missouri Clean Water Law or any standard, rule or regulation promulgated by the commission.

(A) Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses. The discharge from this facility is made up of treated domestic wastewater. Based upon review of the Report of Compliance Inspection for the inspection conducted on March 7-10, 2017, no evidence of an excursion of this criterion has been observed by the Department in the past and the facility has not disclosed any

other information related to the characteristics of the discharge on their permit application which has the potential to cause or contribute to an excursion of this narrative criterion. Additionally, this facility utilizes equivalent to secondary treatment technology and is currently in compliance with effluent limitations that are more stringent than the equivalent to secondary treatment technology based effluent limits established in 40 CFR 133 and there has been no indication to the Department that the stream has had issues maintaining beneficial uses as a result of this discharge. Based on the information reviewed during the drafting of this permit, these final effluent limitations appear to have protected against the excursion of this criterion in the past. Therefore, the discharge does not have the reasonable potential to cause or contribute to an excursion of this criterion.

(B) Waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses. Please see (A) above as justification is the same.

(C) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses. Please see (A) above as justification is the same.

(D) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life. This permit contains final effluent limitations which are protective of both acute and chronic toxicity for various pollutants that are either expected to be discharged by domestic wastewater facilities or that were disclosed by this facility on the application for permit coverage. Based on the information reviewed during the drafting of this permit, it has been determined if the facility meets final effluent limitations established in this permit, there is no reasonable potential for the discharge to cause an excursion of this criterion.

(E) Waters shall provide for the attainment and maintenance of water quality standards downstream including waters of another state. Please see (D) above as justification is the same.

(F) There shall be no significant human health hazard from incidental contact with the water. Please see (D) above as justification is the same.

(G) There shall be no acute toxicity to livestock or wildlife watering. Please see (D) above as justification is the same.

(H) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community. Please see (A) above as justification is the same.

(I) Waters shall be free from used tires, car bodies, appliances, demolition debris, used vehicles or equipment and solid waste as defined in Missouri's Solid Waste Law, section 260.200, RSMo, except as the use of such materials is specifically permitted pursuant to section 260.200-260.247. The discharge from this facility is made up of treated domestic wastewater. No evidence of an excursion of this criterion has been observed by the Department in the past and the facility has not disclosed any other information related to the characteristics of the discharge on their permit application which has the potential to cause or contribute to an excursion of this narrative criterion. Additionally, any solid wastes received or produced at this facility are wholly contained in appropriate storage facilities, are not discharged, and are disposed of offsite. This discharge is subject to Standard Conditions Part III, which contains requirements for the management and disposal of sludge to prevent its discharge. Therefore, this discharge does not have reasonable potential to cause or contribute to an excursion of this criterion.

Part VII – Cost Analysis for Compliance

Pursuant to Section 644.145, RSMo, when issuing permits under this chapter that incorporate a new requirement for discharges from publicly owned combined or separate sanitary or storm sewer systems or publicly owned treatment works, or when enforcing provisions of this chapter or the Federal Water Pollution Control Act, 33 U.S.C. 1251 et seq., pertaining to any portion of a publicly owned combined or separate sanitary or storm sewer system or [publicly owned] treatment works, the Department of Natural Resources shall make a "finding of affordability" on the costs to be incurred and the impact of any rate changes on ratepayers upon which to base such permits and decisions, to the extent allowable under this chapter and the Federal Water Pollution Control Act. This process is completed through a cost analysis for compliance. Permits that do not include new requirements may be deemed affordable.

✓ The Department is required to make a "finding of affordability" on the new environmental requirement(s) within the permit. However, the facility chose to waive the finding of affordability requirement; therefore, no Cost Analysis for Compliance was conducted.

Part VIII – Administrative Requirements

On the basis of preliminary staff review and the application of applicable standards and regulations, the Department, as administrative agent for the Missouri Clean Water Commission, proposes to issue a permit(s) subject to certain effluent limitations, schedules, and special conditions contained herein and within the operating permit. The proposed determinations are tentative pending public comment.

WATER QUALITY STANDARD REVISION:
In accordance with section 644.058, RSMo, the Department is required to utilize an evaluation of the environmental and economic impacts of modifications to water quality standards of twenty-five percent or more when making individual site-specific permit decisions.

✓ This operating permit does not contain requirements for a water quality standard that has changed twenty-five percent or more since the previous operating permit.

PERMIT SYNCHRONIZATION:
The Department of Natural Resources is currently undergoing a synchronization process for operating permits. Permits are normally issued on a five-year term, but to achieve synchronization many permits will need to be issued for less than the full five years allowed by regulation. The intent is that all permits within a watershed will move through the Watershed Based Management (WBM) cycle together will all expire in the same fiscal year. This will allow further streamlining by placing multiple permits within a smaller geographic area on public notice simultaneously, thereby reducing repeated administrative efforts. This will also allow the Department to explore a watershed based permitting effort at some point in the future. Renewal applications must continue to be submitted within 180 days of expiration, however, in instances where effluent data from the previous renewal is less than 4 years old, that data may be re-submitted to meet the requirements of the renewal application. If the permit provides a schedule of compliance for meeting new water quality based effluent limits beyond the expiration date of the permit, the time remaining in the schedule of compliance will be allotted in the renewed permit.

PUBLIC NOTICE:
The Department shall give public notice that a draft permit has been prepared and its issuance is pending. Additionally, public notice will be issued if a public hearing is to be held because of a significant degree of interest in and water quality concerns related to a draft permit. No public notice is required when a request for a permit modification or termination is denied; however, the requester and permittee must be notified of the denial in writing. The Department must issue public notice of a pending operating permit or of a new or reissued statewide general permit. The public comment period is the length of time not less than 30 days following the date of the public notice which interested persons may submit written comments about the proposed permit. For persons wanting to submit comments regarding this proposed operating permit, then please refer to the Public Notice page located at the front of this draft operating permit. The Public Notice page gives direction on how and where to submit appropriate comments.

✓ The Public Notice period for this operating permit was from January 29, 2021 to March 1, 2021. No responses received.

DATE OF FACT SHEET: MARCH 9, 2021

COMPLETED BY:

BRANT FARRIS, ENVIRONMENTAL SPECIALIST
MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
OPERATING PERMITS SECTION - DOMESTIC WASTEWATER UNIT
(660) 385-8019
brant.farris@dnr.mo.gov

Appendices

APPENDIX - CLASSIFICATION WORKSHEET:

Item	Points Possible	Points Assigned
Maximum Population Equivalent (P.E.) served , peak day	1 pt./10,000 PE or major fraction thereof. (Max 10 pts.)	10
Design Flow (avg. day) or peak month's flow (avg. day) whichever is larger	1 pt. / MGD or major fraction thereof. (Max 10 pts.)	10
Effluent Discharge		
Missouri or Mississippi River	0	0
All other stream discharges except to losing streams and stream reaches supporting whole body contact recreation	1	
Discharge to lake or reservoir outside of designated whole body contact recreational area	2	
Discharge to losing stream, or stream, lake or reservoir area supporting whole body contact recreation	3	3
Direct reuse or recycle of effluent	6	
Land Application/Irrigation		
Drip Irrigation	3	
Land application/irrigation	5	
Overland flow	4	
Variation in Raw Wastes (highest level only)		
Variations do not exceed those normally or typically expected	0	
Reoccurring deviations or excessive variations of 100 to 200 percent in strength and/or flow	2	
Reoccurring deviations or excessive variations of more than 200 percent in strength and/or flow	4	
Department-approved pretreatment program	6	6
Preliminary Treatment		
STEP systems (operated by the permittee)	3	
Screening and/or comminution	3	3
Grit removal	3	3
Plant pumping of main flow	3	
Flow equalization	5	
Primary Treatment		
Primary clarifiers	5	5
Chemical addition (except chlorine, enzymes)	4	
Secondary Treatment		
Trickling filter and other fixed film media with or without secondary clarifiers	10	10
Activated sludge (including aeration, oxidation ditches, sequencing batch reactors, membrane bioreactors, and contact stabilization)	15	
Stabilization ponds without aeration	5	
Aerated lagoon	8	
Advanced Lagoon Treatment – Aerobic cells, anaerobic cells, covers, or fixed film	10	
Biological, physical, or chemical	12	
Carbon regeneration	4	
Total from page **ONE (1)**	----	50

APPENDIX - CLASSIFICATION WORKSHEET (CONTINUED):

ITEM	POINTS POSSIBLE	POINTS ASSIGNED
Solids Handling		
Sludge Holding	5	5
Anaerobic digestion	10	10
Aerobic digestion	6	
Evaporative sludge drying	2	
Mechanical dewatering	8	8
Solids reduction (incineration, wet oxidation)	12	12
Land application	6	6
Disinfection		
Chlorination or comparable	5	5
On-site generation of disinfectant (except UV light)	5	
Dechlorination	2	2
UV light	4	
Required Laboratory Control Performed by Plant Personnel (highest level only)		
Lab work done outside the plant	0	
Push – button or visual methods for simple test such as pH, settleable solids	3	
Additional procedures such as DO, COD, BOD, titrations, solids, volatile content	5	
More advanced determinations, such as BOD seeding procedures, fecal coliform, nutrients, total oils, phenols, etc.	7	7
Highly sophisticated instrumentation, such as atomic absorption and gas chromatograph	10	
Total from page **TWO (2)**	----	55
Total from page **ONE (1)**	---	50
Grand Total	---	105

☒ - A: 71 points and greater
☐ - B: 51 points – 70 points
☐ - C: 26 points – 50 points
☐ - D: 0 points – 25 points

APPENDIX: RECEIVING STREAM LOW-FLOW VALUE:

KC Blue River WWTF MO-0024911 (105 MGD Design Flow)								
	Flow (CFS)	Design Flow (CFS)	ZID Dilution (from 2008 dye study)	ZID based on 2008 study (CFS)	Default ZID - 1/40th streamflow (CFS)	MZ Dilution (from 2008 dye study)	MZ based on 2008 study (CFS)	Default MZ (1/4th stream flow)
1Q10	18002.9	162.45915	2.8	292.42647	450.0725	30.1	4890.02042	4500.725
7Q10	19042.7	162.45915	2.8	292.42647	476.0675	30.1	4890.02042	4760.675
30Q10	20362.1	162.45915	2.8	292.42647	509.0525	30.1	4890.02042	5090.525

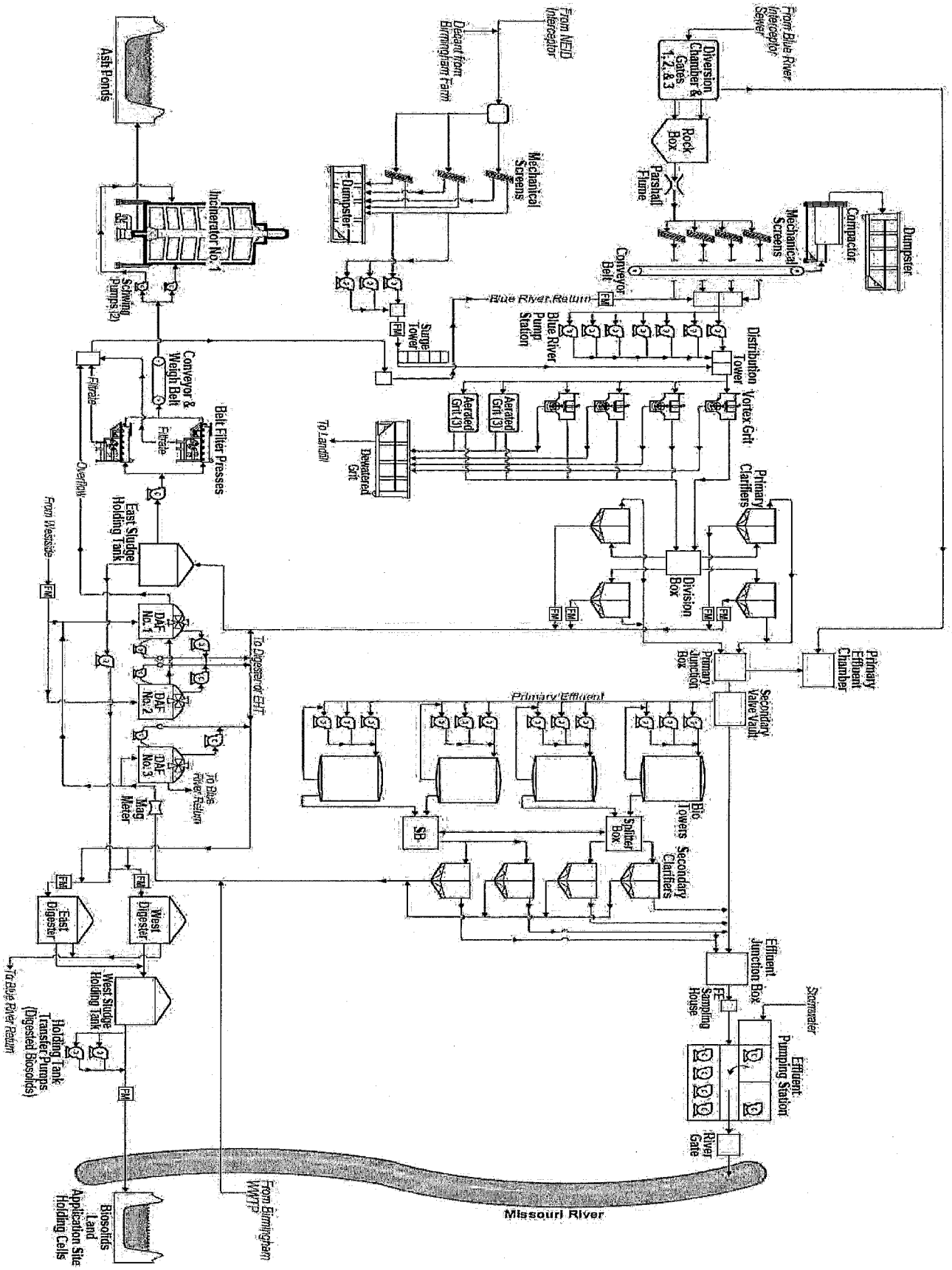
APPENDIX – RPA RESULTS:

Parameter	CMC*	RWC Acute*	CCC*	RWC Chronic*	n**	Range max/min	CV***	MF	RP Yes/No
Ammonia as N – January (mg/L)	22.7	14.09	2.7	1.28	87.00	32.2/6	0.30	1.22	NO
Ammonia as N – February (mg/L)	23.0	16.83	2.7	1.52	82.00	37.8/6.6	0.31	1.24	NO
Ammonia as N – March (mg/L)	24.4	13.14	2.8	1.19	95.00	30/6.6	0.32	1.22	NO
Ammonia as N – April (mg/L)	21.9	10.12	2.3	0.92	89.00	23.7/4.8	0.26	1.19	NO
Ammonia as N – May (mg/L)	21.0	12.81	1.9	1.16	89.00	27.3/4.5	0.41	1.31	NO
Ammonia as N – June (mg/L)	20.8	15.10	1.2	1.37	111.00	35/4.8	0.33	1.21	YES
Ammonia as N – July (mg/L)	23.9	11.88	1.0	1.08	113.00	28.5/5.5	0.27	1.17	YES
Ammonia as N – August (mg/L)	25.6	16.74	1.2	1.52	113.00	38/2.5	0.38	1.23	YES
Ammonia as N – September (mg/L)	25.7	11.84	1.5	1.08	111.00	27.7/3.7	0.31	1.19	NO
Ammonia as N – October (mg/L)	26.8	11.10	2.4	1.01	115.00	25.9/1.6	0.33	1.20	NO
Ammonia as N – November (mg/L)	26.3	11.91	2.9	1.08	103.00	28.3/3.1	0.27	1.18	NO
Ammonia as N – December (mg/L)	21.9	12.44	2.7	1.13	92.00	28.6/5.5	0.30	1.22	NO
Arsenic, Total Recoverable	340.0	1.74	150.0	0.16	19.00	2.1/0.0425	0.6	2.32	NO
Cadmium, TR	12.9	0.84	1.7	0.08	21.00	2.5/0.055	2.3	0.94	NO
Chromium III, TR	3,844.0	8.00	183.7	0.72	21.00	11/1.5	0.5	2.04	NO
Chromium VI, Dissolved	16.0	3.88	11.0	0.35	22.00	10/4.85	0.2	1.08	NO
Copper, Total Recoverable	33.4	27.47	20.6	2.47	21.00	37/5	0.5	2.08	NO
Lead, Total Recoverable	264.7	4.57	10.3	0.41	20.00	4.6/0.013	0.8	2.78	NO
Mercury, Total Recoverable	1.6	0.16	0.8	0.01	21.00	0.2/0.0125	1.3	2.18	NO
Nickel, Total Recoverable	1,026.1	23.95	114.0	2.16	21.00	20/0.2	1.1	3.35	NO
Thallium, Total Recoverable	NA	NA	6.3	0.36	21.00	5.9/0.014	3.4	1.90	NO
Zinc, Total Recoverable	262.7	30.52	260.6	2.75	21.00	56/6.6	0.3	1.52	NO
Fluoride (mg/L)	NA	NA	4.0	0.03	291.00	0.848/0.077	0.3	1.05	NO
Total Residual Chlorine (mg/L)	19.0	34.84	11.0	3.14	51.00	100/10	0.3	0.97	YES
Cyanide, ATC	22.0	11.97	5.2	1.08	63.00	25/2.5	1.0	1.34	NO
Phenol	NA	NA	100.0	3.34	20.00	38/0.39	1.49	2.73	NO
Chloroform	NA	NA	5.7	0.40	5.00	3.3/0.65	0.6	3.76	NO
Bis(2-ethylhexyl) phthalate	NA	NA	5.90	2.27	6	20.1/0.42	0.6	3.501629	NO

N/A – Not Applicable
* - Units are (µg/L) unless otherwise noted.
** - If the number of samples is 10 or greater, then the CV value must be used in the WQBEL for the applicable constituent. If the number of samples is < 10, then the default CV value must be used in the WQBEL for the applicable constituent.
*** - Coefficient of Variation (CV) is calculated by dividing the Standard Deviation of the sample set by the Mean of the same sample set.
RWC – Receiving Water Concentration. It is the concentration of a toxicant or the parameter toxicity in the receiving water after mixing (if applicable).
n – Is the number of samples.
MF – Multiplying Factor. 99% Confidence Level and 99% Probability Basis.
RP – Reasonable Potential. It is where an effluent is projected or calculated to cause an excursion above a water quality standard based on a number of factors including, as a minimum, the four factors listed in 40 CFR 122.44(d)(1)(ii).

Reasonable Potential Analysis is conducted as per (TSD, EPA/505/2-90-001, Section 3.3.2). A more detailed version including calculations of this RPA is available upon request.

APPENDIX – ALTERNATIVE: Flow diagram



Appendix – Sewer Extension Authority Supervised Program Reauthorization Letter

Missouri Department of
NATURAL RESOURCES
Michael L. Parson, Governor — Carol S. Comer, Director

DEC 19 2019

Mr. Terry Leeds, Director
Kansas City Water
4800 E. 63rd Street
Kansas City, MO 64130

RE: Kansas City Sewer Extension Authority Program Reauthorization, ACT235, MO-0024911, Jackson County

Dear Mr. Leeds:

The Missouri Department of Natural Resources' Water Protection Program has reevaluated the Kansas City's Sewer Extension Authority Supervised Program (Program) and approved the reauthorization per 10 CSR 20-6.010(6). This Program delegates administrative responsibility of construction sewer extension permits to the City of Kansas City and reporting requirements are included in the associated Missouri State Operating Permits (MSOP).

The Program shall apply to construction permits for sewer extensions that discharge to the following MSOP(s):

- MO-0024911 [Kansas City- Blue River WWTF, Jackson County]
- MO-0024929 [Kansas City- Westside WWTF, Jackson County]
- MO-0048305 [Kansas City- Rock Branch WWTF, Clay County]
- MO-0048313 [Kansas City- Fishing River WWTF, Clay County]
- MO-0049531 [Kansas City- Birmingham WWTF, Clay County]
- MO-0024961 [Kansas City- Todd Creek WWTF, Platte County]

Kansas City shall act as the continuing authority for the constructed collection system.

This approval is granted until it is reauthorized during the operating permit renewal. Enclosed are the Program conditions, annual reporting requirements, and renewal reauthorization requirements. The Program annual report must be submitted to the Department by April 30 of each year.

This reauthorization does not supersede any requirements of the operating permit or enforcement actions. Nothing in this reauthorization removes any obligations to comply with county or other local ordinances or restrictions.

Recycled paper

If you were adversely affected by this decision, you may be entitled to an appeal before the Administrative Hearing Commission (AHC) pursuant to 10 CSR 20-1.020 and Section 621.250, RSMo. To appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC. Contact information for the AHC is: Administrative Hearing Commission, United States Post Office Bldg., Third Floor, 131 West High Street, P.O. Box 1557, Jefferson City, MO 65102, Phone: 573-751-2422, Fax: 573-751-5018, and Website: www.oa.mo.gov/ahc.

If you have any questions concerning this matter, please contact Ms. Leasue Meyers, of the Water Protection Program by phone at 573-751-7906, or by email at leasue.meyers@dnr.mo.gov or by mail at Department of Natural Resources, P.O. Box 176, Jefferson City, MO 65102.

Thank you for your efforts to help ensure clean water in Missouri.

Sincerely,

WATER PROTECTION PROGRAM

Chris Wieberg
Director

CW:lmt

Enclosure

c: Ms. Sherri Irving, Kansas City Water
Mr. Blake Anderson, PE, Kansas City Water
Ms. Karine Papikian, PE, Kansas City Water
Mr. Brant Farris, Domestic Wastewater Unit
Mr. Scott Honig, Kansas City Regional Office

Kansas City Sewer Extension Authority Activity No. ACT235
Page One

SEWER EXTENSION AUTHORITY SUPERVISED PROGRAM REAUTHORIZATION

I. CONDITIONS:

1. This approval is limited to sewer extensions proposed within Kansas City Water's boundaries for which the receiving wastewater treatment facility is owned, operated, and maintained by Kansas City.

2. Upon completion of accepted construction, Kansas City will become the continuing authority for the operation, maintenance, and modernization of the sewer extension.

3. Additional requirements may be necessary to comply with the requirements contained in 10 CSR 20-4, "Grants and Loans" when funding from the Department is requested.

4. Any updates to the Kansas City Water's Standard Specifications, signed and sealed on December 3, 2019 will require a subsequent review and approval by the Department.

   A. This approval is limited to only wastewater components. Other items contained in this standard specification and details such as drinking water, roadways, structural, mechanical, electrical, etc. were not reviewed.

5. This approval may be reopened and modified to comply with any new or amended design regulations in 10 CSR 20-6.010 and 10 CSR 20-8.

II. ANNUAL REPORTS:

Kansas City must submit an annual report by April 30th of each year to the Engineering Section. The electronic submittals may be emailed to DNR.WPPEngineerSection@dnr.mo.gov. The report shall contain the following for each sewer extension, per 10 CSR 20-6.010(6)(D)1:

1. Name of sewer extension;

2. Population or number of lots to be served;

3. Type of wastewater (i.e. domestic or industrial);

4. Design flow in gallons per day;

5. Length of sewer and force main;

6. Capacity of each pump station, if applicable;

7. The ultimate receiving wastewater treatment facility;

8. Date sewer extension permit is issued;

9. Date sewer extension construction is accepted; and

10. The remaining capacity of each wastewater treatment facility.

III. REAUTHORIZATION REQUEST:

Kansas City must submit a request for reauthorization to the Engineering Section at least 180 days prior to the expiration date of the Kansas City Blue River Wastewater Treatment Facility Operating Permit, MO-0024911. The request shall contain the following, per 10 CSR 20-6.010(6)(E):

1. The current standard technical specifications and typical detail drawings signed, sealed, and dated by a Missouri registered professional engineer.

2. A current layout map, or maps, of the collection system or electronic demonstration. The map(s) shall show sewer sizes and lengths, manholes, cleanouts, pump stations, force mains, air release valves, other sewer appurtenances as necessary, and street names.

3. A list and current number of Missouri registered professional engineers and other qualified staff reviewing plans, issuing sewer extension permits, preparing reports, inspecting construction, and enforcing local and state requirements under the Program.

4. A written statement from Kansas City ensuring that permanent plans of all permitted and constructed sewer extensions records are maintained.

Leasue Meyers, EI
Engineering Section
leasue.meyers@dnr.mo.gov

STANDARD CONDITIONS FOR NPDES PERMITS
ISSUED BY
THE MISSOURI DEPARTMENT OF NATURAL RESOURCES
MISSOURI CLEAN WATER COMMISSION
REVISED
AUGUST 1, 2014

These Standard Conditions incorporate permit conditions as required by 40 CFR 122.41 or other applicable state statutes or regulations. These minimum conditions apply unless superseded by requirements specified in the permit.

Part I – General Conditions
Section A – Sampling, Monitoring, and Recording

1. **Sampling Requirements.**
   a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
   b. All samples shall be taken at the outfall(s) or Missouri Department of Natural Resources (Department) approved sampling location(s), and unless specified, before the effluent joins or is diluted by any other body of water or substance.

2. **Monitoring Requirements.**
   a. Records of monitoring information shall include:
      i. The date, exact place, and time of sampling or measurements;
      ii. The individual(s) who performed the sampling or measurements;
      iii. The date(s) analyses were performed;
      iv. The individual(s) who performed the analyses;
      v. The analytical techniques or methods used; and
      vi. The results of such analyses.
   b. If the permittee monitors any pollutant more frequently than required by the permit at the location specified in the permit using test procedures approved under 40 CFR Part 136, or another method required for an industry-specific waste stream under 40 CFR subchapters N or O, the results of such monitoring shall be included in the calculation and reported to the Department with the discharge monitoring report data (DMR) submitted to the Department pursuant to Section B, paragraph 7.

3. **Sample and Monitoring Calculations.** Calculations for all sample and monitoring results which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in the permit.

4. **Test Procedures**. The analytical and sampling methods used shall conform to the reference methods listed in 10 CSR 20-7.015 unless alternates are approved by the Department. The facility shall use sufficiently sensitive analytical methods for detecting, identifying, and measuring the concentrations of pollutants. The facility shall ensure that the selected methods are able to quantify the presence of pollutants in a given discharge at concentrations that are low enough to determine compliance with Water Quality Standards in 10 CSR 20-7.031 or effluent limitations unless provisions in the permit allow for other alternatives. A method is "sufficiently sensitive" when; 1) the method minimum level is at or below the level of the applicable water quality criterion for the pollutant or, 2) the method minimum level is above the applicable water quality criterion, but the amount of pollutant in a facility's discharge is high enough that the method detects and quantifies the level of pollutant in the discharge, or 3) the method has the lowest minimum level of the analytical methods approved under 10 CSR 20-7.015. These methods are also required for parameters that are listed as monitoring only, as the data collected may be used to determine if limitations need to be established. A permittee is responsible for working with their contractors to ensure that the analysis performed is sufficiently sensitive.

5. **Record Retention.** Except for records of monitoring information required by the permit related to the permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR part 503), the permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by the permit, and records of all data used to complete the application for the permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the Department at any time.

6. **Illegal Activities.**
   a. The Federal Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under the permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than two (2) years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than four (4) years, or both.
   b. The Missouri Clean Water Law provides that any person or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained pursuant to sections 644.006 to 644.141 shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than six (6) months, or by both. Second and successive convictions for violation under this paragraph by any person shall be punished by a fine of not more than $50,000 per day of violation, or by imprisonment for not more than two (2) years, or both.

Section B – Reporting Requirements

1. **Planned Changes.**
   a. The permittee shall give notice to the Department as soon as possible of any planned physical alterations or additions to the permitted facility when:
      i. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); or
      ii. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42;
      iii. The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan;
      iv. Any facility expansions, production increases, or process modifications which will result in a new or substantially different discharge or sludge characteristics must be reported to the Department 60 days before the facility or process modification begins. Notification may be accomplished by application for a new permit. If the discharge does not violate effluent limitations specified in the permit, the facility is to submit a notice to the Department of the changed discharge at least 30 days before such changes. The Department may require a construction permit and/or permit modification as a result of the proposed changes at the facility.

2. **Non-compliance Reporting.**
   a. The permittee shall report any noncompliance which may endanger health or the environment. Relevant information shall be provided orally or via the current electronic method approved by the Department, within 24 hours from the time the permittee becomes aware of the circumstances, and shall be reported to the appropriate Regional Office during normal business hours or the Environmental Emergency Response hotline at 573-634-2436 outside of normal business hours. A written submission shall also be provided within five (5) business days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

b. The following shall be included as information which must be reported within 24 hours under this paragraph.
   i. Any unanticipated bypass which exceeds any effluent limitation in the permit.
   ii. Any upset which exceeds any effluent limitation in the permit.
   iii. Violation of a maximum daily discharge limitation for any of the pollutants listed by the Department in the permit required to be reported within 24 hours.

c. The Department may waive the written report on a case-by-case basis for reports under paragraph 2. b. of this section if the oral report has been received within 24 hours.

3. **Anticipated Noncompliance.** The permittee shall give advance notice to the Department of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. The notice shall be submitted to the Department 60 days prior to such changes or activity.

4. **Compliance Schedules.** Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of the permit shall be submitted no later than 14 days following each schedule date. The report shall provide an explanation for the instance of noncompliance and a proposed schedule or anticipated date, for achieving compliance with the compliance schedule requirement.

5. **Other Noncompliance.** The permittee shall report all instances of noncompliance not reported under paragraphs 2, 3, and 6 of this section, at the time monitoring reports are submitted. The reports shall contain the information listed in paragraph 2. a. of this section.

6. **Other Information.** Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or information.

7. **Discharge Monitoring Reports.**
   a. Monitoring results shall be reported at the intervals specified in the permit.
   b. Monitoring results must be reported to the Department via the current method approved by the Department, unless the permittee has been granted a waiver from using the method. If the permittee has been granted a waiver, the permittee must use forms provided by the Department.
   c. Monitoring results shall be reported to the Department no later than the 28th day of the month following the end of the reporting period.

Section C – Bypass/Upset Requirements

1. **Definitions.**
   a. *Bypass*: the intentional diversion of waste streams from any portion of a treatment facility, except in the case of blending.
   b. *Severe Property Damage*: substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
   c. *Upset*: an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

2. **Bypass Requirements.**
   a. Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs 2. b. and 2. c. of this section.
   b. Notice.
      i. Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least 10 days before the date of the bypass.
      ii. Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in Section B – Reporting Requirements, paragraph 5 (24-hour notice).
   c. Prohibition of bypass.
      i. Bypass is prohibited, and the Department may take enforcement action against a permittee for bypass, unless:
         1. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
         2. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
         3. The permittee submitted notices as required under paragraph 2. b. of this section.
      ii. The Department may approve an anticipated bypass, after considering its adverse effects, if the Department determines that it will meet the three (3) conditions listed above in paragraph 2. c. i. of this section.

3. **Upset Requirements.**
   a. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of paragraph 3. b. of this section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.
   b. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
      i. An upset occurred and that the permittee can identify the cause(s) of the upset;
      ii. The permitted facility was at the time being properly operated; and
      iii. The permittee submitted notice of the upset as required in Section B – Reporting Requirements, paragraph 2. b. ii. (24-hour notice).
      iv. The permittee complied with any remedial measures required under Section D – Administrative Requirements, paragraph 4.
   c. Burden of proof. In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

Section D – Administrative Requirements

1. **Duty to Comply.** The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Missouri Clean Water Law and Federal Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.
   a. The permittee shall comply with effluent standards or prohibitions established under section 307(a) of the Federal Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.
   b. The Federal Clean Water Act provides that any person who violates section 301, 302, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any such sections in a permit issued under section 402, or any requirement imposed in a pretreatment program approved under sections 402(a)(3) or 402(b)(8) of the Act, is subject to a civil penalty not to exceed $25,000 per day for each violation. The Federal Clean Water Act provides that any person who negligently violates sections 301, 302, 306, 307, 308, 318, or 405 of the Act, or any condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, or any requirement

imposed in a pretreatment program approved under section 402(a)(3) or 402(b)(8) of the Act, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than one (1) year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than two (2) years, or both. Any person who knowingly violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than three (3) years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than six (6) years, or both. Any person who knowingly violates section 301, 302, 303, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.

c. Any person may be assessed an administrative penalty by the EPA Director for violating section 301, 302, 306, 307, 308, 318 or 405 of this Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.

d. It is unlawful for any person to cause or permit any discharge of water contaminants from any water contaminant or point source located in Missouri in violation of sections 644.006 to 644.141 of the Missouri Clean Water Law, or any standard, rule or regulation promulgated by the commission. In the event the commission or the director determines that any provision of sections 644.006 to 644.141 of the Missouri Clean Water Law or standard, rules, limitations or regulations promulgated pursuant thereto, or permits issued by, or any final abatement order, other order, or determination made by the commission or the director, or any filing requirement pursuant to sections 644.006 to 644.141 of the Missouri Clean Water Law or any other provision which this state is required to enforce pursuant to any federal water pollution control act, is being, was, or is in imminent danger of being violated, the commission or director may cause to have instituted a civil action in any court of competent jurisdiction for the injunctive relief to prevent any such violation or further violation or for the assessment of a penalty not to exceed $10,000 per day for each day, or part thereof, the violation occurred and continues to occur, or both, as the court deems proper. Any person who willfully or negligently commits any violation in this paragraph shall, upon conviction, be punished by a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than one year, or both. Second and successive convictions for violation of the same provision of this paragraph by any person shall be punished by a fine of not more than $50,000 per day of violation, or by imprisonment for not more than two (2) years, or both.

2. **Duty to Reapply.**
   a. If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit.
   b. A permittee with a currently effective site-specific permit shall submit an application for renewal at least 180 days before the expiration date of the existing permit, unless permission for a later date has been granted by the Department. (The Department shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)
   c. A permittees with currently effective general permit shall submit an application for renewal at least 30 days before the existing permit expires, unless the permittee has been notified by the Department that an earlier application must be made. The Department may grant permission for a later submission date. (The Department shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)

3. **Need to Halt or Reduce Activity Not a Defense.** It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

4. **Duty to Mitigate.** The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

5. **Proper Operation and Maintenance.** The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

6. **Permit Actions.**
   a. Subject to compliance with statutory requirements of the Law and Regulations and applicable Court Order, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to, the following:
      i. Violations of any terms or conditions of this permit or the law;
      ii. Having obtained this permit by misrepresentation or failure to disclose fully any relevant facts;
      iii. A change in any circumstances or conditions that requires either a temporary or permanent reduction or elimination of the authorized discharge; or
      iv. Any reason set forth in the Law or Regulations.
   b. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

7. **Permit Transfer.**
   a. Subject to 10 CSR 20-6.010, an operating permit may be transferred upon submission to the Department of an application to transfer signed by the existing owner and the new owner, unless prohibited by the terms of the permit. Until such time the permit is officially transferred, the original permittee remains responsible for complying with the terms and conditions of the existing permit.
   b. The Department may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Missouri Clean Water Law or the Federal Clean Water Act.
   c. The Department, within 30 days of receipt of the application, shall notify the new permittee of its intent to revoke or reissue or transfer the permit.

8. **Toxic Pollutants.** The permittee shall comply with effluent standards or prohibitions established under section 307(a) of the Federal Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the Federal Clean Water Act within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.

9. **Property Rights.** This permit does not convey any property rights of any sort, or any exclusive privilege.

10. **Duty to Provide Information.** The permittee shall furnish to the Department, within a reasonable time, any information which the Department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish to the Department upon request, copies of records required to be kept by this permit.

11. **Inspection and Entry.** The permittee shall allow the Department, or an authorized representative (including an authorized contractor acting as a representative of the Department), upon presentation of credentials and other documents as may be required by law, to:
    a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of the permit;
    b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
    c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
    d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Federal Clean Water Act or Missouri Clean Water Law, any substances or parameters at any location.

12. **Closure of Treatment Facilities.**
    a. Persons who cease operation or plan to cease operation of waste, wastewater, and sludge handling and treatment facilities shall close the facilities in accordance with a closure plan approved by the Department.
    b. Operating Permits under 10 CSR 20-6.010 or under 10 CSR 20-6.015 are required until all waste, wastewater, and sludges have been disposed of in accordance with the closure plan approved by the Department and any disturbed areas have been properly stabilized. Disturbed areas will be considered stabilized when perennial vegetation, pavement, or structures using permanent materials cover all areas that have been disturbed. Vegetative cover, if used, shall be at least 70% plant density over 100% of the disturbed area.

13. **Signatory Requirement.**
    a. All permit applications, reports required by the permit, or information requested by the Department shall be signed and certified. (See 40 CFR 122.22 and 10 CSR 20-6.010)
    b. The Federal Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than six (6) months per violation, or by both.
    c. The Missouri Clean Water Law provides that any person who knowingly makes any false statement, representation or certification in any application, record, report, plan, or other document filed or required to be maintained pursuant to sections 644.006 to 644.141 shall, upon conviction, be punished by a fine of not more than ten thousand dollars, or by imprisonment for not more than six months, or by both.

14. **Severability.** The provisions of the permit are severable, and if any provision of the permit, or the application of any provision of the permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of the permit, shall not be affected thereby.

STANDARD CONDITIONS FOR NPDES PERMITS
ISSUED BY
THE MISSOURI DEPARTMENT OF NATURAL RESOURCES
MISSOURI CLEAN WATER COMMISSION
REVISED
MAY 1, 2013

PART II - SPECIAL CONDITIONS – PUBLICLY OWNED TREATMENT WORKS
SECTION A – INDUSTRIAL USERS

1. Definitions

Definitions as set forth in the Missouri Clean Water Laws and approved by the Missouri Clean Water Commission shall apply to terms used herein.

Significant Industrial User (SIU). Except as provided in the *General Pretreatment Regulation* 10 CSR 20-6.100, the term Significant Industrial User means:

1. All Industrial Users subject to Categorical Pretreatment Standards; and
2. Any other Industrial User that: discharges an average of 25,000 gallons per day or more of process wastewater to the Publicly-Owned Treatment Works (POTW) (excluding sanitary, noncontact cooling and boiler blowdown wastewater); contributes a process wastestream which makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority on the basis that the Industrial User has a reasonable potential for adversely affecting the POTW's or for violating any Pretreatment Standard or requirement.

Clean Water Act (CWA) is the the federal Clean Water Act of 1972, 33 U.S.C. § 1251 et seq. (2002).

2. Identification of Industrial Discharges

Pursuant to 40 CFR 122.44(j)(1), all POTWs shall identify, in terms of character and volume of pollutants, any Significant Industrial Users discharging to the POTW subject to Pretreatment Standards under section 307(b) of the CWA and 40 CFR 403.

3. Application Information

Applications for renewal or modification of this permit must contain the information about industrial discharges to the POTW pursuant to 40 CFR 122.21(j)(6)

4. Notice to the Department

Pursuant to 40 CFR 122.42(b), all POTWs must provide adequate notice of the following:

1. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to section 301 or 306 of CWA if it were directly discharging these pollutants; and
2. Any substantial change into the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.
3. For purposes of this paragraph, adequate notice shall include information on:
   i. the quality and quantity of effluent introduced into the POTW, and
   ii. any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

For POTWs without an approved pretreatment program, the notice of industrial discharges which was not included in the permit application shall be made as soon as practicable. For POTWs with an approved pretreatment program, notice is to be included in the annual pretreatment report required in the special conditions of this permit. Notice may be sent to:

Missouri Department of Natural Resources
Water Protection Program
Attn: Pretreatment Coordinator
P.O. Box 176
Jefferson City, MO 65102

STANDARD CONDITIONS FOR NPDES PERMITS
ISSUED BY
THE MISSOURI DEPARTMENT OF NATURAL RESOURCES
MISSOURI CLEAN WATER COMMISSION
August 1, 2019

PART III – BIOSOLIDS AND SLUDGE FROM DOMESTIC TREATMENT FACILITIES

SECTION A – GENERAL REQUIREMENTS

1. PART III Standard Conditions pertain to biosolids and sludge requirements under the Missouri Clean Water Law and regulations for domestic and municipal wastewater and also incorporates federal sludge disposal requirements under 40 CFR Part 503 for domestic wastewater. The Environmental Protection Agency (EPA) has principal authority for permitting and enforcement of the federal sludge regulations under 40 CFR Part 503 for domestic biosolids and sludge.
2. PART III Standard Conditions apply only to biosolids and sludge generated at domestic wastewater treatment facilities, including public owned treatment works (POTW) and privately owned facilities.
3. Biosolids and Sludge Use and Disposal Practices:
    a. The permittee is authorized to operate the biosolids and sludge generating, treatment, storage, use, and disposal facilities listed in the facility description of this permit.
    b. The permittee shall not exceed the design sludge/biosolids volume listed in the facility description and shall not use biosolids or sludge disposal methods that are not listed in the facility description, without prior approval of the permitting authority.
    c. For facilities operating under general operating permits that incorporate Standard Conditions PART III, the facility is authorized to operate the biosolids and sludge generating, treatment, storage, use and disposal facilities identified in the original operating permit application, subsequent renewal applications or subsequent written approval by the department.
4. Biosolids or Sludge Received from other Facilities:
    a. Permittees may accept domestic wastewater biosolids or sludge from other facilities as long as the permittee's design sludge capacity is not exceeded and the treatment facility performance is not impaired.
    b. The permittee shall obtain a signed statement from the biosolids or sludge generator or hauler that certifies the type and source of the sludge
5. Nothing in this permit precludes the initiation of legal action under local laws, except to the extent local laws are preempted by state law.
6. This permit does not preclude the enforcement of other applicable environmental regulations such as odor emissions under the Missouri Air Pollution Control Law and regulations.
7. This permit may (after due process) be modified, or alternatively revoked and reissued, to comply with any applicable biosolids or sludge disposal standard or limitation issued or approved under Section 405(d) of the Clean Water Act or under Chapter 644 RSMo.
8. In addition to Standard Conditions PART III, the Department may include biosolids and sludge limitations in the special conditions portion or other sections of a site specific permit.
9. Exceptions to Standard Conditions PART III may be authorized on a case-by-case basis by the Department, as follows:
    a. The Department may modify a site-specific permit following permit notice provisions as applicable under 10 CSR 20-6.020, 40 CFR § 124.10, and 40 CFR § 501.15(a)(2)(ix)(E).
    b. Exceptions cannot be granted where prohibited by the federal sludge regulations under 40 CFR Part 503.

SECTION B – DEFINITIONS

1. Best Management Practices are practices to prevent or reduce the pollution of waters of the state and include agronomic loading rates (nitrogen based), soil conservation practices, spill prevention and maintenance procedures and other site restrictions.
2. Biosolids means organic fertilizer or soil amendment produced by the treatment of domestic wastewater sludge.
3. Biosolids land application facility is a facility where biosolids are spread onto the land at agronomic rates for production of food, feed or fiber. The facility includes any structures necessary to store the biosolids until soil, weather, and crop conditions are favorable for land application.
4. Class A biosolids means a material that has met the Class A pathogen reduction requirements or equivalent treatment by a Process to Further Reduce Pathogens (PFRP) in accordance with 40 CFR Part 503.
5. Class B biosolids means a material that has met the Class B pathogen reduction requirements or equivalent treatment by a Process to Significantly Reduce Pathogens (PSRP) in accordance with 40 CFR Part 503.
6. Domestic wastewater means wastewater originating from the sanitary conveniences of residences, commercial buildings, factories and institutions; or co-mingled sanitary and industrial wastewater processed by a (POTW) or a privately owned facility.
7. Feed crops are crops produced primarily for consumption by animals.
8. Fiber crops are crops such as flax and cotton.
9. Food crops are crops consumed by humans which include, but is not limted to, fruits, vegetables and tobacco.
10. Industrial wastewater means any wastewater, also known as process wastewater, not defined as domestic wastewater. Per 40 CFR Part 122.2, process wastewater means any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product. Land application of industrial wastewater, residuals or sludge is not authorized by Standard Conditions PART III.
11. Mechanical treatment plants are wastewater treatment facilities that use mechanical devices to treat wastewater, including, sand filters, extended aeration, activated sludge, contact stabilization, trickling filters, rotating biological contact systems, and other similar facilities. It does not include wastewater treatment lagoons or constructed wetlands for wastewater treatment.
12. Plant Available Nitrogen (PAN) is nitrogen that will be available to plants during the growing seasons after biosolids application.
13. Public contact site is land with a high potential for contact by the public. This includes, but is not limited to, public parks, ball fields, cemeteries, plant nurseries, turf farms, and golf courses.
14. Sludge is the solid, semisolid, or liquid residue removed during the treatment of wastewater. Sludge includes septage removed from septic tanks or equivalent facilities. Sludge does not include carbon coal byproducts (CCBs), sewage sludge incinerator ash, or grit/screenings generated during preliminary treatment of domestic sewage.
15. Sludge lagoon is part of a mechanical wastewater treatment facility. A sludge lagoon is an earthen or concrete lined basin that receives sludge that has been removed from a wastewater treatment facility. It does not include a wastewater treatment lagoon or sludge treatment units that are not a part of a mechanical wastewater treatment facility.
16. Septage is the sludge pumped from residential septic tanks, cesspools, portable toilets, Type III marine sanitation devices, or similar treatment works such as sludge holding structures from residential wastewater treatment facilities with design populations of less than 150 people. Septage does not include grease removed from grease traps at a restaurant or material removed from septic tanks and other similar treatment works that have received industrial wastewater. The standard for biosolids from septage is different from other sludges. See Section H for more information.

SECTION C – MECHANICAL WASTEWATER TREATMENT FACILITIES

1. Biosolids or sludge shall be routinely removed from wastewater treatment facilities and handled according to the permit facility description and the requirements of Standard Conditions PART III or in accordance with Section A.3.c., above.
2. The permittee shall operate storage and treatment facilities, as defined by Section 644.016(23), RSMo, so that there is no biosolids or sludge discharged to waters of the state. Agricultural storm water discharges are exempt under the provisions of Section 644.059, RSMo.
3. Mechanical treatment plants shall have separate biosolids or sludge storage compartments in accordance with 10 CSR 20, Chapter 8. Failure to remove biosolids or sludge from these storage compartments on the required design schedule is a violation of this permit.

SECTION D – BIOSOLIDS OR SLUDGE DISPOSED AT OTHER TREATMENT FACILITY OR BY CONTRACT HAULER

1. Permittees that use contract haulers, under the authority of their operating permit, to dispose of biosolids or sludge, are responsible for compliance with all the terms of this permit. Contract haulers that assume the responsibility of the final disposal of biosolids or sludge, including biosolids land application, must obtain a Missouri State Operating Permit unless the hauler transports the biosolids or sludge to another permitted treatment facility.
2. Testing of biosolids or sludge, other than total solids content, is not required if biosolids or sludge are hauled to a permitted wastewater treatment facility, unless it is required by the accepting facility.

SECTION E – INCINERATION OF SLUDGE

1. Please be aware that sludge incineration facilities may be subject to the requirements of 40 CFR Part 503 Subpart E, Missouri Air Conservation Commission regulations under 10 CSR 10, and solid waste management regulations under 10 CSR 80, as applicable.
2. Permittee may be authorized under the facility description of this permit to store incineration ash in lagoons or ash ponds. This permit does not authorize the disposal of incineration ash. Incineration ash shall be disposed in accordance with 10 CSR 80; or, if the ash is determined to be hazardous, with 10 CSR 25.
3. In addition to normal sludge monitoring, incineration facilities shall report the following as part of the annual report, mass of sludge incinerated and mass of ash generated. Permittee shall also provide the name of the ash disposal facility and permit number if applicable.

SECTION F – SURFACE DISPOSAL SITES AND BIOSOLIDS AND SLUDGE LAGOONS

1. Please be aware that surface disposal sites of biosolids or sludge from wastewater treatment facilities may be subject to other laws including the requirements in 40 CFR Part 503 Subpart C, Missouri Air Conservation Commission regulations under 10 CSR 10, and solid waste management regulations under 10 CSR 80, as applicable.
2. Biosolids or sludge storage lagoons are temporary facilities and are not required to obtain a permit as a solid waste management facility under 10 CSR 80. In order to maintain biosolids or sludge storage lagoons as storage facilities, accumulated biosolids or sludge must be removed routinely, but not less than once every two years unless an alternate schedule is approved in the permit. The amount of biosolids or sludge removed will be dependent on biosolids or sludge generation and accumulation in the facility. Enough biosolids or sludge must be removed to maintain adequate storage capacity in the facility.
    a. In order to avoid damage to the lagoon seal during cleaning, the permittee may leave a layer of biosolids or sludge on the bottom of the lagoon, upon prior approval of the Department; or
    b. Permittee shall close the lagoon in accordance with Section I.

SECTION G – LAND APPLICATION OF BIOSOLIDS

1. The permittee shall not land apply biosolids unless land application is authorized in the facility description, the special conditions of the issued NPDES permit, or in accordance with Section A.3.c., above.
2. This permit only authorizes "Class A" or "Class B" biosolids derived from domestic wastewater to be land applied onto grass land, crop land, timber, or other similar agricultural or silviculture lands at rates suitable for beneficial use as organic fertilizer and soil conditioner.
3. Class A Biosolids Requirements: Biosolids shall meet Class A requirements for application to public contact sites, residential lawns, home gardens or sold and/or given away in a bag or other container.
4. Class B biosolids that are land applied to agricultural and public contact sites shall comply with the following restrictions:
    a. Food crops that touch the biosolids/soil mixture and are totally above the land surface shall not be harvested for 14 months after application of biosolids.
    b. Food crops below the surface of the land shall not be harvested for 20 months after application of biosolids when the biosolids remain on the land surface for four months or longer prior to incorporation into the soil.
    c. Food crops below the surface of the land shall not be harvested for 38 months after application of biosolids when the biosolids remain on the land surface for less than four months prior to incorporation into the soil.
    d. Animal grazing shall not be allowed for 30 days after application of biosolids.
    e. Food crops, feed crops, and fiber crops shall not be harvested for 30 days after application of biosolids.
    f. Turf shall not be harvested for one year after application of biosolids if used for lawns or high public contact sites in close proximity to populated areas such as city parks or golf courses.
    g. After Class B biosolids have been land applied to public contact sites with high potential for public exposure, as defined in 40 CFR § 503.31, such as city parks or golf courses, access must be restricted for 12 months.
    h. After Class B biosolids have been land applied public contact sites with low potential for public exposure as defined in 40 CFR § 503.31, such as a rural land application or reclamation sites, access must be restricted for 30 days.
5. Pollutant limits
    a. Biosolids shall be monitored to determine the quality for regulated pollutants listed in Table 1, below. Limits for any pollutants not listed below may be established in the permit.
    b. The number of samples taken is directly related to the amount of biosolids or sludge produced by the facility (See Section J, below). Samples should be taken only during land application periods. When necessary, it is permissible to mix biosolids with lower concentrations of biosolids as well as other suitable Department approved material to achieve pollutant concentration below those identified in Table 1, below.
    c. Table 1 gives the ceiling concentration for biosolids. Biosolids which exceed the concentrations in Table 1 may not be land applied.

TABLE 1

Biosolids ceiling concentration	
Pollutant	Milligrams per kilogram dry weight
Arsenic	75
Cadmium	85
Copper	4,300
Lead	840
Mercury	57
Molybdenum	75
Nickel	420
Selenium	100
Zinc	7,500

d. Table 2 below gives the low metal concentration for biosolids. Because of its higher quality, biosolids with pollutant concentrations below those listed in Table 2 can safely be applied to agricultural land, forest, public contact sites, lawns, home gardens or be given away without further analysis. Biosolids containing metals in concentrations above the low metals concentrations but below the ceiling concentration limits may be land applied but shall not exceed the annual loading rates in Table 3 and the cumulative loading rates in Table 4. The permittee is required to track pollutant loading onto application sites for parameters that have exceeded the low metal concentration limits.

TABLE 2

Biosolids Low Metal Concentration	
Pollutant	Milligrams per kilogram dry weight
Arsenic	41
Cadmium	39
Copper	1,500
Lead	300
Mercury	17
Nickel	420
Selenium	100
Zinc	2,800

e. Annual pollutant loading rate.

Table 3

Biosolids Annual Loading Rate	
Pollutant	Kg/ha (lbs./ac) per year
Arsenic	2.0 (1.79)
Cadmium	1.9 (1.70)
Copper	75 (66.94)
Lead	15 (13.39)
Mercury	0.85 (0.76)
Nickel	21 (18.74)
Selenium	5.0 (4.46)
Zinc	140 (124.96)

f. Cumulative pollutant loading rates.

Table 4

Biosolids Cumulative Pollutant Loading Rate	
Pollutant	Kg/ha (lbs./ac)
Arsenic	41 (37)
Cadmium	39 (35)
Copper	1500 (1339)
Lead	300 (268)
Mercury	17 (15)
Nickel	420 (375)
Selenium	100 (89)
Zinc	2800 (2499)

6. Best Management Practices. The permittee shall use the following best management practices during land application activities to prevent the discharge of biosolids to waters of the state.
   a. Biosolids shall not be applied to the land if it is likely to adversely affect a threatened or endangered species listed under § 4 of the Endangered Species Act or its designated critical habitat.
   b. Apply biosolids only at the agronomic rate of nitrogen needed (see 5.c. of this section).
   c. The applicator must document the Plant Available Nitrogen (PAN) loadings, available nitrogen in the soil, and crop

nitrogen removal when either of the following occurs: 1) When biosolids are greater than 50,000 mg/kgTN; or 2) When biosolids are land applied at an application rate greater than two dry tons per acre per year.

i. PAN can be determined as follows:

(Nitrate + nitrite nitrogen) + (organic nitrogen x 0.2) + (ammonia nitrogen x volatilization factor[1]).

[1] Volatilization factor is 0.7 for surface application and 1 for subsurface application. Alternative volitalization factors and mineralization rates can be utilized on a case-by-case basis.

ii. Crop nutrient production/removal to be based on crop specific nitrogen needs and realistic yield goals. **NOTE**: There are a number of reference documents on the Missouri Department of Natural Resources website that are informative to implement best management practices in the proper management of biosolids, including crop specific nitrogen needs, realistic yields on a county by county basis and other supporting references.

iii. Biosolids that are applied at agronomic rates shall not cause the annual pollutant loading rates identified in Table 3 to be exceeded.

d. Buffer zones are as follows:

i. 300 feet of a water supply well, sinkhole, water supply reservoir or water supply intake in a stream;

ii. 300 feet of a losing stream, no discharge stream, stream stretches designated for whole body contact recreation, wild and scenic rivers, Ozark National Scenic Riverways or outstandingstate resource waters as listed in the Water Quality Standards, 10 CSR 20-7.031;

iii. 150 feet of dwellings or public use areas;

iv. 100 feet (35 feet if biosolids application is down-gradient or the buffer zone is entirely vegetated) of lake, pond, wetlands or gaining streams (perennial or intermittent);

v. 50 feet of a property line. Buffer distances from property lines may be waived with written permission from neighboring property owner.

vi. For the application of dry, cake or liquid biosolids that are subsurface injected, buffer zones identified in 5.d.i. through 5.d.iii above, may be reduced to 100 feet. The buffer zone may be reduced to 35 feet if the buffer zone is permanently vegetated. Subsurface injection does not include methods or technology reflective of combination surface/shallow soil incorporation.

e. Slope limitation for application sites are as follows:

i. For slopes less than or equal to 6 percent, no rate limitation;

ii. Applied to a slope 7 to 12 percent, the applicator may apply biosolids when soil conservation practices are used to meet the minimum erosion levels;

iii. Slopes > 12 percent, apply biosolids only when grass is vegetated and maintained with at least 80 percent ground cover at a rate of two dry tons per acre per year or less.

iv. Dry, cake or liquid biosolids that are subsurface injected, may be applied on slopes not to exceed 20 percent. Subsurface injection does not include the use of methods or technology reflective of combination surface/shallow soil incorporation.

f. No biosolids may be land applied in an area that it is reasonably certain that pollutants will be transported into waters of the state.

g. Biosolids may be land applied to sites with soil that are snow covered, frozen, or saturated with liquid when site restrictions or other controls are provided to prevent pollutants from being discharged to waters of the state during snowmelt or stormwater runoff. During inclement weather or unfavorable soil conditions use the following management practices:

i. A maximum field slope of 6% and a minimum 300 feet grass buffer between the application site and waters of the state. A 35 feet grass buffer may be utilized for the application of dry, cake or liquid biosolids that are subsurface injected. Subsurface injection does not include the use of mthods or technology refletive of combination surface/shallowsoil incorporation;

ii. A maximum field slope of 2% and 100 feet grass buffer between the application site and waters of the state. A 35 feet grass buffer may be used for the application of dry, cake or liquid biosolids that are subsurface injected. Subsurface injection does not included the use of methods or technology refletive of combination surface/shallow soil incorporation;

iii. Other best management practices approved by the Department.

SECTION H – SEPTAGE

1. Haulers that land apply septage must obtain a state permit. An operating permit is not required for septage haulers who transport septage to another permitted treatment facility for disposal.
2. Do not apply more than 30,000 gallons of septage per acre per year or the volume otherwise stipulated in the operating permit.
3. Septic tanks are designed to retain sludge for one to three years which will allow for a larger reduction in pathogens and vectors, as compared to mechanical treatment facilities.
4. Septage must comply with Class B biosolids regarding pathogen and vector attraction reduction requirements before it may be applied to crops, pastures or timberland. To meet required pathogen and vector reduction requirements, mix 50 pounds of hydrated lime for every 1,000 gallons of septage and maintain a septage pH of at least 12 pH standard units for 30 minutes or more prior to application.
5. Lime is to be added to the pump truck and not directly to the septic tanks, as lime would harm the beneficial bacteria of the septic tank.
6. As residential septage contains relatively low levels of metals, the testing of metals in septage is not required.

SECTION I– CLOSURE REQUIREMENTS

1. This section applies to all wastewater facilities (mechanical and lagoons) and sludge or biosolids storage and treatment facilities. It does not apply to land application sites.
2. Permittees of a domestic wastewater facility who plan to cease operation must obtain Department approval of a closure plan which addresses proper removal and disposal of all sludges and/or biosolids. Permittee must maintain this permit until the facility is closed in accordance with the approved closure plan per 10 CSR 20 – 6. 010 and 10 CSR 20 – 6.015.
3. Biosolids or sludge that are left in place during closure of a lagoon or earthen structure or ash pond shall not exceed the agricultural loading rates as follows:
    a. Biosolids and sludge shall meet the monitoring and land application limits for agricultural rates as referenced in Section G, above.
    b. If a wastewater treatment lagoon has been in operation for 15 years or more without sludge removal, the sludge in the lagoon qualifies as a Class B biosolids with respect to pathogens due to anaerobic digestion, and testing for fecal coliform is not required. For other lagoons, testing for fecal coliform is required to show compliance with Class B biosolids limitations. In order to reach Class B biosolids requirements, fecal coliform must be less than 2,000,000 colony forming units or 2,000,000 most probable number. All fecal samples must be presented as geometric mean per gram.
    c. The allowable nitrogen loading that may be left in the lagoon shall be based on the plant available nitrogen (PAN) loading. For a grass cover crop, the allowable PAN is 300 pounds/acre. Alternative, site-specific application rates may be included in the closure plan for department consideration.
        i. PAN can be determined as follows:
        (Nitrate + nitrite nitrogen) + (organic nitrogen x 0.2) + (ammonia nitrogen x volatilization factor[1]).
        [1] Volatilization factor is 0.7 for surface application and 1 for subsurface application. Alternative volitalization factors and mineralization rates can be utilized on a case-by-case basis
4. Domestic wastewater treatment lagoons with a design treatment capacity less than or equal to 150 persons, are "similar treatment works" under the definition of septage. Therefore the sludge within the lagoons may be treated as septage during closure activities. See Section B, above. Under the septage category, residuals may be left in place as follows:
    a. Testing for metals or fecal coliform is not required.
    b. If the wastewater treatment lagoon has been in use for less than 15 years, mix lime with the sludge at a rate of 50 pounds of hydrated lime per 1000 gallons (134 cubic feet) of sludge.
    c. The amount of sludge that may be left in the lagoon shall be based on the plant available nitrogen (PAN) loading. 100 dry tons/acre of sludge may be left in the basin without testing for nitrogen. If 100 dry tons/acre or more will be left in the lagoon, test for nitrogen and determine the PAN using the calculation above. Allowable PAN loading is 300 pounds/acre.
5. Biosolids or sludge left within the domestic lagoon shall be mixed with soil on at least a 1 to 1 ratio, and unless otherwise approved, the lagoon berm shall be demolished, and the site shall be graded and contain ≥70% vegetative density over 100% of the site so as to avoid ponding of storm water and provide adequate surface water drainage without creating erosion. Alternative biosolids or sludge and soil mixing ratios may be included in the closure plan for department consideration.
6. Lagoon and earthen structure closure activities shall obtain a storm water permit for land disturbance activities that equal or exceed one acre in accordance with 10 CSR 20-6.200.
7. When closing a mechanical wastewater plant, all biosolids or sludge must be cleaned out and disposed of in accordance with the Department approved closure plan before the permit for the facility can be terminated.
    a. Land must be stabilized which includes any grading, alternate use or fate upon approval by the Department, remediation, or other work that exposes sediment to stormwater per 10 CSR 20-6.200. The site shall be graded and contain ≥70% vegetative density over 100% of the site, so as to avoid ponding of storm water and provide adequate

surface water drainage without creating erosion.

b. Hazardous Waste shall not be land applied or disposed during mechanical plant closures unless in accordance with Missouri Hazardous Waste Management Law and Regulations pursuant to 10 CSR 25.

c. After demolition of the mechanical plant, the site must only contain clean fill defined in Section 260.200.1(6) RSMo as uncontaminated soil, rock, sand, gravel, concrete, asphaltic concrete, cinderblocks, brick, minimal amounts of wood and metal, and inert solids as approved by rule or policy of the Department for fill, reclamation, or other beneficial use. Other solid wastes must be removed.

8. If biosolids or sludge from the domestic lagoon or mechanical treatment plant exceeds agricultural rates under Section G and/or I, a landfill permit or solid waste disposal permit must be obtained if the permittee chooses to seek authorization for on-site sludge disposal under the Missouri Solid Waste Management Law and regulations per 10 CSR 80, and the permittee must comply with the surface disposal requirements under 40 CFR Part 503, Subpart C.

SECTION J – MONITORING FREQUENCY

1. At a minimum, biosolids or sludge shall be tested for volume and percent total solids on a frequency that will accurately represent sludge quantities produced and disposed. Please see the table below.

TABLE 5

Biosolids or Sludge produced and disposed (Dry Tons per Year)	Monitoring Frequency (See Notes 1, and 2)		
	Metals, Pathogens and Vectors, Total Phosphorus, Total Potassium	Nitrogen TKN, Nitrogen PAN[1]	Priority Pollutants[2]
319 or less	1/year	1 per month	1/year
320 to 1650	4/year	1 per month	1/year
1651 to 16,500	6/year	1 per month	1/year
16,501+	12/year	1 per month	1/year

[1] Calculate plant available nitrogen (PAN) when either of the following occurs: 1) when biosolids are greater than 50,000 mg/kg TN; or 2) when biosolids are land applied at an application rate greater than two dry tons per acre per year.

[2] Priority pollutants (40 CFR 122.21, Appendix D, Tables II and III) are required only for permit holders that must have a pre-treatment program. Monitoring requirements may be modified and incorporated into the operating permit by the Department on a case-by-case basis.

Note 1: Total solids: A grab sample of sludge shall be tested one per day during land application periods for percent total solids. This data shall be used to calculate the dry tons of sludge applied per acre.
Note 2: Table 5 is not applicable for incineration and permit holders that landfill their sludge.

2. Permittees that operate wastewater treatment lagoons, peak flow equalization basins, combined sewer overflow basins or biosolids or sludge lagoons that are cleaned out once a year or less, may choose to sample only when the biosolids or sludge is removed or the lagoon is closed. Test one composite sample for each 319 dry tons of biosolids or sludge removed from the lagoon during the reporting year or during lagoon closure. Composite sample must represent various areas at one-foot depth.
3. Additional testing may be required in the special conditions or other sections of the permit.
4. Biosolids and sludge monitoring shall be conducted in accordance with federal regulation 40 CFR § 503.8, Sampling and analysis.

SECTION K – RECORD KEEPING AND REPORTING REQUIREMENTS

1. The permittee shall maintain records on file at the facility for at least five years for the items listed in Standard Conditions PART III and any additional items in the Special Conditions section of this permit. This shall include dates when the biosolids or sludge facility is checked for proper operation, records of maintenance and repairs and other relevant information.
2. Reporting period
   a. By February 19th of each year, applicable facilities shall submit an annual report for the previous calendar year period for all mechanical wastewater treatment facilities, sludge lagoons, and biosolids or sludge disposal facilities.
   b. Permittees with wastewater treatment lagoons shall submit the above annual report only when biosolids or sludge are removed from the lagoon during the report period or when the lagoon is closed.
3. Report Form. The annual report shall be prepared on report forms provided by the Department or equivalent forms approved by the Department.
4. Reports shall be submitted as follows:
   Major facilities, which are those serving 10,000 persons or more or with a design flow equal to or greater than 1 million gallons per day or that are required to have an approved pretreatment program, shall report to both the Department and EPA if the facility land applied, disposed of biosolids by surface disposal, or operated a sewage sludge incinerator. All other facilities shall maintain their biosolids or sludge records and keep them available to Department personnel upon request. State reports shall be submitted to the address listed as follows:

   DNR regional or other applicable office listed in the
   permit (see cover letter of permit)
   ATTN: Sludge Coordinator

Reports to EPA must be electronically submitted online via the Central Data Exchange at: https://cdx.epa.gov/ Additional information is available at: https://www.epa.gov/biosolids/compliance-and-annual-reporting-guidance-about-clean-water-act-laws

5. Annual report contents. The annual report shall include the following:
    a. Biosolids and sludge testing performed. If testing was conducted at a greater frequency than what is required by the permit, all test results must be included in the report.
    b. Biosolids or sludge quantity shall be reported as dry tons for the quantity produced and/or disposed.
    c. Gallons and % solids data used to calculate the dry ton amounts.
    d. Description of any unusual operating conditions.
    e. Final disposal method, dates, and location, and person responsible for hauling and disposal.
        i. This must include the name and address for the hauler and sludge facility. If hauled to a municipal wastewater treatment facility, sanitary landfill, or other approved treatment facility, give the name of that facility.
        ii. Include a description of the type of hauling equipment used and the capacity in tons, gallons, or cubic feet.
    f. Contract Hauler Activities:
    If using a contract hauler, provide a copy of a signed contract from the contractor. Permittee shall require the contractor to supply information required under this permit for which the contractor is responsible. The permittee shall submit a signed statement from the contractor that he has complied with the standards contained in this permit, unless the contract hauler has a separate biosolids or sludge use permit.
    g. Land Application Sites:
        i. Report the location of each application site, the annual and cumulative dry tons/acre for each site, and the landowners name and address. The location for each spreading site shall be given as a legal description for nearest ¼, ¼, Section, Township, Range, and county, or UTM coordinates. The facility shall report PAN when either of the following occurs: 1) When biosolids are greater than 50,000 mg/kg TN; or 2) when biosolids are land applied at an application rate greater than two dry tons per acre per year.
        ii. If the "Low Metals" criteria are exceeded, report the annual and cumulative pollutant loading rates in pounds per acre for each applicable pollutant, and report the percent of cumulative pollutant loading which has been reached at each site.
        iii. Report the method used for compliance with pathogen and vector attraction requirements.
        iv. Report soil test results for pH and phosphorus. If no soil was tested during the year, report the last date when tested and the results.

RECEIVED

MAY 23 2016

Water Protection Program

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM, WATER POLLUTION CONTROL BRANCH

FORM B2 – APPLICATION FOR OPERATING PERMIT FOR FACILITIES THAT RECEIVE PRIMARILY DOMESTIC WASTE AND HAVE A DESIGN FLOW MORE THAN 100,000 GALLONS PER DAY

FACILITY NAME	
Kansas City, Blue River Wastewater Treatment Facility	
PERMIT NO. *MO-0024911*	COUNTY *Jackson*

APPLICATION OVERVIEW

Form B2 has been developed in a modular format and consists of Parts A, B and C and a Supplemental Application Information (Parts D, E, F and G) packet. All applicants must complete Parts A, B and C. Some applicants must also complete parts of the Supplemental Application Information packet. The following items explain which parts of Form B2 you must complete. Submittal of an incomplete application may result in the application being returned.

BASIC APPLICATION INFORMATION

A. Basic Application Information for all Applicants. All applicants must complete Part A.

B. Additional Application Information for all Applicants. All applicants must complete Part B.

C. Certification. All applicants must complete Part C.

SUPPLEMENTAL APPLICATION INFORMATION

D. Expanded Effluent Testing Data. A treatment works that discharges effluent to surface water of the United States and meets one or more of the following criteria must complete *Part D - Expanded Effluent Testing Data*:

1. Has a design flow rate greater than or equal to 1 million gallons per day.
2. Is required to have or currently has a pretreatment program.
3. Is otherwise required by the permitting authority to provide the information.

E. Toxicity Testing Data. A treatment works that meets one or more of the following criteria must complete *Part E - Toxicity Testing Data*:

1. Has a design flow rate greater than or equal to 1 million gallons per day.
2. Is required to have or currently has a pretreatment program.
3. Is otherwise required by the permitting authority to provide the information.

F. Industrial User Discharges and Resource Conservation and Recovery Act / Comprehensive Environmental Response, Compensation and Liability Act Wastes. A treatment works that accepts process wastewater from any significant industrial users, also known as SIUs, or receives a Resource Conservation and Recovery Act or CERCLA wastes must complete *Part F - Industrial User Discharges and Resource Conservation and Recovery Act /CERCLA Wastes*.

SIUs are defined as:

1. All Categorical Industrial Users, or CIUs, subject to Categorical Pretreatment Standards under 40 Code of Federal Regulations 403.6 and 40 Code of Federal Regulations 403.6 and 40 CFR Chapter 1, Subchapter N.
2. Any other industrial user that meets one or more of the following:
   - i. Discharges an average of 25,000 gallons per day or more of process wastewater to the treatment works (with certain exclusions).
   - ii. Contributes a process waste stream that makes up five percent or more of the average dry weather hydraulic or organic capacity of the treatment plant.
   - iii. Is designated as an SIU by the control authority.
   - iv. Is otherwise required by the permitting authority to provide the information.

G. Combined Sewer Systems. A treatment works that has a combined sewer system must complete *Part G - Combined Sewer Systems*.

ALL APPLICANTS MUST COMPLETE PARTS A, B and C

RECEIVED

MAY 23 2016

Water Protection Program

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM, WATER POLLUTION CONTROL BRANCH

FORM B2 – APPLICATION FOR AN OPERATING PERMIT FOR FACILITIES THAT RECEIVE PRIMARILY DOMESTIC WASTE AND HAVE A DESIGN FLOW MORE THAN 100,000 GALLONS PER DAY

FOR AGENCY USE ONLY	
CHECK NUMBER	
DATE RECEIVED	FEE SUBMITTED
5/23/16	

PART A – BASIC APPLICATION INFORMATION

1. THIS APPLICATION IS FOR:

- ☐ An operating permit for a new or unpermitted facility. Construction Permit # ____
  (Please include completed Antidegradation Review or request to conduct an Antidegradation Review, see instructions)
- ☒ An operating permit renewal: Permit #MO-0024911 Expiration Date 11/15/2016
- ☐ An operating permit modification: Permit #MO-____ Reason: ____

1.1 Is the appropriate fee included with the application (see instructions for appropriate fee)? ☒ YES ☐ NO

2. FACILITY

NAME		TELEPHONE NUMBER WITH AREA CODE	
Kansas City, Blue River Wastewater Treatment Facility		816-513-7200	
ADDRESS (PHYSICAL)	CITY	STATE	ZIP
7300 Hawthorne Road	Kansas City	MO	64120

2.1 **LEGAL DESCRIPTION** (Facility Site): NW ¼ NW ¼, ¼, Sec. 25, T 50N, R 32 W — COUNTY: Jackson

2.2 UTM Coordinates Easting (X): 2789959.74 Northing (Y): 1075248.48
For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)

2.3 Name of receiving stream: Missouri River and tributary to Missouri River

2.4 Number of Outfalls: 1 wastewater outfalls, 3 stormwater outfalls, 0 instream monitoring sites

3. OWNER

NAME	E-MAIL ADDRESS	TELEPHONE NUMBER WITH AREA CODE	
City of Kansas City MO	N/A	816-513-7200	
ADDRESS	CITY	STATE	ZIP
414 East 12th Street	Kansas City	MO	64130

3.1 Request review of draft permit prior to Public Notice? ☒ YES ☐ NO

3.2 Are you a Publically Owned Treatment Works (POTW)? ☒ YES ☐ NO

3.3 Are you a Privately Owned Treatment Facility? ☐ YES ☒ NO

3.4 Are you a Privately Owned Treatment Facility regulated by the Public Service Commission (PSC)? ☐ YES ☒ NO

4. CONTINUING AUTHORITY: Permanent organization which will serve as the continuing authority for the operation, maintenance and modernization of the facility.

NAME	EMAIL ADDRESS	TELEPHONE WITH AREA CODE	
KCMO Water Services	N/A	816-513-0504	
ADDRESS	CITY	STATE	ZIP
4800 East 63rd Street	Kansas City	MO	64130

If the Continuing Authority is different than the Owner, please include a copy of the contract agreement between the two parties and a description of the responsibilities of both parties within the agreement.

5. OPERATOR

NAME	TITLE	CERTIFICATE NUMBER (IF APPLICABLE)
Hans B Newsom	Utility Superintendent	6075
E-MAIL ADDRESS	TELEPHONE NUMBER WITH AREA CODE	
hans.newsom@kcmo.org	(816) 513-7225	

6. FACILITY CONTACT

NAME	TITLE		
Hans B. Newsom	Utility Superintendent		
E-MAIL ADDRESS	TELEPHONE NUMBER WITH AREA CODE		
hans.newsom@kcmo.org	(816) 513-7225		
ADDRESS	CITY	STATE	ZIP CODE
7300 Hawthorne Road	Kansas City	MO	64120

FACILITY NAME	PERMIT NO.	OUTFALL NO.
KC Blue River Wastewater Treatment Facility	MO- *0024911*	*001*

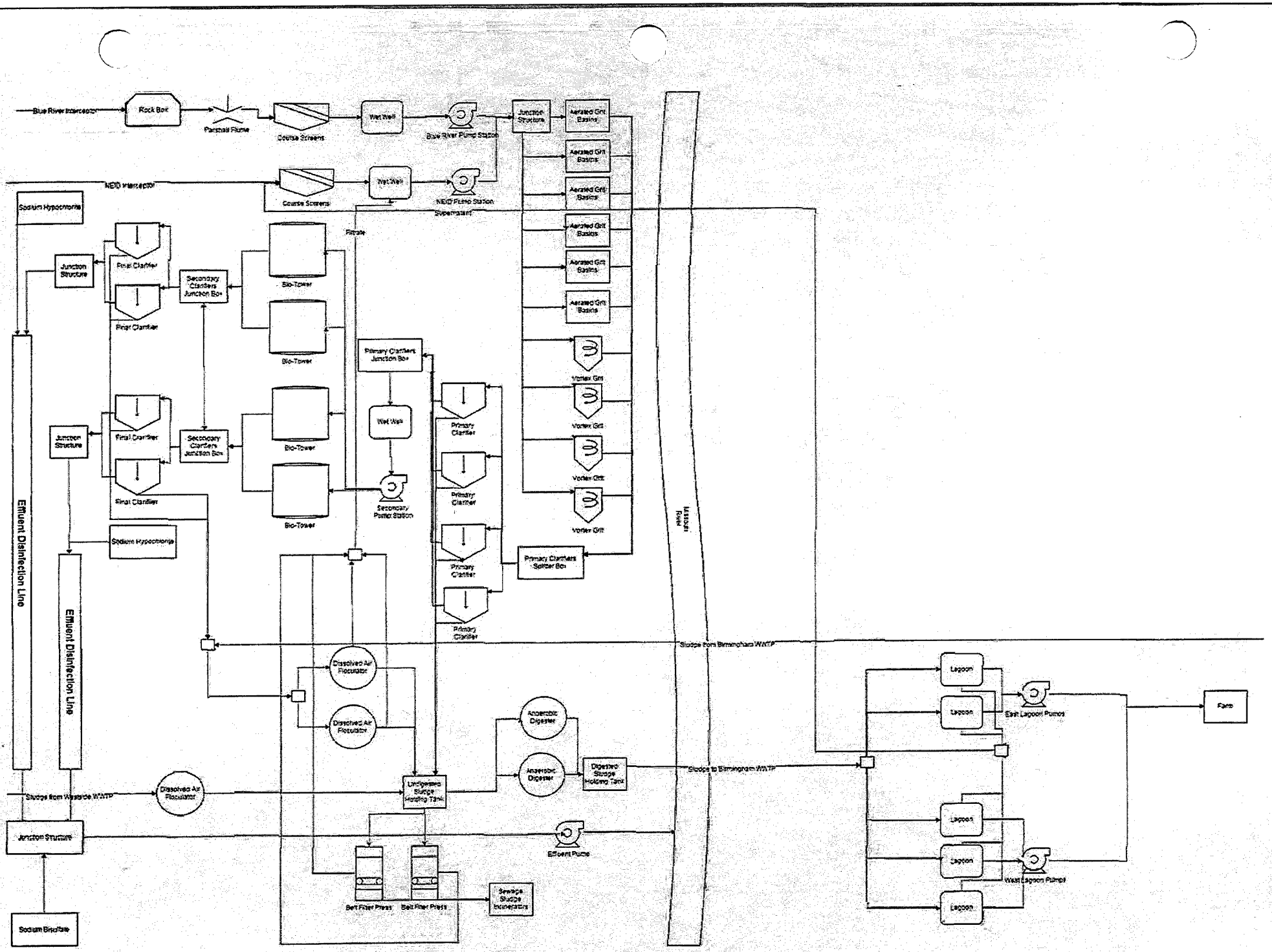
PART A – BASIC APPLICATION INFORMATION

7. FACILITY INFORMATION

7.1 Process Flow Diagram or Schematic. Provide a diagram showing the processes of the treatment plant. Show all of the treatment units, including disinfection (e.g. – Chlorination and Dechlorination), influents, and outfalls. Indicate any treatment process changes in the routing of wastewater during dry weather and peak wet weather. Include a brief narrative description of the diagram. Attach sheets as necessary.

1. Preliminary Treatment: rock box, coarse and fine barscreens, hydrocyclone grit removal and aerated grit chambers
2. Primary Treatment: gravity clarifiers
3. Secondary Treatment: high rate trickling filter and gravity clarifiers
4. Sodium hypochlorite Disinfection
5. Sodium Bisulfite Dechlorination
6. All sludge from the Blue River WWTP, Westside WWTP (MO-0024929), and Birmingham WWTP (MO-0049531) is dewatered as needed and fed to a sludge holding tank.
6. A portion of the sludge is dewatered and incinerated. Ash is accumulated in ash lagoon.
7. Another portion of the sludge is anaerobically (mesophilic) digested.
8. Remaining Sludge is dewatered and landfilled.
9. Digested sludge is pumped to Birmingham Land Application Facility (MO-0049531) for land application

See attached page with flow diagram for Blue River WWTP


Blue River Interceptor
Rock Box
Parshall Flume
Course Screens
Wet Well
Blue River Pump Station
Junction Structure
Aerated Grit Basins
NEID Interceptor
Course Screens
Wet Well
NEID Pump Station
Supernatant
Filtrate
Sodium Hypochlorite
Junction Structure
Final Clarifier
Final Clarifier
Secondary Clarifiers Junction Box
Bio-Tower
Bio-Tower
Primary Clarifiers Junction Box
Wet Well
Secondary Pump Station
Primary Clarifier
Primary Clarifier
Primary Clarifier
Primary Clarifier
Primary Clarifiers Splitter Box
Vortex Grit
Vortex Grit
Vortex Grit
Vortex Grit
Junction Structure
Final Clarifier
Final Clarifier
Secondary Clarifiers Junction Box
Bio-Tower
Bio-Tower
Sodium Hypochlorite
Effluent Disinfection Line
Effluent Disinfection Line
Metcalf Road
Sludge from Birmingham WWTP
Dissolved Air Flocculator
Dissolved Air Flocculator
Anaerobic Digester
Anaerobic Digester
Digested Sludge Holding Tank
Sludge to Birmingham WWTP
Sludge from Westside WWTP
Dissolved Air Flocculator
Undigested Sludge Holding Tank
Junction Structure
Effluent Pump
Belt Filter Press
Belt Filter Press
Sewage Sludge Incinerators
Sodium Bisulfate
Lagoon
Lagoon
East Lagoon Pumps
Farm
Lagoon
Lagoon
Lagoon
West Lagoon Pumps

FACILITY NAME	PERMIT NO.	OUTFALL NO.
KC Blue River Wastewater Treatment Facility	MO-0024911	001

PART A – BASIC APPLICATION INFORMATION

7. FACILITY INFORMATION (continued)

7.2 Topographic Map. Attach to this application a topographic map of the area extending at least one mile beyond facility property boundaries. This map must show the outline of the facility and the following information.

a. The area surrounding the treatment plant, including all unit processes.
b. The location of the downstream landowner(s). (See Item 10.)
c. The major pipes or other structures through which wastewater enters the treatment works and the pipes or other structures through which treated wastewater is discharged from the treatment plant. Include outfalls from bypass piping, if applicable.
d. The actual point of discharge.
e. Wells, springs, other surface water bodies and drinking water wells that are: 1) within ¼ mile of the property boundaries of the treatment works, and 2) listed in public record or otherwise known to the applicant.
f. Any areas where the sewage sludge produced by the treatment works is stored, treated, or disposed.
g. If the treatment works receives waste that is classified as hazardous under the Resource Conservation and Recovery Act (RCRA) by truck, rail, or special pipe, show on the map where that hazardous waste enters the treatment works and where it is treated, stored, or disposed.

7.3 Facility SIC Code: 4952 | Discharge SIC Code: 4952

7.4 Number of people presently connected or population equivalent (P.E.): 750,000 Design P.E. 850,000

7.5 Connections to the facility:

Number of units presently connected:

Homes 100,000 Trailers 5,000 Apartments 10,000 Other (including industrial) _____

Number of Commercial Establishments: _____

7.6 Design Flow 105 MGD | Actual Flow 70.5 MGD

7.7 Will discharge be continuous through the year? Yes ☒ No ☐

Discharge will occur during the following months: How many days of the week will discharge occur?

Will occur during all months and 7 days a week

7.8 Is industrial waste discharged to the facility? Yes ☒ No ☐

If yes, please describe the number and types of industries that discharge to your facility.

Forty-two (42) industries discharge to the facility: twelve (12) metal finishers, two (2) commercial laundries, one (1) meat processing plant, one (1) lawn mower blade manufacturer, two (2) soybean processors, three (3) pharmaceutical manufacturers, seven (7) hospitals/medical centers, four (4) hazardous/non-hazardous treatment, storage, and disposal facilities, two (2) packaging manufacturers, two (2) railroad facilities, one (1) lab equipment manufacturer, one (1) electrical equipment manufacturer, two (2) medical research facilities, one (1) beverage manufacturer, and one (1) food processing equipment manufacturer. In addition, one (1) sanitary landfill discharges leachate to the wastewater treatment facility.

Refer to the APPLICATION OVERVIEW to determine whether additional information is needed for Part F.

7.9 Does the facility accept or process leachate from landfills?: Yes ☒ No ☐

7.10 Is wastewater land applied? Yes ☐ No ☒

If yes, is Form I attached? Yes ☐ No ☐

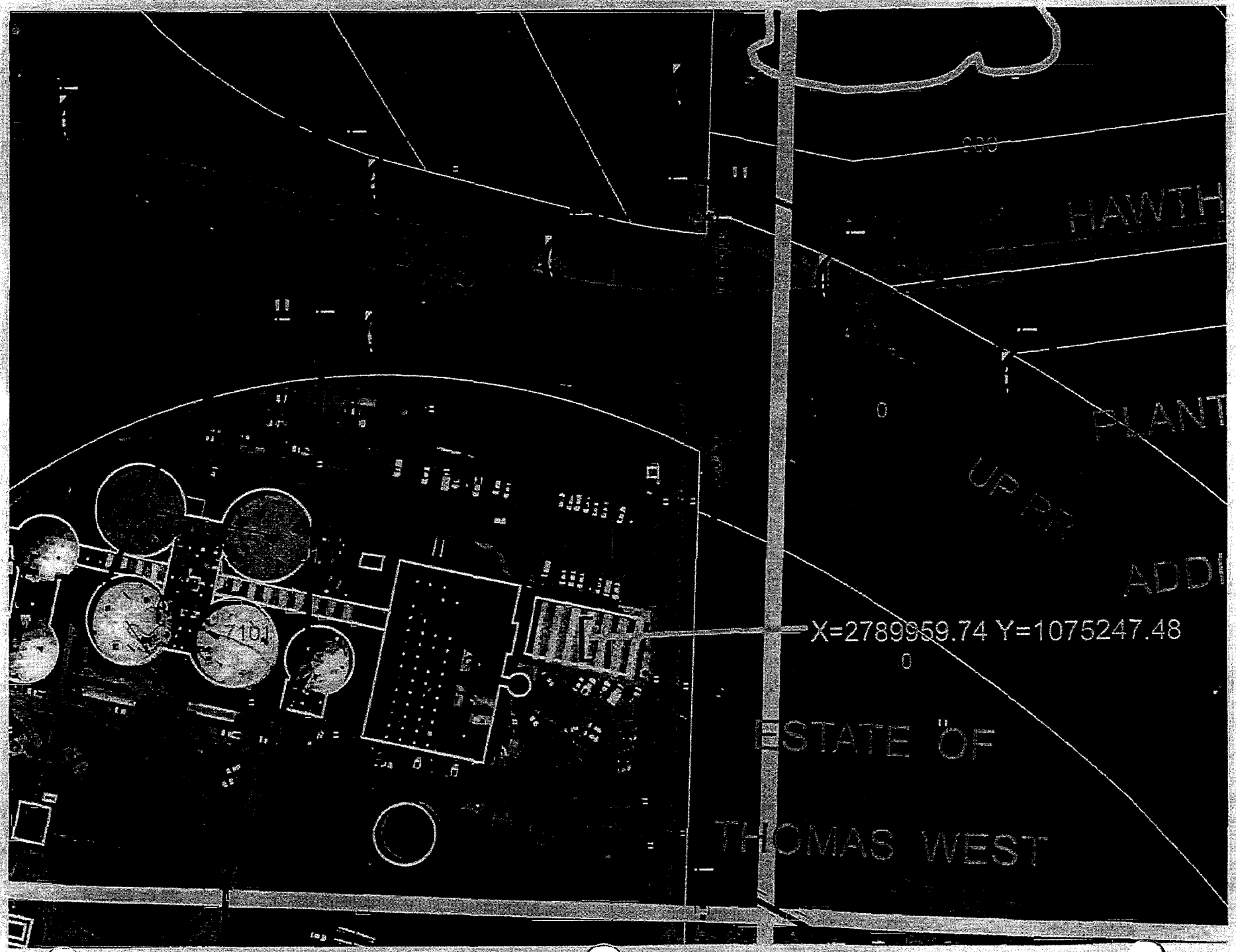
7.11 Does the facility discharge to a losing stream or sinkhole? Yes ☐ No ☒

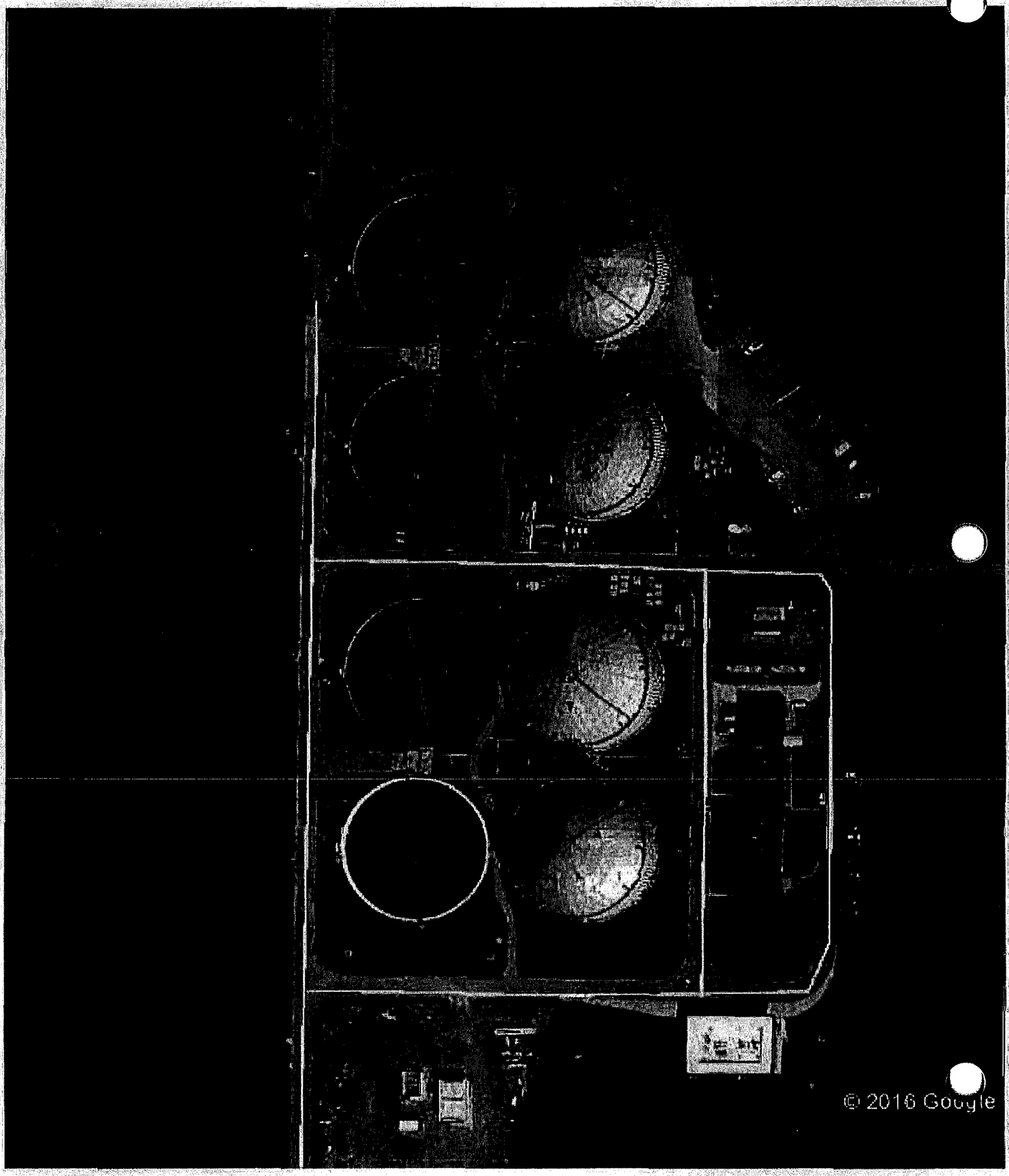
7.12 Has a wasteload allocation study been completed for this facility? Yes ☐ No ☒

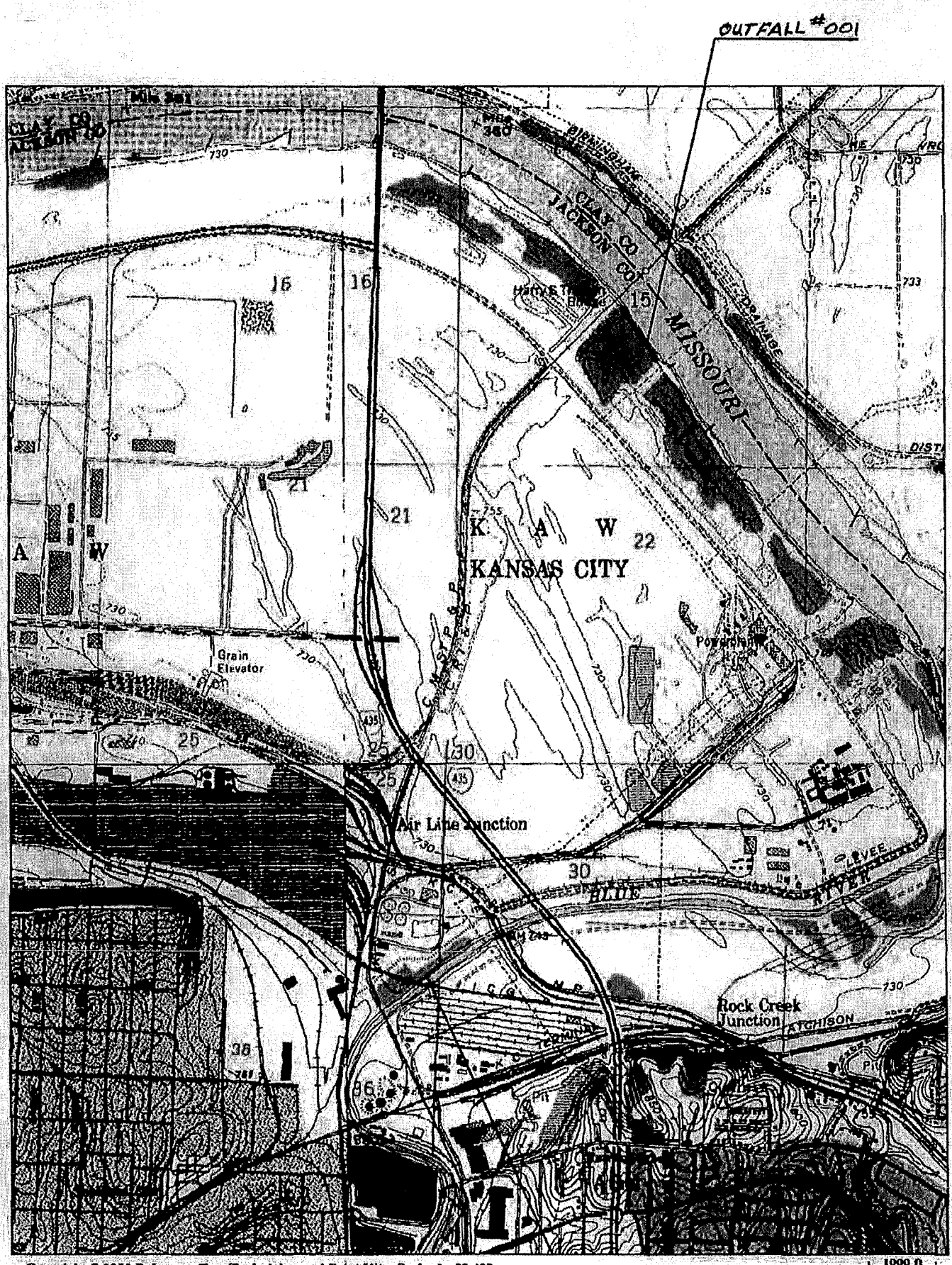
8. LABORATORY CONTROL INFORMATION

LABORATORY WORK CONDUCTED BY PLANT PERSONNEL

Lab work conducted outside of plant.	Yes ☒	No ☐
Push–button or visual methods for simple test such as pH, settleable solids.	Yes ☒	No ☐
Additional procedures such as Dissolved Oxygen, Chemical Oxygen Demand, Biological Oxygen Demand, titrations, solids, volatile content.	Yes ☒	No ☐
More advanced determinations such as BOD seeding procedures, fecal coliform, nutrients, total oils, phenols, etc.	Yes ☐	No ☒
Highly sophisticated instrumentation, such as atomic absorption and gas chromatograph.	Yes ☐	No ☒


HAWTH
PLANT
UP RT
ADDI
X=2789959.74 Y=1075247.48
ESTATE OF
THOMAS WEST


© 2016 Google


OUTFALL #001
CLAY CO
JACKSON CO
MISSOURI
KANSAS CITY
Grain Elevator
Air Line Junction
Rock Creek Junction
BLUE
RIVER
LEVEE
ATCHISON
Copyright © 2000 DeLorme. TopoTools Advanced Print Kit. Scale: 1 : 22,400
1000 ft

FACILITY NAME	PERMIT NO.	OUTFALL NO.
KC Blue River Wastewater Treatment Facility	MO- 0024911	001

PART A – BASIC APPLICATION INFORMATION

9. SLUDGE HANDLING, USE AND DISPOSAL

9.1 Is the sludge a hazardous waste as defined by 10 CSR 25? Yes ☐ No ☒

9.2 Sludge production (Including sludge received from others): Design Dry Tons/Year 56,479 Actual Dry Tons/Year

9.3 Sludge storage provided: 350,000 Cubic feet; 9 Days of storage; 3.6 Average percent solids of sludge;

☐ No sludge storage is provided. ☐ Sludge is stored in lagoon.

9.4 Type of storage:

☒ Holding Tank ☐ Basin ☐ Concrete Pad ☐ Building ☐ Lagoon ☒ Other (Please describe) Stablize sludge lagoons

9.5 Sludge Treatment:

☒ Anaerobic Digester ☐ Aerobic Digester ☐ Storage Tank ☐ Air or Heat Drying ☐ Lime Stabilization ☐ Composting ☒ Lagoon ☐ Other (Attach Description)

9.6 Sludge use or disposal:

☒ Land Application ☐ Contract Hauler ☐ Hauled to Another Treatment Facility ☒ Solid Waste Landfill
☐ Surface Disposal (Sludge Disposal Lagoon, Sludge Held For More Than Two Years) ☒ Incineration
☐ Other (Attach Explanation Sheet) ____

9.7 Person responsible for hauling sludge to disposal facility:
☒ By Applicant | By Others (complete below)

NAME	E-MAIL ADDRESS
City of Kansas City, MO	hans.newsom@kcmo.org

ADDRESS	CITY	STATE	ZIP CODE
7300 Hawthorne Road	Kansas City	MO	64120

CONTACT PERSON	TELEPHONE WITH AREA CODE	PERMIT NO.
Hans B. Newsom	(816) 513-7225	MO- 0024911

9.8 Sludge use or disposal facility:
☒ By Applicant ☐ By Others (Please complete below)

NAME	E-MAIL ADDRESS
Birmingham WWTP Land Application Facility	timothy.walters@kcmo.org

ADDRESS	CITY	STATE	ZIP CODE
10801 NE 28th St	Kansas City	MO	64161

CONTACT PERSON	TELEPHONE WITH AREA CODE	PERMIT NO.
Timothy Walters	(816) 719-0469	MO- 0049531

9.9 Does the sludge or biosolids disposal comply with Federal Sludge Regulation 40 CFR 503?
☒ Yes ☐ No (Please explain)

END OF PART A

FACILITY NAME	PERMIT NO.	OUTFALL NO.
KC Blue River Wastewater Treatment Facility	MO- 0024911	001

PART B – ADDITIONAL APPLICATION INFORMATION

10. COLLECTION SYSTEM

10.1 Length of sanitary sewer collection system in miles
888 miles (Separate) 851 miles (Combined)

10.2 Does significant infiltration occur in the collection system? ☒ Yes ☐ No
If yes, briefly explain any steps underway or planned to minimize inflow and infiltration:

See 13 for projects that will decrease the amount of infiltration in the collection system. Additional ongoing efforts include: sewer cleaning, CCTV investigation, Cast-in-Place-Pipe relining, rehabilitation of manholes

11. BYPASSING

Does any bypassing occur anywhere in the collection system or at the treatment facility? Yes ☒ No ☐
If yes, explain:

Bypassing can occur in the combined sewer portion of the service area if the sewer system is overwhelmed by storm events

12. OPERATION AND MAINTENANCE PERFORMED BY CONTRACTOR(S)

Are any operational or maintenance aspects (related to wastewater treatment and effluent quality) of the treatment works the responsibility of the contractor?
Yes ☐ No ☒
If Yes, list the name, address, telephone number and status of each contractor and describe the contractor's responsibilities. (Attach additional pages if necessary.)

NAME	
MAILING ADDRESS	
TELEPHONE NUMBER WITH AREA CODE	EMAIL ADDRESS
RESPONSIBILITIES OF CONTRACTOR	

13. SCHEDULED IMPROVEMENTS AND SCHEDULES OF IMPLEMENTATION

Provide information about any uncompleted implementation schedule or uncompleted plans for improvements that will affect the wastewater treatment, effluent quality, or design capacity of the treatment works. If the treatment works has several different implementation schedules or is planning several improvements, submit separate responses for each.

Current Projects (Planned Completion):
I/I Reduction: Blue River Central- Project 1 (2017)
I/I Reduction: Blue River Central- Project 2 (2017)
I/I Reduction: Blue River North- Project 1 (2018)
I/I Reduction: Blue River South- Projects 1 & 2 (2017)
I/I Reduction: Blue River South- Project 3 (2017)
I/I Reduction: Blue River South- Project 4 (2019)
I/I Reduction: Blue River South- Project 5 (2018)
Sewer Separation: Outfall 067 (2019)
Sewer Separation: Outfall 099 (2018)
Sewer Pipe Consolidation: Outfall 063 (2018)
NEID Sewer Separation DS 006 (2017)

Future Projects (Start Date):
I/I Reduction: Round Grove Creek (2017)
I/I Reduction: Little Blue River- Projects 1 (2018)
I/I Reduction: Little Blue River- Projects 2 (2018)
I/I Reduction: Little Blue River- Projects 3 (2018)
Small Sewer Rehabilitation: Lower Blue River (2018)

FACILITY NAME	PERMIT NO.	OUTFALL NO.
KC Blue River Wastewater Treatment Facility	MO- 0024911	001

PART B - ADDITIONAL APPLICATION INFORMATION

14. EFFLUENT TESTING DATA

Applicants must provide effluent testing data for the following parameters. Provide the indicated effluent data **for each outfall through which effluent is discharged.** Do not include information of combined sewer overflows in this section. All information reported must be based on data collected through analysis conducted using 40 CFR Part 136 methods. In addition, this data must comply with QA/QC requirements of 40 CFR Part 136 and other appropriate QA/QC requirements for standard methods for analytes not addressed by 40 CFR Part 136. At a minimum, effluent testing data must be based on at least **three samples** and must be no more than four and one-half years apart.

Outfall Number

PARAMETER	MAXIMUM DAILY VALUE		AVERAGE DAILY VALUE		
	Value	Units	Value	Units	Number of Samples
pH (Minimum)	6.5	S.U.	—	S.U.	360
pH (Maximum)	8.7	S.U.	—	S.U.	360
Flow Rate	159.2	MGD	70.5	MGD	365

*For pH report a minimum and a maximum daily value

POLLUTANT		MAXIMUM DAILY DISCHARGE		AVERAGE DAILY DISCHARGE			ANALYTICAL METHOD	ML/MDL
		Conc.	Units	Conc.	Units	Number of Samples		
Conventional and Nonconventional Compounds								
BIOCHEMICAL OXYGEN DEMAND (Report One)	BOD_5	158	mg/L	33.0	mg/L	257	SM5210B	2
	$CBOD_5$	—	mg/L	—	mg/L	—	—	—
E. COLI		435,200	#/100 mL	17.8	#/100 mL	154	SM9223A.B	10
TOTAL SUSPENDED SOLIDS (TSS)		120	mg/L	39.5	mg/L	258	SM2540	1
AMMONIA (as N)		38	mg/L	16.1	mg/L	261	SM4500 - NH3C	0.13
CHLORINE* (TOTAL RESIDUAL, TRC)		0.1	mg/L	0.004	mg/L	31	SM4500 - CIG	0.1
DISSOLVED OXYGEN		10.0	mg/L	7.7	mg/L	360		
OIL and GREASE		5.5	mg/L	3.5	mg/L	12	SM5520B	1.4
OTHER			mg/L		mg/L			

*Report only if facility chlorinates

END OF PART B

FACILITY NAME	PERMIT NO.	OUTFALL NO.
KC Blue River Wastewater Treatment Facility	MO- 0024911	001

PART C – CERTIFICATION

15. CERTIFICATION

All applicants must complete the Certification Section. This certification must be signed by an officer of the company or city official. All applicants must complete all applicable sections as explained in the Application Overview. By signing this certification statement, applicants confirm that they have reviewed the entire form and have completed all sections that apply to the facility for which this application is submitted.

ALL APPLICANTS MUST COMPLETE THE FOLLOWING CERTIFICATION.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

PRINTED NAME	OFFICIAL TITLE (MUST BE AN OFFICER OF THE COMPANY OR CITY OFFICIAL)
Terry Leeds	Water Services Department Director

SIGNATURE: Andy Shively by Proxy Andy Shively

TELEPHONE NUMBER WITH AREA CODE: 816-513-0504

DATE SIGNED: 5/16/16

Upon request of the permitting authority, you must submit any other information necessary to assess wastewater treatment practices at the treatment works or identify appropriate permitting requirements.

Send Completed Form to:

Department of Natural Resources
Water Protection Program
ATTN: NPDES Permits and Engineering Section
P.O. Box 176
Jefferson City, MO 65102

END OF PART C
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH PARTS OF FORM B2 YOU MUST COMPLETE.

Do not complete the remainder of this application, unless at least one of the following statements applies to your facility:

1. Your facility design flow is equal to or greater than 1,000,000 gallons per day.
2. Your facility is a pretreatment treatment works.
3. Your facility is a combined sewer system.

Submittal of an incomplete application may result in the application being returned. Permit fees for returned applications shall be forfeited. Permit fees for applications being processed by the department that are withdrawn by the applicant shall be forfeited.

MAKE ADDITIONAL COPIES OF THIS FORM FOR EACH OUTFALL

FACILITY NAME	PERMIT NO.	OUTFALL NO.
KC Blue River Wastewater Treatment Facility	MO- *0024911*	*001*

PART D – EXPANDED EFFLUENT TESTING DATA

16. EXPANDED EFFLUENT TESTING DATA

Refer to the APPLICATION OVERVIEW to determine whether Part D applies to the treatment works.

If the treatment works has a design flow greater than or equal to 1 million gallons per day or it has (or is required to have) a pretreatment program, or is otherwise required by the permitting authority to provide the data, then provide effluent testing data for the following pollutants. Provide the indicated effluent testing information **for each outfall through which effluent is discharged.** Do not include information of combined sewer overflows in this section. All information reported must be based on data collected through analysis conducted using 40 CFR Part 136 methods. The facility shall use sufficiently sensitive analytical methods for detecting, identifying, and measuring the concentrations of pollutants. In addition, this data must comply with QA/QC requirements of 40 CFR Part 136 and other appropriate QA/QC requirements for standard methods for analytes not addressed by 40 CFR Part 136. Indicate in the blank rows provided below any data you may have on pollutants not specifically listed in this form. At a minimum, effluent testing data must be based on at least **three pollutant scans** and must be no more than four and one-half years apart.

Outfall Number (Complete Once for Each Outfall Discharging Effluent to Waters of the State.)

POLLUTANT	MAXIMUM DAILY DISCHARGE				AVERAGE DAILY DISCHARGE					ANALYTICAL METHOD	ML/MDL
	Conc.	Units	Mass	Units	Conc.	Units	Mass	Units	No. of Samples		
METALS (TOTAL RECOVERABLE), CYANIDE, PHENOLS AND HARDNESS											
ANTIMONY	*0.7*	*ug/L*			*0.63*	*ug/L*			*4*	*EPA 200.8*	*0.029*
ARSENIC	*1.73*	*ug/L*			*1.34*	*ug/L*			*4*	*EPA 200.8*	*0.085*
BERYLLIUM	*<0.04*	*ug/L*			*<0.04*	*ug/L*			*4*	*EPA 200.7*	*0.04*
CADMIUM	*<0.11*	*ug/L*			*<0.11*	*ug/L*			*4*	*EPA 200.7*	*0.11*
CHROMIUM III	—	*ug/L*			—	*ug/L*			—	—	—
CHROMIUM VI	*<9.8*	*ug/L*			*<9.8*	*ug/L*			*4*	*SM3500CrB*	*9.8*
COPPER	*6.0*	*ug/L*			*4.5*	*ug/L*			*4*	*EPA 200.7*	*0.26*
LEAD	*3.85*	*ug/L*			*2.23*	*ug/L*			*4*	*EPA 200.8*	*0.013*
MERCURY	*0.2*	*ug/L*			*0.07*	*ug/L*			*4*	*EPA 245.1*	*0.084*
NICKEL	*4.0*	*ug/L*			*3.0*	*ug/L*			*4*	*EPA 200.7*	*0.4*
SELENIUM	*2.7*	*ug/L*			*2.3*	*ug/L*			*4*	*EPA 200.8*	*0.068*
SILVER	*<0.74*	*ug/L*			*<0.74*	*ug/L*			*4*	*EPA 200.7*	*0.74*
THALLIUM	*<0.028*	*ug/L*			*<0.028*	*ug/L*			*4*	*EPA 200.8*	*0.028*
ZINC	*45*	*ug/L*			*39*	*ug/L*			*4*	*EPA 200.7*	*0.16*
CYANIDE	*45*	*ug/L*			*9.6*	*ug/L*			*12*	*SM4500CNE*	*5*
TOTAL PHENOLIC COMPOUNDS	*0.188*	*mg/L*			*0.048*	*mg/L*			*4*	*SM5530 C*	*0.002*
HARDNESS (as $CaCO_3$)											
VOLATILE ORGANIC COMPOUNDS											
ACROLEIN	*<1.98*	*ug/L*			*<1.98*	*ug/L*			*3*	*EPA 624*	*1.98*
ACRYLONITRILE	*<1.49*	*ug/L*			*<1.49*	*ug/L*			*3*	*EPA 624*	*1.49*
BENZENE	*<0.5*	*ug/L*			*<0.5*	*ug/L*			*3*	*EPA 624*	*0.5*
BROMOFORM	*<1.04*	*ug/L*			*<1.04*	*ug/L*			*3*	*EPA 624*	*1.04*
CARBON TETRACHLORIDE	*<1.03*	*ug/L*			*<1.03*	*ug/L*			*3*	*EPA 624*	*1.03*
CHLOROBENZENE	*<1.49*	*ug/L*			*<1.49*	*ug/L*			*3*	*EPA 624*	*1.49*

FACILITY NAME	PERMIT NO.	OUTFALL NO.
KC Blue River Wastewater Treatment Facility	MO- 0024911	001

PART D – EXPANDED EFFLUENT TESTING DATA

16. EXPANDED EFFLUENT TESTING DATA

Complete Once for Each Outfall Discharging Effluent to Waters of the State

POLLUTANT	MAXIMUM DAILY DISCHARGE				AVERAGE DAILY DISCHARGE					ANALYTICAL METHOD	ML/MDL
	Conc.	Units	Mass	Units	Conc.	Units	Mass	Units	No. of Samples		
CHLORODIBROMO-METHANE	<0.51	ug/L			<0.51	ug/L			3	EPA 624	0.51
CHLOROETHANE	<0.68	ug/L			<0.68	ug/L			3	EPA 624	0.68
2-CHLORO-ETHYLVINYL ETHER	<0.5	ug/L			<0.5	ug/L			3	EPA 624	0.5
CHLOROFORM	2.2	ug/L			1.5	ug/L			3	EPA 624	1.3
DICHLOROBROMO-METHANE	<1.35	ug/L			<1.35	ug/L			3	EPA 624	1.35
1,1-DICHLORO-ETHANE	<0.59	ug/L			<0.59	ug/L			3	EPA 624	0.59
1,2-DICHLORO-ETHANE	<1.52	ug/L			<1.52	ug/L			3	EPA 624	1.52
TRANS-1,2-DICHLOROETHYLENE	<1.43	ug/L			<1.43	ug/L			3	EPA 624	1.43
1,1-DICHLORO-ETHYLENE	<1.26	ug/L			<1.26	ug/L			3	EPA 624	1.26
1,2-DICHLORO-PROPANE	<0.51	ug/L			<0.51	ug/L			3	EPA 624	0.51
1,3-DICHLORO-PROPYLENE	<1.31	ug/L			<1.31	ug/L			3	EPA 624	1.31
ETHYLBENZENE	<1.37	ug/L			<1.37	ug/L			3	EPA 624	1.37
METHYL BROMIDE	<0.54	ug/L			<0.54	ug/L			3	EPA 624	0.54
METHYL CHLORIDE	<0.61	ug/L			<0.61	ug/L			3	EPA 624	0.61
METHYLENE CHLORIDE	<1.32	ug/L			<1.32	ug/L			3	EPA 624	1.32
1,1,2,2-TETRA-CHLOROETHANE	<0.87	ug/L			<0.87	ug/L			3	EPA 624	0.87
TETRACHLORO-ETHANE	<1.38	ug/L			<1.38	ug/L			3	EPA 624	1.38
TOLUENE	<1.34	ug/L			<1.34	ug/L			3	EPA 624	1.34
1,1,1-TRICHLORO-ETHANE	<1.2	ug/L			<1.2	ug/L			3	EPA 624	1.2
1,1,2-TRICHLORO-ETHANE	<0.63	ug/L			<0.63	ug/L			3	EPA 624	0.63
TRICHLORETHYLENE	<1.39	ug/L			<1.39	ug/L			3	EPA 624	1.39
VINYL CHLORIDE	<1.28	ug/L			<1.28	ug/L			3	EPA 624	1.28
ACID-EXTRACTABLE COMPOUNDS											
P-CHLORO-M-CRESOL	<2	ug/L			<2	ug/L			3	EPA 624	2
2-CHLOROPHENOL	<2.4	ug/L			<2.4	ug/L			3	EPA 624	2.4
2,4-DICHLOROPHENOL	<2.3	ug/L			<2.3	ug/L			3	EPA 624	2.3
2,4-DIMETHYLPHENOL	<1.8	ug/L			<1.8	ug/L			3	EPA 624	1.8
4,6-DINITRO-O-CRESOL	<2.2	ug/L			<2.2	ug/L			3	EPA 624	2.2
2,4-DINITROPHENOL	<2.8	ug/L			<2.8	ug/L			3	EPA 624	2.8
2-NITROPHENOL	<1.9	ug/L			<1.9	ug/L			3	EPA 624	1.9
4-NITROPHENOL	<0.96	ug/L			<0.96	ug/L			3	EPA 624	0.96

FACILITY NAME	PERMIT NO.	OUTFALL NO.
KC Blue River Wastewater Treatment Facility	MO- 0024911	001

PART D – EXPANDED EFFLUENT TESTING DATA

16. EXPANDED EFFLUENT TESTING DATA

Complete Once for Each Outfall Discharging Effluent to Waters of the State.

POLLUTANT	MAXIMUM DAILY DISCHARGE				AVERAGE DAILY DISCHARGE					ANALYTICAL METHOD	ML/MDL
	Conc.	Units	Mass	Units	Conc.	Units	Mass	Units	No. of Samples		
PENTACHLOROPHENOL	<3.4	ug/L			<3.4	ug/L			3	EPA 625	3.4
PHENOL	<0.78	ug/L			<0.78	ug/L			3	EPA 625	0.78
2,4,6-TRICHLOROPHENOL	<1.8	ug/L			<1.8	ug/L			3	EPA 625	1.8
BASE-NEUTRAL COMPOUNDS											
ACENAPHTHENE	<0.82	ug/L			<0.82	ug/L			3	EPA 625	0.82
ACENAPHTHYLENE	<1.1	ug/L			<1.1	ug/L			3	EPA 625	1.1
ANTHRACENE	<0.74	ug/L			<0.74	ug/L			3	EPA 625	0.74
BENZIDINE	<1.6	ug/L			<1.6	ug/L			3	EPA 625	1.6
BENZO(A)ANTHRACENE	<1.3	ug/L			<1.3	ug/L			3	EPA 625	1.3
BENZO(A)PYRENE	<1.5	ug/L			<1.5	ug/L			3	EPA 625	1.5
3,4-BENZO-FLUORANTHENE	<1.9	ug/L			<1.9	ug/L			3	EPA 625	1.9
BENZO(GH) PHERYLENE	<1.2	ug/L			<1.2	ug/L			3	EPA 625	1.2
BENZO(K) FLUORANTHENE	<1.9	ug/L			<1.9	ug/L			3	EPA 625	1.9
BIS (2-CHLOROTHOXY) METHANE	<1.3	ug/L			<1.3	ug/L			3	EPA 625	1.3
BIS (2-CHLOROETHYL) – ETHER	<1.5	ug/L			<1.5	ug/L			3	EPA 625	1.5
BIS (2-CHLOROISO-PROPYL) ETHER	<1.0	ug/L			<1.0	ug/L			3	EPA 625	1.0
BIS (2-ETHYLHEXYL) PHTHALATE	42.66	ug/L			15.48	ug/L			3	EPA 625	0.84
4-BROMOPHENYL PHENYL ETHER	<0.86	ug/L			<0.86	ug/L			3	EPA 625	0.86
BUTYL BENZYL PHTHALATE	<1.3	ug/L			<1.3	ug/L			3	EPA 625	1.3
2-CHLORONAPH-THALENE	<0.69	ug/L			<0.69	ug/L			3	EPA 625	0.69
4-CHLORPHENYL PHENYL ETHER	<0.9	ug/L			<0.9	ug/L			3	EPA 625	0.9
CHRYSENE	<1.3	ug/L			<1.3	ug/L			3	EPA 625	1.3
DI-N-BUTYL PHTHALATE	<1.1	ug/L			<1.1	ug/L			3	EPA 625	1.1
DI-N-OCTYL PHTHALATE	<0.74	ug/L			<0.74	ug/L			3	EPA 625	0.74
DIBENZO (A,H) ANTHRACENE	<1.7	ug/L			<1.7	ug/L			3	EPA 625	1.7
1,2-DICHLORO-BENZENE	<0.94	ug/L			<0.94	ug/L			3	EPA 625	0.94
1,3-DICHLORO-BENZENE	<0.58	ug/L			<0.58	ug/L			3	EPA 625	0.58
1,4-DICHLORO-BENZENE	<0.58	ug/L			<0.58	ug/L			3	EPA 625	0.58
3,3-DICHLORO-BENZIDINE	<1.6	ug/L			<1.6	ug/L			3	EPA 625	1.6
DIETHYL PHTHALATE	<0.99	ug/L			<0.99	ug/L			3	EPA 625	0.99
DIMETHYL PHTHALATE	<1.4	ug/L			<1.4	ug/L			3	EPA 625	1.4

FACILITY NAME	PERMIT NO.	OUTFALL NO.
KC Blue River Wastewater Treatment Facility	MO- 0024911	001

PART D – EXPANDED EFFLUENT TESTING DATA

16. EXPANDED EFFLUENT TESTING DATA

Complete Once for Each Outfall Discharging Effluent to Waters of the State.

POLLUTANT	MAXIMUM DAILY DISCHARGE				AVERAGE DAILY DISCHARGE					ANALYTICAL METHOD	ML/MDL
	Conc.	Units	Mass	Units	Conc.	Unite	Mass	Units	No. of Samples		
2,4-DINITRO-TOLUENE	<1.4	ug/L			<1.4	ug/L			3	EPA 625	1.4
2,6-DINITRO-TOLUENE	<1.2	ug/L			<1.2	ug/L			3	EPA 625	1.2
1,2-DIPHENYL-HYDRAZINE	<0.8	ug/L			<0.8	ug/L			3	EPA 625	0.8
FLUORANTHENE	<1.2	ug/L			<1.2	ug/L			3	EPA 625	1.2
FLUORENE	<1.1	ug/L			<1.1	ug/L			3	EPA 625	1.1
HEXACHLOROBENZENE	<0.91	ug/L			<0.91	ug/L			3	EPA 625	0.91
HEXACHLOROBUTADIENE	<0.7	ug/L			<0.7	ug/L			3	EPA 625	0.7
HEXACHLOROCYCLO-PENTADIENE	<0.33	ug/L			<0.33	ug/L			3	EPA 625	0.33
HEXACHLOROETHANE	<0.77	ug/L			<0.77	ug/L			3	EPA 625	0.77
INDENO (1,2,3-CD) PYRENE	<1.6	ug/L			<1.6	ug/L			3	EPA 625	1.6
ISOPHORONE	<1.5	ug/L			<1.5	ug/L			3	EPA 625	1.5
NAPHTHALENE	<1.0	ug/L			<1.0	ug/L			3	EPA 625	1.0
NITROBENZENE	<1.4	ug/L			<1.4	ug/L			3	EPA 625	1.4
N-NITROSODI-PROPYLAMINE	<1.4	ug/L			<1.4	ug/L			3	EPA 625	1.4
N-NITROSODI-METHYLAMINE	<1.4	ug/L			<1.4	ug/L			3	EPA 625	1.4
N-NITROSODI-PHENYLAMINE	<1.4	ug/L			<1.4	ug/L			3	EPA 625	1.4
PHENANTHRENE	<1.2	ug/L			<1.2	ug/L			3	EPA 625	1.2
PYRENE	<1.2	ug/L			<1.2	ug/L			3	EPA 625	1.2
1,2,4-TRICHLOROBENZENE	<0.87	ug/L			<0.87	ug/L			3	EPA 625	0.87

Use this space (or a separate sheet) to provide information on other pollutants not specifically listed in this form.

END OF PART D

REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM B2 YOU MUST COMPLETE.

MAKE ADDITIONAL COPIES OF THIS FORM FOR EACH OUTFALL		
FACILITY NAME: KC Blue River Wastewater Treatment Facility	PERMIT NO.: MO- 0024911	OUTFALL NO.: 001

PART E – TOXICITY TESTING DATA

17. TOXICITY TESTING DATA

Refer to the APPLICATION OVERVIEW to determine whether Part E applies to the treatment works.

Publicly owned treatment works, or POTWs, meeting one or more of the following criteria must provide the results of whole effluent toxicity tests for acute or chronic toxicity for each of the facility's discharge points.

A. POTWs with a design flow rate greater than or equal to 1 million gallons per day

B. POTWs with a pretreatment program (or those that are required to have one under 40 CFR Part 403)

C. POTWs required by the permitting authority to submit data for these parameters

- At a minimum, these results must include quarterly testing for a 12-month period within the past one year using multiple species (minimum of two species), or the results from four tests performed at least annually in the four and one-half years prior to the application, provided the results show no appreciable toxicity, and testing for acute or chronic toxicity, depending on the range of receiving water dilution. Do not include information about combined sewer overflows in this section. All information reported must be based on data collected through analysis conducted using 40 CFR Part 136 methods. In addition, this data must comply with QA/QC requirements of 40 CFR Part 136 and other appropriate QA/QC requirements for standard methods for analytes not addressed by 40 CFR Part 136.
- If EPA methods were not used, report the reason for using alternative methods. If test summaries are available that contain all of the information requested below, they may be submitted in place of Part E. If no biomonitoring data is required, do not complete Part E. Refer to the application overview for directions on which other sections of the form to complete.

Indicate the number of whole effluent toxicity tests conducted in the past four and one-half years: 0 chronic 9 acute

Complete the following chart **for the last three whole effluent toxicity tests.** Allow one column per test. Copy this page if more than three tests are being reported.

	Most Recent	2ND Most Recent	3RD Most Recent
A. Test Information			
Test Method Number	EPA 821-C-02-006	EPA 821-C-02-006	EPA 821-C-02-006
Final Report Number	60211175	60200323	60186076
Outfall Number	001	001	001
Dates Sample Collected	1/13/2016	8/11/2015	1/13/2015
Date Test Started	1/14/2016	8/12/2015	1/14/2015
Duration	48 HRS	48 HRS	48 HRS
B. Toxicity Test Methods Followed			
Manual Title	US EPA Manual	US EPA Manual	US EPA Manual
Edition Number and Year of Publication	Nov 2002	Nov 2002	Nov 2002
Page Number(s)			
C. Sample collection method(s) used. For multiple grab samples, indicate the number of grab samples used			
24-Hour Composite	X	X	X
Grab			
D. Indicate where the sample was taken in relation to disinfection (Check all that apply for each)			
Before Disinfection			
After Disinfection	X	X	X
After Dechlorination			
E. Describe the point in the treatment process at which the sample was collected			
Sample Was Collected:	Final Effluent	Final Effluent	Final Effluent
F. Indicate whether the test was intended to assess chronic toxicity, acute toxicity, or both			
Chronic Toxicity			
Acute Toxicity	X	X	X
G. Provide the type of test performed			
Static	X	X	X
Static-renewal			
Flow-through			
H. Source of dilution water. If laboratory water, specify type; if receiving water, specify source			
Laboratory Water			
Receiving Water	X	X	X

FACILITY NAME	PERMIT NO.	OUTFALL NO.
KC Blue River Wastewater Treatment Facility	MO- 0024911	001

PART E – TOXICITY TESTING DATA

17. TOXICITY TESTING DATA (continued)

	Most Recent	2ND Most Recent	3RD Most Recent
I. Type of dilution water. If salt water, specify "natural" or type of artificial sea salts or brine used.			
Fresh Water	X	X	X
Salt Water			
J. Percentage of effluent used for all concentrations in the test series			
	100%	100%	100%
K. Parameters measured during the test (State whether parameter meets test method specifications)			
pH	7.66	7.51	7.79
Salinity			
Temperature	25 C	25 C	25 C
Ammonia		17.7 mg/L	
Dissolved Oxygen	8.00 mg/L	7.10 mg/L	6.60 mg/L
L. Test Results			
Acute:			
Percent Survival in 100% Effluent	100% / 100%	100% / 60%	100% / 80%
LC_{50}	> 100% / >100%	> 100% / 89.83%	> 100% / >78.77%
95% C.I.			
Control Percent Survival	100% / 100%	100% / 100%	100% / 100%
Other (Describe)			
Chronic:			
NOEC			
IC_{25}			
Control Percent Survival			
Other (Describe)			
M. Quality Control/ Quality Assurance			
Is reference toxicant data available?	Yes	Yes	Yes
Was reference toxicant test within acceptable bounds?	Yes	Yes	Yes
What date was reference toxicant test run (MM/DD/YYYY)?	1/11/2016	7/22/2015	1/17/2015
Other (Describe)			

Is the treatment works involved in a toxicity reduction evaluation? ☐ Yes ☒ No

If yes, describe:

If you have submitted biomonitoring test information, or information regarding the cause of toxicity, within the past four and one-half years, provide the dates the information was submitted to the permitting authority and a summary of the results.

Date Submitted (MM/DD/YYYY) 2/28/2016, 9/28/2015, 2/28/2015

Summary of Results (See Instructions)

All Passed

END OF PART E

REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM B2 YOU MUST COMPLETE.

MAKE ADDITIONAL COPIES OF THIS FORM FOR EACH OUTFALL

FACILITY NAME	PERMIT NO.	OUTFALL NO.
KC Blue River Wastewater Treatment Facility	MO- *0024911*	*001*

PART F – INDUSTRIAL USER DISCHARGES AND RCRA/CERCLA WASTES

Refer to the APPLICATION OVERVIEW to determine whether Part F applies to the treatment works.

18. GENERAL INFORMATION

18.1 Does the treatment works have, or is it subject to, an approved pretreatment program?

☒ Yes ☐ No

18.2 Number of Significant Industrial Users (SIUs) and Categorical Industrial Users (CIUs). Provide the number of each of the following types of industrial users that discharge to the treatment works:

Number of non-categorical SIUs *2*

Number of CIUs *43*

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME			
MAILING ADDRESS	CITY	STATE	ZIP

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.

Principal Product(s):

Raw Material(s):

19.3 Flow Rate

a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.

gpd ☐ Continuous ☐ Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.

gpd ☐ Continuous ☐ Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:

a. Local Limits ☐ Yes ☐ No

b. Categorical Pretreatment Standards ☐ Yes ☐ No

If subject to categorical pretreatment standards, which category and subcategory?

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?

☐ Yes ☐ No

If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
A1 Paint, Powder and Sandblasting

MAILING ADDRESS:	CITY:	STATE:	ZIP:
7601 E 12th Street	*Kansas City*	*MO*	*64126*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Powder coating and painting of steel fabricated parts

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
None (service industry)

Raw Material(s):
Powder coating and industrial wet paint

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
500 gpd [X] Continuous [ ] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
100 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No
b. Categorical Pretreatment Standards [X] Yes [ ] No
If subject to categorical pretreatment standards, which category and subcategory? 433.17

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No
If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
Ace ImageWear

MAILING ADDRESS:	CITY:	STATE:	ZIP:
4120 Truman Road	*Kansas City*	*MO*	*64127*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Laundry service

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
None (service industry)

Raw Material(s):
Laundry detergent and cleaning chemicals, wash water

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
40,000 gpd [X] Continuous [ ] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
5,000 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No
b. Categorical Pretreatment Standards [ ] Yes [X] No
If subject to categorical pretreatment standards, which category and subcategory? N/A

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No
If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
Artcraft Nameplate and Engraving

MAILING ADDRESS:	CITY:	STATE:	ZIP:
1130 Elmwood Ave.	*Kansas City*	*MO*	*64124*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Engraver

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
silk screening, lithographing, etching, embossing, stamping, hot stamping, digital printing & plotting machines, 4 color ink jet printing, mechanical and laser engraving

Raw Material(s):
Paper, ink, printing plates, solvents, fountain solution, metal dust and engraving waste

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
0 gpd [ ] Continuous [X] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
4,000 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [X] Yes [ ] No
If subject to categorical pretreatment standards, which category and subcategory? 433.17

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No

If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
Bount International

MAILING ADDRESS:	CITY:	STATE:	ZIP:
4840 E. 12th St.	*Kansas City*	*MO*	*64127*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Manufacture lawn mower blades

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
lawn mower blades

Raw Material(s):
various grads of cold rolled steel

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
3,000 gpd [X] Continuous [ ] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
1,500 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [X] Yes [ ] No
If subject to categorical pretreatment standards, which category and subcategory? 433.17

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No

If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
Cargill, Inc.

MAILING ADDRESS:	CITY:	STATE:	ZIP:
PO Box 33413	*Kansas City*	*MO*	*64120*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Soybean crush plant. Process soybeans into four major products: soybean meal, soybean oil, soy hulls, and soy hull pellets.

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
Soybean meal, soybean oil, soy hulls, and soy hull pellets

Raw Material(s):
soybeans

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
89,000 gpd [X] Continuous [ ] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
36,000 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [ ] Yes [X] No
If subject to categorical pretreatment standards, which category and subcategory? N/A

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No

If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
Catalent

MAILING ADDRESS:	CITY:	STATE:	ZIP:
PO Box 9724	*Kansas City*	*MO*	*64134*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Pharmaceutical research and development. Manufacture of pharmaceutical products and clinical supplies.

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
Pharmaceutical products and clinical supplies

Raw Material(s):
Hydrochloric acid, methanol, acetone, acetonitrile, starches, sugars, active pharmaceutical ingredients, ethanol

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
12,000 gpd [ ] Continuous [X] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
32,000 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [X] Yes [ ] No
If subject to categorical pretreatment standards, which category and subcategory? 439.47

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No

If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
Hubzone 1, Inc.

MAILING ADDRESS:	CITY:	STATE:	ZIP:
7605 E. 12th St., Suite B	*Kansas City*	*MO*	*64125*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Painting and Powder Coatings

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
Painted and powder coated parts

Raw Material(s):
Paint, powder coating, steel

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
1,000 gpd [ ] Continuous [X] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
150 gpd [ ] Continuous [X] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [X] Yes [ ] No
If subject to categorical pretreatment standards, which category and subcategory? 433.17

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No
If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
Department of Veteran Affairs, VA Medical Center

MAILING ADDRESS:	CITY:	STATE:	ZIP:
4801 Linwood Blvd.	*Kansas City*	*MO*	*64128*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Hospital

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
None (service industry)

Raw Material(s):
Boiler system chemicals, lab chemicals, radiology, pharmacy

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
0 gpd [ ] Continuous [ ] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
166,000 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [ ] Yes [X] No
If subject to categorical pretreatment standards, which category and subcategory? N/A

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No
If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
Duroseal Coatings Company, LLC

MAILING ADDRESS:	CITY:	STATE:	ZIP:
3456 E 155th Street	*Kansas City*	*MO*	*64147*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Coatings

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
Coated pipes, tubing, couplings, valves, etc

Raw Material(s):
Solvents, coating overspray and waste

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
3,000 gpd [X] Continuous [ ] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
100 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [ ] Yes [X] No
If subject to categorical pretreatment standards, which category and subcategory? 433.17

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No
If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
Environmental Specialists, Inc.

MAILING ADDRESS:	CITY:	STATE:	ZIP:
3001 E. 83rd St.	*Kansas City*	*MO*	*64132*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Recover oil and hyudrocarbons from non-hazardous wastewater usually impacted wth petroleum products from a spill or accident, preventive maintenance activities of pipeline companies, or cleaning of vac trucks or frac tanks used in maintenance activities.

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
None (service industry)

Raw Material(s):
Emergency clean up of waste water from industrial and commercial sources

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
varies gpd [ ] Continuous [X] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
200 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [X] Yes [ ] No
If subject to categorical pretreatment standards, which category and subcategory? 437.15 & 437.25

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No
If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
G&K Services

MAILING ADDRESS:	CITY:	STATE:	ZIP:
1745 Reynolds Ave.	*Kansas City*	*MO*	*64120*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Textile leasing and laundering service

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
None (service industry)

Raw Material(s):
Laundry detergent and cleaning chemicals, wash water

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
40,000 gpd [X] Continuous [ ] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
600 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [ ] Yes [X] No
If subject to categorical pretreatment standards, which category and subcategory? N/A

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No
If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
Gateway Packaging Co.

MAILING ADDRESS:	CITY:	STATE:	ZIP:
5910 Winner Rd.	*Kansas City*	*MO*	*64125*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Packaging Manufacturer

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
paper bags

Raw Material(s):
paper, glue, and ink

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
1,400 gpd [X] Continuous [X] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
700 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [ ] Yes [X] No
If subject to categorical pretreatment standards, which category and subcategory? N/A

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No
If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
Hazmat, Inc.

MAILING ADDRESS:	CITY:	STATE:	ZIP:
6300 Stadium Drive	*Kansas City*	*MO*	*64129*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Environmental clean-up

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
Packaging

Raw Material(s):
Paper, plastic, foil, ink, solvents, adhesives, printing wastes

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
0 gpd [ ] Continuous [ ] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
0 gpd [ ] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [X] Yes [ ] No
If subject to categorical pretreatment standards, which category and subcategory? 437.46

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No

If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
Jackson Plating & Polishing, Inc.

MAILING ADDRESS:	CITY:	STATE:	ZIP:
2641 Jackson Ave.	*Kansas City*	*MO*	*64127*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Plating and Polishing

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
Plating, polishing, etching, embossing, stamping, hot stamping, mechanical and laser engraving

Raw Material(s):
Cleaning baths, plating baths, electroplated parts

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
60 gpd [ ] Continuous [X] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
100 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [X] Yes [ ] No
If subject to categorical pretreatment standards, which category and subcategory? 413.14A

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No

If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS: INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
KC Southern Railway

MAILING ADDRESS:	CITY:	STATE:	ZIP:
PO Box 219335	*Kansas City*	*MO*	*64121*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Locomotive maintenonce and repair,railroad reight hauling, switching yard

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
Service/Transportation

Raw Material(s):
Oil, petroleum products, stormwater generoted on site

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
3300 gpd [X] Continuous [X] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
280 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [ ] Yes [X] No
If subject to categorical pretreatment standards, which category and subcategory? N/A

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No
If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS: INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
KCMO Regional HHW Center

MAILING ADDRESS:	CITY:	STATE:	ZIP:
4707 Deramus St.	*Kansas City*	*MO*	*Kindred Hospitol*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Household Hazardous Waste Disposal

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
None (service industry)

Raw Material(s):
Adhesives, antifreeze, batteries, brake fluid, bleach, disinfectants, fluorescent lights, gasoline, fuel, oils, paint, pest poison, solvents, household chemicals, etc.

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
0 gpd [ ] Continuous [ ] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
300 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [X] Yes [ ] No
If subject to categorical pretreatment standards, which category and subcategory? 437.46

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No
If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
Kindred Hospital

MAILING ADDRESS:	CITY:	STATE:	ZIP:
8701 Troost Ave.	*Kansas City*	*MO*	*64131*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Hospital

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
None (service industry)

Raw Material(s):
Boiler system chemicals, lab chemicals, radiology, pharmacy

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
0 gpd [ ] Continuous [ ] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
10,400 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [ ] Yes [X] No
If subject to categorical pretreatment standards, which category and subcategory? N/A

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No

If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
Labconco Corp.

MAILING ADDRESS:	CITY:	STATE:	ZIP:
8811 Prospect Ave.	*Kansas City*	*MO*	*64132*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Manufacturing

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
Manufacturer and supplier of laboratory equipment

Raw Material(s):
Steel, epoxy powder paint and chmicals in the wash system(Galaxy 752 Detergent, Galaxy 758 Phosphate, Galaxy 745 Non-Chromate sealer)

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
7,800 gpd [X] Continuous [ ] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
1,900 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [X] Yes [ ] No
If subject to categorical pretreatment standards, which category and subcategory? 433.17

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No

If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
LPF High Performance Coatings

MAILING ADDRESS:	CITY:	STATE:	ZIP:
5000 E. 59th St.	*Kansas City*	*MO*	*64130*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Coatings and sandblasting

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
Paint and coatings applied to pipes, tubing, couplings, valves, etc

Raw Material(s):
Paint and powder coatinhgs, washline chemicals, and cleaning solvents

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
0 gpd [ ] Continuous [ ] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
175 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [X] Yes [ ] No
If subject to categorical pretreatment standards, which category and subcategory? 433.17

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No

If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
Millbank Manufacturing

MAILING ADDRESS:	CITY:	STATE:	ZIP:
PO Box 419028	*Kansas City*	*MO*	*64141*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Manufacture of electric meter sockets, enclosures, and related electrical equipment

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
Meters, Enclosed Controls, Generators

Raw Material(s):
Steel, aluminum, copper, insulating material, powder paint

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
1,000 gpd [X] Continuous [ ] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
10,250 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [X] Yes [ ] No
If subject to categorical pretreatment standards, which category and subcategory? 433.17

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No

If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
Missouri MPP Corp.

MAILING ADDRESS:	CITY:	STATE:	ZIP:
2800 Truman Rd.	*Kansas City*	*MO*	*64127*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Electroplating

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
Electroplated metal products

Raw Material(s):
Nickel, zinc, caustic sodeo, sulfuric acid, mrulatic acid, potassium chloride, *zinc chloride, sodium cyanide*

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
11,400 gpd [X] Continuous [ ] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
1,300 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [X] Yes [ ] No
If subject to categorical pretreatment standards, which category and subcategory? 433.17

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No

If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
Missouri Plating Co.

MAILING ADDRESS:	CITY:	STATE:	ZIP:
7001 E. 13th St.	*Kansas City*	*MO*	*64126*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Plating

19.2 Describe all of the principle processes and raw materials that affect or contribute tothe SIU's discharge.
Principal Product(s):
Zinc plating, decorative nickel plating, lacquering

Raw Material(s):
Nickel, zinc, brass, caustic soda,sulfuric acid, muriatic acid, potassium chloride, zinc chloride, sodium cyanide, copper cyanide, zinc cyanide

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
19,100 gpd [X] Continuous [ ] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
2,100 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [X] Yes [ ] No
If subject to categorical pretreatment standards, which category and subcategory? 413.14c

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No

If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
Mondi Bags USA, LLC

MAILING ADDRESS:	CITY:	STATE:	ZIP:
3244 Gardner Ave.	*Kansas City*	*MO*	*64120*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Manufacture of multiwall bags, roll print, and industrial wrap

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
Multiwall bags, roll print, and industrial wrap

Raw Material(s):
Paper, ink, polyethylene and polypropylene film, adhesive, lacquer

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
2,100 gpd [X] Continuous [ ] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
5,600 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [ ] Yes [X] No
If subject to categorical pretreatment standards, which category and subcategory? N/A

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No
If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
MRI Global

MAILING ADDRESS:	CITY:	STATE:	ZIP:
425 Volker Boulevard	*Kansas City*	*MO*	*64110*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Research

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
Pharmaceuticals

Raw Material(s):
Chemical, pharmaceutical, and lab waste, etc

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
13,500 gpd [X] Continuous [ ] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
4,700 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [ ] Yes [X] No
If subject to categorical pretreatment standards, which category and subcategory? N/A

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No
If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
North American Galvanizing Co.

MAILING ADDRESS:	CITY:	STATE:	ZIP:
7700 E. 12th St.	*Kansas City*	*MO*	*64126*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Hot dip galvanizing of steel parts

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
Galvanized metal products

Raw Material(s):
Zinc, sodium hydroxide, hydrochloric acid, zinc ammonium chloride, fabricated steel

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
0 gpd [ ] Continuous [ ] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
480 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [X] Yes [ ] No
If subject to categorical pretreatment standards, which category and subcategory? 420.120

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No
If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
Nostrum Laboratories, Inc.

MAILING ADDRESS:	CITY:	STATE:	ZIP:
1800 N. Topping Ave.	*Kansas City*	*MO*	*64120*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Manufacture of generic prescription pharmaceuticals

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
Pharmaceuticals

Raw Material(s):
Carbamazepine USP, Prosolv 50 UPS, Sodium lauryl sulfate USP, SureleaseOpadry clear, Theophyline 400 mg, Glyceryl Behenate USP, Aerosil, Magnesium Sterate, Sucralfate, Isopropyl Alcohol, Povidone, Lysol, Steris DA, Sodium Bicarbonate, Prioxicam USP, Lactose Monohydrate, Corn Starch, Ajax, Windex, Bleach

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
3,880 gpd [X] Continuous [ ] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
1,900 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [X] Yes [ ] No
If subject to categorical pretreatment standards, which category and subcategory? 439.46

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No
If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
P-Americas, LLC

MAILING ADDRESS:	CITY:	STATE:	ZIP:
6050 Manchester Tfwy	*Kansas City*	*MO*	*64130*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Manufacture of beverages

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
Packaged wholesale food

Raw Material(s):
Water, sweeteners, flavorings, etc.

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
91,500 gpd [X] Continuous [ ] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
20,000 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [ ] Yes [X] No
If subject to categorical pretreatment standards, which category and subcategory? N/A

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No
If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
Paseo Cargill Energy, LLC

MAILING ADDRESS:	CITY:	STATE:	ZIP:
PO Box 33413	*Kansas City*	*MO*	*64120*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Biodiesel plant

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
Biodiesel and food grade glycerin

Raw Material(s):
soybean oil, methanol, sodium mthylate, caustic soda, hydrochloric acid

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
108,000 gpd [X] Continuous [ ] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
22,300 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [ ] Yes [X] No
If subject to categorical pretreatment standards, which category and subcategory? N/A

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No
If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
Paulo Products

MAILING ADDRESS:	CITY:	STATE:	ZIP:
4827 Chelsea Ave.	*Kansas City*	*MO*	*64130*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Metal heat treating and metal finishing (black oxide)

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
Heat treated customer parts

Raw Material(s):
Quench oil, heat treat (class 1 nitrate-nitrite salt), chloride salt, alkaline cleaners

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
10,000 gpd [X] Continuous [ ] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
1,350 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [X] Yes [ ] No
If subject to categorical pretreatment standards, which category and subcategory? 413.14b

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No
If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
Research Medical Center

MAILING ADDRESS:	CITY:	STATE:	ZIP:
2316 E. Meyer Blvd.	*Kansas City*	*MO*	*64132*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Hospital

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
None (service industry)

Raw Material(s):
Boiler system chemicals, lab chemicals, radiology, pharmacy

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
75,000 gpd [X] Continuous [ ] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
0 gpd [ ] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [ ] Yes [X] No
If subject to categorical pretreatment standards, which category and subcategory? N/A

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No
If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:			
RME Steel Comoany			
MAILING ADDRESS:	CITY:	STATE:	ZIP:
4417 E. 119th St.	*Grandview*	*MO*	*64030*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge

Manufacture of food processing equipment

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.

Principal Product(s):

Steel Food Service Equipment

Raw Material(s):

Steel, plastic, and metol byproducts, oil, petroleum products, paint overspray and waste, coolant, etc

19.3 Flow Rate

a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.

2,000 gpd [ ] Continuous [X] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.

2,000 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:

a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [X] Yes [ ] No

If subject to categorical pretreatment standards, which category and subcategory? 433.17

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?

[ ] Yes [X] No

If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:			
Saint Joseph Medical Center			
MAILING ADDRESS:	CITY:	STATE:	ZIP:
1000 Carondelet Dr.	*Kansas City*	*MO*	*64114*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge

Hospital

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.

Principal Product(s):

None (service industry)

Raw Material(s):

Boiler system chemicals, lab chemicals, radiology, pharmacy

19.3 Flow Rate

a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.

105,500 gpd [X] Continuous [ ] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.

0 gpd [ ] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:

a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [ ] Yes [X] No

If subject to categorical pretreatment standards, which category and subcategory? N/A

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?

[ ] Yes [X] No

If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
Saint Luke's Hospital

MAILING ADDRESS:	CITY:	STATE:	ZIP:
901 E 104th Street	*Kansas City*	*MO*	*64131*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Hospital

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
None (service industry)

Raw Material(s):
Boiler system chemicals, lab chemicals, radiology, pharmacy

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
0 gpd [ ] Continuous [ ] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
280,000 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [ ] Yes [X] No
If subject to categorical pretreatment standards, which category and subcategory? N/A

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No
If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
Saint Luke's North Hospital

MAILING ADDRESS:	CITY:	STATE:	ZIP:
5830 Northwest Barry Road	*Kansas City*	*MO*	*64154*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Hospital

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
None (service industry)

Raw Material(s):
Boiler system chemicals, lab chemicals, radiology, pharmacy

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
13,000 gpd [X] Continuous [ ] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
14,000 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [ ] Yes [X] No
If subject to categorical pretreatment standards, which category and subcategory? N/A

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No
If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
Sanofi

MAILING ADDRESS:	CITY:	STATE:	ZIP:
PO Box 9720	*Kansas City*	*MO*	*64134*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Manufactur prescription and non-prescription pharmaceuticol products

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
Pharmaceuticals

Raw Material(s):
Acetone, Actyl tribuytl citrate, Alcohol SDA-3A, Carnauba wax, Colloidal silicon dioxide, croscarmellose sodium, diethyl phtholate, diltiazem hydrochloride, empty gel caps, eudragit RL, eudragit RD, FDC Blue #1, Fexofenadine HCl, Glycerin, hypromellose, isopropyl alcohol, magnesiu

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
96,000 gpd [ ] Continuous [X] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
35,000 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [X] Yes [ ] No
If subject to categorical pretreatment standards, which category and subcategory? 439.46

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No
If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
Smithfield Farmland

MAILING ADDRESS:	CITY:	STATE:	ZIP:
13825 Wyandotte	*Kansas City*	*MO*	*64145*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Meat processing

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
Meat products

Raw Material(s):
Pork, water, food grade ham additives, wood for natural smoking of hams, meat conditioner

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
187,200 gpd [X] Continuous [ ] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
16,200 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [ ] Yes [X] No
If subject to categorical pretreatment standards, which category and subcategory? N/A

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No
If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
Southeast Sanitary Landfill, LLC

MAILING ADDRESS:	CITY:	STATE:	ZIP:
5605 Moreau River Access Road	*Jefferson City*	*MO*	*64132*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Landfill leachate collection

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
None (service industry)

Raw Material(s):
Residential, industrial, and commercial waste

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
17,300 gpd [X] Continuous [ ] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
0 gpd [ ] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [ ] Yes [X] No
If subject to categorical pretreatment standards, which category and subcategory? N/A

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No
If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
Stowers Institute for Medical Research

MAILING ADDRESS:	CITY:	STATE:	ZIP:
1000 E. 50th St.	*Kansas City*	*MO*	*64110*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Research

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
Pharmaceuticals

Raw Material(s):
Chemical, pharmaceutical, and lab waste, etc

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
0 gpd [ ] Continuous [ ] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
121,000 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [ ] Yes [X] No
If subject to categorical pretreatment standards, which category and subcategory? N/A

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No
If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
Superior Metal Treating & Equipment

MAILING ADDRESS:	CITY:	STATE:	ZIP:
2540 Indiana Ave.	*Kansas City*	*MO*	*64127*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Coatings and metal treating

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
Metal products

Raw Material(s):
Steel, solvents, paints, and coatings

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
9,300 gpd [X] Continuous [ ] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
27,900 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [X] Yes [ ] No
If subject to categorical pretreatment standards, which category and subcategory? 413.44

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No

If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
Union Pacific Railroad

MAILING ADDRESS:	CITY:	STATE:	ZIP:
1400 W 52nd Street	*Denver*	*CO*	*80221*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Railroad

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
Service/Transportation

Raw Material(s):
#2 diesel fuel, lube oil, locomotive cleaner, corrosion inhibitor, journal oil, hydraulic oil, soap

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
36,400 gpd [ ] Continuous [X] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
7,300 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [ ] Yes [X] No
If subject to categorical pretreatment standards, which category and subcategory? N/A

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No

If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
US Plating & Surface Finishing

MAILING ADDRESS:	CITY:	STATE:	ZIP:
1341 Montgall Ave.	*Kansas City*	*MO*	*64127*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Plating & anodizing

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
Zinc plating, decorative nickel plating, lacquering

Raw Material(s):
Nickel sulfate, sulfuric acid, chromic aicd, zinc chloride, stannous sulphate

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
400 gpd [ ] Continuous [X] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
2,400 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [X] Yes [ ] No
If subject to categorical pretreatment standards, which category and subcategory? 433.17

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No
If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
Valicor Enviromental Services, LLC

MAILING ADDRESS:	CITY:	STATE:	ZIP:
1717 N. Topping Ave.	*Kansas City*	*MO*	*64120*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Non-hazardous centralized waste pretreatment and discharge facility

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
Used Oil

Raw Material(s):
Sulfuric acid, sodium, hydroxide, specialty polymers

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
60,000 gpd [X] Continuous [ ] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
150 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [X] Yes [ ] No
If subject to categorical pretreatment standards, which category and subcategory? 437.47

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No
If Yes, describe each episode

19. INDUSTRIES CONTRIBUTING MORE THAN 5 PERCENT OF THE ACTUAL FLOW TO THE FACILITY OR OTHER SIGNIFICANT INDUSTRIAL USERS INFORMATION

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, provide the information requested for each. Submit additional pages as necessary.

NAME:
Walker Towel & Uniform Service

MAILING ADDRESS:	CITY:	STATE:	ZIP:
2601 Truman Rd.	*Kansas City*	*MO*	*64127*

19.1 Describe all of the industrial processes that affect or contribute to the SIU's discharge
Industrial laundry

19.2 Describe all of the principle processes and raw materials that affect or contribute to the SIU's discharge.
Principal Product(s):
None (service industry)

Raw Material(s):
Water, steam, surfactants, alkalis

19.3 Flow Rate
a. PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
58,600 gpd [X] Continuous [ ] Intermittent

b. NON-PROCESS WASTEWATER FLOW RATE. Indicate the average daily volume of non-process wastewater discharged into the collection system in gallons per day, or gpd, and whether the discharge is continuous or intermittent.
1,000 gpd [X] Continuous [ ] Intermittent

19.4 Pretreatment Standards. Indicate whether the SIU is subject to the following:
a. Local Limits [X] Yes [ ] No

b. Categorical Pretreatment Standards [ ] Yes [X] No
If subject to categorical pretreatment standards, which category and subcategory? N/A

19.5 Problems at the Treatment Works attributed to waste discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?
[ ] Yes [X] No

If Yes, describe each episode

RECEIVED
MAY 23 2016
Water Protection Program

MAKE ADDITIONAL COPIES OF THIS FORM FOR EACH OUTFALL

FACILITY NAME	PERMIT NO.	OUTFALL NO.
KC Blue River Wastewater Treatment Facility	MO- 0024911	001

PART F – INDUSTRIAL USER DISCHARGES AND RCRA/CERCLA WASTES

20. RCRA HAZARDOUS WASTE RECEIVED BY TRUCK, RAIL, OR DEDICATED PIPELINE

20.1 Does the treatment works receive or has it in the past three years received RCRA hazardous waste by truck, rail or dedicated pipe? ☐ Yes ☒ No

20.2 Method by which RCRA waste is received. (Check all that apply)
☐ Truck ☐ Rail ☐ Dedicated Pipe

20.3 Waste Description

EPA Hazardous Waste Number	Amount (volume or mass)	Units

21. CERCLA (SUPERFUND) WASTEWATER, RCRA REMEDIATION/CORRECTIVE ACTION WASTEWATER, AND OTHER REMEDIAL ACTIVITY WASTEWATER

21.1 Does the treatment works currently (or has it been notified that it will) receive waste from remedial activities?
☒ Yes ☐ No
Provide a list of sites and the requested information for each current and future site.

21.2 Waste Origin. Describe the site and type of facility at which the CERCLA/RCRA/or other remedial waste originates (or is expected to originate in the next five years).

Former Tronox wood treating plant. Groundwater is being treated under RCRA Permit No. MOD007128978 Treated groundwater is discharged under an Industrial Wastewater Discharge Permit issued to Greenfield Environmental Multistate Trust, LLC.

21.3 List the hazardous constituents that are received (or are expected to be received). Included data on volume and concentration, if known. (Attach additional sheets if necessary)

Treated groundwater containing 0.024 mg/L phenols and 0.75 ug/L phenanthrene Average volume discharged is 5140 gpd.
Average is based on the two samples collected since operations restarted in October 2015

21.4 Waste Treatment

a. Is this waste treated (or will it be treated) prior to entering the treatment works?
☒ Yes ☐ No

If Yes, describe the treatment (provide information about the removal efficiency):
Groundwater is pumped to the primary oil/water tank for Dense Non-Aqueous Phase Liquid, or DNAPL, separation and settling. Water then flows to the secondary oil/water tank or additional settling of DNAPL. Water then flows to a holding tank. From the holding tank it flows to the biological treatment tank where nutrients and a moving bed biofilm reactor treat organic constituents. Effluent from the biologic treatment tank discharges to the sewer.

b. Is the discharge (or will the discharge be) continuous or intermittent?
☒ Continuous ☐ Intermittent

If intermittent, describe the discharge schedule:

END OF PART F
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM B2 YOU MUST COMPLETE.

RECEIVED
MAY 23 2016
Water Protection Program

MAKE ADDITIONAL COPIES OF THIS FORM FOR EACH OUTFALL

FACILITY NAME	PERMIT NO.	OUTFALL NO.
KC Blue River Wastewater Treatment Facility	MO- *0024911*	*001*

PART F – INDUSTRIAL USER DISCHARGES AND RCRA/CERCLA WASTES

20. RCRA HAZARDOUS WASTE RECEIVED BY TRUCK, RAIL, OR DEDICATED PIPELINE

20.1 Does the treatment works receive or has it in the past three years received RCRA hazardous waste by truck, rail or dedicated pipe? ☐ Yes ☒ No

20.2 Method by which RCRA waste is received. (Check all that apply)
☐ Truck ☐ Rail ☐ Dedicated Pipe

20.3 Waste Description

EPA Hazardous Waste Number	Amount (volume or mass)	Units

21. CERCLA (SUPERFUND) WASTEWATER, RCRA REMEDIATION/CORRECTIVE ACTION WASTEWATER, AND OTHER REMEDIAL ACTIVITY WASTEWATER

21.1 Does the treatment works currently (or has it been notified that it will) receive waste from remedial activities?
☒ Yes ☐ No
Provide a list of sites and the requested information for each current and future site.

21.2 Waste Origin. Describe the site and type of facility at which the CERCLA/RCRA/or other remedial waste originates (or is expected to originate in the next five years).

Former waste oil management facility.
Groundwater is being treated under RCRA permit no. MOD073027609
Treated groundwater is discharged under an Industrial Wastewater Discharge Permit issued to Quality Analytical Services.

21.3 List the hazardous constituents that are received (or are expected to be received). Included data on volume and concentration, if known. (Attach additional sheets if necessary)

Treated groundwater containing 7.7 ug/L lead. Average volume discharged is 7,660 gpd. Average is based on 5 samples collected from Oct 2014 - Jan 2015.

21.4 Waste Treatment

a. Is this waste treated (or will it be treated) prior to entering the treatment works?
☒ Yes ☐ No

If Yes, describe the treatment (provide information about the removal efficiency):

Groundwater is pumped to a holding tank then routed through two granular activated carbon vessels prior to discharge

b. Is the discharge (or will the discharge be) continuous or intermittent?
☐ Continuous ☒ Intermittent

If intermittent, describe the discharge schedule:

Approximately 7-8 discharge events per day of 1,250 gal each.

END OF PART F
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM B2 YOU MUST COMPLETE.

MAKE ADDITIONAL COPIES OF THIS FORM FOR EACH OUTFALL

FACILITY NAME	PERMIT NO.	OUTFALL NO.
KC Blue River Wastewater Treatment Facility	*MO- 0024911*	*001*

PART G – COMBINED SEWER SYSTEMS

Refer to the APPLICATION OVERVIEW to determine whether Part G applies to the treatment works.

22. GENERAL INFORMATION

22.1 System Map. Provide a map indicating the following: (May be included with basic application information.)

A. All CSO Discharges.
B. Sensitive Use Areas Potentially Affected by CSOs. (e.g., beaches, drinking water supplies, shellfish beds, sensitive aquatic ecosystems and Outstanding Natural Resource Waters.)
C. Waters that Support Threatened and Endangered Species Potentially Affected by CSOs.

22.2 System Diagram. Provide a diagram, either in the map provided above or on a separate drawing, of the Combined Sewer Collection System that includes the following information:

A. Locations of Major Sewer Trunk Lines, Both Combined and Separate Sanitary.
B. Locations of Points where Separate Sanitary Sewers Feed into the Combined Sewer System.
C. Locations of In-Line or Off-Line Storage Structures.
D. Locations of Flow-Regulating Devices.
E. Locations of Pump Stations.

22.3 Percent of collection system that is combined sewer *63%*

22.4 Population served by combined sewer collection system *182,000*

22.5 Name of any satellite community with combined sewer collection system *No satellite communities are served by CSS*

23. CSO OUTFALLS. COMPLETE THE FOLLOWING ONCE FOR EACH CSO DISCHARGE POINT

23.1 Description of Outfall

a. Outfall Number *See attached CSO Outfall list*
b. Location
c. Distance from Shore (If applicable) _____ ft
d. Depth Below Surface (If applicable) _____ ft
e. Which of the following were monitored during the last year for this CSO?
☐ Rainfall ☐ CSO Pollutant Concentrations ☒ CSO
☐ CSO Flow Volume ☐ Receiving Water Quality
f. How many storm events were monitored last year?

23.2 CSO Events

a. Give the Number of CSO Events in the Last Year	*27*	Events	☐ Actual	☒ Approximate
b. Give the Average Duration Per CSO Event	*58*	Hours	☐ Actual	☒ Approximate
c. Give the Average Volume Per CSO Event	*13*	Million Gallons	☐ Actual	☒ Approximate

d. Give the minimum rainfall that caused a CSO event in the last year *0.24* inches of rainfall

23.3 Description of Receiving Waters

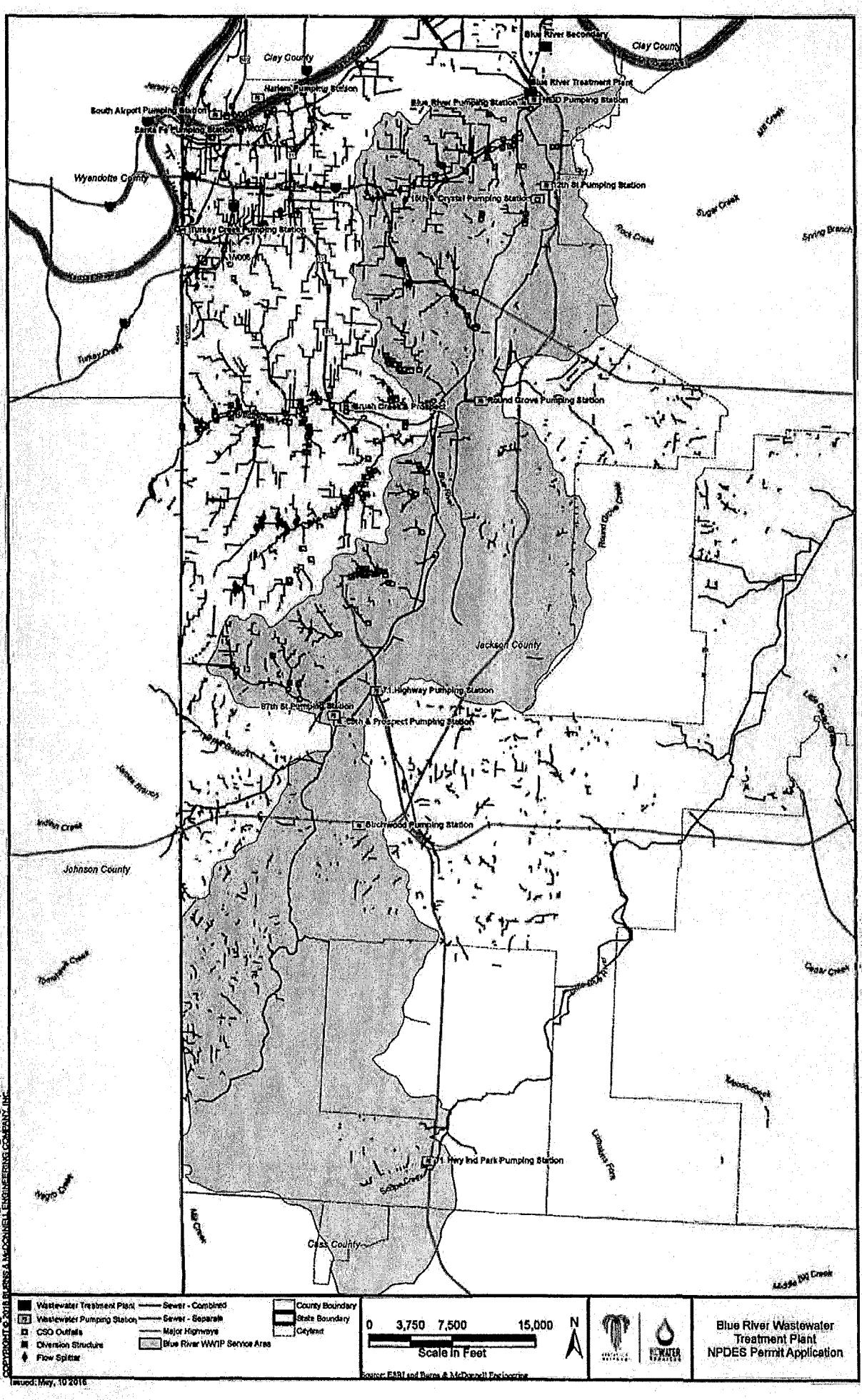
a. Name of Receiving Water *See attached CSO Outfall list*
b. Name of Watershed/River/Stream System
c. U.S. Soil Conservation Service 14-Digit Watershed Code (If Known)
d. Name of State Management/River Basin
e. U.S. Geological Survey 8- Digit Hydrologic Cataloging Unit Code (If Known)

23.4 CSO Operations

Describe any known water quality impacts on the receiving water caused by this CSO (e.g., permanent or intermittent beach closings, permanent or intermittent shellfish bed closings, fish kills, fish advisories, other recreational loss, or violation of any applicable state water quality standard.)

No known water quality impacts as a result of CSOs

END OF PART G
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM B2 YOU MUST COMPLETE.


Blue River Secondary
Clay County
Blue River Treatment Plant
Harlem Pumping Station
Blue River Pumping Station
HRSD Pumping Station
South Airport Pumping Station
Santa Fe Pumping Station
Wyandotte County
12th St Pumping Station
Sixth Crystal Pumping Station
Turkey Creek Pumping Station
Brush Creek Pumping Station
Round Grove Pumping Station
Jackson County
71 Highway Pumping Station
87th St Pumping Station
63rd & Prospect Pumping Station
Birchwood Pumping Station
Johnson County
71 Hwy Ind Park Pumping Station
Cass County
Wastewater Treatment Plant
Wastewater Pumping Station
CSO Outfalls
Diversion Structure
Flow Splitter
Sewer - Combined
Sewer - Separate
Major Highways
Blue River WWTP Service Area
County Boundary
State Boundary
City limit
0 3,750 7,500 15,000
Scale in Feet
N
Source: ESRI and Burns & McDonnell Engineering
Blue River Wastewater Treatment Plant NPDES Permit Application
Issued: May, 10 2016
COPYRIGHT © 2016 BURNS & McDONNELL ENGINEERING COMPANY, INC.

NPDES Permit Application
23.1 and 23.3

CSO No.	Description	UTM Coordinates		Legal Description	Receiving Water	First Classified Stream & ID	USGS Basin & Sub-Watershed No.
006	50th & Stateline	X= 361374	Y= 4321912	NE 1/4 NW 1/4 Sec 31 T49N R33W	Brush Creek	Blue River (418) (303 (d), MND)	10300101-0105
007	50th Terrace & Brush Creek	X= 361400	Y= 4322004	SE 1/4 SW 1/4 Sec 30 T49N R33W	Brush Creek	Blue River (418) (303 (d), MND)	10300101-0105
008	49th Terrace & Westwood Road	X= 361450	Y= 4322126	SE 1/4 SW 1/4 Sec 30 T49N R33W	Brush Creek	Blue River (418) (303 (d), MND)	10300101-0105
009	50th & Holly	X= 361450	Y= 4322126	SE 1/4 SW 1/4 Sec 30 T49N R33W	Brush Creek	Blue River (418) (303 (d), MND)	10300101-0105
010	50th & Brush Creek	X= 361498	Y= 4322126	SE 1/4 SW 1/4 Sec 30 T49N R33W	Brush Creek	Blue River (418) (303 (d), MND)	10300101-0105
011	Roanoke & Brush Creek	X= 361815	Y= 4322367	SW 1/4 SE 1/4 Sec 30 T49N R33W	Brush Creek	Blue River (418) (303 (d), MND)	10300101-0105
012	Summit & Brush Creek	X= 361814	Y= 4322305	SW 1/4 SE 1/4 Sec 30 T49N R33W	Brush Creek	Blue River (418) (303 (d), MND)	10300101-0105
013	47th & Wornall	X= 362249	Y= 4322421	NW 1/4 SW 1/4 Sec 29 T49N R33W	Brush Creek	Blue River (418) (303 (d), MND)	10300101-0105
014	49th & Wornall	X= 362273	Y= 4322420	NW 1/4 SW 1/4 Sec 29 T49N R33W	Brush Creek	Blue River (418) (303 (d), MND)	10300101-0105
015	Nichols Road & Wornall	X= 362490	Y= 4322478	NW 1/4 SW 1/4 Sec 29 T49N R33W	Brush Creek	Blue River (418) (303 (d), MNDe)	10300101-0105
016	Main Street & Brush Creek	X= 362754	Y= 4322412	NE 1/4 SW 1/4 Sec 29 T49N R33W	Brush Creek	Blue River (418) (303 (d), MND)	10300101-0105
017	46th Terrace & Wornall	X= 362944	Y= 4322316	NE 1/4 SE 1/4 Sec 29 T49N R33W	Brush Creek	Blue River (418) (303 (d), MND)	10300101-0105
018	48th & Harrison	X= 363760	Y= 4322179	NE 1/4 SE 1/4 Sec 29 T49N R33W	Brush Creek	Blue River (418) (303 (d), MND)	10300101-0105
019	49th & Troost	X= 363879	Y= 4322146	SW 1/4 SW 1/4 Sec 28 T49N R33W	Brush Creek	Blue River (418) (303 (d), MND)	10300101-0105
020	48th & The Paseo	X= 364244	Y= 4322355	NE 1/4 SW 1/4 Sec 28 T49N R33W	Brush Creek	Blue River (418) (303 (d), MND)	10300101-0105
021	47th & The Paseo	X= 364318	Y= 4322508	NE 1/4 SW 1/4 Sec 29 T49N R33W	Brush Creek	Blue River (418) (303 (d), MND)	10300101-0105
022	Virginia & Brush Creek Boulevard	X= 364200	Y= 4322778	SW 1/4 NW 1/4 Sec 28 T49N R33W	Brush Creek	Blue River (418) (303 (d), MND)	10300101-0105
023	46th & Woodland	X= 364706	Y= 4322687	SE 1/4 NW 1/4 Sec 28 T49N R33W	Brush Creek	Blue River (418) (303 (d), MND)	10300101-0105
024	45th & Garfield	X= 365065	Y= 4322588	SW 1/4 NE 1/4 Sec 28 T49N R33W	Brush Creek	Blue River (418) (303 (d), MND)	10300101-0105
025	46th & Prospect	X= 365447	Y= 4322427	NE 1/4 SE 1/4 Sec 28 T49N R33W	Brush Creek	Blue River (418) (303 (d), MND)	10300101-0105
026	49th & Chestnut	X= 365925	Y= 4322234	NE 1/4 SW 1/4 Sec 27 T49N R33W	Brush Creek	Blue River (418) (303 (d), MND)	10300101-0105
027	45th & Mersington	X= 366823	Y= 4322743	SE 1/4 NE 1/4 Sec 27 T49N R33W	Tributary to Brush Creek	Blue River (418) (303 (d), MND)	10300101-0105
028	46th & Norton	X= 366989	Y= 4322555	SE 1/4 NE 1/4 Sec 27 T49N R33W	Tributary to Brush Creek	Blue River (418) (303 (d), MND)	10300101-0105
029	51st Terrace & Brookside	X= 36290	Y= 4321676	NE 1/4 NW 1/4 Sec 32 T49N R33W	Tributary to Brush Creek	Blue River (418) (303 (d), MND)	10300101-0105
030	4200 Brush Creek	X= 363569	Y= 4322274	NE 1/4 SE 1/4 Sec 29 T49N R33W	Brush Creek	Blue River (418) (303 (d), MND)	10300101-0105
031	Gardner Avenue at MO River	X= 371070	Y= 4330967	NW 1/4 NW 1/4 Sec 31 T50N R32W	Blue River	Blue River (417) (303 (d), MND)	10300101-0106
032	Belmont Ave & Belmont Blvd	X= 370454	Y= 4329991	NE 1/4 SE 1/4 Sec 36 T50B R33W	Blue River	Blue River (417) (303 (d), MND)	10300101-0106
033	Wilson & Bennington	X= 370335	Y= 4330085	NE 1/4 SE 1/4 Sec 36 T50N R33W	Blue River	Blue River (417) (303 (d), MND)	10300101-0106
034	8th Street at Blue River	X= 370440	Y= 4329127	NE 1/4 NE 1/4 Sec 01 T49N R33W	Blue River	Blue River (417) (303 (d), MND)	10300101-0106
035	Truman Road at Blue River	X= 370809	Y= 4328196	SW 1/4 SW 1/4 Sec 06 T49N R32W	Blue River	Blue River (418) (303 (d), MND)	10300101-0106
036	18th Street at Blue River	X= 370437	Y= 4327524	NE 1/4 NE 1/4 Sec 12 T49N R33W	Blue River	Blue River (418) (303 (d), MND)	10300101-0106
037	35th Street at Blue River	X= 369093	Y= 4324740	SW 1/4 SW 1/4 Sec 13 T49N R33W	Blue River	Blue River (418) (303 (d), MND)	10300101-0106
038	37th Street & White	X= 368989	Y= 4324279	NW 1/4 NW 1/4 Sec 24 T49N R33W	Blue River	Blue River (418) (303 (d), MND)	10300101-0106

CSO No.	Description	UTM Coordinates		Legal Description					Receiving Water	First Classified Stream & ID	USGS Basin & Sub-Watershed No.
039	33rd Terrace & Topping	X= 369044	Y= 4324679	NW 1/4	NW 1/4	Sec 24	T49N	R33W	Blue River	Blue River (418) (303 (d), MND)	10300101-0106
040	41st & Elmwood	X= 367486	Y= 4323533	SW 1/4	SW 1/4	Sec 23	T49N	R33W	Unnamed Tributary to the Blue River	Blue River (418) (303 (d), MND)	10300101-0106
041	40th & Cleveland	X= 366744	Y= 4323731	NE 1/4	SE 1/4	Sec 22	T49N	R33W	Unnamed Tributary to the Blue River	Blue River (418) (303 (d), MND)	10300101-0106
042	40th Terrace & Monroe	X= 366657	Y= 4323810	NW 1/4	SE 1/4	Sec 22	T49N	R33W	Unnamed Tributary to the Blue River	Blue River (418) (303 (d), MND)	10300101-0106
043	40th Terrace & Cleveland	X= 366816	Y= 4323699	NW 1/4	SE 1/4	Sec 22	T49N	R33W	Unnamed Tributary to the Blue River	Blue River (418) (303 (d), MND)	10300101-0106
044	40th Terrace & Myrtle	X= 366910	Y= 4323605	NW 1/4	SE 1/4	Sec 22	T49N	R33W	Unnamed Tributary to the Blue River	Blue River (418) (303 (d), MND)	10300101-0106
045	41st & Myrtle	X= 366958	Y= 4323573	SE 1/4	SE 1/4	Sec 22	T49N	R33W	Unnamed Tributary to the Blue River	Blue River (418) (303 (d), MND)	10300101-0106
046	41st & Norton	X= 367054	Y= 4323572	SE 1/4	SE 1/4	Sec 22	T49N	R33W	Unnamed Tributary to the Blue River	Blue River (418) (303 (d), MND)	10300101-0106
047	41st & Jackson	X= 367173	Y= 4323508	SW 1/4	SW 1/4	Sec 23	T49N	R33W	Unnamed Tributary to the Blue River	Blue River (418) (303 (d), MND)	10300101-0106
048	45th Terrace & Lister	X= 367833	Y= 4322695	SE 1/4	NW 1/4	Sec 26	T49N	R33W	Blue River	Blue River (418) (303 (d), MND)	10300101-0106
049	41st & Spruce	X= 367270	Y= 4323537	SW 1/4	SW 1/4	Sec 23	T49N	R33W	Unnamed Tributary to the Blue River	Blue River (418) (303 (d), MND)	10300101-0106
050	Spruce & Towers Road	X= 367246	Y= 4323598	SW 1/4	SW 1/4	Sec 23	T49N	R33W	Unnamed Tributary to the Blue River	Blue River (418) (303 (d), MND)	10300101-0106
051	Skiles & Winner Road	X= 370785	Y= 4329708	SW 1/4	SW 1/4	Sec 31	T50N	R32W	Blue River	Blue River (417) (303 (d), MND)	10300101-0106
052	Truman & Crystal	X= 370833	Y= 4328196	SW 1/4	SW 1/4	Sec 06	T49N	R32W	Blue River	Blue River (418) (303 (d), MND)	10300101-0106
053	12th & Frisco Railroad	X= 367672	Y= 4328781	SW 1/4	NW 1/4	Sec 02	T49N	R33W	Unnamed Tributary to the Blue River	Blue River (418) (303 (d), MND)	10300101-0106
054	17th & Belmont	X= 369238	Y= 4327667	NW 1/4	NW 1/4	Sec 12	T49N	R33W	Unnamed Tributary to the Blue River	Blue River (418) (303 (d), MND)	10300101-0106
055	I-70 & White	X= 369060	Y= 4325666	SW 1/4	NW 1/4	Sec 13	T49N	R33W	Unnamed Tributary to the Blue River	Blue River (418) (303 (d), MND)	10300101-0106
056	55th & Elmwood	X= 367607	Y= 4320725	NE 1/4	SW 1/4	Sec 35	T49N	R33W	Unnamed Tributary to the Blue River	Blue River (418) (303 (d), MND)	10300101-0105
057	76th & Indiana	X= 365926	Y= 4316622	NW 1/4	NW 1/4	Sec 15	T48N	R33W	Unnamed Tributary to the Blue River	Blue River (419) (303 (d), MND)	10300101-0105
058	83rd Terrace & McGee	X= 362559	Y= 4315384	NE 1/4	NW 1/4	Sec 20	T48N	R33W	Dyke Branch	Blue River (419) (303 (d), MND)	10300101-0105
059	85th & Tracy	X= 363680	Y= 4314810	SW 1/4	NW 1/4	Sec 21	T48N	R33W	Dyke Branch	Blue River (419) (303 (d), MND)	10300101-0105
060	58th & Kensington	X= 367165	Y= 4320209	SW 1/4	SW 1/4	Sec 35	T49N	R33W	Unnamed Tributary to the Blue River	Blue River (418) (303 (d), MND)	10300101-0105
061	58th & Elmwood	X= 367309	Y= 4320144	SW 1/4	SW 1/4	Sec 35	T49N	R33W	Unnamed Tributary to the Blue River	Blue River (418) (303 (d), MND)	10300101-0105
062	63rd Terrace & Elmwood	X= 367459	Y= 4319093	NE 1/4	SW 1/4	Sec 02	T48N	R33W	Unnamed Tributary to the Blue River	Blue River (419) (303 (d), MND)	10300101-0105
063	69th & Cleveland	X= 366405	Y= 4317939	SW 1/4	NE 1/4	Sec 10	T48N	R33W	Unnamed Tributary to the Blue River	Blue River (419) (303 (d), MND)	10300101-0105
064	Gregory & Mersington	X= 366594	Y= 4317690	SE 1/4	NE 1/4	Sec 10	T48N	R33W	Unnamed Tributary to the Blue River	Blue River (419) (303 (d), MND)	10300101-0105
065	81st Terrace & Campbell	X= 363471	Y= 4315214	SE 1/4	NE 1/4	Sec 20	T48N	R33W	Unnamed Tributary to the Blue River	Blue River (419) (303 (d), MND)	10300101-0105
066	84th & Main	X= 362269	Y= 4315328	NE 1/4	NW 1/4	Sec 20	T48N	R33W	Dyke Branch	Blue River (419) (303 (d), MND)	10300101-0105
067	83rd & Main	X= 362270	Y= 4315359	NE 1/4	NW 1/4	Sec 20	T48N	R33W	Dyke Branch	Blue River (419) (303 (d), MND)	10300101-0105
068	85th & Flora	X= 363989	Y= 4314558	SE 1/4	NW 1/4	Sec 21	T48N	R33W	Dyke Branch	Blue River (419) (303 (d), MND)	10300101-0105
069	77th & Prospect	X= 365126	Y= 4316296	SW 1/4	NW 1/4	Sec 15	T48N	R33W	Unnamed Tributary to the Blue River	Blue River (419) (303 (d), MND)	10300101-0105
070	Meyer at Blue River	X= 367834	Y= 4318470	SW 1/4	SE 1/4	Sec 02	T48N	R33W	Blue River	Blue River (419) (303 (d), MND)	10300101-0105
071	Delaware Street at MO River	X= 362918	Y= 4330458			Sec 32	T50N	R33W	Missouri River	Missouri River (356) (303 (d))	10300101-0301
072	Main Street at MO River	X= 363403	Y= 4330727			Sec 32	T50N	R33W	Missouri River	Missouri River (356) (303 (d))	10300101-0301
073	Gillis Avenue at MO River	X= 363985	Y= 4331025			Sec 32	T50N	R33W	Missouri River	Missouri River (356) (303 (d))	10300101-0301

CSO No.	Description	UTM Coordinates		Legal Description	Receiving Water	First Classified Stream & ID	USGS Basin & Sub-Watershed No.
074	Lydia Avenue at MO River	X= 364421	Y= 4331264	Sec 33 T50N R33W	Missouri River	Missouri River (356) (303 (d))	10300101-0301
075	Prospect Avenue at MO River	X= 365973	Y= 4332070	Sec 28 T50N R33W	Missouri River	Missouri River (356) (303 (d))	10300101-0301
076	Chouteau Trafficway at MO River	X= 367752	Y= 4333613	Sec 18 T50N R33W	Missouri River	Missouri River (356) (303 (d))	10300101-0301
077	Holmes Street at MO River	X= 363597	Y= 4330816	Sec 32 T50N R33W	Missouri River	Missouri River (356) (303 (d))	10300101-0301
078	Lydia Avenue at MO River	X= 364445	Y= 4331264	Sec 33 T50N R33W	Missouri River	Missouri River (356) (303 (d))	10300101-0301
079	51st & Indiana	X= 366275	Y= 4321611	NW 1/4 NE 1/4 Sec 34 T49N R33W	Townfork (Mill) Creek	Blue River (418) (303 (d), MND)	10300101-0105
080	53rd & Walrond	X= 366014	Y= 4321242	SE 1/4 NW 1/4 Sec 34 T49N R33W	Townfork (Mill) Creek	Blue River (418) (303 (d), MND)	10300101-0105
081	53rd Terrace & Walrond	X= 366003	Y= 4321153	SE 1/4 NW 1/4 Sec 34 T49N R33W	Townfork (Mill) Creek	Blue River (418) (303 (d), MND)	10300101-0105
082	55th & Indiana	X= 366022	Y= 4320845	SE 1/4 NW 1/4 Sec 34 T49N R33W	Townfork (Mill) Creek	Blue River (418) (303 (d), MND)	10300101-0105
083	57th & Agnes	X= 365919	Y= 4320446	NW 1/4 SW 1/4 Sec 34 T49N R33W	Townfork (Mill) Creek	Blue River (418) (303 (d), MND)	10300101-0105
084	58th & S. Benton	X= 365608	Y= 4320256	SW 1/4 SW 1/4 Sec 34 T49N R33W	Townfork (Mill) Creek	Blue River (418) (303 (d), MND)	10300101-0105
085	59th & Prospect	X= 365528	Y= 4320082	SW 1/4 SW 1/4 Sec 34 T49N R33W	Townfork (Mill) Creek	Blue River (418) (303 (d), MND)	10300101-0105
086	60th Terrace & Montgall	X= 365476	Y= 4319723	NW 1/4 NW 1/4 Sec 03 T48N R33W	Unnamed Tributary to Mill Creek	Blue River (418) (303 (d), MND)	10300101-0105
087	60th & Prospect	X= 365306	Y= 4319889	NW 1/4 NW 1/4 Sec 03 T48N R33W	Unnamed Tributary to Mill Creek	Blue River (418) (303 (d), MND)	10300101-0106
088	60th Terrace & Wabash	X= 365206	Y= 4319805	NE 1/4 NE 1/4 Sec 04 T48N R33W	Townfork (Mill) Creek	Blue River (418) (303 (d), MND)	10300101-0105
089	61st Terrace & Park	X= 365063	Y= 4319628	SE 1/4 NE 1/4 Sec 04 T48N R33W	Townfork (Mill) Creek	Blue River (418) (303 (d), MND)	10300101-0105
090	63rd & Highland	X= 364342	Y= 4319399	SE 1/4 NW 1/4 Sec 04 T48N R33W	Townfork (Mill) Creek	Blue River (418) (303 (d), MND)	10300101-0105
091	59th & Bellefontaine	X= 365794	Y= 4320201	SW 1/4 SW 1/4 Sec 34 T49N R33W	Townfork (Mill) Creek	Blue River (418) (303 (d), MND)	10300101-0105
092	Gregory & Tracy	X= 363780	Y= 4317799	SW 1/4 NW 1/4 Sec 09 T48N R33W	Unnamed Tributary to Mill Creek	Blue River (418) (303 (d), MND)	10300101-0105
093	Gregory & Tracy	X= 363804	Y= 4317799	SW 1/4 NW 1/4 Sec 09 T48N R33W	Unnamed Tributary to Mill Creek	Blue River (418) (303 (d), MND)	10300101-0105
094	69th Terrace & Lydia	X= 363987	Y= 4318081	SE 1/4 NW 1/4 Sec 09 T48N R33W	Townfork (Mill) Creek	Blue River (418) (303 (d), MND)	10300101-0105
095	69th & Flora	X= 364154	Y= 4318533	NE 1/4 NW 1/4 Sec 09 T48N R33W	Townfork (Mill) Creek	Blue River (418) (303 (d), MND)	10300101-0105
096	68th & Woodland	X= 364368	Y= 4318375	NW 1/4 NW 1/4 Sec 09 T48N R33W	Unnamed Tributary to Mill Creek	Blue River (418) (303 (d), MND)	10300101-0105
097	66th Terrace & Flora	X= 364156	Y= 4318687	SE 1/4 SW 1/4 Sec 04 T48N R33W	Townfork (Mill) Creek	Blue River (418) (303 (d), MND)	10300101-0105
098	66th Terrace & Woodland	X= 364434	Y= 4318674	SW 1/4 SE 1/4 Sec 04 T48N R33W	Unnamed Tributary to Mill Creek	Blue River (418) (303 (d), MND)	10300101-0105
099	56th & Bellefontaine	X= 365970	Y= 4320630	NE 1/4 SW 1/4 Sec 34 T49N R33W	Townfork (Mill) Creek	Blue River (418) (303 (d), MND)	10300101-0105
100	7300 Hawthorne Road	X= 370643	Y= 4329802	SE 1/4 SE 1/4 Sec 36 T50N R33W	Blue River	Blue River (417) (303 (d), MND)	10300101-0106

INSTRUCTIONS FOR COMPLETING FORM B2
APPLICATION FOR OPERATING PERMIT FOR FACILITIES THAT RECEIVE PRIMARILY DOMESTIC WASTE AND HAVE A DESIGN FLOW MORE THAN 100,000 GALLONS PER DAY. Form 780-1805
(Facilities less than or equal to 100,000 gallons per day of domestic waste must use Form B - 780-1512.)

PART A – BASIC APPLICATION INFORMATION

1. Check the appropriate box. **Do not check more than one item.** Operating permits refer to permits issued by the Department of Natural Resources, Water Protection Program. If an Antidegradation Review has not been conducted, please submit the application located at the following link to the Missouri Department of Natural Resources, Water Protection Program, P.O. Box 176, Jefferson City, MO 65102: dnr.mo.gov/forms/780-1893-f.pdf.

1.1 **Fees Information:**

DOMESTIC OPERATING PERMIT FEES – PRIVATE

Annual operating permit fees are based on flow.

Annual fee/Design flow	Annual fee/Design flow	Annual fee/Design flow
$100.....<5,000 gpd	$375.....10,000-10,999 gpd	$650.....16,000-16,999 gpd
$150.....5,000-5,999 gpd	$400.....11,000-11,999 gpd	$800.....17,000-19,999 gpd
$175.....6,000-6,999 gpd	$450.....12,000-12,999 gpd	$1,000.....20,000-22,999 gpd
$200.....7,000-7,999 gpd	$500.....13,000-13,999 gpd	$2,000.....23,000-24,999 gpd
$225.....8,000-8,999 gpd	$550.....14,000-14,999 gpd	$2,500.....25,000-29,999 gpd
$250.....9,000-9,999 gpd	$600.....15,000-15,999 gpd	$3,000.....30,000 gpd -1 mgd

New domestic wastewater treatment facilities must submit the annual fee with the original application.

If the application is for a site-specific permit re-issuance, send no fees. You will be invoiced separately by the department on the anniversary date of the original permit. Permit fees must be current for the department to reissue the operating permit. Late fees of two percent per month are charged and added to outstanding annual fees.

PUBLIC SEWER SYSTEM OPERATING PERMIT FEES (City, Public Sewer District, Public Water District, or other publicly owned treatment works). Annual fee is based on number of service connections. The table of fees is in 10 CSR 20-6.011 and is available at www.sos.mo.gov/adrules/csr/current/10csr/10c20-6a.pdf. New Public Sewer System facilities should not submit any fee as the department will invoice the permittee.

OPERATING PERMIT MODIFICATIONS, including transfers, are subject to the following fees:

a. Municipals - $200 each.
b. All others – $100 each.

Note: Facility name or address changes where owner, operator and continuing authority remain the same are not considered transfers.

2. Name of Facility – Include the name by which this facility is locally known. Example: Southwest Sewage Treatment Plant, Country Club Mobile Home Park, etc. Provide the street address or location of the facility. If the facility lacks a street name or route number, provide the names of the closest intersection, highway, country road, etc.

2.1 Self-explanatory.

2.2 Global Positioning System, or GPS, is a satellite-based navigation system. The department prefers that a GPS receiver is used and the displayed coordinates submitted. If access to a GPS receiver is not available, use a mapping system to approximate the coordinates; the department's mapping system is available at www.dnr.mo.gov/intermetmapviewer/.

2.3-2.4 Self-explanatory.

3. Owner – Provide the legal name, mailing address, phone number, and e-mail address of the owner.

3.1 Prior to submitting a permit to public notice, the Department of Natural Resources shall provide the permit applicant 15 days to review the draft permit for nonsubstantive drafting errors. In the interest of expediting permit issuance, permit applicants may waive the opportunity to review draft permits prior to public notice.

3.2-3.4 Self-explanatory.

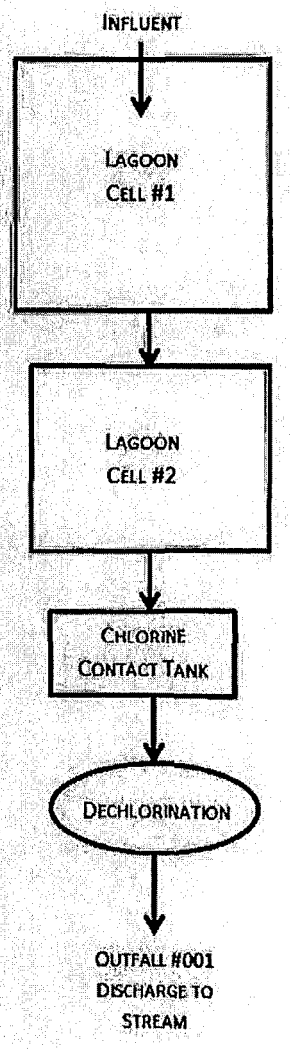
4. Continuing Authority – Provide information for the permanent organization which will serve as the continuing authority for the operation, maintenance, and modernization of the facility. The regulatory requirement regarding continuing authority is available at www.sos.mo.gov/adrules/csr/current/10csr/10c20-6a.pdf or contact the Department of Natural Resources Water Protection Program (see contact information below).

5. Operator – Provide the name, certificate number, title, mailing address, phone number, and e-mail address of the operator of the facility.

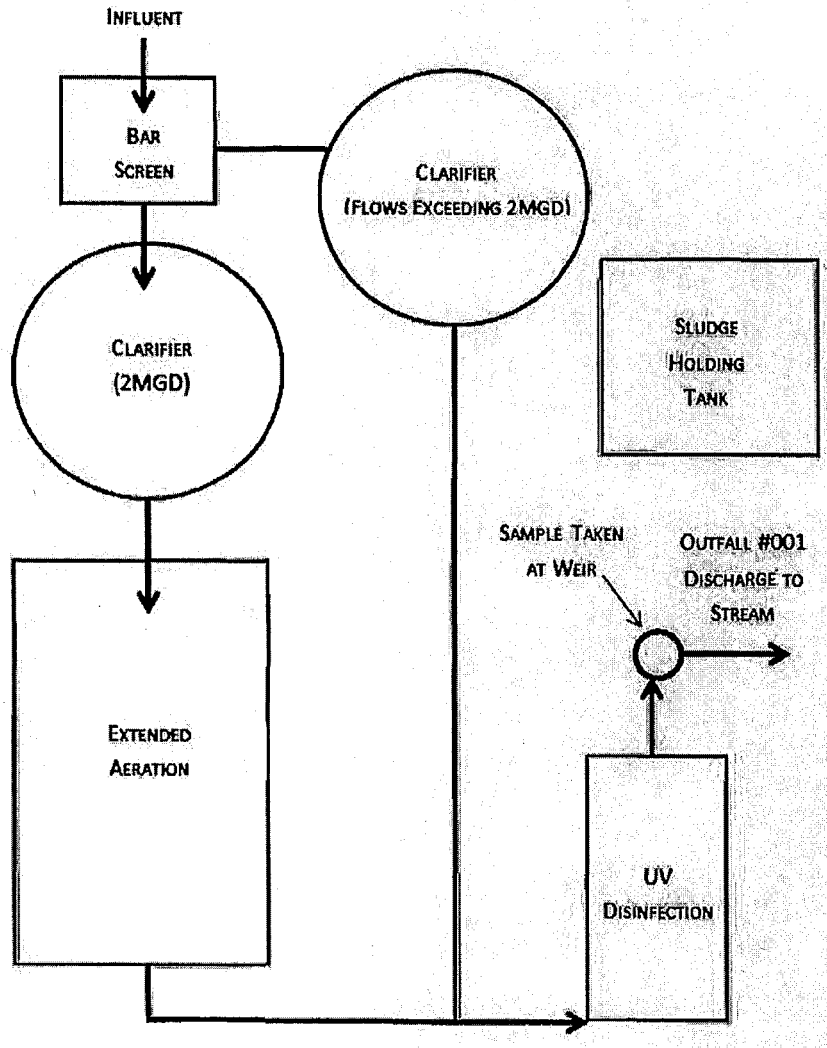
6. Provide the name, title, mailing address, work phone number, and e-mail address of a person who is thoroughly familiar with the operation of the facility and with the facts reported in this application and who can be contacted by the department.

7.1 **Process Flow Diagram Examples**

WASTEWATER TREATMENT LAGOON



WASTEWATER TREATMENT FACILITY



7.2 A topographic map is available on the web at www.dnr.mo.gov/internetmapviewer/ or from the Department of Natural Resources' Geological Survey in Rolla at 573-368-2125.
7.3 For Standard Industrial Codes visit www.osha.gov/pls/imis/sicsearch.html and for the North American Industry Classification System, visit www.census.gov/naics or contact the Department of Natural Resources Water Protection Program.
7.4-7.8 Self – explanatory.
7.9 If wastewater is land applied please submit form I: www.dnr.mo.gov/forms/780-1686-f.pdf.
7.10-8. Self-explanatory
9.1 A copy of 10 CSR 25 is available at www.sos.mo.gov/adrules/csr/current/10csr/10csr.asp#10-25.
9.2-9.9 Self – explanatory.

INSTRUCTIONS FOR COMPLETING FORM B2
APPLICATION FOR OPERATING PERMIT FOR FACILITIES THAT RECEIVE PRIMARILY DOMESTIC WASTE AND HAVE A DESIGN FLOW MORE THAN 100,000 GALLONS PER DAY
(continued)

PART B – ADDITIONAL APPLICATION INFORMATION
10.-14. Self-explanatory

PART C – CERTIFICATION
15. Signature – All applications must be signed as follows and the signatures must be original:
   a. For a corporation, by an officer having responsibility for the overall operation of the regulated facility or activity or for environmental matters.
   b. For a partnership or sole proprietorship, by a general partner or the proprietor.
   c. For a municipal, state, federal or other public facility, by either a principal executive officer or by an individual having overall responsibility for environmental matters at the facility.

PART D – EXPANDED EFFLUENT TESTING DATA
16. Self-explanatory. ML/MDL means minimum limit or minimum detection limit.

PART E – TOXICITY TESTING DATA
17. Self- explanatory.

PART F – INDUSTRIAL USER DISCHARGES AND RCRA/CERCLA WASTES
18. Federal regulations are available through the U.S. Government Printing Office at www.gpoaccess.gov/cfr/index.html.
18.1 Self – explanatory
18.2 A non-categorical significant industrial user is an industrial user that is not a CIU and meets one or more of the following:
   i. Discharges an average of 25,000 gallons per day or more of process wastewater to the treatment works (with certain exclusions).
   ii. Contributes a process waste stream that makes up five percent or more of the average dry weather hydraulic or organic capacity of the treatment plant.
   iii. Is designated as an SIU by the control authority.
19.-21.4 Self-explanatory.

PART G – COMBINED SEWER SYSTEMS
22.-23.4 Self-explanatory.

Submittal of an incomplete application may result in the application being returned.

This completed form and any attachments along with the applicable permit fees, should be submitted to:

Department of Natural Resources
Water Protection Program
ATTN: NPDES Permits and Engineering Section
P.O. Box 176
Jefferson City, MO 65102

If there are any questions concerning this form, contact the appropriate Department of Natural Resources regional office or the Water Protection Program at 573-751-6825. A map of the department's regional offices with addresses and phone numbers is available at www.dnr.mo.gov/regions/ro-map.pdf.

APPENDIX F – GEOTECHNICAL REPORT

FINAL REPORT OF SUBSURFACE EXPLORATION AND GEOTECHNICAL ENGINEERING EVALUATION

BLUE RIVER BIOSOLIDS FACILITY
KANSAS CITY, MISSOURI
TSI PROJECT NUMBER 20182055

CAROLLO ENGINEERS, INC.
903 E. 104th Street, Suite 320
Kansas City, Missouri 64131

TSi geotechnical, inc.

8248 NW 101st Terrace #5
Kansas City, Missouri 64131

February 22, 2019

TSi
geotechnical, inc.

8248 NW 101st Terrace #5
Kansas City, MO 64153
816.599.7965 (tel)
816.599.7967 (fax)
www.tsigeotech.rocks

PROFESSIONAL SERVICE SINCE 1989

February 22, 2019

Mr. Mike Morris, P.E.
CAROLLO ENGINEERS, INC.
903 E. 104th Street, Suite 320
Kansas City, Missouri 64131

Re: **Final Report of Subsurface Exploration and Geotechnical Engineering Evaluation**
Blue River Biosolids Facility
Kansas City, Missouri
TSi Project No. 20182055

Dear Mr. Morris:

TSi Geotechnical, Inc. (TSi) has completed the authorized subsurface exploration and geotechnical engineering evaluation for the referenced project and is pleased to submit this report of our findings to Carollo Engineers, Inc. (Carollo). The purpose of our work was to determine subsurface conditions at specific exploration locations and to gather data on which to prepare geotechnical recommendations for the design and construction of improvements at the Blue River Wastewater Treatment Plant (WWTP). This report describes the exploration procedures used, exhibits the data obtained, and presents our evaluations and recommendations relative to the geotechnical engineering aspects of the project.

We appreciate the opportunity to assist you with this project. If you have any questions, or if we may be of further service to you, please call us.

Respectfully submitted,
TSI GEOTECHNICAL, INC

Benjamin Wilmes, EI
Staff Engineer

for: Denise Hervey, PE
Principal

Brian Robben, PE, PG
Geotechnical Department Manager

STATE OF MISSOURI
BRIAN WILLIAM ROBBEN
NUMBER PE-2004017235
2/22/19
PROFESSIONAL ENGINEER

TABLE OF CONTENTS

1.0 SCOPE OF SERVICES 1

2.0 SITE AND PROJECT DESCRIPTIONS 2

3.0 FIELD EXPLORATION AND LABORATORY TESTING 3
- 3.1 Field Exploration 3
- 3.2 Laboratory Testing 3
- 3.3 Potholing 4

4.0 SUBSURFACE CONDITIONS 5
- 4.1 Regional Geology 5
- 4.2 Generalized Subsurface Profile 5
- 4.3 Groundwater 6

5.0 ENGINEERING ASSESSMENTS AND RECOMMENDATIONS 7
- 5.1 Swelling Clay Considerations 7
- 5.2 Foundations 7
- 5.3 Deep Foundation Lateral Loads 13
- 5.4 Buoyancy 14
- 5.5 Seismic Site Classification 14
- 5.6 Lateral Earth Pressures for Subsurface Walls 15
- 5.7 Pavement Design 16
- 5.6 Corrosion Potential 16

6.0 SITE PREPARATION AND EXCAVATION CONSIDERATIONS 18
- 6.1 Subgrade Preparation 18
- 6.2 Subgrade Protection 18
- 6.3 Groundwater and Dewatering Considerations 18
- 6.4 Excavations 19
- 6.5 Fill and Backfill Materials 19
- 6.6 Fill and Backfill Placement 19

7.0 CONSTRUCTION OBSERVATION AND TESTING 21

8.0 REPORT LIMITATIONS 22

Appendix A
- Site and Boring Location Plan, Figure 1
- Approximate Pothole Locations, Figure 2

Appendix B
- Boring Logs
- Subsurface Profile
- Unified Soil Classification System
- General Notes

Appendix C
- Laboratory Test Results

FINAL SUBSURFACE EXPLORATION AND GEOTECHNICAL ENGINEERING EVALUATION BLUE RIVER BIOSOLIDS FACILITY KANSAS CITY, MISSOURI

1.0 SCOPE OF SERVICES

This final report summarizes the results of a geotechnical study performed for the proposed improvements to the Blue River Wastewater Treatment Plant (WWTP) in Kansas City, Missouri. Based on TSi's understanding of the project, the following items have been identified for inclusion in this final study report:

- Engineering characteristics of the materials encountered at the site;
- Recommendations for deep foundations, including allowable bearing capacity and bearing depth including anticipated settlement;
- Lateral earth pressures for design of below grade walls;
- Impact of groundwater on the design and construction of the proposed structures, including a design groundwater level and general recommendations for dewatering;
- General site preparation and excavation recommendations for the structures, including the need for excavation retention and dewatering, and lateral pressures to use in the design of retention systems;
- Subgrade improvement recommendations, if necessary;
- Seismic site classification according to 2018 IBC codes, and a general assessment of liquefaction potential for site soils;
- Corrosion potential of the soils at select site locations;
- General construction considerations; and
- Recommendations for fill and backfill materials, placement, and compaction.

2.0 SITE AND PROJECT DESCRIPTIONS

The project site is the Blue River WWTP in Kansas City, Missouri. TSi understands the project will consist of a new sludge screening building, new cake storage building, improvements to solids processing building, as well as various other improvements and structures. Loads for structures are summarized in Table 3 in Section 5.2 of this report. The general location of the project site is shown below. The Site and Boring Location Plan, Figure 1 in Appendix A, provides a more detailed plan of the project area.



3.0 FIELD EXPLORATION AND LABORATORY TESTING

3.1 FIELD EXPLORATION

TSi has completed an exploration program consisting of 7 borings for the project. The borings were drilled to auger refusal on bedrock. The logs from this exploration are included in Appendix B. The approximate locations of the borings are indicated on the Site and Boring Location Plan, Figure 1, in Appendix A. The boring locations were selected by Carollo. Boring elevations were surveyed by Trekk Design Group.

The borings were drilled using CME-550 and CME-75 ATV-mounted drill rigs to advance hollow stem auger drilling tools. Mud rotary drilling was also used in conjunction with hollow stem techniques and generally occurred below 30 feet in depth. Split-spoon samples were recovered from the borings. Split-spoon samples and thin wall samples were recovered using a 2-inch outside-diameter, split-barrel sampler, driven by an automatic hammer (90% and 86% hammer efficiency for CME 550 and CME 75, respectively), in accordance with ASTM D 1586 and ASTM D 1587, respectively.

The results of the field tests and measurements were recorded on field logs and appropriate data sheets by a geologist from TSi. Those data sheets and logs contain information concerning the exploration methods, samples attempted and recovered, indications of the presence of various subsurface materials, and the observation of groundwater. The field logs and data sheets contain the engineer's interpretations of the conditions between samples, based on the performance of the exploration equipment and the cuttings brought to the surface. The final logs included in this report were based on the field logs, modified as appropriate based on the results of laboratory testing of soil samples. After completion all borings were fully grouted to the ground surface. Soil spoils were spread thin adjacent to the boreholes.

3.2 LABORATORY TESTING

A laboratory testing program was conducted by TSi to determine selected engineering properties of the obtained soil samples. The following laboratory tests were performed on the samples recovered from the borings:

- Visual descriptions by color and texture of each sample (ASTM 2488);
- Natural moisture content of fine-grained samples (ASTM D 2216);
- Atterberg limits on selected cohesive samples (ASTM D 4318);
- Unit weight on selected cohesive samples (ASTM D 7263);
- Unconfined compression on selected cohesive samples (ASTM D 2166);
- Grain size analysis of selected samples including hydrometer (ASTM C 136 & D 422); and
- Corrosivity testing of selected samples including: pH, chloride, sulfide, sulfate, resistivity, and oxidation/reduction potential.

The results of the laboratory tests are summarized on the boring logs and on the laboratory test reports in Appendix C. The analysis and conclusions contained in the final report are based on field and laboratory test results and on the interpretations of the subsurface conditions as reported on the logs. Only data pertinent to the objectives of this report have been included on the logs; therefore, these logs should not be used for other purposes.

3.3 POTHOLING

TSi performed an additional exploration to verify the depth and location of existing utilities between January 29th and February 12th, 2019. The exploration will consisted of 36 potholes excavated to a depths of 4 feet to 17 feet. Table 1 below summarizes the depth and utility located at each pothole location. Pothole locations can be found in Appendix A.

TABLE 1
POTHOLE UTILITY DEPTHS

Pothole Number	Depth (in)	Description
1A	12	6" PVC
1B	51	6" CIP, sludge
1C	49	6" CIP, sludge
1D	36	8" CIP, sewer
2A	45	6" CIP, sludge
2B	46	6" CIP, sludge
3	38	8" CIP, sewer
4	18	6" PVC, water
5	66	8" CIP, water
6A	63	8" CIP, water
6B	18	6" PVC, water
7A	54	12" steel
7B	80	10" steel, water
8A	35	manhole
8B	67	12" RCP
9	42	16" concrete
10	45	8" steel, sewer
11	41	27" concrete, duct bank
12	199	72" concrete
13	73	15" steel pipe
14A	15	manhole
14B	81	12" concrete, duct bank
15	23	24" CIP
16	56	12" steel, water
17	90	27" duct bank, electrical
18	104	24" CIP

Pothole Number	Depth (in)	Description
19A	43	6" pvc, gas
19B	59	8" steel, water
20A	67	18" steel, sewer
20B	48	6" PVC, gas
20C	9	6" PVC, sewer
21	58	6" pvc gas
22	103	72" Concrete
23A	103	10" steel, sludge
23B	103	10" steel, sludge
24	43	4" PVC, gas
25	38	18" steel, sewer
26A	26	4" CIP, chiller
26B	26	4" CIP, chiller
27A	32	6" CIP, Ash disposal
27B	176	15" CIP, sewer
28	50	12" CIPl, sewer
29A	24	4" CIP, chiller
29B	24	4" CIP, chiller
30	101	10" CIP, sludge
31A	106	10" CIP, sludge
31B	107	10" CIP, sludge
32	54	6" PVC, gas
33	64	6"CIP, water
34A	27	1" PVC, electrical
34B	27	1" PVC, electrical
35	43	18" steel, sewer

4.0 SUBSURFACE CONDITIONS

Details of the subsurface conditions encountered at the boring locations are shown on the logs in Appendix B. The general subsurface conditions encountered and their pertinent engineering characteristics are described in the following paragraphs. Conditions represented by the borings should be considered applicable only at these locations on the dates shown; the reported conditions may be different at other locations or at other times.

4.1 REGIONAL GEOLOGY

This project is within the flood plains of the Missouri River and the Blue River. Subsurface conditions in the Missouri River flood plain typically consist of alluvial soils extending to shale bedrock at a depth of 70 to 150 feet. The depth to shale bedrock is deeper near the center of the floodplain. The alluvial soils typically consist of soft, silty clays in the upper 5 to 15 feet, with fine grained sands continuing below the shallow clays to shale bedrock. In areas where river channels were more recently abandoned, the surface soils tend to be very soft fat clays to depths of 20 to 30 feet. Coarser grained sands and some gravel are typically present at greater depths, with several feet of gravel sometimes present just above the top of shale bedrock. In the Blue River flood plain, the subsurface profile is similar to the Missouri River floodplain. However, the fine grained soils at the ground surface typically continue to greater depths (20 to 50 feet) and are softer.

The alluvial soils are underlain by the Pleasanton Shale formation. This formation is part of the Missourian Series, Pennsylvanian System, Pleasanton Group. The geologic units with this Group are generally shales and sandstones.

4.2 GENERALIZED SUBSURFACE PROFILE

Surficial materials at the project site consisted primarily of 6 to 8 inches of lean clay with roots and organics. Borings B-02 to B-04 encountered 5 to 8 inches of concrete or asphaltic pavement at the surface. Boring B-07 was drilling within the footprint of an existing building and encountered 21 inches of concrete at the surface. Approximately 13 feet of sand fill was encountered below the concrete at Boring B-07. The surficial materials were underlain by native alluvium.

The underlying cohesive alluvial soils are comprised predominantly of lean and fat clays (CL and CH, as designated by the Unified Soil Classification System) and clayey silt (ML) and is underlain by granular soils. Granular alluvial soils were primarily composed of poorly and well-graded sands (SP and SW, respectively). The sand also had varying amounts of gravel and fines throughout the project. Standard penetration tests within the cohesive soils exhibited N-values ranging from 0 to 10 blows per foot (bpf). Moisture contents within the cohesive soils ranged from 9 to 40. Standard penetration tests within the granular soils exhibited N-values ranging widely from 3 to 78 bpf. Moisture contents within the granular soils ranged from 10 to 46.

The alluvial soils were underlain by shale bedrock at all of the boring locations at depths ranging from approximately 63.5 to 78.5 feet below the ground surface. The depths and elevations to bedrock are listed in Table 2 below. The shale was generally gray, slightly weathered, soft, and

thinly bedded. N-values in the shale exhibited 50 blows for up to 6 inches of penetration with corresponding moisture contents ranging from 11% to 23%.

TABLE 2
APPROXIMATE BEDROCK DEPTHS AND ELEVATIONS

Boring	Approx. Bedrock Depth (ft)	Bedrock Elevation (ft)
B-01	72.5	668.6
B-02	77.0	665.4
B-03	76.0	666.1
B-04	63.5	677.3
B-05	78.5	663.6
B-06	73.5	668.3
B-07	77.0	665.6

4.3 GROUNDWATER

Groundwater was observed during drilling throughout the project site. Groundwater levels are presented in Table 3 below. The presence or absence of groundwater at a particular location does not necessarily mean that groundwater will be present or absent at that location at other times. Seasonal variations, fluctuations in the Kansas and Missouri Rivers, and other unknown considerations will cause fluctuations in the presence of water in the soils.

TABLE 3
GROUNDWATER DEPTHS AND ELEVATIONS

Boring	Groundwater Depth (ft)	Groundwater Elevation (ft)
B-01	18.0	723.1
B-02	8.0	734.4
B-03	19.0	723.1
B-04	23.0	717.8
B-05	23.0	719.1
B-06	22.0	719.8
B-07	8.0	734.6

5.0 Engineering Assessments and Recommendations

5.1 Swelling Clay Considerations

High plasticity clay will be exposed during grading in some areas of the site below the proposed structure and pavements. The fat clays are of concern with regard to their potential for volume change. This concern applies to these materials whether they are in their natural condition or used as fill material. These materials tend to swell when they absorb water and shrink when they dry out. Potential detrimental effects for development of the site include heaving, settlement, and differential movements of floor slabs, pavements, and other structures constructed directly over these materials.

All high plasticity clays (CH) should be overexcavated from beneath the slabs-on-grade areas to a minimum depth of 18 inches below the subgrade level for the building area and 12 inches for pavement areas. These materials should be replaced with Low Volume Change (LVC) fill material as discussed in Section 6.4 of this report. In addition to removal and replacement, some relatively simple design and construction considerations are recommended that will help to maintain the natural moisture contents of the fat clay. Avoiding conditions that could result in excessive wetting or drying of these materials will reduce their potential for volume change. The following design and construction precautions are recommended:

1. High plasticity clay should not be used as fill or backfill material in the upper 18 inches of the building area, or behind subsurface walls and 12 inches for pavement areas.
2. High plasticity clay used as fill should be placed and compacted wet of its optimum moisture content, as discussed in Section 6.6 of this report.
3. Positive surface drainage should be provided during and after construction to prevent ponding of water in and around the structure areas and on, or adjacent to, pavements.
4. Stormwater runoff from roofs should be collected by a gutter system or other means and carried away from the structure to avoid saturating the subgrade under and adjacent to the structure.
5. Excessive watering of grass or shrubs adjacent to the structure or pavements should be avoided.

These considerations should be incorporated into the site grading and development plans for the project. In addition, individual structure and pavement areas should be observed during construction to determine the specific soil conditions that exist at that location and the most prudent approach for mitigating any swelling soil concerns.

5.2 Foundations

Because the various structures have different foundation loads and bearing depths, the foundation systems will vary. The following recommendations for foundation support and assessment for the planned structures are based on the anticipation that proposed ground surface elevations not differing significantly from the existing ground elevations. TSi does not anticipate significant amounts of cut and fill across the project. Table 4 below presents the proposed structures and corresponding pertinent information.

TABLE 4
SUMMARY OF DATA FOR STRUCTURES

Structure	Approx. Plan Dimensions (ft)	Approximate Existing Grade Elevation (ft)	Gross Structural Load (Dead Load + Live Load)
Screening Building	74 x 31	742.1	Building walls: 4 kips/ft Building footprint: 3,000 psf Below grade wet wells: 2,500 psf
Solids Building	Existing Building	742.6	New loads are expected to be less than or close to the existing building loads
THP System	80 x 72	741.0	Equipment loading: 600 psf
Cake Loading Building	61 x 83	741.1	Column Load: 1,500 kips Masonry Staircase: 650 kips Building walls: 5 kips/ft Slab-on-grade: 300 psf
Holding Tanks	Walls: 35' L x 35' H	743.0	Building walls: 4.2 kips/ft
Biogas Processing Buildings	44 x 44	742.1	Building walls: 2 kips/ft Slab-on-grade: 500 psf
CHP Buildings	20 x 50	741.0	Building walls: 2 kips/ft Slab-on-grade: 500 psf
Electrical and IC Building	20 x 40	741.0	Building walls: 4 kips/ft Slab-on-grade: 500 psf

Screening Building

The Screening Building could be supported by auger cast piles. Auger cast piles are installed by drilling continuous hollow stem augers through the overburden soils to a predetermined depth with primary support of friction.

Auger cast pile installation must be done by an experienced contractor using suitable equipment and procedures. It should be noted that the disposal of cuttings from drilling the piles will be required unless drilled displacement methods are used. After drilling, non-shrink fluid such as Portland cement grout is pumped through the hollow-stem augers under pressure, and exits at the tip of the auger. Grouting continues as the augers are slowly withdrawn, producing a cylindrical, cast-in-place, concrete pile. Table 5 below presents the side resistance and uplift capacities for auger cast piles embedded between 30.0 to 50.0 feet below elevations of the proposed structures into the soil profile for three different diameter sizes. These capacities are applicable for top of

pile elevations of approximately 729.0 and below due to approximately 14 foot below grade basement level. A factor of safety of 2.5 was used in the calculation of allowable capacities.

TABLE 5
ALLOWABLE AUGER CAST PILE CAPACITIES
SCREENING BUILDING

Structure	Pile Depth (ft)	Compression Capacity (kips) Pile Diameter		
		16 inches	18 inches	24 inches
Screening Building (El. 742.1)	30	64.0	70.0	92.0
	40	88.0	98.0	130.0
	50	126.0	142.0	188.0

A reduction of the allowable end bearing pressure and side friction to account for group effects will be required if auger cast pile foundations are placed less than 3 diameters apart (center-to-center spacing). The reduction in individual capacity depends on many factors including the configuration of the group, number of piles in the group, pile size, depth of installation, and pile spacing.

Higher than noted design capacities may be possible by performing a pile load test program. In our opinion, a program consisting of 4 to 6 pile load tests would be appropriate considering the variability encountered within the subsurface profile at this site.

It is recommended that TSi personnel provide on-site full-time monitoring of the installations to check that the design depths and grout volume requirements are being met. Measurement devices such as the Pile Installation Recorder (PIR-A) developed by Pile Dynamics, Inc. for ACIP should be considered to provide quality assurance during construction.

Solids Building

TSi understands that work in the solids handling building will be limited to replacement of current process equipment with units of similar weight and operating frequency. In that case, Existing foundations are expected to be capable of supporting these loads.

Due to limited construction space, micropiles could be used for support of any new equipment unable to be supported by existing foundations. Micropiles are small diameter piles (typically less than 12 inches) drilled and installed to the appropriate termination depth and grouted. Compaction grouted micropiles are recommended for this project. A resistance factor of 0.55 should be used in design for compression. Pile resistance in tension should be factored by 0.5 of the factored compressive value for design.

Micropiles are usually installed by design-build contractors. Installation must be done by an experienced contractor using suitable equipment and procedures. TSi recommends that the project plans and specifications for micropiles be performance-based, allowing a variety of contractors the opportunity to bid the work. Specifications should indicate the allowable total and

differential settlements, the structural loads at each footing, and the verification procedure. The bid documents should address a contingency or factor for excessive length of micropiles. It should be noted that the disposal of cutting from drilling the piles will be required.

THP System

TSi understand that the new THP system will be supported by an approximately 80' x 72' concrete mat. Mat foundations bearing on native soils or engineered fill may be designed for a net allowable bearing pressure of 1,500 pounds per square foot (psf) for structural dead load plus maximum live load. All mat foundations should be underlain by a minimum of 6 inches of well-graded crushed aggregate base, such as MoDOT Type 5. The mat should be constructed at least 36 inches below the exterior finish grade to provide protection against the detrimental effects of seasonal moisture variations and frost penetration. Post construction total and differential settlement of the structural mat is expected to be less than 1 inch and ½ inch, respectively.

The excavations should be kept dry, and foot traffic should be kept to a minimum to limit disturbance. Any loose or soft material that accumulates or develops at the footing subgrade should be removed prior to the placement of the mat foundations. If zones of excessively wet or soft soil are encountered at the foundation support level, they should be removed and replaced with properly compacted fill, or the mats should be deepened to bear on stiffer soil. The mat foundations should be constructed as soon as practical after excavation is complete to avoid deterioration of the bearing surface due to excessive drying, or excessive wetting caused by precipitation.

Cake Loading Building

The cake loading building and cake silos could be supported by a combination of shallow foundations and auger cast piles. TSi understands that column loads for the cake silos will be on the order of 1,500 kips. Loads for the masonry staircase are expected to be on the order of 650 kips. Loads for the building walls and slab-on-grade are expected to be approximately 5 kips/foot and 300 psf, respectively.

The building walls and slab-on-grade could be supported by spread footings bearing on native clay soils or new structural fill. Foundations bearing on the clay soil at the site may be designed for a net allowable bearing pressure of 1,500 psf for structural dead load plus maximum live load.

Wall or strip-type footings should be at least 2.0 feet wide, and individual footing pads should be at least 3.0 feet in both length and width, regardless of the applied structural load, in order to provide a bearing area that will account for minor variations in the supporting soils. Exterior footings and footings in unheated areas should be constructed at least 36 inches below the exterior finish grade to provide protection against the detrimental effects of seasonal moisture variations and frost penetration. Interior footings or footings in heated areas may be constructed at a nominal depth below the floor slab.

The cake silos and masonry staircase could be supported by auger cast piles. Auger cast piles are installed by drilling continuous hollow stem augers through the overburden soils to a predetermined depth with primary support of friction.

Auger cast pile installation must be done by an experienced contractor using suitable equipment and procedures. The bid documents should address a contingency or factor for excessive length of auger cast piles. After drilling, non-shrink fluid such as Portland cement grout is pumped through the hollow-stem augers under pressure, and exits at the tip of the auger. Grouting continues as the augers are slowly withdrawn, producing a cylindrical, cast-in-place, concrete pile. Table 6 below presents the side resistance and uplift capacities for auger cast piles embedded between 50.0 to 75.0 feet below elevations of the proposed structures into the soil profile for three different diameter sizes. A factor of safety of 2.5 was used in the calculation of allowable capacities.

TABLE 6
ALLOWABLE AUGER CAST PILE CAPACITIES
CAKE LOADING BUILDING

Structure	Pile Depth (ft)	Compression Capacity (kips)		
		Pile Diameter		
		16 inches	18 inches	24 inches
Cake Loading (El. 741.1)	50	110.0	124.0	168.0
	60	142.0	160.0	212.0
	70	180.0	200.0	268.0
	75	190.0*	212.0*	284.0*

*An additional end bearing capacity of 20 ksf can be added to capacity if piles are embedded 3 feet into shale.

A reduction of the allowable end bearing pressure and side friction to account for group effects will be required if auger cast pile foundations are placed less than 3 diameters apart (center-to-center spacing). The reduction in individual capacity depends on many factors including the configuration of the group, number of piles in the group, pile size, depth of installation, and pile spacing.

Higher than noted design capacities may be possible by performing a pile load test program. In our opinion, a program consisting of 4 to 6 pile load tests would be appropriate considering the variability encountered within the subsurface profile at this site.

It is recommended that TSi personnel provide on-site full-time monitoring of the installations to check that the design depths and grout volume requirements are being met. Measurement devices such as the Pile Installation Recorder (PIR-A) developed by Pile Dynamics, Inc. for ACIP should be considered to provide quality assurance during construction.

Alternatively, the cake silos could be supported by steel H-piles driven to practical refusal on shale bedrock. Practical refusal on competent shale bedrock at the Cake Building location is anticipated to be at an approximate elevation of 662.4 feet. The capacity of piles driven to practical refusal will be controlled by the structural capacity of the pile. Table 7 presents structural capacities of HP 10x42, HP 12x53, and HP 14x73 pile sections presented in the MoDOT EPG 751.36.3.

TABLE 7
STRUCTURAL STEEL H-PILE CAPACITIES

Section	End Area (in^2)	GRADE 50	
		Structural Nominal Resistance (kips)	Structural Factored Compression Resistance (ϕ=0.5) (kips)
HP 10x42	12.4	620	310
HP 12x53	15.5	775	380
HP 14x73	21.4	1070	535

Similar to auger cast piles, a reduction in factored capacity results from steel H-piles being placed closer than 3 pier diameters apart (center-to-center spacing). The reduction in individual capacity depends on many factors including the configuration of the group, number of piles in the group, pile size, depth of installation, and pile spacing.

Pile driving resistance should be closely monitored. We recommend minimum PDA testing of one pile per bent. If refusal is encountered early, TSi recommends PDA testing of that pile during re-strike to measure the achieved capacity.

Holding Tanks

TSi understands new full height walls will be constructed inside the existing pump station to separate the east and west holding tanks from the pump station. Loads for these walls are expected to be on the order of 4.2 kips/foot. New holding tank walls could be supported by spread footings bearing in native clay soils or new structural fill. Foundations bearing on the clay soil at the site may be designed for a net allowable bearing pressure of 1,500 psf for structural dead load plus maximum live load.

Wall or strip-type footings should be at least 2.0 feet wide, and individual footing pads should be at least 3.0feet in both length and width, regardless of the applied structural load, in order to provide a bearing area that will account for minor variations in the supporting soils. Exterior footings and footings in unheated areas should be constructed at least 36 inches below the exterior finish grade to provide protection against the detrimental effects of seasonal moisture variations and frost penetration. Interior footings or footings in heated areas may be constructed at a nominal depth below the floor slab.

Biogas Processing Building

TSi understands building wall and slab-on-grade loads for the Biogas Processing Building will be approximately 2 kips/foot and 500 psf, respectively. The Biogas Processing building could be supported by spread footings bearing on native clay soils or new structural fill. Foundations bearing on the clay soil at the site may be designed for a net allowable bearing pressure of 1,500 psf for structural dead load plus maximum live load.

Wall or strip-type footings should be at least 2.0 feet wide, and individual footing pads should be at least 3.0 feet in both length and width, regardless of the applied structural load, in order to provide a bearing area that will account for minor variations in the supporting soils. Exterior footings and footings in unheated areas should be constructed at least 36 inches below the exterior finish grade to provide protection against the detrimental effects of seasonal moisture variations and frost penetration. Interior footings or footings in heated areas may be constructed at a nominal depth below the floor slab.

Combined Heat and Power Building

TSi understands building wall and slab-on-grade loads for the Combined Heat and Power Building will be approximately 2 kips/foot and 500 psf, respectively. The Combined Heat and Power Building could be supported by spread footings bearing on native clay soils or new structural fill. Foundations bearing on the clay soil at the site may be designed for a net allowable bearing pressure of 1,500 psf for structural dead load plus maximum live load.

Wall or strip-type footings should be at least 2.0 feet wide, and individual footing pads should be at least 3.0 feet in both length and width, regardless of the applied structural load, in order to provide a bearing area that will account for minor variations in the supporting soils. Exterior footings and footings in unheated areas should be constructed at least 36 inches below the exterior finish grade to provide protection against the detrimental effects of seasonal moisture variations and frost penetration. Interior footings or footings in heated areas may be constructed at a nominal depth below the floor slab.

Electrical and IC

TSi understands building wall and slab-on-grade loads for the Electrical and IC Building will be approximately 4 kips/foot and 500 psf, respectively. The Electrical and IC Building could be supported by spread footings bearing on native clay soils or new structural fill. Foundations bearing on the clay soil at the site may be designed for a net allowable bearing pressure of 1,500 psf for structural dead load plus maximum live load.

Wall or strip-type footings should be at least 2.0 feet wide, and individual footing pads should be at least 3.0 feet in both length and width, regardless of the applied structural load, in order to provide a bearing area that will account for minor variations in the supporting soils. Exterior footings and footings in unheated areas should be constructed at least 36 inches below the exterior finish grade to provide protection against the detrimental effects of seasonal moisture variations and frost penetration. Interior footings or footings in heated areas may be constructed at a nominal depth below the floor slab.

5.3 Deep Foundation Lateral Loads

The lateral load capacity of deep foundations will vary based on the dimensions and depth of piles. Foundations subjected to lateral loads should be designed and analyzed for lateral deflection using the LPILE Version 6 computer program by Ensoft, Inc., or an equivalent program. This program analyzes pile deflection as a function of the design loads, foundation properties and subsurface conditions.

Recommended parameters for use in the evaluation of lateral load capacity and deflection for foundations are presented in Table 8 below. The lateral design parameters below assume that no interaction of loading will occur between the drilled shafts, auger cast-in-place piles, or H-pile foundations. This condition can be achieved if the foundations are spaced at least 3 diameters apart (center-to-center spacing) in a direction perpendicular to the applied loading and at least 6 diameters apart (center-to-center spacing) in a direction parallel to the applied loading. If the foundations are more closely spaced than this, then a reduction in the lateral design parameters would apply as previously presented in the report.

TABLE 8
LPILE PARAMETERS

Approximate Elevation (ft)	LPILE Soil Type	Effective Unit Weight (pcf)	Angle of Internal Friction (degrees)	Undrained Cohesion (psf)	Strain at 50% Maximum Stress	p-y Soil Modulus K (pci)
Above 720	Stiff Clay w/o Free Water	120	25	2,300	.01	100
Below 720	Sand (Reese)	125	31	N/A	N/A	60

pcf = pounds per cubic foot psf = pounds per square foot pci = pounds per cubic inch

5.4 BUOYANCY

The structures for the wastewater treatment plant should be designed to resist the buoyant force resulting from a high groundwater level due to flooding of the adjacent Missouri and Blue Rivers. The recommended design groundwater level within the treatment plant and in the area of the improvements should be equal to the elevation of the finish ground surface.

5.5 SEISMIC SITE CLASSIFICATION

In the absence of liquefaction potential and based on the general soil characteristics as determined by field and laboratory tests, the project area is designated as Site Class D in accordance with the 2012 International Building Code. A detailed evaluation of liquefaction was not included in the scope of work for this study; however, a general assessment of liquefaction was performed. Liquefaction is the loss of shear strength that occurs within a saturated soil mass when a cyclic load is applied. Liquefaction occurs when the pore water pressure in the soil mass increases to a value equaling the overburden pressure, resulting in zero effective stress. Recent developments in evaluating liquefaction potential indicate that any fine-grained soil for which the Standard Penetration Test (N) value is less than or equal to 4 may be susceptible to liquefaction. The site generally consisted native alluvial deposits composed of silts, fine grained sand and lean clays underlain by poorly graded sand. Based on the general character of the soils encountered at the site during the exploration, the site is considered to have a low potential for liquefaction.

5.6 Lateral Earth Pressures for Subsurface Walls

No retaining walls are planned at the site, but there will be below-grade walls incorporated into the proposed structures. Walls that are restricted from movement at the top, such as basement walls, should be designed to resist at-rest pressures. Walls that are free to move and deflect at the top should be designed to resist active earth pressures. A horizontal deflection at the top of the wall of approximately 1% of the freestanding wall height is typically required to permit active pressure to develop. Earth pressures are a function of the excavation configuration and the backfill materials. Table 9 below presents the recommended design parameters for the indicated subsurface wall backfill materials.

Table 9
Lateral Earth Pressure Parameters for Subsurface Walls

Parameter		Backfilled with Crushed Limestone* (pcf)	Backfilled with Cohesive Soil* (pcf)	Backfilled with Cohesionless Soil* (pcf)
At-Rest Equivalent Fluid Pressure	Drained	55	90	55
	Undrained	90	95	85
Active Equivalent Fluid Pressure	Drained	35	50	35
	Undrained	80	85	80
Passive Equivalent Fluid Pressure	Drained	480	295	345
	Undrained	310	205	220
Soil Unit Weight		130	120	115
Angle of Internal Friction for Backfill		35°	25°	30°
Assumed Surcharge Condition		None	None	None
Slope Profile Behind Wall		Horizontal	Horizontal	Horizontal

*** No factor of safety has been applied to the above values**

Note that cohesionless soil consists primarily of grain size greater than 0.06 millimeters. Crushed limestone should have a maximum particle size on 1 inch. Significant wall movements would generally be necessary to develop the full values of passive pressures given; typically, the passive values stated are reduced by up to one-half for design.

Hydrostatic forces should be added to the analyses below the design groundwater level unless the structure is designed with a permanent underdrain and pump system to prevent buildup of hydrostatic forces on the structure. To prevent the accumulation of water behind new walls and resulting hydrostatic pressure, a free-draining granular backfill material is recommended for the walls designed for drained soil conditions. The drainage backfill material should be encased in a nonwoven geotextile fabric per AASHTO M288, such as Mirafi® 140N. A perforated pipe should be placed at the base of the wall to collect the water and carry it to daylight, to a storm sewer, or to a sump.

The effects of vertical surcharge loads or sloping ground behind the wall are not included for the stated fluid pressures. The effect of surface loading may be included as a uniform horizontal load against the wall equal to one-half the vertical load intensity.

5.7 Pavement Design

A standard Proctor test was conducted on composite soil samples of clay obtained from 0 to 2 feet in depth at the site. The test yielded maximum dry density of 101.2 pounds per square foot (psf) and an optimum moisture contents of 21.2% A California Bearing Ratio (CBR) test of the native soil was also conducted on the composite sample of subgrade soil from the test pit locations. The test resulted in a CBR value of 3.2. The CBR test results are included in Appendix C of this report. Based on the general character of the on-site subsurface conditions and assuming a properly prepared subgrade, the measured CBR value of 3.2 is considered appropriate for use in designing the flexible pavement sections for the site. Rigid pavement design can be based on a modulus of subgrade reaction (k) of 75 pci for the subgrade. These values for rigid and flexible pavement design are based on the requirement that the pavement subgrade be prepared in accordance with the recommendations provided in this report.

TSi recommends that asphaltic concrete pavements have a minimum thickness of 6.0 inches with a 6.0-inch thick crushed aggregate base. If the crushed aggregate base is increased to 9.0 inches, the asphalt thickness could be reduced to 4.0 inches. The asphaltic concrete pavement section should include a minimum surface course thickness of 2.0 inches. The crushed aggregate base for asphaltic pavements should consist of MoDOT Type 5, or equivalent.

For areas where heavy wheel loads will be concentrated, such as cake storage truck loading areas, routes, or trash dumpster unloading pads, TSi recommends pavements be constructed of a minimum thickness of 8.0 inches of Portland cement concrete. We recommend that a 6.0-inch base course of well-graded crushed limestone, such as MoDOT Type 5, be placed below all concrete pavements.

The recommended pavement sections are minimum design thicknesses; periodic maintenance should be anticipated. The recommended pavement sections are not intended to support construction traffic.

5.6 Corrosion Potential

Representative samples of the soil encountered in the borings were selected for chemical and physical testing to determine corrosion potential. Tests were completed for pH, electrical resistivity, sulfide content, sulfate content, oxidation/reduction potential, and chloride content on ten samples. The results of these tests are presented in Table 10. The results of these laboratory tests were used to evaluate the corrosion potential of the soil using DIPRA's "10 Point" evaluation system, as outlined in Table 11. Our interpretation of the test results is that the materials encountered in the test borings are moderately corrosive to buried ferrous metal piping, cast iron pipes, or other objects made of these materials. Any piping should be installed as manufactured with its protective standard shop coating/annealing oxide system.

To evaluate the potential for sulfate attack on buried concrete, laboratory chemical tests were completed on the samples. The results of the tests indicate that water soluble sulfates were not

detected in any of the samples. Interpretation of these test results, using Section 318 of the ACI Manual of Concrete Practice, indicates that the on-site materials may have negligible sulfate exposure characteristics.

TABLE 10
CORROSION POTENTIAL LABORATORY TEST RESULTS

Parameter	B-02 SS-5	B-03 SS-3	B-04 SS-7
Chloride (mg/kg)	ND	ND	ND
pH	8.3	7.7	7.8
Redox (mV)	-104.5	-116.4	-107.9
Resistivity (Ohms-cm)	5380	2660	4160
Water Soluble Sulfate (mg/kg)	ND	ND	ND
Sulfide (mg/kg)	ND	ND	ND

TABLE 11
DIPRA CORROSION POTENTIAL "10 POINT" SCORING SYSTEM

Parameter	Range	Points	Points Assigned for This Project
Resistivity (Ohms-cm)	< 1500 1500 – 1800 1800 – 2100 2100 – 2500 2500 - 3000 > 3000	10 8 5 2 1 0	0 to 1
pH	0.0 – 2.0 2.0 – 4.0 4.0 – 6.5 6.5 – 7.5 7.5 – 8.5 > 8.5	5 3 0 0ǂ 0 3	0
Redox (mV)	> 100 50 – 100 0 – 50 Negative	0 3.5 4 5	5
Sulfides	Positive Trace Non-Detect	3.5 2 0	0
Moisture	Poor drainage, continuously wet Fair drainage, generally moist Good drainage, generally dry	2 1 0	1
ǂ 3 points assigned if sulfides are present and redox is < 0.			TOTAL = 6 to 7

6.0 SITE PREPARATION AND EXCAVATION CONSIDERATIONS

6.1 SUBGRADE PREPARATION

Construction areas should be stripped of existing pavement, organic soil, and any deleterious materials prior to site excavation and grading. Care should be taken during stripping to prevent excessive disturbance of the underlying soil. After the removal of these materials, and where further excavation is not required, the exposed subgrade should be proofrolled. Proofrolling is accomplished by passing over the subgrade with a fully loaded tandem-axle dump truck or fully loaded scraper and observing the subgrade for areas of excessive pumping or rolling which indicate the presence of soft, wet, disturbed, or otherwise unsuitable soils. Any unacceptable materials thus found should be excavated and either recompacted or replaced with new structural fill.

Prior to placing fill in any area, the subgrade should be scarified to a depth of about 6 inches, the moisture contents adjusted as outlined in Section 6.6 of this report, and the subgrade recompacted in accordance with recommendations made in subsequent sections of this report. The recommended proofrolling and/or scarification and recompaction may be waived if, in the opinion of a geotechnical engineer, this procedure would be detrimental or unnecessary. Following the satisfactory preparation of the subgrade, controlled fill material may be placed.

6.2 SUBGRADE PROTECTION

Construction areas should be properly drained in order to reduce or prevent surface runoff from collecting on the exposed subgrade. Any ponded water on the exposed subgrade should be removed immediately. Temporary storm water swales and collection areas may be required to control surface water flow into low areas of the site.

To prevent unnecessary disturbance of the subgrade soils, heavy construction vehicles should be restricted from traveling through the finished subgrade. If areas of disturbed subgrade develop, they should be properly repaired in accordance with the recommendations in this report.

6.3 GROUNDWATER AND DEWATERING CONSIDERATIONS

Groundwater levels encountered at the site are presently between Elevations 719.1 to 734.6 feet, and could be higher depending on seasonal conditions as well as the stage of the adjacent Blue and Missouri Rivers. It is anticipated that the rate of groundwater flow into excavations below the groundwater level cannot be handled by shallow swales and a sump and pump arrangement. The design and contract documents should require dewatering using deep wells, wellpoints, or eductors for those excavations near or below the groundwater level in order to draw down the water level several feet below the base of the excavation. Dewatering may also be required for excavations that extend within a few feet of the groundwater level in order to provide a stable excavation base. It should be recognized that lowering the groundwater level within the existing treatment plant for new construction at a particular location could impact the adjacent structures. Dewatering induced settlement may occur in cohesive soils across the project site which are susceptible to shrinkage and swelling as a resulting changes the moisture content. The clays encountered throughout the site pose a low to moderate shrink/swell risk during changes in the

moisture content. This should be evaluated as part of the dewatering plan for construction. It is recommended that dewatering systems be designed by a registered professional engineer with at least 5 years of dewatering design experience.

Groundwater levels in the area are expected to vary with local rainfall and the stage of the adjacent Blue and Missouri Rivers. During normal river stages, it is anticipated that the groundwater level would slope downward toward the river channel, as well as down-river, with the level approaching that of the river itself. During periods of high water in the river, the gradient of the groundwater perpendicular to the river flow would lessen and possibly reverse, so that the gradient would be away from the river toward the site.

6.4 Excavations

The existing clay and sand soils can be excavated using conventional earth moving equipment and methods. Trenching, excavating, and bracing should be performed in accordance with OSHA (Occupational Safety and Health Administration) regulations and other applicable regulatory agencies. In accordance with the OSHA excavation standards, the soil at the site is considered Type C, which requires a side slope for excavations of not steeper than 1.5H:1.0V. However, worker safety and classification of the excavation soil is the responsibility of the contractor. Also according to OSHA requirements, any excavation extending to a depth of more than 20 feet must be designed by a registered professional engineer. Where the excavation lies within the zone of influence of existing pavements, buildings, utilities, or other structures, the integrity of the those elements should be maintained by a properly designed earth retention system, underpinning, or other suitable means.

6.5 Fill and Backfill Materials

Some of the fill material may require the addition of moisture prior to compaction. This should be performed in a controlled manner using a tank truck with a spray bar, and the moistened soil should be thoroughly blended with a disk or pulverizer to produce a uniform moisture content. Repeated passages of the equipment may be required to achieve a uniform moisture content. If fill is placed during the winter season, fill materials should be carefully observed to see that no ice or frozen soils are placed as fill or remain in the base materials upon which fill is placed.

Some of the fill material may require moisture reduction prior to compaction. During warm weather, moisture reduction can generally be accomplished by disking, or otherwise aerating the soil. When air-drying is not possible, a moisture-reducing chemical additive, such as lime or Class C fly ash, may be used as a drying agent.

6.6 Fill and Backfill Placement

Cohesive fill should be compacted to a dry density of at least 95% of the standard Proctor maximum dry density (ASTM D 698) of the soil. Granular material, such as crushed limestone, placed for structure or pavement support, should be compacted to at least 100% of the standard Proctor maximum dry density. The moisture content of lean clay or granular fill at the time of compaction should be within ±2% of the optimum moisture content of the material as determined by the standard Proctor compaction test. The moisture content of fat clay fill materials should be from the optimum moisture content to 4% above optimum. Fill should be placed in loose lifts not

in excess of 8 inches thick, and compacted to the aforementioned criterion. However, it may be necessary to place fill in thinner lifts to achieve the recommended compaction when using small hand-operated equipment.

7.0 CONSTRUCTION OBSERVATION AND TESTING

It is recommended that TSi be retained during construction to perform testing and observation services for the following items:

- Removal of soils with grass, roots, and any other deleterious material;
- Proofrolling, recompaction, and preparation of the soil subgrade that will support new fill or structural elements;
- Placement and compaction of fill and backfill; and
- Observation of the installation of foundation elements; and
- Concrete testing and reinforcing steel placement.

These quality assurance services should help to verify the design assumptions and maintain construction procedures in accordance with the project plans, specifications, and good engineering practice.

8.0 REPORT LIMITATIONS

This geotechnical report has been prepared for the exclusive use of **Carollo Engineers, Inc.** for the specific application to the subject project. The information and recommendations contained in this report have been made in accordance with generally accepted geotechnical and foundation engineering practices; no other warranties are implied or expressed.

The assessments and recommendations submitted in this report are based in part upon the data obtained from the borings. The nature and extent of variations between the borings may not be evident at this time. If variations appear evident at a later date, it may be necessary to re-evaluate the recommendations of this report.

We emphasize that this report was prepared for design purposes only and may not be sufficient to prepare an accurate construction bid. Contractors reviewing this report acknowledge that the information and recommendations contained herein are for design purposes.

If conditions at the site have changed due to natural causes or other operations, this report should be reviewed by TSi to determine the applicability of the analysis and recommendations considering the changed conditions. The report should also be reviewed by TSi if changes occur in the design, elevations and site development plans or the project concepts.

TSi requests the opportunity to review the final plans and specifications for the project prior to construction to verify that the recommendations in this report are properly interpreted and incorporated in the design and construction documents. If TSi is not accorded the opportunity to make this recommended review, we can assume no responsibility for the misinterpretation of our recommendations.

APPENDIX A

Site and Boring Location Plan
Approximate Pothole Locations



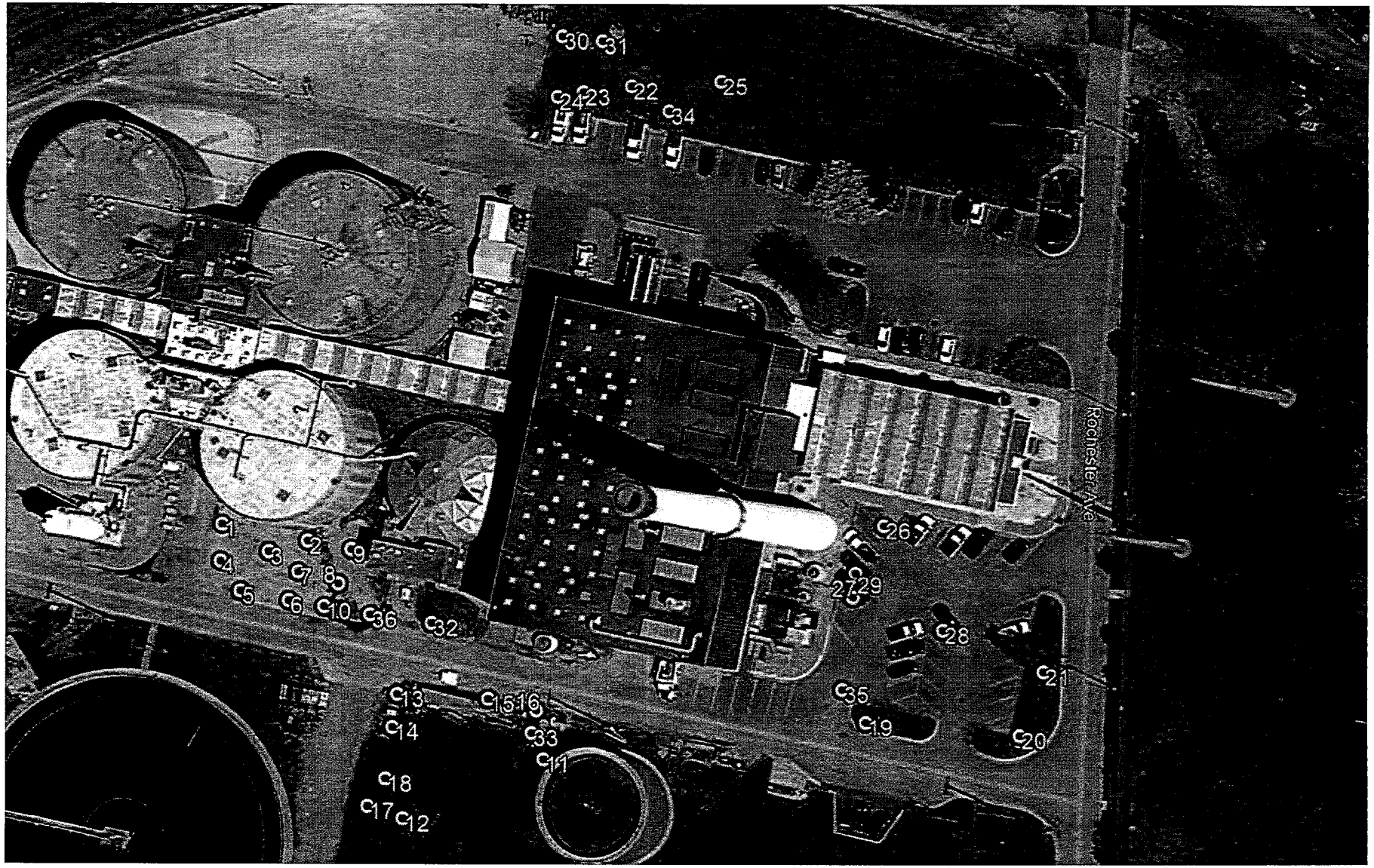
Legend

◎ **Boring Location**

N
W E
S

Figure 1, Boring Location Plan	Project No. 20182055
Blue River Wastewater Treatment Plant Kansas City, MO	
Not to Scale | Approved by: BMW	

TSI geotechnical, inc.



Legend

Pothole Location

N
W E
S

Figure 2, Approximate Pothole Locations	Project No. 20182055
Blue River Wastewater Treatment Plant Kansas City, MO	
Not to Scale	Approved by: BMW

APPENDIX B

Logs of Boring
General Notes
Unified Soil Classification System

LOG OF BORING NO. B-01

Project Description: **Blue River Biosolids Facility**
Kansas City, MO

TSi Geotechnical, Inc.
8248 NW 101st Terrace #5
Kansas City, Missouri 64153
(816) 599-7965 (816) 599-7967 FAX

Surface El.: **741.1**
Location: **See Site and Boring Location Plan**

Depth, feet	Samples	Sample #	Graphic Log	MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows Per 6 inches	Hand Penetrometer TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				Brown, lean CLAY, with roots and organics										
				Brown and gray, silty lean CLAY (CL)										
5		ST-1			25				0.39	96	26	31	19	12
10		SS-2			100		2 3 3				40			
15		ST-3		- with sand and silt below 13.5 ft.	100						9			
20		SS-4			56		3 4 4				25			
				Brown, fine to medium grained SAND (SW), trace silt and clay										
25		SS-5			56		1 2 1				24			

KC LOG WITH LAB BLUE RIVER LOGS.GPJ 1/10/19

Completion Depth:	78.70
Date Boring Started:	11/6/18
Date Boring Completed:	11/7/18
Engineer/Geologist:	SM
Project No.:	20182055

Remarks: Boring drilled using CME-550 drill rig with auto SPT. Groundwater was encountered at 18.0 feet during drilling. Auger refusal was encountered at 78.7 feet.

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

Continued Next Page

LOG OF BORING NO. B-01

Project Description: **Blue River Biosolids Facility**
Kansas City, MO

TSi Geotechnical, Inc.
8248 NW 101st Terrace #5
Kansas City, Missouri 64153
(816) 599-7965 (816) 599-7967 FAX

Surface El.: **741.1**

Location: **See Site and Boring Location Plan**

Depth, feet	Samples	Sample #	Graphic Log	MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows Per 6 inches	Hand Penetrometer TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				Brown, fine to medium grained SAND (SW), trace silt and clay*(continued)*										
							5							
30		SS-6			100		6 10				20			
							20							
35		SS-7			83		25 30				20			
							30							
40		SS-8			78		35 22				17			
							5							
45		SS-9			72		6 6				14			
							4							
50		SS-10			56		3 4				15			

Completion Depth:	78.70
Date Boring Started:	11/6/18
Date Boring Completed:	11/7/18
Engineer/Geologist:	SM
Project No.:	20182055

Remarks: Boring drilled using CME-550 drill rig with auto SPT. Groundwater was encountered at 18.0 feet during drilling. Auger refusal was encountered at 78.7 feet.

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

Continued Next Page

KC LOG WITH LAB BLUE RIVER LOGS.GPJ 1/10/19

LOG OF BORING NO. B-01

Project Description: **Blue River Biosolids Facility**
Kansas City, MO

TSi Geotechnical, Inc.
8248 NW 101st Terrace #5
Kansas City, Missouri 64153
(816) 599-7965 (816) 599-7967 FAX

Surface El.: **741.1**

Location: **See Site and Boring Location Plan**

Depth, feet	Samples	Sample #	Graphic Log	MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows Per 6 inches	Hand Penetrometer TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				Brown, fine to medium grained SAND (SW), trace silt and clay*(continued)*										
55		SS-11		- medium to coarse grained below 53.5 ft.	56		9 9 8				13			
60		SS-12			72		8 11 9				14			
65		SS-13			78		10 27 6				11			
70		SS-14		Brown and gray, poorly-graded GRAVEL (GP), with sand, trace silt and clay	67		10 7 8				10			
75		SS-15		SHALE, gray, highly weathered	22		50/4"				17			

Completion Depth:	78.70
Date Boring Started:	11/6/18
Date Boring Completed:	11/7/18
Engineer/Geologist:	SM
Project No.:	20182055

Remarks: Boring drilled using CME-550 drill rig with auto SPT. Groundwater was encountered at 18.0 feet during drilling. Auger refusal was encountered at 78.7 feet.

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

Continued Next Page

KC LOG WITH LAB BLUE RIVER LOGS.GPJ 1/10/19

LOG OF BORING NO. B-01

Project Description: **Blue River Biosolids Facility**
Kansas City, MO

TSi Geotechnical, Inc.
8248 NW 101st Terrace #5
Kansas City, Missouri 64153
(816) 599-7965 (816) 599-7967 FAX

Surface El.: **741.1**

Location: **See Site and Boring Location Plan**

Depth, feet	Samples	Sample #	Graphic Log	MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows Per 6 inches	Hand Penetrometer TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				SHALE, gray, highly weathered*(continued)*										
		SS-16			100		50/3"				18			
				Boring terminated at 78.7 ft.										
80														
85														
90														
95														
100														

Completion Depth:	78.70
Date Boring Started:	11/6/18
Date Boring Completed:	11/7/18
Engineer/Geologist:	SM
Project No.:	20182055

Remarks: Boring drilled using CME-550 drill rig with auto SPT. Groundwater was encountered at 18.0 feet during drilling. Auger refusal was encountered at 78.7 feet.

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

KC LOG WITH LAB BLUE RIVER LOGS.GPJ 1/10/19

LOG OF BORING NO. B-02

Project Description: **Blue River Biosolids Facility**
Kansas City, MO

TSi Geotechnical, Inc.
8248 NW 101st Terrace #5
Kansas City, Missouri 64153
(816) 599-7965 (816) 599-7967 FAX

Surface El.: **742.4**

Location: **See Site and Boring Location Plan**

Depth, feet	Samples	Sample #	Graphic Log	MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows Per 6 inches	Hand Penetrometer TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				CONCRETE (9")										
				Brown and gray, silty lean CLAY (CL)										
5		ST-1			100				1.16	108	19	34	22	12
10		SS-2		▽	67		WH WH WH				23			
15		SS-3			100		3 1 1							
20		SS-4			100		1 1 2				31			
25		SS-5			100		3 1 4				33			

Completion Depth:	79.50
Date Boring Started:	11/12/18
Date Boring Completed:	11/12/18
Engineer/Geologist:	SM
Project No.:	20182055

Remarks: Boring drilled using CME-550 drill rig with auto SPT. Groundwater was encountered at 8.0 feet during drilling. Auger refusal was encountered at 79.5 feet.

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

Continued Next Page

KC LOG WITH LAB BLUE RIVER LOGS.GPJ 1/10/19

LOG OF BORING NO. B-02

Project Description: **Blue River Biosolids Facility**
Kansas City, MO

TSi Geotechnical, Inc.
8248 NW 101st Terrace #5
Kansas City, Missouri 64153
(816) 599-7965 (816) 599-7967 FAX

Surface El.: **742.4**

Location: **See Site and Boring Location Plan**

Depth, feet	Samples	Sample #	Graphic Log	MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows Per 6 inches	Hand Penetrometer TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				Brown, fine to medium grained SAND (SW), trace silt and clay										
30		SS-6			89		3 4 7				20			
35		SS-7			67		7 9 11				18			
40		SS-8			67		11 13 11				12			
45		SS-9			44		4 3 5				20			
50		SS-10			67		9 5 6				18			

Completion Depth:	79.50
Date Boring Started:	11/12/18
Date Boring Completed:	11/12/18
Engineer/Geologist:	SM
Project No.:	20182055

Remarks: Boring drilled using CME-550 drill rig with auto SPT. Groundwater was encountered at 8.0 feet during drilling. Auger refusal was encountered at 79.5 feet.

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

Continued Next Page

KC LOG WITH LAB BLUE RIVER LOGS.GPJ 1/10/19

LOG OF BORING NO. B-02

Project Description: **Blue River Biosolids Facility**
Kansas City, MO

TSi Geotechnical, Inc.
8248 NW 101st Terrace #5
Kansas City, Missouri 64153
(816) 599-7965 (816) 599-7967 FAX

Surface El.: **742.4**

Location: **See Site and Boring Location Plan**

Depth, feet	Samples	Sample #	Graphic Log	MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows Per 6 inches	Hand Penetrometer TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				Brown, fine to medium grained SAND (SW), trace silt and clay*(continued)* - medium to coarse grained below 50.0 ft.										
55		SS-11			67		10 8 11				14			
		SS-12		Brown, medium to coarse grained SAND (SP), trace gravel, silt, and clay	67		11 8 6				13			
60														
65		SS-13			67		32 34 34				11			
		SS-14			72		9 8 9				20			
70														
		SS-15			67		7 6 8				20			
75														

Completion Depth: 79.50
Date Boring Started: 11/12/18
Date Boring Completed: 11/12/18
Engineer/Geologist: SM
Project No.: 20182055

Remarks: Boring drilled using CME-550 drill rig with auto SPT. Groundwater was encountered at 8.0 feet during drilling. Auger refusal was encountered at 79.5 feet.

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

Continued Next Page

KC LOG WITH LAB BLUE RIVER LOGS.GPJ 1/10/19

LOG OF BORING NO. B-02

Project Description: **Blue River Biosolids Facility**
Kansas City, MO

TSi Geotechnical, Inc.
8248 NW 101st Terrace #5
Kansas City, Missouri 64153
(816) 599-7965 (816) 599-7967 FAX

Surface El.: **742.4**

Location: **See Site and Boring Location Plan**

Depth, feet	Samples	Sample #	Graphic Log	MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows Per 6 inches	Hand Penetrometer TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				Brown, medium to coarse grained SAND (SP), trace gravel, silt, and clay*(continued)*										
				SHALE, gray, highly weathered										
		SS-16			100		21 50/6"				19			
80				Boring terminated at 79.5 ft.										
85														
90														
95														
100														

Completion Depth:	79.50
Date Boring Started:	11/12/18
Date Boring Completed:	11/12/18
Engineer/Geologist:	SM
Project No.:	20182055

Remarks: Boring drilled using CME-550 drill rig with auto SPT. Groundwater was encountered at 8.0 feet during drilling. Auger refusal was encountered at 79.5 feet.

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

KC LOG WITH LAB BLUE RIVER LOGS.GPJ 1/10/19

LOG OF BORING NO. B-03

Project Description: **Blue River Biosolids Facility**
Kansas City, MO

TSI Geotechnical, Inc.
8248 NW 101st Terrace #5
Kansas City, Missouri 64153
(816) 599-7965 (816) 599-7967 FAX

Surface El.: **742.1**
Location: **See Site and Boring Location Plan**

Depth, feet	Samples	Sample #	Graphic Log	MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows Per 6 inches	Hand Penetrometer TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				ASPHALT (5")										
				Brown and gray, silty lean CLAY (CL)										
5		SS-1			33		3 4 4				14	30	17	13
		ST-2			75						12			
10														
		SS-3		Brown, sandy SILT (ML), trace clay	89		3 2 3							
15														
		SS-4		▽	89		2 2 3				29			
20				Brown, fine to medium grained SAND (SW), trace silt and clay										
		SS-5			89		3 2 5				31			
25														

Completion Depth:	88.70
Date Boring Started:	11/7/18
Date Boring Completed:	11/7/18
Engineer/Geologist:	SM
Project No.:	20182055

Remarks: Boring drilled using CME-550 drill rig with auto SPT. Groundwater was encountered at 19.0 feet during drilling. Auger refusal was encountered at 88.7 feet.

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

Continued Next Page

KC LOG WITH LAB BLUE RIVER LOGS.GPJ 1/10/19

LOG OF BORING NO. B-03

Project Description: **Blue River Biosolids Facility**
Kansas City, MO

TSi Geotechnical, Inc.
8248 NW 101st Terrace #5
Kansas City, Missouri 64153
(816) 599-7965 (816) 599-7967 FAX

Surface El.: **742.1**

Location: **See Site and Boring Location Plan**

Depth, feet	Samples	Sample #	Graphic Log	MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows Per 6 inches	Hand Penetrometer TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				Brown, fine to medium grained SAND (SW), trace silt and clay*(continued)*										
		SS-6			100		2 3 3				17			
30														
		SS-7			89		15 17 15				17			
35														
		SS-8			78		5 7 9				27			
40														
		SS-9			67		5 3 4				16			
45														
		SS-10			72		9 11 11				21			
50														

Completion Depth: 88.70
Date Boring Started: 11/7/18
Date Boring Completed: 11/7/18
Engineer/Geologist: SM
Project No.: 20182055

Remarks: Boring drilled using CME-550 drill rig with auto SPT. Groundwater was encountered at 19.0 feet during drilling. Auger refusal was encountered at 88.7 feet.

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

Continued Next Page

KC LOG WITH LAB BLUE RIVER LOGS.GPJ 1/10/19

LOG OF BORING NO. B-03

Project Description: **Blue River Biosolids Facility**
Kansas City, MO

TSi Geotechnical, Inc.
8248 NW 101st Terrace #5
Kansas City, Missouri 64153
(816) 599-7965 (816) 599-7967 FAX

Surface El.: **742.1**

Location: **See Site and Boring Location Plan**

Depth, feet	Samples	Sample #	Graphic Log	MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows Per 6 inches	Hand Penetrometer TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				Brown, fine to medium grained SAND (SW), trace silt and clay*(continued)*										
55		SS-11			67		9 9 10				14			
60		SS-12			67		7 8 6				12			
65		SS-13			89		38 30 28				10			
70		SS-14			83		10 11 11				12			
75		SS-15			100		11 12 17				18			

KC LOG WITH LAB BLUE RIVER LOGS.GPJ 1/10/19

Completion Depth:	88.70
Date Boring Started:	11/7/18
Date Boring Completed:	11/7/18
Engineer/Geologist:	SM
Project No.:	20182055

Remarks: Boring drilled using CME-550 drill rig with auto SPT. Groundwater was encountered at 19.0 feet during drilling. Auger refusal was encountered at 88.7 feet.

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

Continued Next Page

LOG OF BORING NO. B-03

Project Description: **Blue River Biosolids Facility**
Kansas City, MO

TSi Geotechnical, Inc.
8248 NW 101st Terrace #5
Kansas City, Missouri 64153
(816) 599-7965 (816) 599-7967 FAX

Surface El.: **742.1**

Location: **See Site and Boring Location Plan**

Depth, feet	Samples	Sample #	Graphic Log	MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows Per 6 inches	Hand Penetrometer TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				Brown, fine to medium grained SAND (SW), trace silt and clay*(continued)*										
				SHALE, gray, highly weathered										
		SS-16			98		50/2"				19			
80														
		SS-17			98		50/2"							
85														
		SS-18			98		50/2"							
				Boring terminated at 88.7 ft.										
90														
95														
100														

Completion Depth:	88.70
Date Boring Started:	11/7/18
Date Boring Completed:	11/7/18
Engineer/Geologist:	SM
Project No.:	20182055

Remarks: Boring drilled using CME-550 drill rig with auto SPT. Groundwater was encountered at 19.0 feet during drilling. Auger refusal was encountered at 88.7 feet.

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

KC LOG WITH LAB BLUE RIVER LOGS.GPJ 1/10/19

LOG OF BORING NO. B-04

Project Description: **Blue River Biosolids Facility**
Kansas City, MO

TSi Geotechnical, Inc.
8248 NW 101st Terrace #5
Kansas City, Missouri 64153
(816) 599-7965 (816) 599-7967 FAX

Surface El.: **740.8**
Location: **See Site and Boring Location Plan**

Depth, feet	Samples	Sample #	Graphic Log	MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows Per 6 inches	Hand Penetrometer TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				ASPHALT (8")	-									
				Brown and gray, fat CLAY (CH)										
5		SS-1			50		3 4 6				33	50	18	32
		ST-2		Brown and gray, silty lean CLAY (CL), trace sand	29						23			
10														
		SS-3			83		5 5 3							
15														
		SS-4			56		4 3 3				26			
20				Brown, fine to medium grained SAND (SW), trace silt and clay										
		SS-5		▽	100		4 5 10				24			
25														

KC LOG WITH LAB BLUE RIVER LOGS.GPJ 1/10/19

Completion Depth:	63.50
Date Boring Started:	11/7/18
Date Boring Completed:	11/7/18
Engineer/Geologist:	BW
Project No.:	20182055

Remarks: Boring drilled using CME-550 drill rig with auto SPT. Groundwater was encountered at 23.0 feet during drilling. Auger refusal was encountered at 63.9 feet.

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

Continued Next Page

LOG OF BORING NO. B-04

Project Description: **Blue River Biosolids Facility**
Kansas City, MO

TSi Geotechnical, Inc.
8248 NW 101st Terrace #5
Kansas City, Missouri 64153
(816) 599-7965 (816) 599-7967 FAX

Surface El.: **740.8**

Location: **See Site and Boring Location Plan**

Depth, feet	Samples	Sample #	Graphic Log	MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows Per 6 inches	Hand Penetrometer TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				Brown, fine to medium grained SAND (SW), trace silt and clay*(continued)*										
-30		SS-6			100		5 5 7				20			
-35		SS-7			83		2 3 4				20			
-40		SS-8		- fine to coarse grained below 38.5 ft.	56		13 17 8				16			
-45		SS-9			22		9 13 16				11			
-50		SS-10			28		10 13 17				17			

Completion Depth:	63.50
Date Boring Started:	11/7/18
Date Boring Completed:	11/7/18
Engineer/Geologist:	BW
Project No.:	20182055

Remarks: Boring drilled using CME-550 drill rig with auto SPT. Groundwater was encountered at 23.0 feet during drilling. Auger refusal was encountered at 63.9 feet.

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

Continued Next Page

KC LOG WITH LAB BLUE RIVER LOGS.GPJ 1/10/19

LOG OF BORING NO. B-04

Project Description: **Blue River Biosolids Facility**
Kansas City, MO

TSi Geotechnical, Inc.
8248 NW 101st Terrace #5
Kansas City, Missouri 64153
(816) 599-7965 (816) 599-7967 FAX

Surface El.: **740.8**

Location: **See Site and Boring Location Plan**

Depth, feet	Samples	Sample #	Graphic Log	MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows Per 6 inches	Hand Penetrometer TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				Brown, fine to medium grained SAND (SW), trace silt and clay*(continued)*										
55		SS-11			22		27 24 24				19			
60		SS-12			17		25 23 26				16			
		SS-13		SHALE, gray, highly weathered	76		50/5"				11			
65				Boring terminated 63.9 ft.										
70														
75														

KC LOG WITH LAB BLUE RIVER LOGS.GPJ 1/10/19

Completion Depth:	63.50
Date Boring Started:	11/7/18
Date Boring Completed:	11/7/18
Engineer/Geologist:	BW
Project No.:	20182055

Remarks: Boring drilled using CME-550 drill rig with auto SPT. Groundwater was encountered at 23.0 feet during drilling. Auger refusal was encountered at 63.9 feet.

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

LOG OF BORING NO. B-05

Project Description: **Blue River Biosolids Facility**
Kansas City, MO

TSI Geotechnical, Inc.
8248 NW 101st Terrace #5
Kansas City, Missouri 64153
(816) 599-7965 (816) 599-7967 FAX

Surface El.: **742.1**

Location: **See Site and Boring Location Plan**

Depth, feet	Samples	Sample #	Graphic Log	MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows Per 6 inches	Hand Penetrometer TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				Potholing from 0 ft. to 10 ft.										
10				Brown, fine to medim grained SAND (SW), trace silt and clay										
15		SS-1			100		6 8 9				32			
		ST-2			100						30			
20				▽										
25		SS-3			100		4 7 7				23			

Completion Depth: 79.00
Date Boring Started: 11/8/18
Date Boring Completed: 11/8/18
Engineer/Geologist: BW
Project No.: 20182055

Remarks: Boring drilled using CME-550 drill rig with auto SPT. Groundwater was encountered at 23.0 feet during drilling. Auger refusal was encountered at 79.0 feet.

KC LOG WITH LAB BLUE RIVER LOGS.GPJ 1/10/19

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

Continued Next Page

LOG OF BORING NO. B-05

Project Description: **Blue River Biosolids Facility**
Kansas City, MO

TSi Geotechnical, Inc.
8248 NW 101st Terrace #5
Kansas City, Missouri 64153
(816) 599-7965 (816) 599-7967 FAX

Surface El.: **742.1**

Location: **See Site and Boring Location Plan**

Depth, feet	Samples	Sample #	Graphic Log	MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows Per 6 inches	Hand Penetrometer TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				Brown, fine to medim grained SAND (SW), trace silt and clay*(continued)*										
30		SS-4			100		5 6 10				19			
		SS-5		- with clay at 33.5 ft.	67		1 3 8				21			
35														
40		SS-6			56		5 6 9				46			
45		SS-7			33		4 5 8				12			
50		SS-8			28		5 3 3				16			

KC LOG WITH LAB BLUE RIVER LOGS.GPJ 1/10/19

Completion Depth:	79.00
Date Boring Started:	11/8/18
Date Boring Completed:	11/8/18
Engineer/Geologist:	BW
Project No.:	20182055

Remarks: Boring drilled using CME-550 drill rig with auto SPT. Groundwater was encountered at 23.0 feet during drilling. Auger refusal was encountered at 79.0 feet.

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

Continued Next Page

LOG OF BORING NO. B-05

Project Description: **Blue River Biosolids Facility**
Kansas City, MO

TSi Geotechnical, Inc.
8248 NW 101st Terrace #5
Kansas City, Missouri 64153
(816) 599-7965 (816) 599-7967 FAX

Surface El.: **742.1**

Location: **See Site and Boring Location Plan**

Depth, feet	Samples	Sample #	Graphic Log	MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows Per 6 inches	Hand Penetrometer TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				Brown, fine to medim grained SAND (SW), trace silt and clay*(continued)*										
55		SS-9			39		3 6 11				21			
60		SS-10			33		5 5 6				22			
65		SS-11			56		33 36 42				11			
70		SS-12		Green and gray, shaley lean CLAY (CL), with sand	100		2 3 6				53			
75		SS-13			39		4 3 11				20			

Completion Depth: 79.00
Date Boring Started: 11/8/18
Date Boring Completed: 11/8/18
Engineer/Geologist: BW
Project No.: 20182055

Remarks: Boring drilled using CME-550 drill rig with auto SPT. Groundwater was encountered at 23.0 feet during drilling. Auger refusal was encountered at 79.0 feet.

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

Continued Next Page

KC LOG WITH LAB BLUE RIVER LOGS.GPJ 1/10/19

LOG OF BORING NO. B-05

Project Description: **Blue River Biosolids Facility**
Kansas City, MO

TSi Geotechnical, Inc.
8248 NW 101st Terrace #5
Kansas City, Missouri 64153
(816) 599-7965 (816) 599-7967 FAX

Surface El.: **742.1**

Location: **See Site and Boring Location Plan**

Depth, feet	Samples	Sample #	Graphic Log	MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows Per 6 inches	Hand Penetrometer TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				Green and gray, shaley lean CLAY (CL), with sand *(continued)*										
		SS-14		SHALE, gray, highly weathered	95		50/5"				19			
				Boring terminated at 79.0 ft.										
80														
85														
90														
95														
100														

Completion Depth:	79.00
Date Boring Started:	11/8/18
Date Boring Completed:	11/8/18
Engineer/Geologist:	BW
Project No.:	20182055

Remarks: Boring drilled using CME-550 drill rig with auto SPT. Groundwater was encountered at 23.0 feet during drilling. Auger refusal was encountered at 79.0 feet.

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

KC LOG WITH LAB BLUE RIVER LOGS.GPJ 1/10/19

LOG OF BORING NO. B-06

Project Description: **Blue River Biosolids Facility**
Kansas City, MO

TSI Geotechnical, Inc.
8248 NW 101st Terrace #5
Kansas City, Missouri 64153
(816) 599-7965 (816) 599-7967 FAX

Surface El.: **741.8**

Location: **See Site and Boring Location Plan**

Depth, feet	Samples	Sample #	Graphic Log	MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows Per 6 inches	Hand Penetrometer TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				Potholing from 0 ft. to 10 ft.										
10		ST-1		Gray, sandy SILT (ML), with clay	33						22			
15				Brown, fine to medium grained SAND (SW), trace silt and clay										
		SS-2			72		4 3 3				21			
20				▽										
		SS-3			100		4 5 5				24			
25														

Completion Depth: 74.30
Date Boring Started: 11/8/18
Date Boring Completed: 11/8/18
Engineer/Geologist: SM
Project No.: 20182055

Remarks: Boring drilled using CME-550 drill rig with auto SPT. Groundwater was encountered at 22.0 feet during drilling. Auger refusal was encountered at 74.3 feet.

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

Continued Next Page

KC LOG WITH LAB BLUE RIVER LOGS.GPJ 1/10/19

LOG OF BORING NO. B-06

Project Description: **Blue River Biosolids Facility**
Kansas City, MO

TSi Geotechnical, Inc.
8248 NW 101st Terrace #5
Kansas City, Missouri 64153
(816) 599-7965 (816) 599-7967 FAX

Surface El.: **741.8**

Location: **See Site and Boring Location Plan**

Depth, feet	Samples	Sample #	Graphic Log	MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows Per 6 inches	Hand Penetrometer TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				Brown, fine to medium grained SAND (SW), trace silt and clay*(continued)*										
30		SS-4			100		4 2 2				21			
35		SS-5			67		9 8 13				20			
40		SS-6			33		6 6 7				19			
45		SS-7			67		9 10 12				16			
50		SS-8			67		12 13 8				10			

Completion Depth:	74.30
Date Boring Started:	11/8/18
Date Boring Completed:	11/8/18
Engineer/Geologist:	SM
Project No.:	20182055

Remarks: Boring drilled using CME-550 drill rig with auto SPT. Groundwater was encountered at 22.0 feet during drilling. Auger refusal was encountered at 74.3 feet.

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

Continued Next Page

KC LOG WITH LAB BLUE RIVER LOGS.GPJ 1/10/19

LOG OF BORING NO. B-06

Project Description: **Blue River Biosolids Facility**
Kansas City, MO

TSi Geotechnical, Inc.
8248 NW 101st Terrace #5
Kansas City, Missouri 64153
(816) 599-7965 (816) 599-7967 FAX

Surface El.: **741.8**

Location: **See Site and Boring Location Plan**

Depth, feet	Samples	Sample #	Graphic Log	MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows Per 6 inches	Hand Penetrometer TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				Brown, fine to medium grained SAND (SW), trace silt and clay*(continued)*										
55		SS-9			56		7 5 5				17			
60		SS-10		- fine to coarse grained, trace gravel below 58.5 ft.	56		7 8 6				11			
65		SS-11			72		8 4 4				25			
70		SS-12			78		15 17 20				18			
75		SS-13		SHALE, gray, highly weathered	44		20 50/5"				23			
				Boring terminated 74.3 ft.										

Completion Depth:	74.30
Date Boring Started:	11/8/18
Date Boring Completed:	11/8/18
Engineer/Geologist:	SM
Project No.:	20182055

Remarks: Boring drilled using CME-550 drill rig with auto SPT. Groundwater was encountered at 22.0 feet during drilling. Auger refusal was encountered at 74.3 feet.

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

KC LOG WITH LAB BLUE RIVER LOGS.GPJ 1/10/19

LOG OF BORING NO. B-07

Project Description: **Blue River Biosolids Facility**
Kansas City, MO

TSi Geotechnical, Inc.
8248 NW 101st Terrace #5
Kansas City, Missouri 64153
(816) 599-7965 (816) 599-7967 FAX

Surface El.: **742.6**

Location: **See Site and Boring Location Plan**

Depth, feet	Samples	Sample #	Graphic Log	MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows Per 6 inches	Hand Penetrometer TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				Brown, fine to medium SAND (FILL)										
5		SS-1			100		WH WH WH				27			
		SS-2		▽	0		WH WH WH							
10				Gray, lean CLAY (CL), with silt										
15		SS-3			100		2 1 2				31			
		SS-4			100		4 10 15				28			
20				Brown, fine to medium grained SAND (SW), trace silt and clay										
		SS-5			67		4 3 5				18			
25														

Completion Depth:	78.80
Date Boring Started:	11/13/18
Date Boring Completed:	11/13/18
Engineer/Geologist:	SM
Project No.:	20182055

Remarks: Boring drilled using CME-550 drill rig with auto SPT. Groundwater was encountered at 8.0 feet during drilling. Auger refusal was encountered at 78.8 feet.

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

Continued Next Page

KC LOG WITH LAB BLUE RIVER LOGS.GPJ 1/10/19

LOG OF BORING NO. B-07

Project Description: **Blue River Biosolids Facility**
Kansas City, MO

TSi Geotechnical, Inc.
8248 NW 101st Terrace #5
Kansas City, Missouri 64153
(816) 599-7965 (816) 599-7967 FAX

Surface El.: **742.6**

Location: **See Site and Boring Location Plan**

Depth, feet	Samples	Sample #	Graphic Log	MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows Per 6 inches	Hand Penetrometer TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				Brown, fine to medium grained SAND (SW), trace silt and clay*(continued)*										
		SS-6			61		9 8 7				21			
30														
		SS-7			100		7 8 9				24			
35														
		SS-8			83		10 12 12				21			
40														
		SS-9			89		8 10 12				27			
45														
		SS-10		- fine to coarse grained below 48.5 ft.	67		5 4 4				13			
50														

Completion Depth:	78.80
Date Boring Started:	11/13/18
Date Boring Completed:	11/13/18
Engineer/Geologist:	SM
Project No.:	20182055

Remarks: Boring drilled using CME-550 drill rig with auto SPT. Groundwater was encountered at 8.0 feet during drilling. Auger refusal was encountered at 78.8 feet.

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

Continued Next Page

KC LOG WITH LAB BLUE RIVER LOGS.GPJ 1/10/19

LOG OF BORING NO. B-07

Project Description: **Blue River Biosolids Facility**
Kansas City, MO

TSi Geotechnical, Inc.
8248 NW 101st Terrace #5
Kansas City, Missouri 64153
(816) 599-7965 (816) 599-7967 FAX

Surface El.: **742.6**

Location: **See Site and Boring Location Plan**

Depth, feet	Samples	Sample #	Graphic Log	MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows Per 6 inches	Hand Penetrometer TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				Brown, fine to medium grained SAND (SW), trace silt and clay*(continued)*										
		SS-11			67		9 11 11				18			
55														
		SS-12		- trace gravel below 58.5 ft.	67		8 7 9				14			
60														
		SS-13			83		23 29 12				12			
65														
		SS-14			83		11 12 12				17			
70														
		SS-15			67		7 7 7				20			
75														

Completion Depth:	78.80
Date Boring Started:	11/13/18
Date Boring Completed:	11/13/18
Engineer/Geologist:	SM
Project No.:	20182055

Remarks: Boring drilled using CME-550 drill rig with auto SPT. Groundwater was encountered at 8.0 feet during drilling. Auger refusal was encountered at 78.8 feet.

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

Continued Next Page

KC LOG WITH LAB BLUE RIVER LOGS.GPJ 1/10/19

LOG OF BORING NO. B-07

Project Description: **Blue River Biosolids Facility**
Kansas City, MO

TSi Geotechnical, Inc.
8248 NW 101st Terrace #5
Kansas City, Missouri 64153
(816) 599-7965 (816) 599-7967 FAX

Surface El.: **742.6**

Location: **See Site and Boring Location Plan**

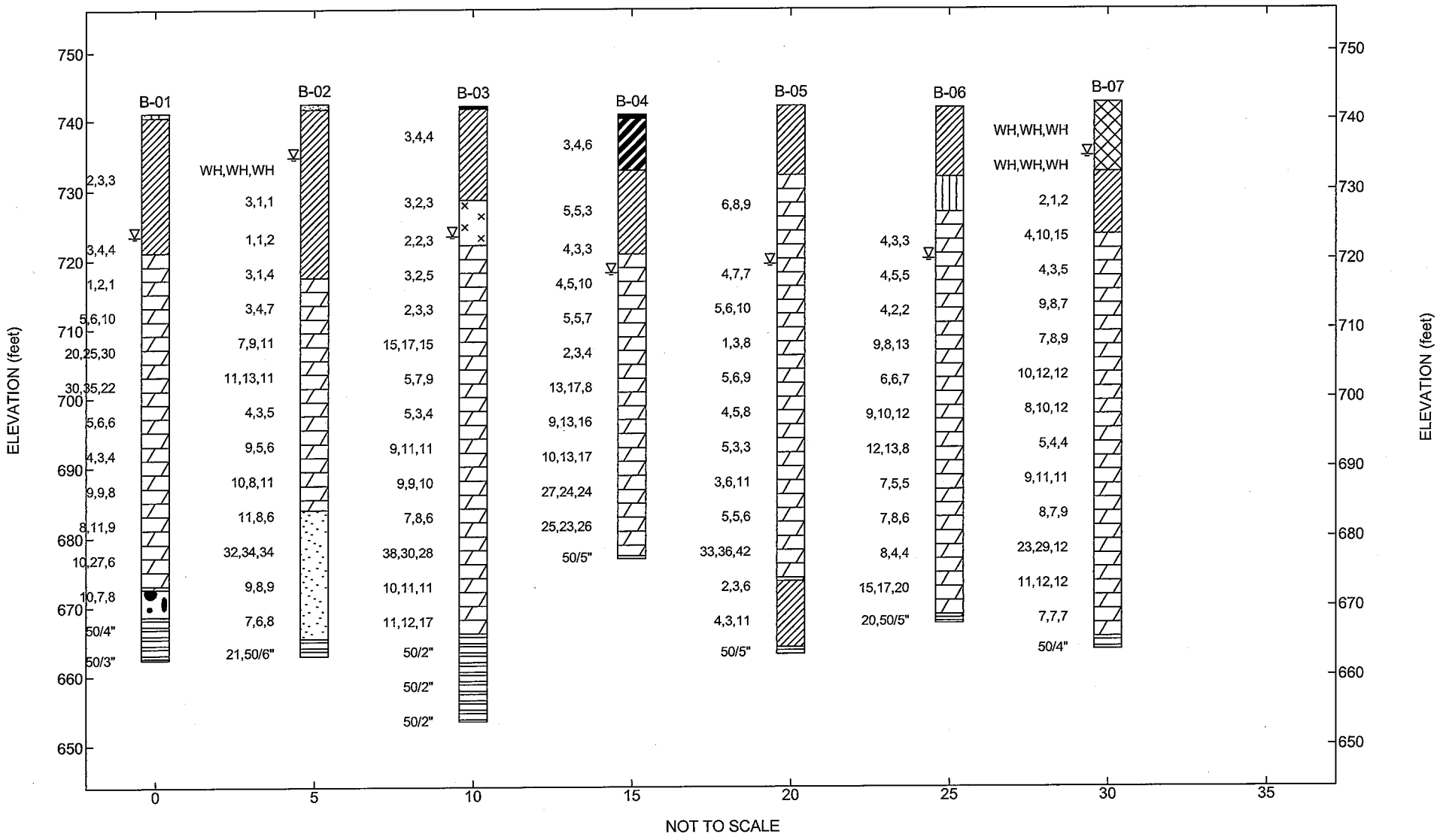
Depth, feet	Samples	Sample #	Graphic Log	MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows Per 6 inches	Hand Penetrometer TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				Brown, fine to medium grained SAND (SW), trace silt and clay*(continued)*										
				SHALE, gray, highly weathered										
		SS-16			101		50/4"				17			
				Boring terminated at 78.8 ft.										
80														
85														
90														
95														
100														

Completion Depth: 78.80
Date Boring Started: 11/13/18
Date Boring Completed: 11/13/18
Engineer/Geologist: SM
Project No.: 20182055

Remarks: Boring drilled using CME-550 drill rig with auto SPT. Groundwater was encountered at 8.0 feet during drilling. Auger refusal was encountered at 78.8 feet.

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

KC LOG WITH LAB BLUE RIVER LOGS.GPJ 1/10/19



TSI engineering, inc.
8248 NW 101st TERRACE, #5
KANSAS CITY, MISSOURI 64153

SUBSURFACE PROFILE

Blue River Biosolids Facility

Kansas City, Missouri

Prepared By: BW	Checked By: BR	
Project No. 20182055	Date:1/10/2018	Figure 2

GENERAL NOTES

TSi geotechnical

The number of borings is based on: topographic and geologic factors; the magnitude of structure loading; the size, shape, and value of the structure; consequences of failure; and other factors. The type and sequence of sampling are selected to reduce the possibility of undiscovered anomalies and maintain drilling efficiency. Attempts are made to detect and/or identify occurrences during drilling and sampling such as the presence of water, boulders, gas, zones of lost circulation, relative ease or resistance to drilling progress, unusual sample recovery, variation in resistance to driving split-spoon samplers, unusual odors, etc. However, lack of notation regarding these occurrences does not preclude their presence.

Although attempts are made to obtain stabilized groundwater levels, the levels shown on the Logs of Boring may not have stabilized, particularly in more impermeable cohesive soils. Consequently, the indicated groundwater levels may not represent present or future levels. Groundwater levels may vary significantly over time due to the effects of precipitation, infiltration, or other factors not evident at the time indicated.

Unless otherwise noted, soil classifications indicated on the Logs of Boring are based on visual observations and are not the result of classification tests. Although visual classifications are performed by experienced technicians or engineers, classifications so made may not be conclusive.

Generally, variations in texture less than one foot in thickness are described as layers within a stratum, while thicker zones are logged as individual strata. However, minor anomalies and changes of questionable lateral extent may appear only in the verbal description. The lines indicating changes in strata on the Logs of Borings are approximate boundaries only, as the actual material change may be between samples or may be a gradual transition.

Samples chosen for laboratory testing are selected in such a manner as to measure selected physical characteristics of each material encountered. However, as samples are recovered only intermittently and not all samples undergo a complete series of tests, the results of such tests may not conclusively represent the characteristics of all subsurface materials present.

NOTATION USED ON BORING LOGS

APPROXIMATE PROPORTIONS

TRACE	<15%
WITH	15-30%
MODIFIER	>30%

Clay or clayey may be used as major material or modifier, regardless of relative proportions, if the clay content is sufficient to dominate the soil properties.

PARTICLE SIZE

BOULDERS		>12 Inches
COBBLES		12 Inches – 3 Inches
GRAVEL		
	Coarse	3 Inches – ¾ Inch
	Fine	¾ Inch – No. 4 Sieve (4.750 mm)
SAND		
	Coarse	No. 4 – No. 10 Sieve (2.000 mm)
	Medium	No. 10 – No. 40 Sieve (0.420 mm)
	Fine	No. 40 – No. 200 Sieve (0.074 mm)
SILT		No. 200 Sieve - 0.002 mm
CLAY		< 0.002 mm

PENETRATION – BLOWS

Number of impacts of a 140-pound hammer falling a distance of 30 inches to cause a standard split-barrel sampler, 1 3/8 inches I.D., to penetrate a distance of 6 inches. The number of impacts for the first 6 inches of penetration is known as the seating drive. The sum of the impacts for the last 12 inches of penetration is the Standard Penetration Test Resistance or "N" value, blows per foot. For example, if blows = 6-8-9, "N" = 8+9 or 17.

OTHER NOTATIONS

Recovery % – length of recovered soil divided by length of sample attempted.

50/2"	Impacts of hammer to cause sampler to penetrate the indicated number of inches
WR	Sampler penetrated under the static loading of the weight of the drill rods
WH	Sampler penetrated under the static loading the weight of the hammer and drill rods
HSA	Hollow stem auger drilling method
FA	Flight auger drilling method
RW	Rotary wash drilling methods with drilling mud
AH	Automatic hammer used for Standard Penetration Test sample
SH	Safety hammer with rope and cathead used for Standard Penetration Test sample

GRAPHIC SYMBOLS

▽ Depth at which groundwater was encountered during drilling

▼ Depth at which groundwater was measured after drilling

⧗ Standard Penetration Test Sample, ASTM D1586

▮ 3-inch diameter Shelby Tube Sample, ASTM D1587

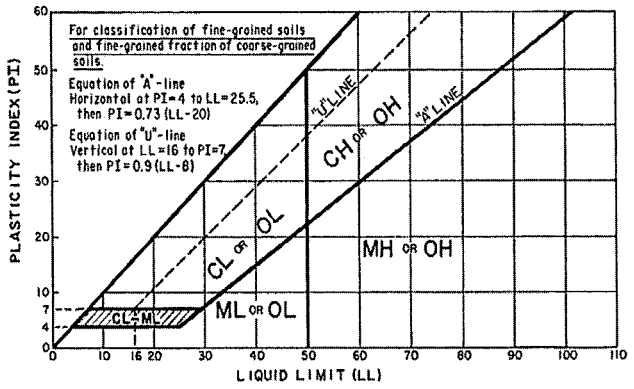
G Sample grabbed from auger

▮▮ NX Size rock core sample

TSi geotechnical

UNIFIED SOIL CLASSIFICATION SYSTEM, (ASTM D-2487)

Major Divisions			*Group Symbols*		*Typical Names*	*Laboratory Classification Criteria*		
Coarse-grained soils (More than half of materials is larger than No. 200 sieve size)	Gravels (More than half of coarse fraction is larger than No. 4 sieve size)	Clean gravels (Little or no fines)	GW		Well-graded gravels, gravel-sand mixtures, little or no fines	Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-Grained soils are classified as follows: Less than 5 per cent GW, GP, SW, SP; More than 12 per cent GM, GC, SM, SC; 5 to 12 per cent Borderline cases requiring dual symbols[b]	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
			GP		Poorly graded gravels, gravel-sand mixtures, little or no fines		Not meeting all gradation requirements for GW	
		Gravels with fines (Appreciable amount of fines)	GM[a]	d	Silty gravels, gravel-sand-silt mixtures		Atterberg limits below "A" line or P.1. less than 4	Above "A" line with P.1. between 4 and 7 are *borderline* cases requiring use of dual symbols
				u			Atterberg limits below "A" line with P.1. greater than 7	
			GC		Clayey gravels, gravel-sand-clay mixtures			
	Sands (More than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (Little or no fines)	SW		Well-graded sands, gravelly sands, little or no fines		$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
			SP		Poorly graded sands, gravelly sands, little or no fines		Not meeting all gradation requirements for SW	
		Sands with fines (Appreciable amount of fines)	SM[a]	d	Silty sands, sand-mix mixtures		Atterberg limits about "A" line or P.I. less than 4	Limits plotting in hatched zone with P.I. between 4 and 7 are *borderline* cases requiring use of dual symbols
				u			Atterberg limits about "A" line with P.I. greater than 7	
			SC		Clayey sands, sand-clay mixtures			
Fine-grained soils (More than half of materials is smaller than No. 200 sieve size)	Silts and clays (Liquid limit less than 50)		ML		Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity			
			CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays			
			OL		Organic silts and organic silty clays of low plasticity			
	Silts and clays (Liquid limit greater than 50)		MH		Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts			
			CH		Inorganic clays of medium to high plasticity, organic silts			
			OH		Organic clays of medium to high plasticity, organic silts			
	Highly organic soils		Pt		Peat and other highly organic soils			



[a]Division of GM and SM groups into subdivisions of d and u are for roads and airfields only. Subdivision is based on Atterberg limits; suffix d used when L.L. is 26 or less and the P.1. is 6 or less; the suffix u used when L.L. is greater than 28.

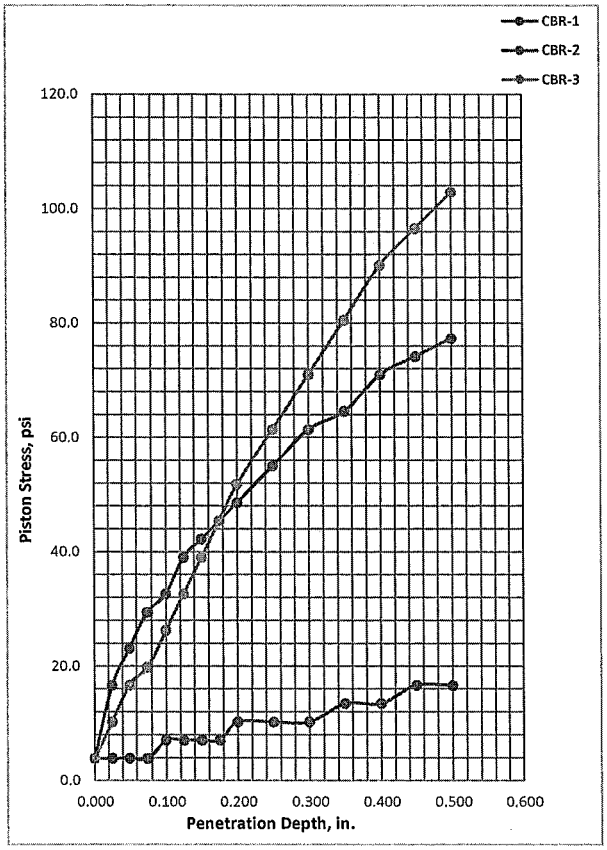
[b]Borderline classifications, used for soils possessing characteristics of two groups, are designated by combinations of group symbols. For example: GW-GC, well-graded gravel-sand mixture with clay binder.

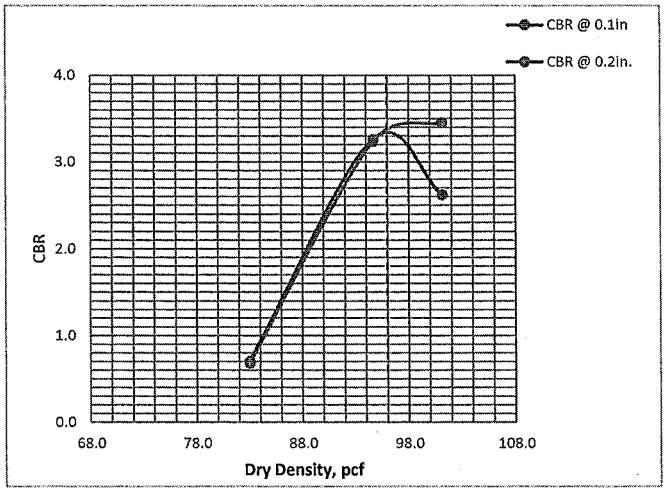
APPENDIX C

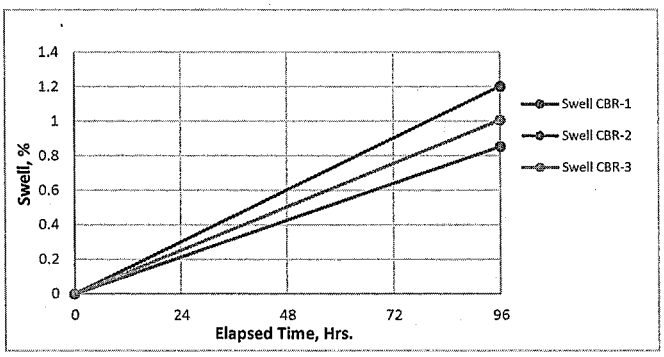
Laboratory Test Results

CALIFORNIA BEARING RATIO TEST REPORT
ASTM D 1883-07

% CBR Value @ 95% Compaction = 3.3 @ 0.1 in. penetration
% CBR Value @ 95% Compaction = 3.4 @ 0.2 in. penetration







	Molded			CBR%		Moisture of Top 1" Layer, %	Surcharge lbs	Max Swell, %
Specimen ID	Density, pcf	Percent of Max. Density	Moisture	0.1 in.	0.2 in			
CBR-1	83.0	82.0	21.3	0.7	0.7	33.6	10	1.2
CBR-2	94.7	93.6	22.3	3.3	3.2	25.5	10	0.9
CBR-3	101.2	100.0	21.4	2.6	3.5	23.1	10	1.0

Material Description	USCS	MAX DENSITY, pcf	OPTIMUM MOISTURE, %	LL	PI
Brown Lean clay	CL	101.2	21.2	36	16

Remarks:

Compaction Method: ASTM D698

TSI geotechnical, inc.
8248 NW 101st
Terrace #5
Kansas City,
Missouri 64153
p| 816.599.7965
f| 816.599.7967

Project: Blue River Biosolids Facility
Location: Kansas City, MO
Client: Carollo Engineers, Inc.
Sample No.: A
Boring: Bulk | **Project No.: 20182055**
Depth: 1 to 2.0 ft. | **Date: 1/9**

TSI geotechnical, inc.

PROCTOR TEST

PROJECT NAME:	**Blue River Biosolids**
PROJECT No.:	20182055
SAMPLE NUMBER:	**A**
SAMPLE LOCATION:	**Bulk**
DEPTH:	**0-2 ft**
VISUAL CLASS. (USCS):	**Brown Lean clay**

TYPE OF COMPACTION	**Std.**	**D698**		
SIEVE ANALYSIS RESULTS	0.75	0.375	No. 4	PROCEDURE
% Retained(cummulative)				**A**

SOIL WEIGHT DATA					
Determination Number	1	2	3	4	5
Weight- Soil + Mold (wet),g	3845.1	3806.7	3827.6	3750.1	
Weight of Mold,g	1986.5	1986.5	1986.5	1986.5	
Weight Wet Soil,g	**1858.6**	**1820.2**	**1841.1**	**1763.6**	
Volume of Mold (ft^3)	**0.0333**	**0.0333**	**0.0333**	**0.0333**	
MOISTURE DATA					
Weight- Soil + Tare (wet),g	291.5	298.7	190.6	249.8	
Weight- Soil + Tare (dry),g	238.9	241.1	159.2	212.0	
Weight- Tare,g	6.9	7.3	7.0	7.0	
COMPUTED DATA					
Wet unit weight (pcf)	**123.0**	**120.5**	**121.9**	**116.8**	
Moisture content (%)	**22.7**	**24.6**	**20.6**	**18.5**	
Dry unit weight (pcf)	**100.3**	**96.7**	**101.1**	**98.6**	

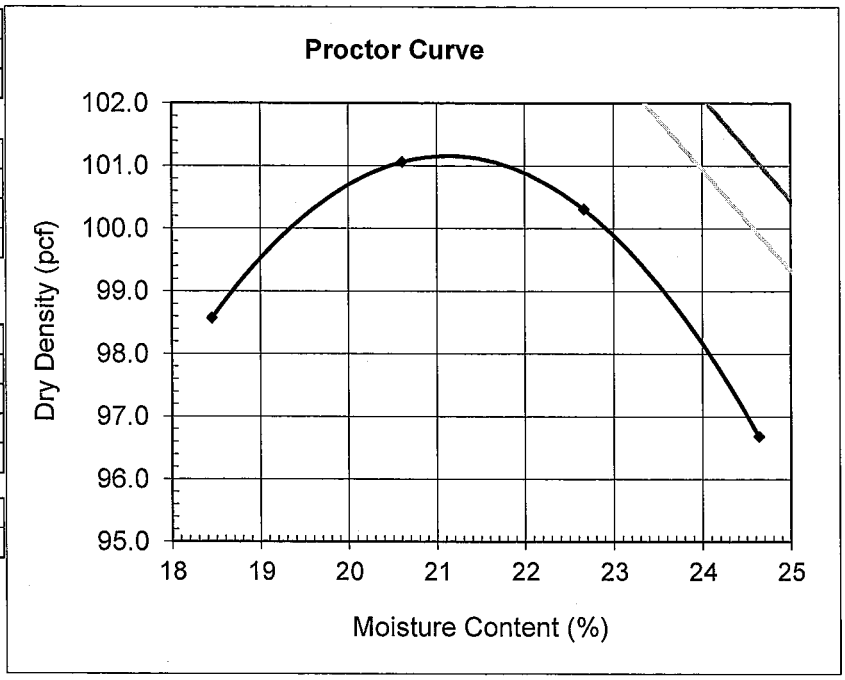
Maximum Dry Density (pcf)	**101.2**
Optimum Moisture Content (%)	**21.2**
Natural Moisture Content (%)*	**22.7**

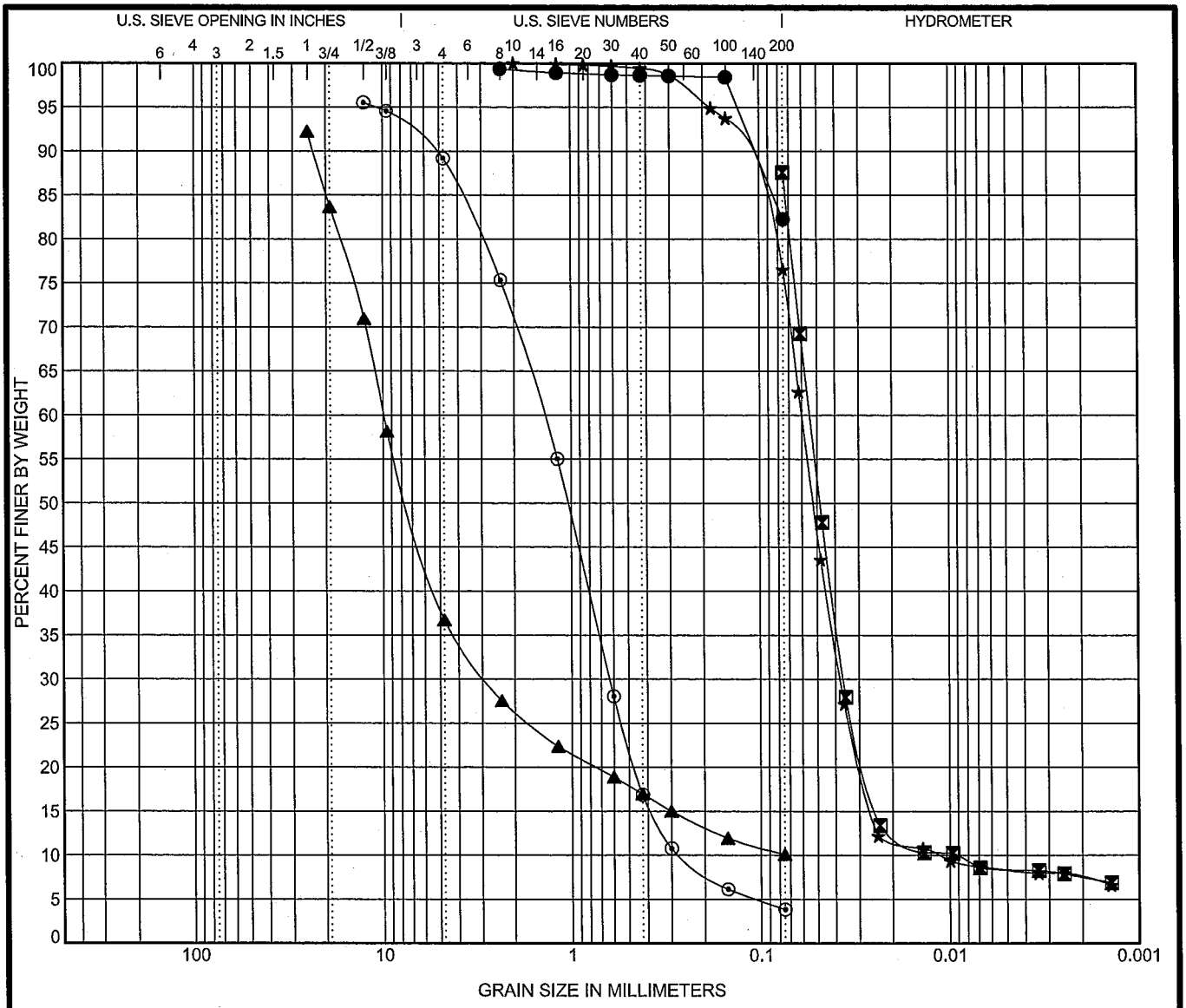
Liquid Limit	**36**
Plastic Limit	**20**
Plasticity Index	**16**
CLASSIFICATION. (USCS)*	**CL**

* with additive

	Date
Tested by: MN	1/2/2019
Calculated by: MN	1/3/2019
Checked by: MN	1/3/2019
Entered Into Excel by: MN	1/3/2019

NOTE:





COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	B-01	13.0						
⊠	B-01	18.5					2.66	5.94
▲	B-01	68.5					11.31	136.64
★	B-02	23.0					2.06	5.20
⊙	B-02	58.5	POORLY GRADED SAND(SP)				1.07	5.24

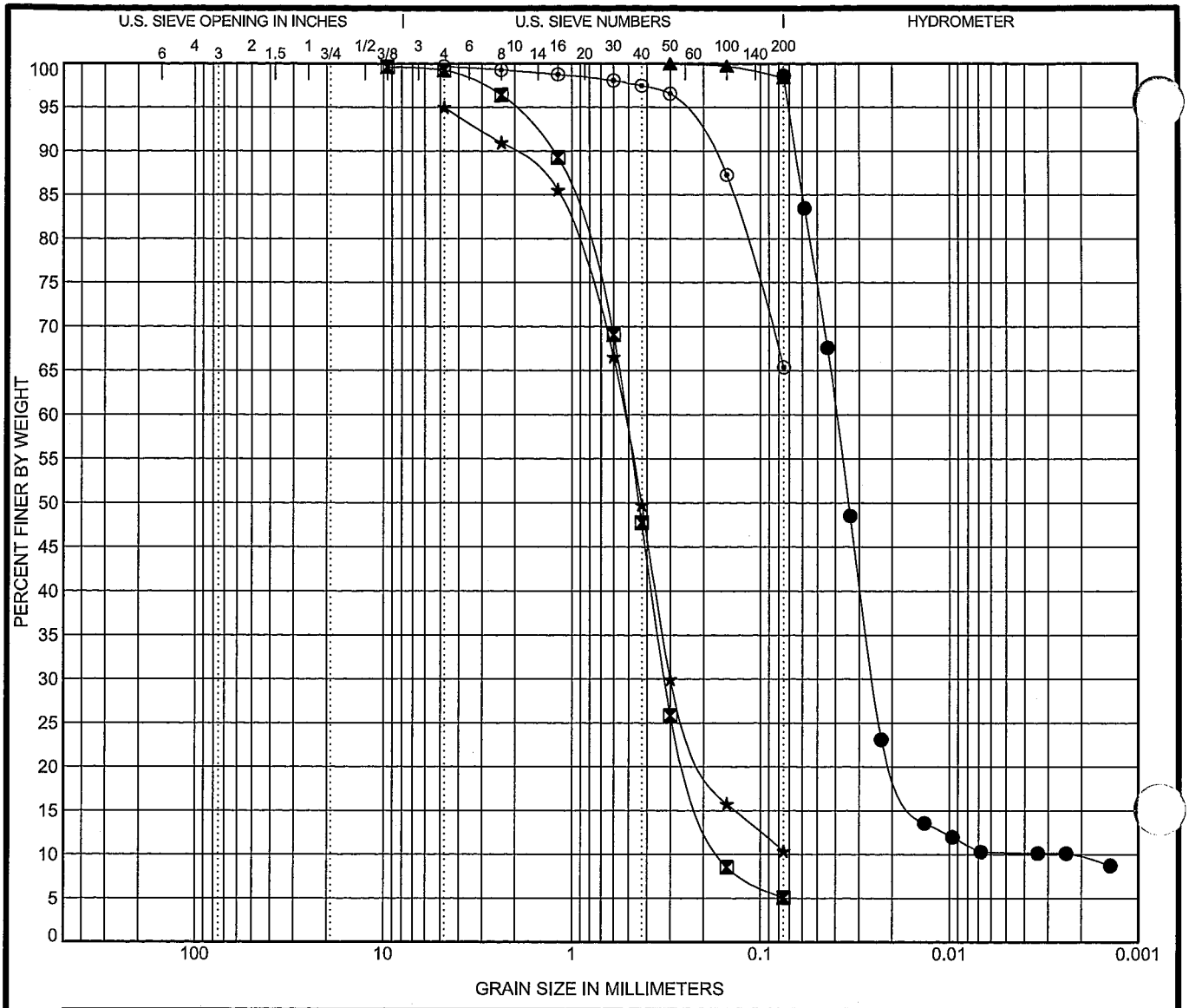
	Specimen Identification		D100	D85	D50	D15	%Gravel	%Sand	%Silt	%Clay
●	B-01	13.0	2.36	0.084			0.0	17.1	82.3	
⊠	B-01	18.5	0.075	0.073	0.048	0.024	0.0	0.0	79.2	8.4
▲	B-01	68.5	25	19.829	7.296	0.299	55.5	26.6	10.1	
★	B-02	23.0	2	0.105	0.052	0.026	0.0	23.4	68.2	8.4
⊙	B-02	58.5	12.5	3.841	1.04	0.382	6.3	85.3	3.9	

TSI engineering, inc.
59TH AND ARSENAL, BUILDING C
2 CAMPBELL PLAZA
ST. LOUIS, MISSOURI 63139

GRAIN SIZE DISTRIBUTION

PROJECT NAME: Blue River Biosolids Facility	Tested By:
PROJECT LOCATION: Kansas City, MO	Calculated By:
PROJECT NUMBER: 20182055	Checked By:

TSI GRAIN SIZE BLUE RIVER LOGS.GPJ US LAB.GDT 2/22/19



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	B-03	18.5					7.16	17.41
⊠	B-03	38.5					1.25	3.26
▲	B-04	13.5						
★	B-04	43.5					2.41	7.34
⊙	B-05	28.0						

	Specimen Identification		D100	D85	D50	D15	%Gravel	%Sand	%Silt	%Clay
●	B-03	18.5	0.075	0.06	0.034	0.015	0.0	0.0	88.4	10.3
⊠	B-03	38.5	9.5	1.022	0.441	0.194	0.3	94.2	5.1	
▲	B-04	13.5	0.3				0.0	1.6	98.4	
★	B-04	43.5	4.75	1.156	0.427	0.136	0.0	84.6	10.4	
⊙	B-05	28.0	4.75	0.14			0.0	34.3	65.4	

TSI engineering, inc.
69TH AND ARSENAL, BUILDING C
2 CAMPBELL PLAZA
ST. LOUIS, MISSOURI 63139

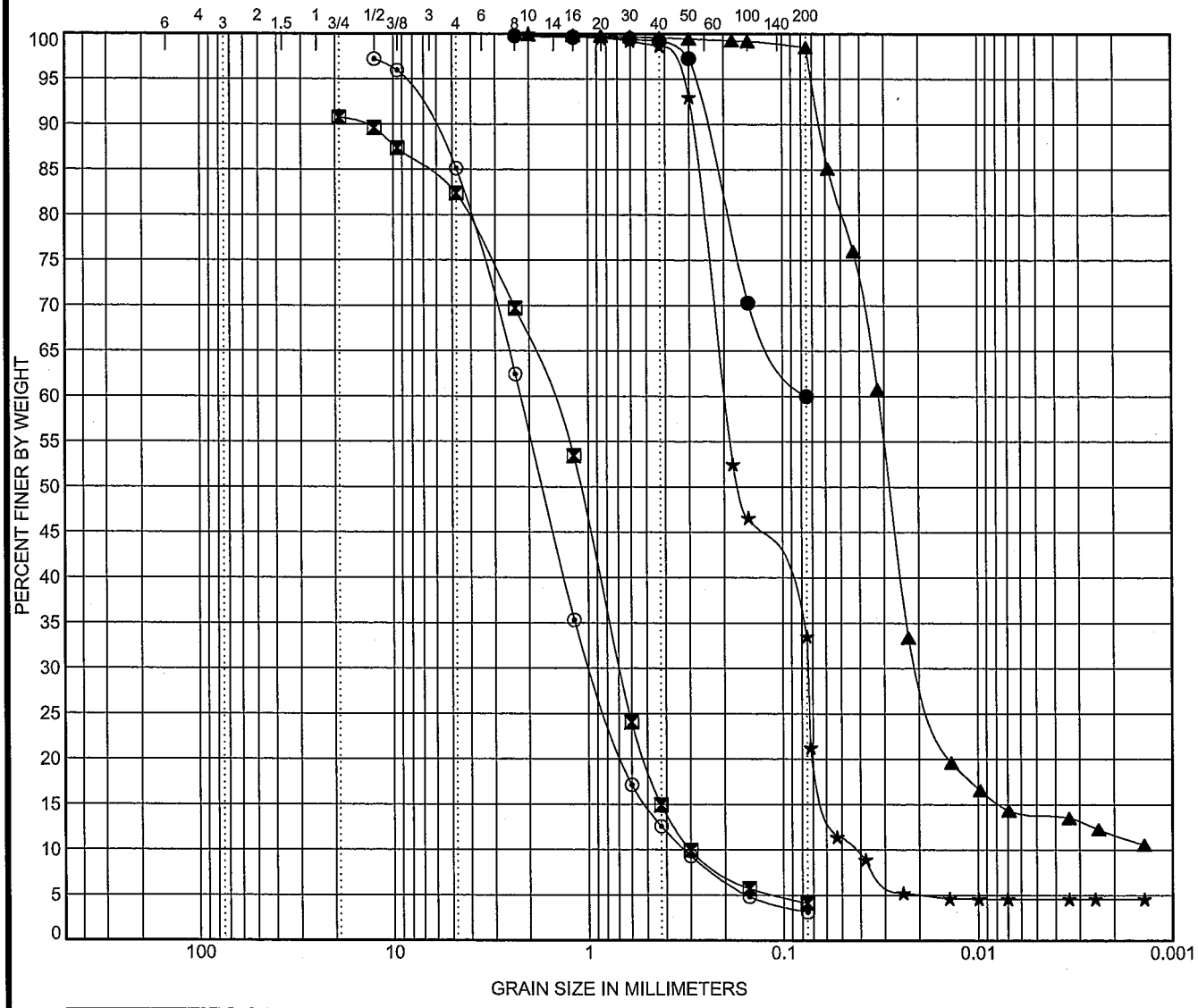
GRAIN SIZE DISTRIBUTION

PROJECT NAME: Blue River Biosolids Facility — Tested By:

PROJECT LOCATION: Kansas City, MO — Calculated By:

PROJECT NUMBER: 20182055 — Checked By:

TSI GRAIN SIZE BLUE RIVER LOGS.GPJ US LAB.GDT 2/22/19



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	B-06	13.0						
⊠	B-06	58.5	POORLY GRADED SAND with GRAVEL(SP)				1.01	5.18
▲	B-07	13.5						
★	B-07	28.5					0.64	4.54
⊙	B-07	48.5	WELL-GRADED SAND(SW)				1.31	6.88

	Specimen Identification		D100	D85	D50	D15	%Gravel	%Sand	%Silt	%Clay
●	B-06	13.0	2.36	0.219			0.0	39.8	60.0	
⊠	B-06	58.5	19	6.831	1.09	0.426	8.4	78.3	4.1	
▲	B-07	13.5	2	0.058	0.028	0.008	0.0	1.4	84.5	14.0
★	B-07	28.5	2	0.271	0.167	0.059	0.0	66.5	28.9	4.6
⊙	B-07	48.5	12.5	4.729	1.717	0.51	12.1	82.0	3.1	

TSI engineering, inc.
59TH AND ARSENAL, BUILDING C
2 CAMPBELL PLAZA
ST. LOUIS, MISSOURI 63139

GRAIN SIZE DISTRIBUTION

PROJECT NAME: Blue River Biosolids Facility	Tested By:
PROJECT LOCATION: Kansas City, MO	Calculated By:
PROJECT NUMBER: 20182055	Checked By:

TSI GRAIN SIZE_BLUE RIVER LOGS.GPJ_US_LAB.GDT 2/22/19

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

December 04, 2018

Benjamin Wilmes
TSi Geotechnical, Inc.
8248 NW 101st Terr.
#5
Kansas City, MO 64153

RE: Project: BLUE RIVER BIOSOLIDS
Pace Project No.: 60287165

Dear Benjamin Wilmes:
Enclosed are the analytical results for sample(s) received by the laboratory on November 16, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jeffrey Shopper
jeff.shopper@pacelabs.com
1(913)563-1408
Project Manager

Enclosures

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: BLUE RIVER BIOSOLIDS
Pace Project No.: 60287165

New Orleans Certification IDs

California Env. Lab Accreditation Program Branch: 11277CA
Florida Department of Health (NELAC): E87595
Illinois Environmental Protection Agency: 0025721
Kansas Department of Health and Environment (NELAC): E-10266
Louisiana Dept. of Environmental Quality (NELAC/LELAP): 02006
Pennsylvania Dept. of Env Protection (NELAC): 68-04202
Texas Commission on Env. Quality (NELAC): T104704405-09-TX
U.S. Dept. of Agriculture Foreign Soil Import: P330-10-00119
Commonwealth of Virginia (TNI): 480246

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Certification Number: 10090
Arkansas Drinking Water
WY STR Certification #: 2456.01
Arkansas Certification #: 18-016-0
Arkansas Drinking Water
Illinois Certification #: 004455
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212018-1
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407-18-11
Utah Certification #: KS000212018-8
Kansas Field Laboratory Accreditation: # E-92587
Missouri Certification: 10070
Missouri Certification Number: 10090

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE SUMMARY

Project: BLUE RIVER BIOSOLIDS
Pace Project No.: 60287165

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60287165001	**B-2, 23.5**	Solid	11/12/18 09:45	11/16/18 15:20
60287165002	**B-3, 13.5**	Solid	11/07/18 08:45	11/16/18 15:20
60287165003	**B-4, 33.5**	Solid	11/07/18 10:30	11/16/18 15:20

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE ANALYTE COUNT

Project: BLUE RIVER BIOSOLIDS
Pace Project No.: 60287165

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60287165001	**B-2, 23.5**	ASTM D2974	DWC	1	PASI-K
		EPA 9034	LJL	1	PASI-N
		EPA 9045	ZMH	1	PASI-K
		SM 2580B	ZMH	1	PASI-K
		EPA 120.1 Resistivity	ZMH	1	PASI-K
		EPA 9056	WNM	2	PASI-K
60287165002	**B-3, 13.5**	ASTM D2974	DWC	1	PASI-K
		EPA 9034	LJL	1	PASI-N
		EPA 9045	ZMH	1	PASI-K
		SM 2580B	ZMH	1	PASI-K
		EPA 120.1 Resistivity	ZMH	1	PASI-K
		EPA 9056	WNM	2	PASI-K
60287165003	**B-4, 33.5**	ASTM D2974	DWC	1	PASI-K
		EPA 9034	LJL	1	PASI-N
		EPA 9045	ZMH	1	PASI-K
		SM 2580B	ZMH	1	PASI-K
		EPA 120.1 Resistivity	ZMH	1	PASI-K
		EPA 9056	WNM	2	PASI-K

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: BLUE RIVER BIOSOLIDS
Pace Project No.: 60287165

Sample: B-2, 23.5 **Lab ID: 60287165001** Collected: 11/12/18 09:45 Received: 11/16/18 15:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Percent Moisture	Analytical Method: ASTM D2974							
Percent Moisture	**14.8**	%	0.50	1		11/26/18 16:11		
9034 Sulfide, Titration	Analytical Method: EPA 9034 Preparation Method: EPA 9030B							
Sulfide	ND	mg/kg	58.7	1	11/26/18 12:00	11/26/18 16:02		H3
9045 pH Soil	Analytical Method: EPA 9045							
pH at 25 Degrees C	**8.3**	Std. Units	0.10	1		11/20/18 15:51		
Oxidation/Reduction Potential	Analytical Method: SM 2580B							
Oxidation/Reduction Potential	**-104.5**	mV	1.0	1		11/20/18 15:17		
Resistivity	Analytical Method: EPA 120.1 Resistivity							
Resistivity	**5380**	ohms-cm	100	1		11/20/18 13:28		
9056 IC Anions	Analytical Method: EPA 9056 Preparation Method: EPA 9056							
Chloride	ND	mg/kg	1170	10	12/01/18 14:25	12/01/18 14:25	16887-00-6	
ulfate	ND	mg/kg	1170	10	12/01/18 14:25	12/01/18 14:25	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: BLUE RIVER BIOSOLIDS
Pace Project No.: 60287165

Sample: B-3, 13.5 **Lab ID: 60287165002** Collected: 11/07/18 08:45 Received: 11/16/18 15:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Percent Moisture	Analytical Method: ASTM D2974							
Percent Moisture	**14.5**	%	0.50	1		11/26/18 16:11		
9034 Sulfide, Titration	Analytical Method: EPA 9034 Preparation Method: EPA 9030B							
Sulfide	ND	mg/kg	58.5	1	11/26/18 12:00	11/26/18 16:02		H3
9045 pH Soil	Analytical Method: EPA 9045							
pH at 25 Degrees C	**7.7**	Std. Units	0.10	1		11/20/18 15:41		
Oxidation/Reduction Potential	Analytical Method: SM 2580B							
Oxidation/Reduction Potential	**-116.4**	mV	1.0	1		11/20/18 14:17		
Resistivity	Analytical Method: EPA 120.1 Resistivity							
Resistivity	**2660**	ohms-cm	100	1		11/20/18 13:29		
9056 IC Anions	Analytical Method: EPA 9056 Preparation Method: EPA 9056							
Chloride	ND	mg/kg	1180	10	12/01/18 14:43	12/01/18 14:43	16887-00-6	
Sulfate	ND	mg/kg	1180	10	12/01/18 14:43	12/01/18 14:43	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: BLUE RIVER BIOSOLIDS
Pace Project No.: 60287165

Sample: B-4, 33.5 **Lab ID: 60287165003** Collected: 11/07/18 10:30 Received: 11/16/18 15:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Percent Moisture	Analytical Method: ASTM D2974							
Percent Moisture	**16.5**	%	0.50	1		11/26/18 16:11		
9034 Sulfide, Titration	Analytical Method: EPA 9034 Preparation Method: EPA 9030B							
Sulfide	ND	mg/kg	59.9	1	11/26/18 12:00	11/26/18 16:02		H3
9045 pH Soil	Analytical Method: EPA 9045							
pH at 25 Degrees C	**7.8**	Std. Units	0.10	1		11/20/18 15:43		
Oxidation/Reduction Potential	Analytical Method: SM 2580B							
Oxidation/Reduction Potential	**-107.9**	mV	1.0	1		11/20/18 14:30		
Resistivity	Analytical Method: EPA 120.1 Resistivity							
Resistivity	**4160**	ohms-cm	100	1		11/20/18 13:30		
9056 IC Anions	Analytical Method: EPA 9056 Preparation Method: EPA 9056							
Chloride	ND	mg/kg	1190	10	12/01/18 15:01	12/01/18 15:01	16887-00-6	
ulfate	ND	mg/kg	1190	10	12/01/18 15:01	12/01/18 15:01	14808-79-8	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: BLUE RIVER BIOSOLIDS
Pace Project No.: 60287165

QC Batch: 556836 Analysis Method: ASTM D2974
QC Batch Method: ASTM D2974 Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 60287165001, 60287165002, 60287165003

METHOD BLANK: 2284878 Matrix: Solid
Associated Lab Samples: 60287165001, 60287165002, 60287165003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Percent Moisture	%	ND	0.50	11/26/18 16:11	

SAMPLE DUPLICATE: 2284879

Parameter	Units	60287165001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	14.8	14.6	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: BLUE RIVER BIOSOLIDS
Pace Project No.: 60287165

QC Batch: 126794 Analysis Method: EPA 9034
QC Batch Method: EPA 9030B Analysis Description: 9034 Sulfide Solid
Associated Lab Samples: 60287165001, 60287165002, 60287165003

METHOD BLANK: 549178 Matrix: Solid
Associated Lab Samples: 60287165001, 60287165002, 60287165003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfide	mg/kg	ND	50.0	11/26/18 16:02	

LABORATORY CONTROL SAMPLE: 549179

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide	mg/kg	1000	882	88	80-120	

MATRIX SPIKE SAMPLE: 549181

Parameter	Units	60287165002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide	mg/kg	ND	1170	1030	84	75-125	H3

SAMPLE DUPLICATE: 549180

Parameter	Units	60287165002 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide	mg/kg	ND	ND		20	H3

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: BLUE RIVER BIOSOLIDS
Pace Project No.: 60287165

QC Batch: 556189 Analysis Method: EPA 9045
QC Batch Method: EPA 9045 Analysis Description: 9045 pH
Associated Lab Samples: 60287165001, 60287165002, 60287165003

SAMPLE DUPLICATE: 2282058

Parameter	Units	60287159001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.2	7.3	1	3	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: BLUE RIVER BIOSOLIDS
Pace Project No.: 60287165

QC Batch: 555885 Analysis Method: SM 2580B
QC Batch Method: SM 2580B Analysis Description: Oxidation/Reduction Potential
Associated Lab Samples: 60287165001, 60287165002, 60287165003

SAMPLE DUPLICATE: 2281166

Parameter	Units	60287165002 Result	Dup Result	RPD	Max RPD	Qualifiers
Oxidation/Reduction Potential	mV	-116.4	-114.1			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: BLUE RIVER BIOSOLIDS
Pace Project No.: 60287165

QC Batch: 557804 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
Associated Lab Samples: 60287165001, 60287165002, 60287165003

METHOD BLANK: 2288445 Matrix: Solid
Associated Lab Samples: 60287165001, 60287165002, 60287165003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/kg	ND	100	12/01/18 10:34	
Sulfate	mg/kg	ND	100	12/01/18 10:34	

LABORATORY CONTROL SAMPLE: 2288446

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/kg	500	475	95	80-120	
Sulfate	mg/kg	500	486	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2288447 2288448

Parameter	Units	60288004002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/kg	2960	6280	6210	8140	7700	82	76	80-120	5	15	H3,M1
Sulfate	mg/kg	ND	6280	6210	5230	6450	64	84	80-120	21	15	H3,M1, R1

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALIFIERS

Project: BLUE RIVER BIOSOLIDS
Pace Project No.: 60287165

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-K	Pace Analytical Services - Kansas City
PASI-N	Pace Analytical Services - New Orleans

ANALYTE QUALIFIERS

H3	Sample was received or analysis requested beyond the recognized method holding time.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
R1	RPD value was outside control limits.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BLUE RIVER BIOSOLIDS
Pace Project No.: 60287165

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60287165001	B-2, 23.5	ASTM D2974	556836		
60287165002	B-3, 13.5	ASTM D2974	556836		
60287165003	B-4, 33.5	ASTM D2974	556836		
60287165001	B-2, 23.5	EPA 9030B	126794	EPA 9034	126823
60287165002	B-3, 13.5	EPA 9030B	126794	EPA 9034	126823
60287165003	B-4, 33.5	EPA 9030B	126794	EPA 9034	126823
60287165001	B-2, 23.5	EPA 9045	556189		
60287165002	B-3, 13.5	EPA 9045	556189		
60287165003	B-4, 33.5	EPA 9045	556189		
60287165001	B-2, 23.5	SM 2580B	555885		
60287165002	B-3, 13.5	SM 2580B	555885		
60287165003	B-4, 33.5	SM 2580B	555885		
60287165001	B-2, 23.5	EPA 120.1 Resistivity	556188		
60287165002	B-3, 13.5	EPA 120.1 Resistivity	556188		
60287165003	B-4, 33.5	EPA 120.1 Resistivity	556188		
60287165001	B-2, 23.5	EPA 9056	557804	EPA 9056	557944
60287165002	B-3, 13.5	EPA 9056	557804	EPA 9056	557944
60287165003	B-4, 33.5	EPA 9056	557804	EPA 9056	557944

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical
www.pacelabs.com

Sample Condition Upon Receipt

WO#: 60287165

60287165

Client Name: Tsi Geotechnical

Courier: FedEx ☐ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☒ Other ☐

Tracking #: _____ Pace Shipping Label Used? Yes ☐ No ☒

Custody Seal on Cooler/Box Present: Yes ☐ No ☒ Seals intact: Yes ☐ No ☒

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☒ Other ☐

Thermometer Used: T-301 Type of Ice: (Wet) Blue None

Cooler Temperature (°C): As-read 2.6 Corr. Factor +0.0 Corrected 2.6

Date and initials of person examining contents: AC 11/16

Temperature should be above freezing to 6°C

Chain of Custody present:	☒Yes ☐No ☐N/A	
Chain of Custody relinquished:	☒Yes ☐No ☐N/A	
Samples arrived within holding time:	☒Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☒No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☒No ☐N/A	
Sufficient volume:	☒Yes ☐No ☐N/A	
Correct containers used:	☒Yes ☐No ☐N/A	
Pace containers used:	☒Yes ☐No ☐N/A	
Containers intact:	☒Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☒N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☒N/A	
Sample labels match COC: Date / time / ID / analyses	☒Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: SL	☐Yes ☒No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☐Yes ☐No ☒N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☒No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☒No	
Trip Blank present:	☐Yes ☐No ☒N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☒N/A	
Samples from USDA Regulated Area: State: MO	☐Yes ☒No ☐N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☒N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: JM Date: 11/18/16

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of 2214928

Section A Required Client Information:

Company: TSi Geotechnical, Inc.
Address: 8248 NW 101st Terrace
Email To: bwilmes@tsigeotech.com
Phone: 913-231-5676 Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To:
Copy To:
Purchase Order No.:
Project Name: Blue River Biosolids
Project Number: 20082055

Section C Invoice Information:

Attention:
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager: Jeffery Shopper
Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE:

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test ↓ Y/N	Conductivity (µH)	Resistivity	pH	Sulfate	Chloride	redox	sulfate			Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	B-2, 23.5			11/12	9:45														X	X	X	X	X	X	X			08287165 01
2	B-3, 18.5			11/7	8:45														X	X	X	X	X	X	X			02
3	B-4, 33.5			11/7	10:30														X	X	X	X	X	X	X			03
4																												
5																												
6																												
7																												
8																												
9																												
10																												
11																												
12																												

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Ben Wilmes	11/16	15:20	[signature] pasl	11.16.18	15:20	2.6	4	N	4

ORIGINAL

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER:
SIGNATURE of SAMPLER:
DATE Signed (MM/DD/YY):

Temp In °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

APPENDIX G – AUTHORIZATION LETTER

DocuSign Envelope ID: 3E0EA876-E562-400B-8320-6E28AE5256D7

KC WATER
ENGINEERING

4800 E. 63rd Street
Kansas City, Missouri 64130
www.kcwater.us

816-513-0387
Fax: 816-513-0185

Date: February 22, 2024

To: Ms. Charlene Fitch, P.E., Chief, Engineering Section, MDNR Solid Waste Management Program

From: Mr. Brent Herring, Deputy Director, KC Water

Subject: Beneficial Use at Blue River Wastewater Treatment Plant

Dear Ms. Fitch:

Burns & McDonnell Engineering Company, Inc. has prepared the enclosed Biosolids Ash Pond Closure Plan (Plan) on behalf of KC Water. The Plan details the closure of two Biosolids Ash Ponds at the Blue River Wastewater Treatment Plant site. The Plan includes a proposal that the North Ash Pond material be approved for beneficial use / site reclamation in accordance with 10 CSR 80-2.020 (9) B. In accordance with this regulation, this letter is to affirm that KC Water, the Owner of the Blue River Wastewater Treatment Plant property on which the beneficial use is requested, is aware of the biosolid ash beneficial use proposal and approves of the operation and details of the proposed beneficial use. Please contact me if you have any questions or require additional information at (816) 513-7241.

Sincerely,

DocuSigned by:
7E459550546B4BF...
Brent Herring

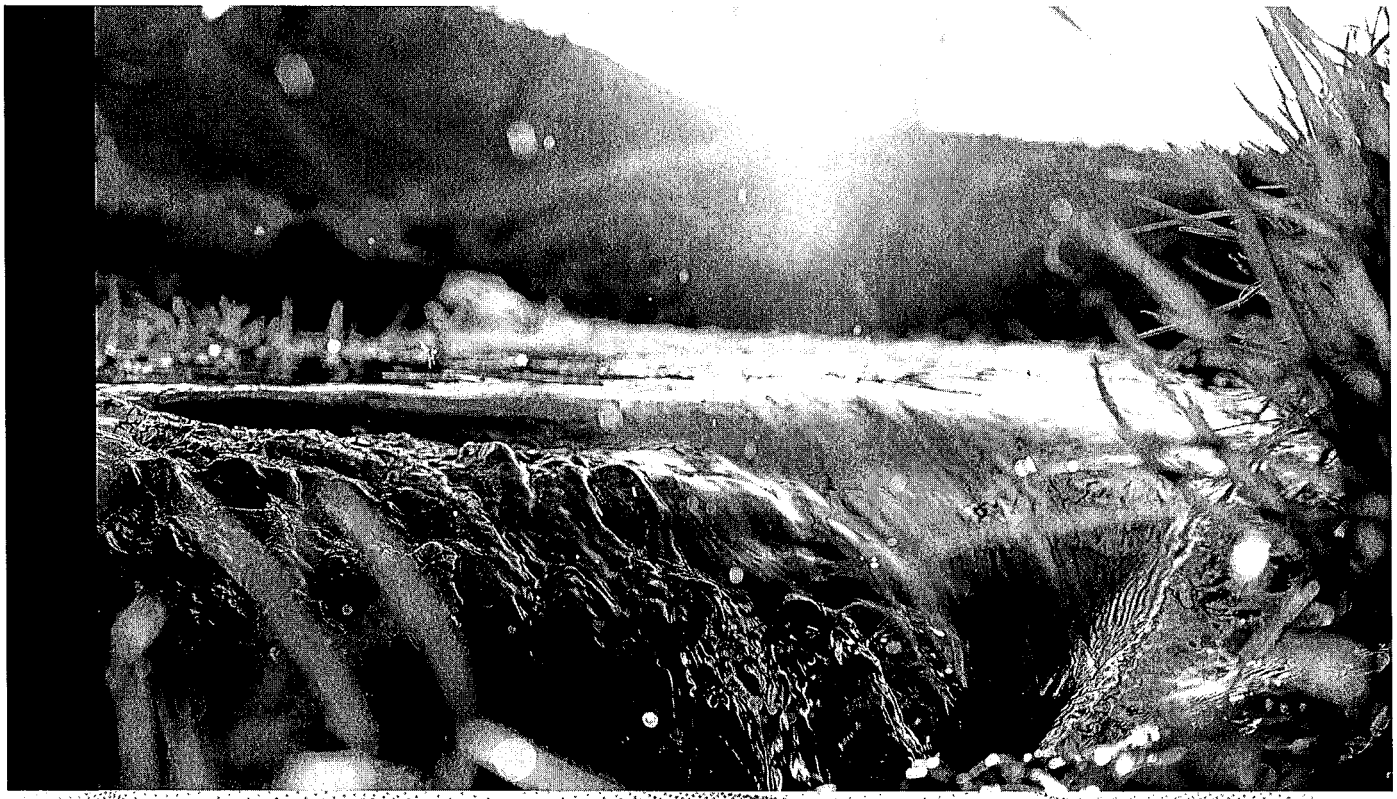
Deputy Director, KC Water

cc: Kevin White, KC Water
Blake Anderson, KC Water
Brian Weis, Burns & McDonnell

BURNS McDONNELL

KC WATER
SERVICES

Blue River Wastewater Treatment Plant Facility Plan and Improvements Design FY 2024



TECHNICAL MEMORANDUM 2

Grit System Improvements

FINAL / February 2024

carollo

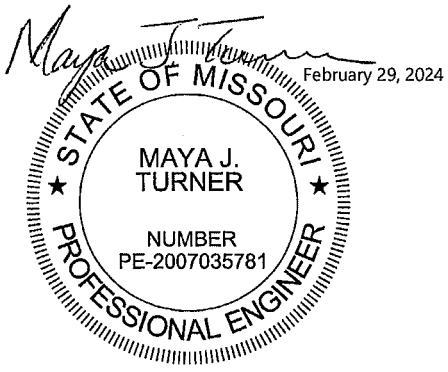
KC WATER
SERVICES

Blue River Wastewater Treatment Plant Facility Plan and Improvements Design FY 2024

TECHNICAL MEMORANDUM 2

Grit System Improvements

FINAL / February 2024



903 EAST 104TH STREET, SUITE 230 ▪ KANSAS CITY, MISSOURI 64131 ▪ P 816-942-5027

Contents

TM 2 GRIT SYSTEM IMPROVEMENTS

2.1 Purpose and Background 2-1
2.1.1 Flow Projections 2-1
2.1.2 Design Requirements 2-1
2.2 Existing Grit Facilities 2-2
2.2.1 Grit Removal Capacity 2-2
2.2.2 Existing System Deficiencies 2-2
2.3 Evaluation of Grit Removal and Handling Alternatives 2-4
2.3.1 Grit Removal Process Design Alternatives 2-4
2.3.2 Grit Handling Design Alternatives 2-7
2.3.3 Siting Alternatives 2-10
2.3.4 Conceptual Design Criteria 2-12
2.4 Quadruple Bottom Line Analysis 2-13
2.5 Future Design Considerations 2-14
2.6 Environmental Review 2-14

Appendices

APPENDIX A GRIT ALTERNATIVE NO. 1
APPENDIX B GRIT ALTERNATIVE NO. 2

Tables

Table 2.1 Basis of Design Flows 2-1
Table 2.2 Grit Removal Facility Design Guidelines 2-2
Table 2.3 Existing Grit Removal Design Criteria 2-2
Table 2.4 Grit Removal Alternative Analysis 2-7
Table 2.5 Grit Handling Alternative Analysis 2-10
Table 2.6 Grit Alternative No. 1 Conceptual Design Criteria 2-13
Table 2.7 Grit Alternative No. 2 Conceptual Design Criteria 2-13
Table 2.8 Grit Improvements Cost Summary 2-14

Figures

Figure 2.1 BRWWTP Aerated Grit Basin 2-5
Figure 2.2 Mechanically Induced Vortex Grit Basins 2-6
Figure 2.3 Headcell® Multi-tray Vortex System 2-6
Figure 2.4 Cyclone and Grit Classifier 2-8
Figure 2.5 COANDA® Grit Washer 2-9
Figure 2.6 Grit Alternative No. 1 – Existing Facility Modifications 2-11
Figure 2.7 Grit Alternative No. 2 – New Facility 2-12

TM 2 GRIT SYSTEM IMPROVEMENTS

2.1 Purpose and Background

The existing Blue River Wastewater Treatment Plant (BRWWTP) is a 105 million gallons per day (mgd) municipal wastewater treatment facility consisting of a primary and secondary treatment facility located on separate properties. The primary treatment facility includes preliminary and primary liquid treatment operations and solids processing facilities. The secondary plant provides secondary treatment before ultimately discharging treated effluent to the Missouri River.

The Kansas City Water (KC Water) seeks to improve and expand the existing grit removal and handling systems at the primary plant. The existing facilities consist of aerated and vortex-style grit removal basins, grit pump stations, grit classifiers, and grit loadout facilities. The Grit System Improvements Project (Project) is necessary to address aging infrastructure and capacity needs, meet current regulatory requirements, and to improve safety, performance, reliability, and hydraulic conditions through the facility.

The primary focus of this Technical Memorandum (TM) 2 is to summarize existing grit facilities and future needs, present design criteria, and summarize results of the grit removal and handling system alternatives analysis.

2.1.1 Flow Projections

The following is a summary of the projected influent flow criteria used as a basis for the grit improvements design. Flow projections are based on initial planning values and may increase based on final flow and loading analyses conducted as part of the BRWWTP Facility Plan and Improvements project (currently in progress).

Table 2.1 Basis of Design Flows

Flow Condition(1)	BRWWTP		
	Grit Facilities	Wet Weather (CSO) Treatment	Primary Treatment
AADF, mgd	91	0	91
PHF, mgd	210	70	140

Notes:
Abbreviations: AADF - average annual daily flow; CSO - combined sewer overflow; PHF - peak hour flow.
(1) Basis of flows for initial planning in Year 1.

2.1.2 Design Requirements

The Missouri Natural Resources Wastewater Guidelines and Standards Document, February 2019, (MDNR Guidelines) was used as a guideline in development of the proposed design criteria. In the event where technologies were not addressed in the MDNR Guidelines, the Water Environment Federations' Design of Municipal Wastewater Treatment Plants Manual of Practice 8 (MOP 8), Sixth Edition were used as guidelines.

Table 2.2 Grit Removal Facility Design Guidelines

Criteria	Guideline[1]
Basis of Design Flow	Fixed capacity to treat PHF
Number of Units	Minimum of two units with provisions for isolation
Detention	Based on the detention required for size of particle to be removed

Notes:
(1) From Missouri Natural Resources Wastewater Guidelines and Standards Document, February 2019.

2.2 Existing Grit Facilities

The BRWWTP grit facilities treat combined screened wastewater from the BRWWTP and the Northeast Industrial District (NEID) interceptor lines. Existing grit removal is accomplished with a combination of aerated and vortex grit basins. The facility was originally constructed in the 1960's with aerated grit removal basins equipped with screw conveyors and various means of grit removal. Ultimately the facility required manual removal of grit using vacuum trucks. In 2005, two of the existing aerated grit basins were repurposed with four vortex basins each equipped with a single grit pump for removal of settled grit. This project also replaced existing aeration piping and diffusers in two of the aerated grit basins. The Grit Dewatering Building includes two classifiers each equipped with two grit concentrators, and a grit conveyor system consisting of a conveyor belt and shafted screw conveyor above the dual grit bins.

2.2.1 Grit Removal Capacity

Following the 2005 grit improvement project, the intent was to solely use the vortex basins for grit removal. The two aerated grit basins with new aeration piping and diffusers were planned as redundant, standby units for the vortex basins. Currently the BRWWTP operates the grit removal facility with all basins in service and continues to struggle with adequate grit removal and grit handling operations.

Reported capacities of the existing grit removal facilities following the 2005 improvements documented in the Grit Removal Operation and Maintenance (O&M) manual are summarized below.

Table 2.3 Existing Grit Removal Design Criteria

Condition	Flow[1]
Minimum Flow, mgd	7.2
Average Flow, mgd	76.8
Maximum Flow, mgd	120

Notes:
(1) Grit Removal Operation and Maintenance Manual, BRWWTP, June 2005.

2.2.2 Existing System Deficiencies

This section summarizes the existing grit removal and handling system deficiencies at the BRWWTP. A condition assessment of the existing facilities by a multi-discipline team was conducted on November 8, 2023. The condition assessment utilized three methods to determine the current condition of the facilities: 1) anecdotal information from KC Water staff, 2) a review of record drawings and reports, and 3) field investigations by Carollo Engineers, Inc. (Carollo) and subconsultant team members. The final report

summarizing the findings of the condition assessment is in progress; however, this section summarizes the major findings of the assessment.

2.2.2.1 Process and Mechanical Operations

The following summarizes the process and mechanical challenges with the existing grit facilities.

- Basins are undersized for existing flows requiring the use of both aerated and vortex basins.
- Influent and effluent boxes and channels are undersized creating submerged conditions and inadequate freeboard.
- Basins do not adequately remove the volume of grit necessary to protect downstream equipment and facilities. Inadequate grit removal can seriously impact the facility's downstream equipment and operations, specifically the new Thermal Hydrolysis Process.
- Aerated grit basins require vacuum trucks to manually remove grit which is labor intensive and resulting in grit carry over.
- Grit concentrators and classifiers are overloaded and produce wet, odorous grit.
- Grit is poorly transferred on the undersized, inadequate conveyor belt and screw conveyor system. The regular, unsafe presence of wet grit on the process area floor requires constant O&M attention.
- Heating, ventilation, and air-conditioning (HVAC) and building drainage are inadequate for the Grit Handling Building process area, electrical room, tunnels, and the grit pump station.

2.2.2.2 Architectural and Structural

The following summarizes the architectural and structural condition of the exiting grit facilities:

- Building superstructure is an average condition considering the age of the facility, with areas ranging in critical to moderate condition.
- Existing concrete is in average condition with areas requiring repair and possible removal and replacement.
- Existing building and structures require significant improvements to meet current building and energy codes.

2.2.2.3 Electrical, Instrumentation and Control

The following summarizes the electrical, instrumentation, and control of the exiting grit facilities:

- Electrical gear is original equipment requiring custom rebuilds and difficulty locating replacement parts.
- Little to no instrumentation and controls exist at the facility necessitating manual operation, inadequate operations, and minimal opportunity for optimization.
- Electrical gear requires complete replacement and relocation to current building, electrical, and fire codes.

2.3 Evaluation of Grit Removal and Handling Alternatives

The primary purpose of grit removal at a wastewater treatment plant is to reduce maintenance of downstream facilities. Benefits of grit removal include reducing accumulation in downstream channels, basins, and digesters and reducing wear in mechanical equipment such as pumps, valves, and sludge collection mechanisms.

This section summarizes the alternative technology evaluation, the recommended grit removal and handling technologies and preliminary design criteria, and implementation and site considerations.

2.3.1 Grit Removal Process Design Alternatives

Two grit separation technologies used in wastewater treatment are aerated grit basins and vortex grit basins. Vortex grit removal technologies include mechanically induced vortex grit removal as well as free vortex grit removal. The following grit removal technologies were evaluated for this analysis:

- Aerated grit basins.
- Mechanically-induced vortex grit basins.
- Free vortex grit removal system (i.e., HeadCell® multi-tray vortex system).

2.3.1.1 Aerated Grit Basins

Aerated grit basins use a specific velocity of roll or agitation to keep organics in suspension while settling the grit out of the wastewater. Compressed air is typically discharged into the rectangular grit chamber along the bottom of one side of the tank creating a rising air column that causes the flow to rotate. The air rate can be adjusted to create a low enough velocity near the floor to allow the grit to settle to the bottom of the basin and into collection hoppers. If the velocity is properly adjusted, in a well-designed basin, the aerated grit process can capture fine, slow settling grit.

Although aerated grit basins are an effective grit removal technology when designed properly with correct geometry and aeration equipment, they are operationally more complicated and have higher capital and O&M costs. Aerated grit chambers have a larger overall footprint than vortex systems and require multiple grit slurry pumps, aeration blowers, aeration piping, and coarse bubble diffusers, which increases the overall capital cost. The air introduced into an aerated grit basin is typically collected and treated in a foul air treatment system. Figure 2.1 is a photo of an aerated grit basin at BRWWTP.

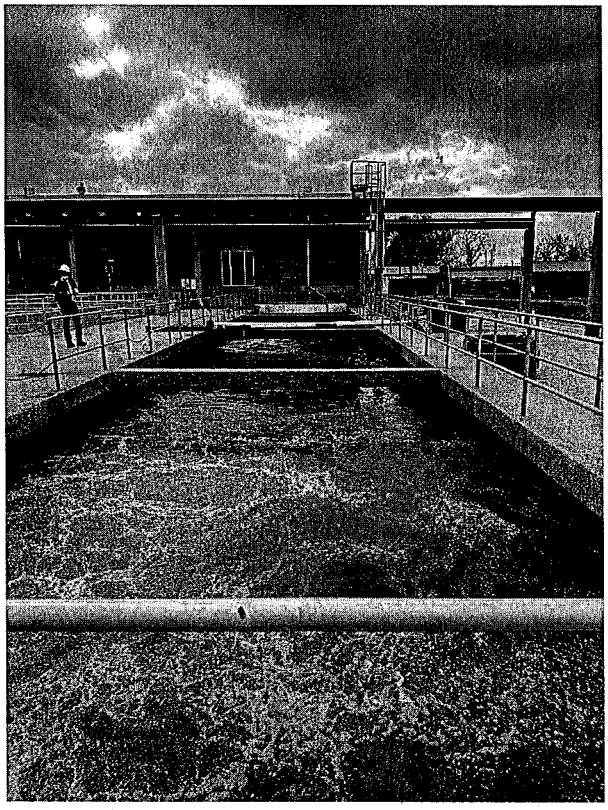


Figure 2.1 BRWWTP Aerated Grit Basin

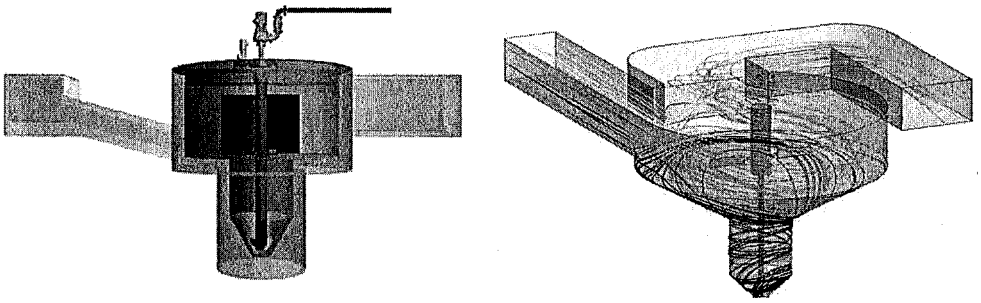
2.3.1.2 Vortex Grit Basins

The vortex grit removal process provides a simpler, less mechanically intensive method of grit removal in a smaller footprint than aerated grit removal.

Mechanically-Induced Vortex Grit Removal

Mechanically induced vortex grit basins work on the principles of gravity and centrifugal action to capture grit in the center hopper of a circular tank. Figure 2.2 presents schematics of the two primary types of mechanically-induced vortex grit basins – a sloped bottom grit basin and a flat bottom grit basin. The influent enters at a tangent to the outside of the basin producing a spiraling doughnut-shaped flow pattern. The flow pattern in the circular basin pushes the heavier grit particles to the outside where travel times are longer, providing more time for the grit to settle below the "lip" of the outlet opening thus "trapping" it. Impellers at the center of the basins cause a lifting action that suspends and lifts the lighter organic material that is then passed out of the basin through the effluent channel.

Vortex grit basins have been used by many wastewater treatment plants (WWTPs) in the United States to remove grit from the influent flow stream. They have a smaller footprint and significantly lower capital cost than aerated grit systems; however, it is Carollo's experience that the forced vortex grit basin technology has not been as effective in removing slow settling grit particles.



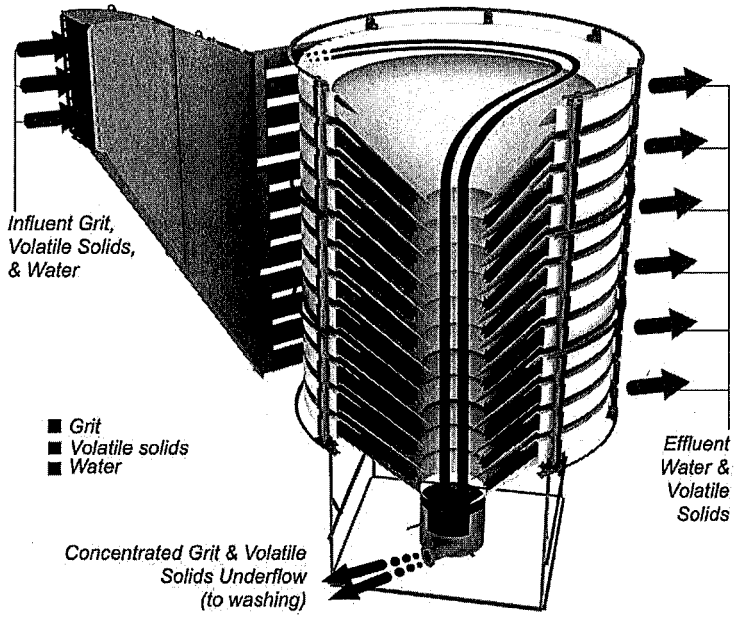
Source: Smith and Loveless and John Meunier, Inc.

Figure 2.2 Mechanically Induced Vortex Grit Basins

Multi-tray Vortex Grit Removal

The Hydro International HeadCell® is a modular, multiple-tray settleable solids concentrator that can be designed to remove fine grit with low settling velocity. Figure 2.3 presents a schematic of a typical HeadCell® system. A flow distribution header evenly distributes the influent flow over multiple conical trays. The tangential feed establishes a vortex flow pattern where solids settle into a boundary layer on each tray and are swept down to the center underflow collection chamber. The settled solids are continuously pumped to a grit separation, classification, and dewatering system.

The HeadCell® system has a smaller footprint than aerated grit systems and require less mechanical equipment for operation, resulting in a lower capital cost. HeadCell® systems are also anticipated to provide higher removal of fine (i.e., slow-settling) grit than aerated grit basins and mechanically-induced vortex grit basins.



Source: Hydro International, Inc.

Figure 2.3 Headcell® Multi-tray Vortex System

2.3.1.3 Alternative Analysis

A qualitative analysis of the grit removal alternatives was performed. Table 2.4 summarizes the key advantages and disadvantages of each alternative.

Table 2.4 Grit Removal Alternative Analysis

Alternative	Advantages	Disadvantages
Aerated Grit	▪ Sized for virtually any flow ▪ Potential improved flocculation of light solids resulting in good primary treatment operation ▪ Improved control of removal	▪ Energy intensive ▪ Increased O&M ▪ Large footprint ▪ More foul air to collect and treat ▪ Higher O&M cost
Mechanically-Induced Vortex Grit Removal	▪ Well-established technology ▪ Continuous or batch grit pumping operation ▪ Easier to inspect ▪ 270- and 360-degree configurations	▪ Less efficient at capturing fine grit ▪ Larger footprint (than Multi-tray) ▪ Requires motorized paddle ▪ Requires de-rating for adequate performance
Multi-tray Grit Removal, Headcell®	▪ High turndown ratios ▪ No moving parts or blowers ▪ Small footprint ▪ Removes more fine particles than other technologies	▪ Newer technology as compared to others ▪ Influent screening requirements (< 1/2 inch) ▪ More difficult to inspect ▪ Higher headloss ▪ Sole source required

Based on the Project goals, alternative analysis results, and the existing grit removal facility condition assessment, vortex grit basins and Headcells® are recommended for Grit Alternative No. 1 – Existing Facility Modifications and Grit Alternative No. 2 – New Facility Construction, respectively.

2.3.2 Grit Handling Design Alternatives

This section summarizes the grit handling technology alternative evaluation.

2.3.2.1 Grit Withdrawal and Transfer

Settled grit must be removed from the bottom of the grit basins and transferred to grit dewatering equipment. This is typically accomplished using heavy-duty pumps with hardened wear components that can handle abrasive materials, which settle in the grit basins.

Recessed impeller pumps located at the bottom of the grit basins are recommended for this application. These pumps have a successful, long track record in grit pumping applications and are very durable and reliable. The pump impellers are located out of the main flow path and the pump can pass solids almost as large in diameter as the inlet of the pump. These pumps require a flooded suction for proper operation.

2.3.2.2 Grit Washing and Dewatering

Grit washing separates grit from organic solids and grit dewatering removes the free water from the material in preparation for disposal. A lower organic content in grit reduces odors and vector attraction while dewatering reduces the weight, volume, and cost of materials hauled. Two technologies were evaluated for project implementation:

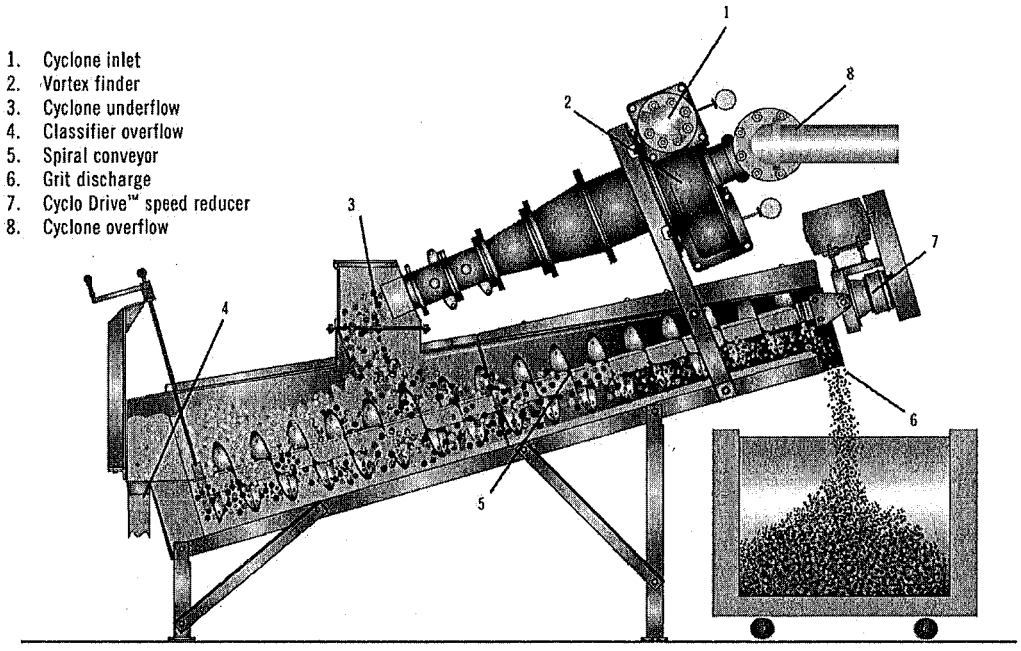
- Cyclone and grit classifier.
- Huber COANDA® grit washer.

Cyclone and Grit Classifier

Cyclone/classifier systems can be supplied by several manufacturers and have a long history of successful operation at municipal WWTPs. Figure 2.4 illustrates the cyclone/classifier grit dewatering system.

In this system, grit slurry withdrawn from the grit basin hopper is pumped to the cyclone, which is mounted on top of the classifier. When the pressurized grit flow enters the cyclone, the energy furnished by the pump is converted into a rotational motion, similar to a cyclone, which causes the grit to be pushed to the outer walls by centrifugal force. The cyclone uses this centrifugal force to concentrate the grit to as little as five percent of the total incoming flow, while draining the remaining water and some organic material back to the plant influent. The concentrated cyclone underflow discharges into the classifier below. Grit settles to the bottom of the classifier and is removed with a short helical auger. The remaining water and suspended organics discharge over a weir at the back of the classifier.

Cyclone/classifier units have a lower capital cost than other technologies; however they have potential to produce a lower quality grit that contains more organics and is more odorous.



Source: Trillium Flow Technologies, Inc.

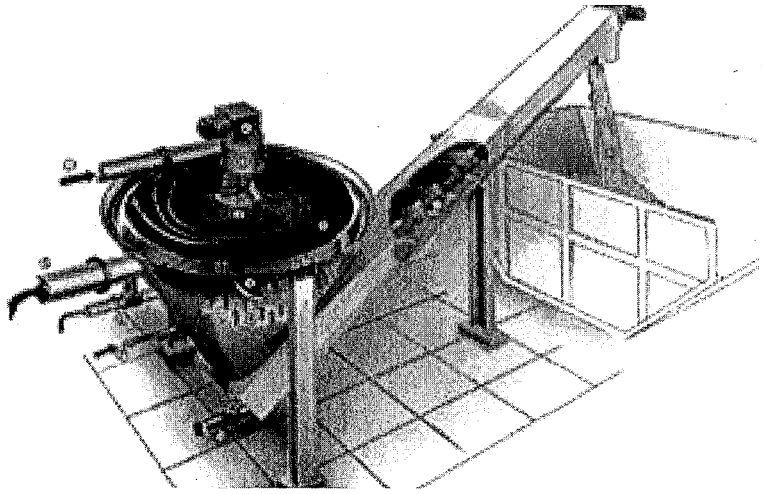
Figure 2.4 Cyclone and Grit Classifier

Coanda® Grit Washer

The COANDA® grit washer is a proprietary grit washing/dewatering system (manufactured by Huber) that typically produces cleaner and drier grit than other systems. Figure 2.5 illustrates the COANDA® grit washing/dewatering system.

In this system, grit slurry is fed through a vortex chamber where a spinning rotational motion is generated. The slurry then flows down through a trumpet-shaped segment into the washing/separation unit. The flow is diverted along the curved inner surface of the trumpet-shaped segment by the COANDA® effect that a liquid flow adheres to the contour of a curved surface. The flow is diverted smoothly, without generation of eddies, from a fast rotating vertical direction to a gradually slower rotating horizontal direction. The water flows evenly in a relatively thin layer below the water surface towards a circumferential overflow weir.

The combined forces of gravity and inertia cause grit and heavier organics particles to settle out of the flow. The separated grit is then washed, which takes place in the bottom portion of the grit washer where a fluidized grit bed is generated. Wash water is fed into a bottom chamber to create a fluidized bed. The vertical flow of water carries the removed low-density organics upwards towards the overflow weir while the heavier grit remains within the fluidized bed. Washed grit is periodically removed through the bottom of the unit. The grit drops into the inclined screw and is conveyed above the water level in the grit washer and drained by gravity. The washed and dewatered grit drops from the conveyor into a dumpster.



Source: Huber Technology, Inc.

Figure 2.5 COANDA® Grit Washer

2.3.2.3 Alternative Analysis

A qualitative analysis of the grit handling alternatives was performed. Table 2.5 summarizes the key advantages and disadvantages of each alternative.

Table 2.5 Grit Handling Alternative Analysis

Alternative	Advantages	Disadvantages
Cyclone/Grit Classifier	▪ Extensive successful experience ▪ Wide range of hydraulic capacity applications ▪ Adequate process performance ▪ Moderate capital cost	▪ Limited washing of grit ▪ Grit product contains levels of organics and odors
COANDA® Grit Washer	▪ Produces cleaner, drier, less odorous product ▪ Reduces hauling volume and frequency	▪ Higher capital cost ▪ Sole source required

Based on the Project goals, alternative analysis results, and the existing grit handling facility condition assessment, Huber's COANDA® grit washer with direct discharge into grit hauling trucks located in a new, dedicated Grit Handling Building is recommended for both Grit Alternative No. 1 – Existing Facility Modifications and Grit Alternative No. 2 – New Facility Construction.

2.3.3 Siting Alternatives

The following site considerations served as the basis when determining the site layout and design of the grit removal and handling facilities:

- Proximity to existing upstream and downstream facilities.
- Ability to enclose and provide odor control.
- Sufficient, safe space for O&M access.
- Adequate clearance for grit hauling activities.
- Continuous treatment operations throughout construction of new facilities.

2.3.3.1 Grit Alternative No. 1 - Existing Facility Modifications

Grit Alternative No. 1 consists of retrofitting the existing grit removal basins with new vortex grit removal basins and grit pump stations. A new Grit Handling Building will house grit washers, grit loadout, and mechanical and electrical rooms. Grit will be conveyed from the grit pump stations to the Grit Handling Building through a utility corridor located on the grit basin deck.

Figure 2.6 presents the site layout of Grit Alternative No. 1.

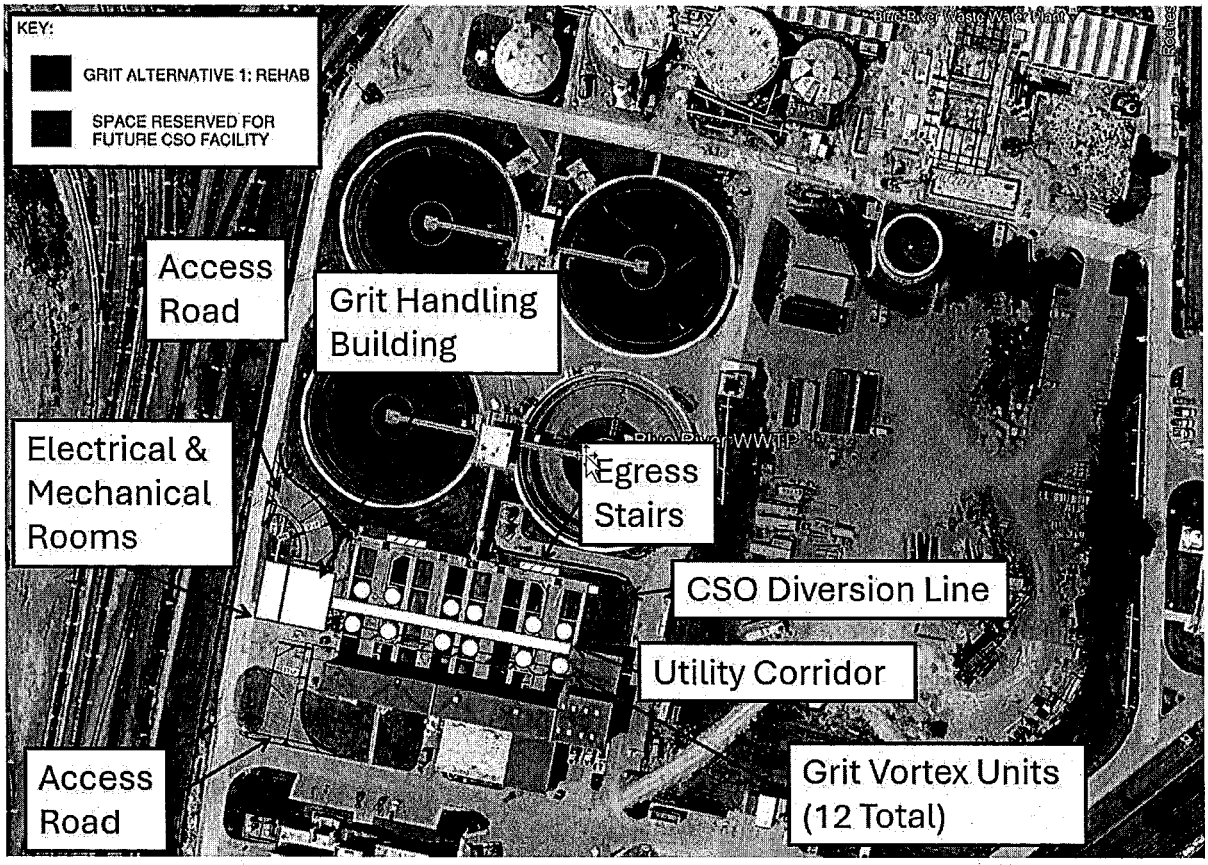


Figure 2.6 Grit Alternative No. 1 – Existing Facility Modifications

Grit Alternative No. 1 repurposes the existing grit removal basins with 12 grit vortex units, new grit pump stations, and a new utility corridor for utility piping to a new Grit Handling Building. Extensive facility modifications and repair are required to accommodate the new processes. Complex construction sequencing and constraint are required to construct the improvements while maintaining adequate process operations. See Appendix A for conceptual level process flow diagrams and 3D renderings of the proposed Grit Alternative No. 1.

2.3.3.2 Grit Alternative No. 2 - New Facility Construction

Grit Alternative No. 2 consists of new Headcell® grit removal basins and grit pump station. A new Grit Handling Building will house grit washers, grit loadout, and mechanical and electrical rooms. Grit will be conveyed from the grit pump stations to the Grit Handling Building through a below-grade tunnel between the basins and building.

Figure 2.7 presents the site layout of Grit Alternative No. 2.

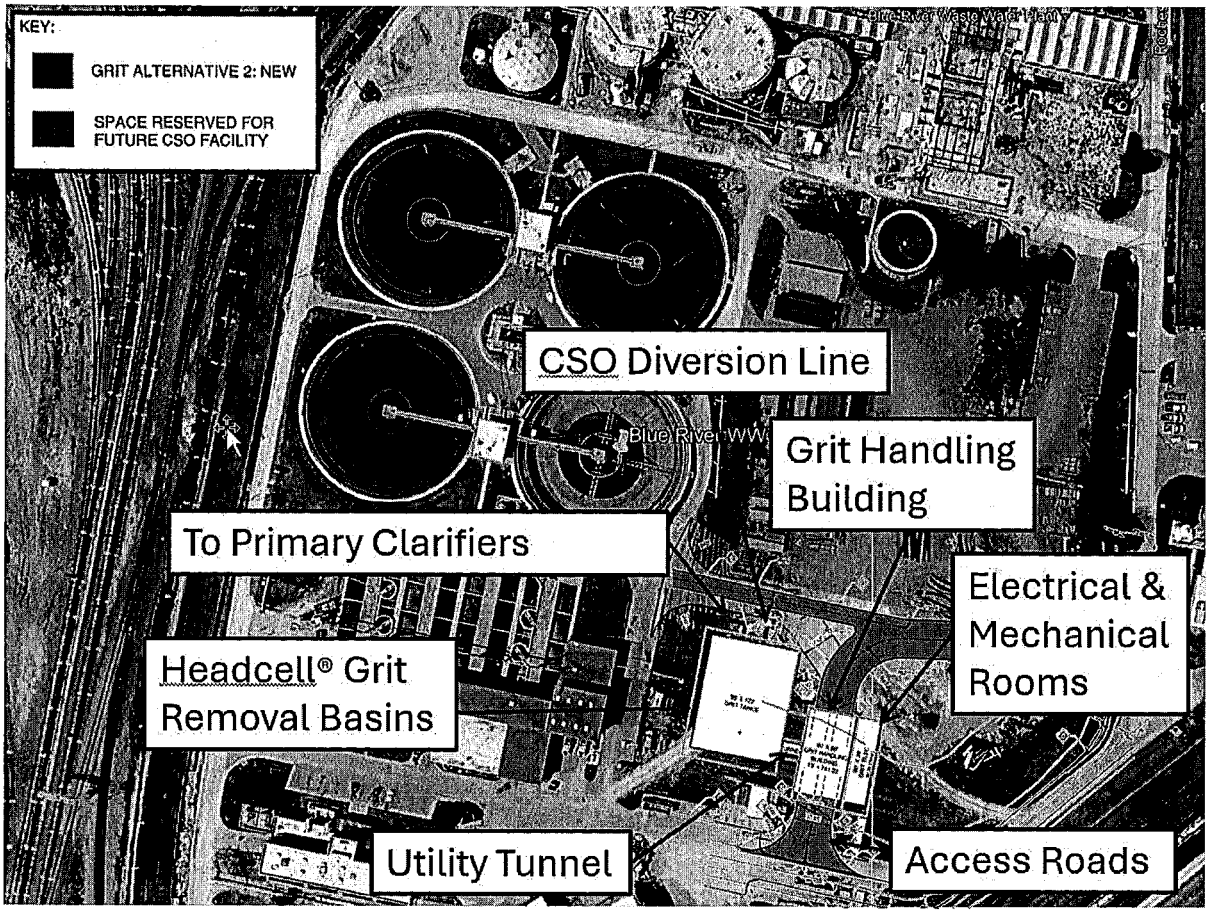


Figure 2.7 Grit Alternative No. 2 – New Facility

Grit Alternative No. 2 consists of eight Headcell® grit basins with an integral, single grit pump station in a dedicated new facility equipped with a new utility tunnel connected to a new Grit Handling Building constructed east of the existing grit facilities. Construction of the facility will require minor construction constraints and sequencing as compared to Grit Alternative No. 1. Improvements to existing screening facilities will be required along with potential pump modifications to accommodate the higher hydraulic head requirements. See Appendix B for conceptual level process flow diagrams and 3D renderings of the proposed Grit Alternative No. 2.

2.3.4 Conceptual Design Criteria

Tables 2.6 and 2.7 summarize the conceptual design criteria for Grit Alternative No. 1 – Existing Facility Modifications and Grit Alternative No. 2 – New Facility Construction, respectively.

Table 2.6 Grit Alternative No. 1 Conceptual Design Criteria

Parameter	Design Criteria
Grit Removal	
Type	Mechanically induced vortex
Number	12
Diameter	18 feet
Capacity (De-rated Treatment)	17.5 mgd each
Grit Pumps	
Type	Recessed impeller
Number	12
Capacity	200 gpm
Grit Washer Classifier	
Type	COANDA®
Number	6
Hydraulic Capacity (Design/Peak)	400 gpm / 500 gpm

Notes:
Abbreviations: gpm - gallons per minute.

Table 2.7 Grit Alternative No. 2 Conceptual Design Criteria

Parameter	Design Criteria
Grit Removal	
Type	Multi tray Headcell®
Number	8
Tray Diameter	12 feet
Number of Trays	12
Capacity (Treatment)	26.25 mgd each
Grit Pumps	
Type	Recessed impeller
Number	8
Capacity	400 gpm
Grit Washer Classifier	
Type	COANDA®
Number	8
Hydraulic Capacity (Design/Peak)	400 gpm / 500 gpm

2.4 Quadruple Bottom Line Analysis

A quadruple bottom line (QBL) evaluation for the Project was completed using framework categories (Environment, Community, Financial, Operations) established in the previous masterplan. New, modified QBL framework will be developed as part of ongoing efforts for the BRWWTP Facility Plan update. Table 2.8 provides a summary of the capital and O&M costs.

Table 2.8 Grit Improvements Cost Summary

Alternative	Total Capital Cost	Total Annual O&M Cost	20-Year O&M Net Present Value	Total Net Present Value
Grit Alternative No. 1	$85,300,000	$730,000	$10,900,000	$96,200,000
Grit Alternative No. 2	$90,100,000	$690,000	$10,300,000	$100,400,000

Grit Alternative No. 2 is the most favorable alternative due to the higher environment, community, and operations rankings. Therefore, KC Water is electing to construct a new grit removal and handling facility as described in Grit Alternative No. 2.

2.5 Future Design Considerations

Grit Alternative No. 2 is conceptually designed with flexibility for future expansion in the event influent flow volumes increase as part of the current master plan flow and load analysis. This will allow KC Water sufficient capacity to provide grit removal for screened mainstream and wet weather liquid streams. Larger, regional preliminary treatment facilities are more cost effective than dispersed treatment facilities for capital and O&M costs. Discussions for future repurposing of existing grit facilities are ongoing and will be captured in the ongoing Master Plan Update efforts.

The intense level of maintenance required to keep the existing grit removal system operational, coupled with its relatively poor performance is driving the need to upgrade the grit removal system as soon as possible. Immediate grit removal performance will be a benefit to the new biosolids THP system which is planned for substantial completion in 2025. For these reasons, the City is undertaking the grit removal system upgrades while sizing for future flow requirements. The City is not asking for an increase in the permitted discharge flow rate; that will occur as part of a future project when the other processes are constructed that would allow higher flow rates through the primary facilities.

The future flow requirements considered include:

1. The City's Consent Decree requires construction of additional wet-weather primary treatment facilities by 2035.
2. The City is evaluating consolidation of treatment facilities which would include some flow from the Birmingham WWTP being conveyed to the BRWWTP primary treatment facility.

2.6 Environmental Review

Each of the alternatives for grit removal and handling developed for this Project occur on previously disturbed existing City property that is currently occupied by the BRWWTP. Additional capacity is required to treat existing and projected future flows. The recommended technologies and site arrangement were selected to maximize the available footprint on site while still maintaining current plant operations. The recommended technologies are superior to existing facilities resulting in improved grit operations and reduced grit impacts on downstream equipment and processes.

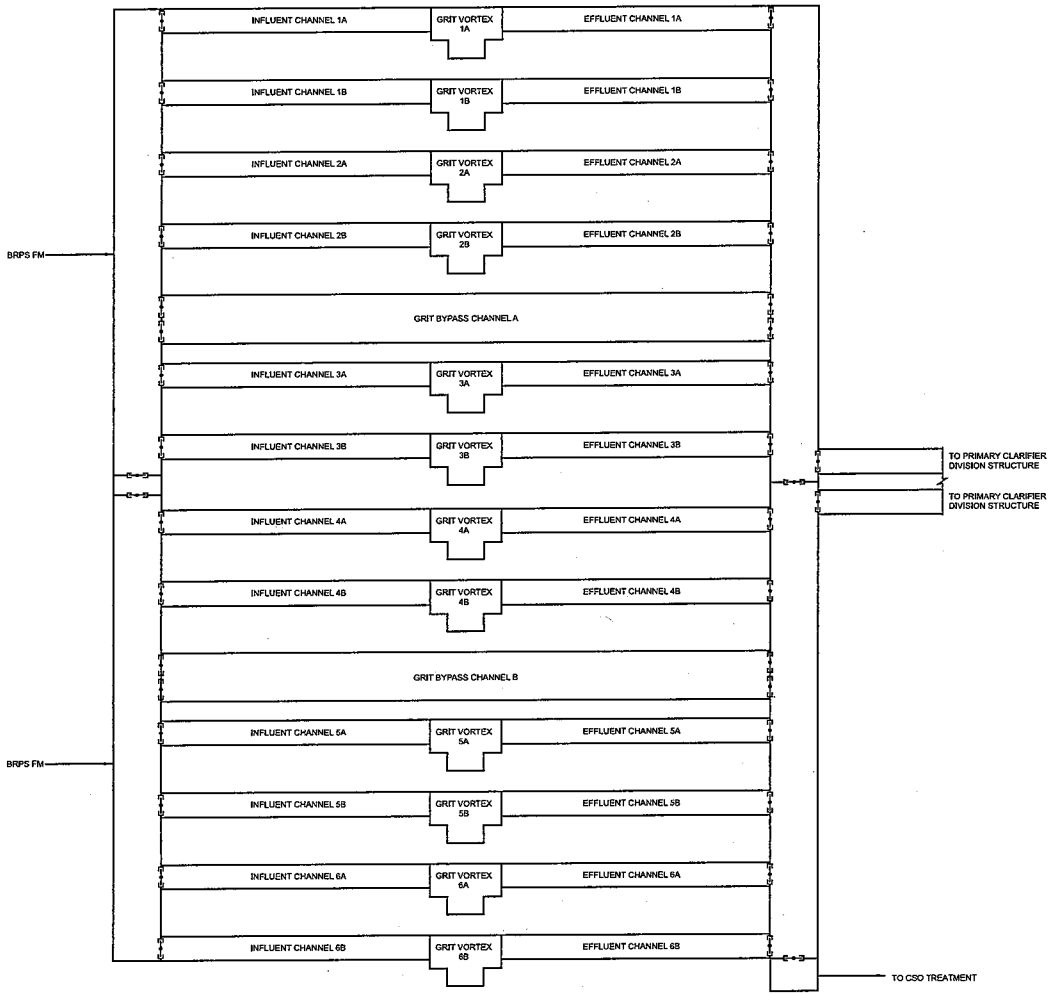
APPENDIX A

GRIT ALTERNATIVE NO. 1

User: svcPW Plot Date: 19-JAN-2024 7:08:16 AM File: E:\ICS\forPDFWorking\97471\277707_51202359_FIG 1.dgn

GENERAL NOTES:

1. NOT ALL VALVES, PIPING, AND APPURTENANCES SHOWN.

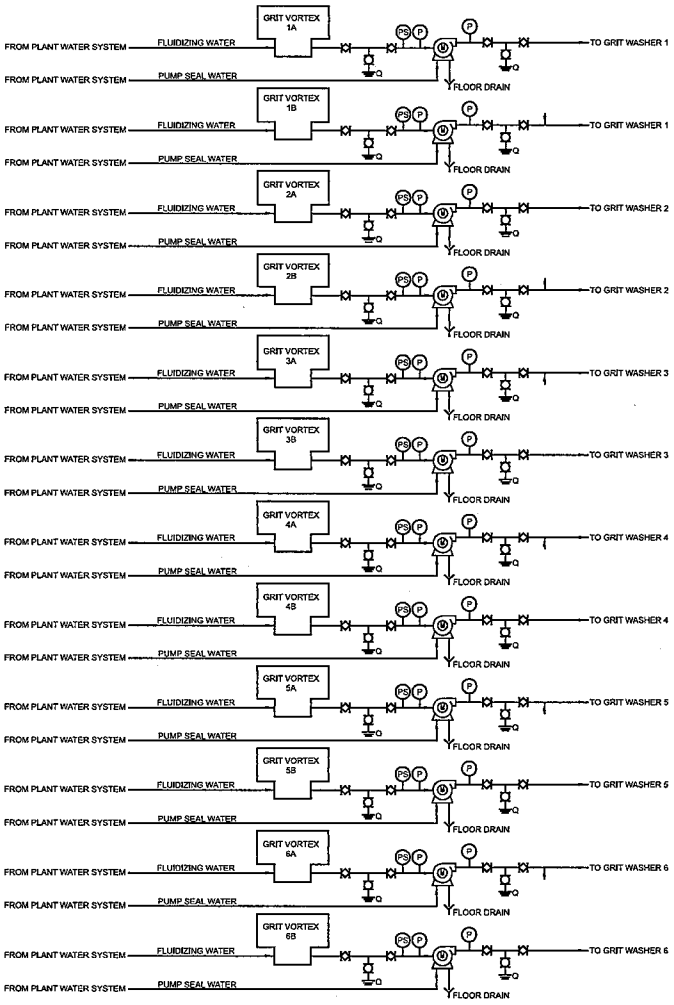


KC WATER BRWWTP
GRIT SYSTEM UPGRADE PROJECT

GRIT ALTERNATIVE NO. 1

PROCESS FLOW DIAGRAM
GRIT REMOVAL

carollo



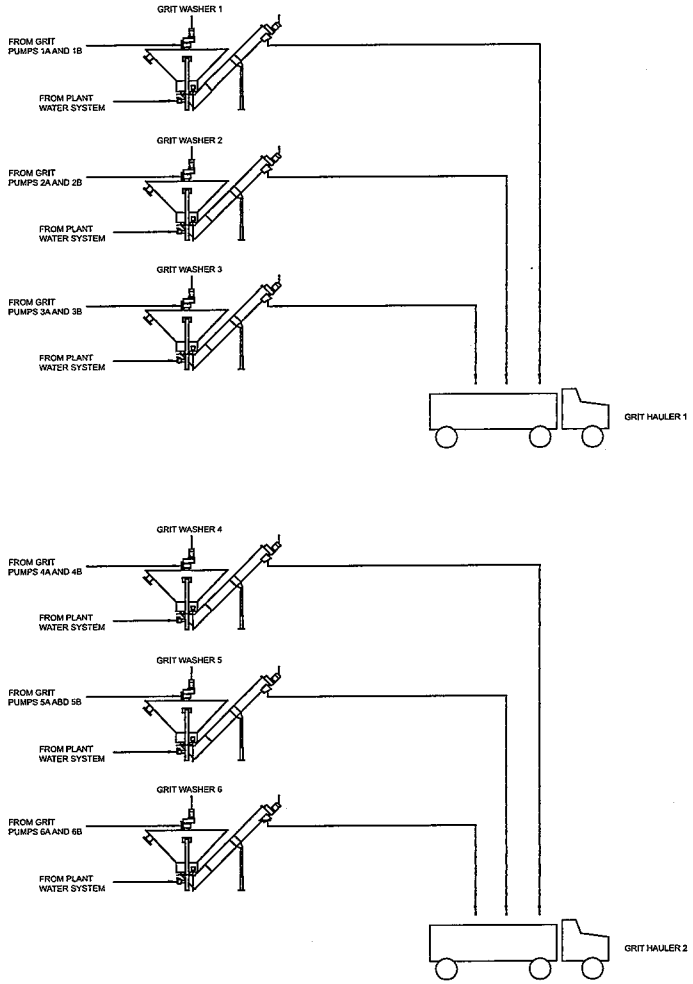
GENERAL NOTES:

1. NOT ALL VALVES, PIPING, AND APPURTENANCES SHOWN.

KC WATER BRWWTP
GRIT SYSTEM UPGRADE PROJECT
GRIT ALTERNATIVE NO. 1
PROCESS FLOW DIAGRAM
GRIT PUMPING

carollo

User: svcPW Plot Date: 19-JAN-2024 7:08:36 AM File: E:\ICS\orPDFWorking\9747\277707_6\202359_FIG 2.dgn



GENERAL NOTES:

1. NOT ALL VALVES, PIPING, AND APPURTENANCES SHOWN.

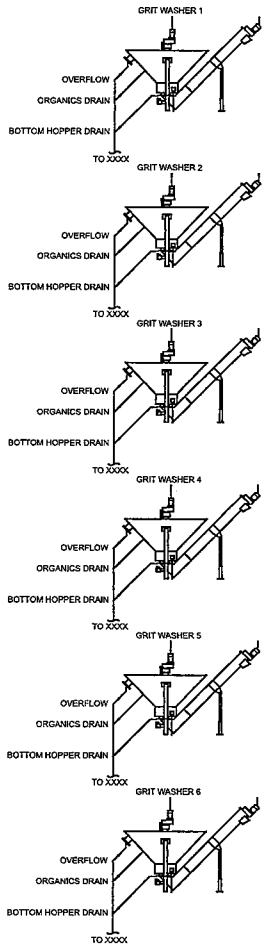
KC WATER BRWWTP
GRIT SYSTEM UPGRADE PROJECT

GRIT ALTERNATIVE NO. 1

PROCESS FLOW DIAGRAM
GRIT HANDLING - WASHERS

carollo

User: svcPW Plot Date: 19-JAN-2024 7:09:13 AM File: E:\ICS\forPDFWorking\9747\2777707_14\202359_FIG 3.dgn



GENERAL NOTES:

1. NOT ALL VALVES, PIPING, AND APPURTENANCES SHOWN.

KC WATER BRWWTP
GRIT SYSTEM UPGRADE PROJECT

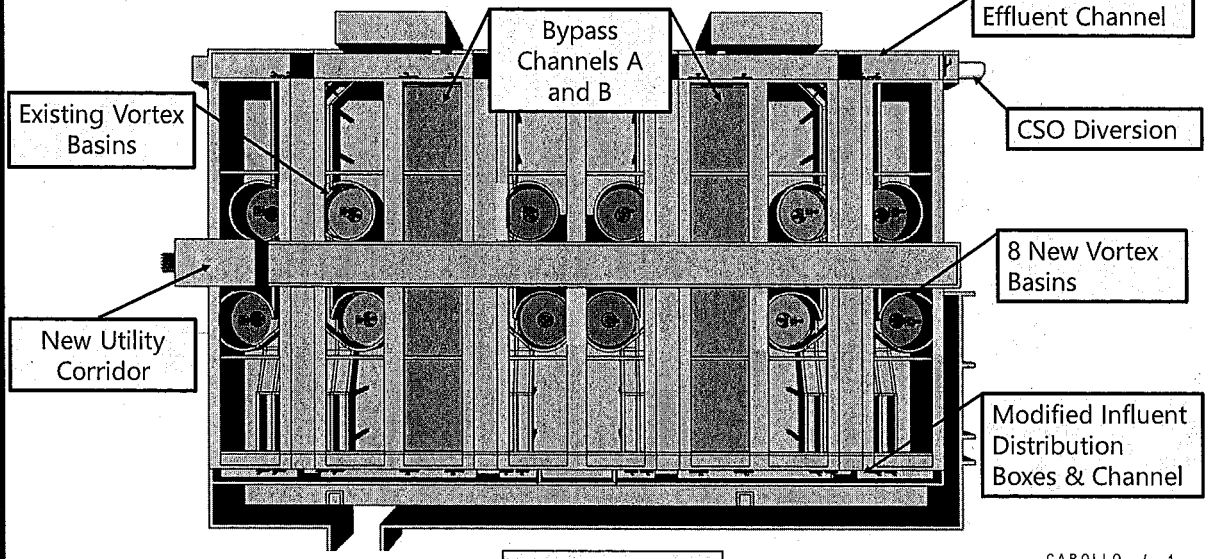
GRIT ALTERNATIVE NO. 1

PROCESS FLOW DIAGRAM
GRIT HANDLING - DRAINAGE

carollo

User: svcPW Plot Date: 19-JAN-2024 7:08:40 AM File: E:\ICS\for\PDFWorking\9747\277707_8\202359_FIG 4.dgn

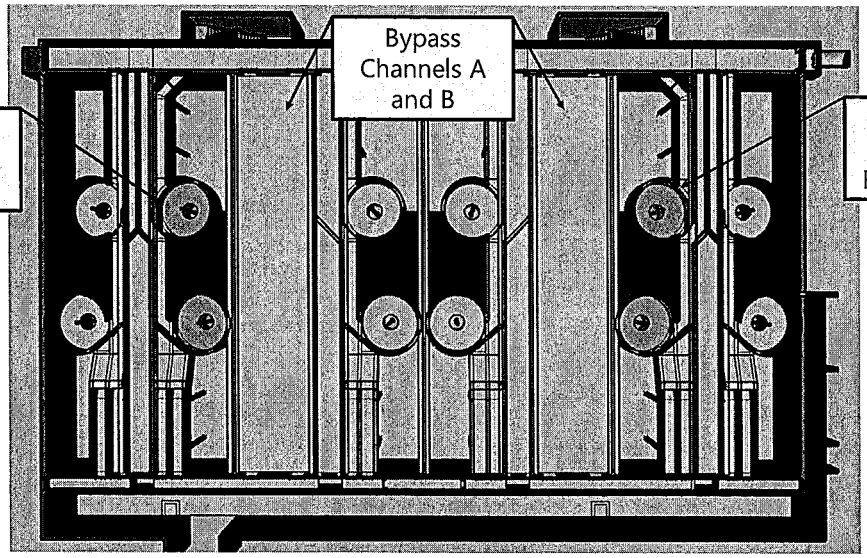
Grit Alternative No. 1 - Retrofit With Vortex Basins



Upper Plan View

CAROLLO / 1

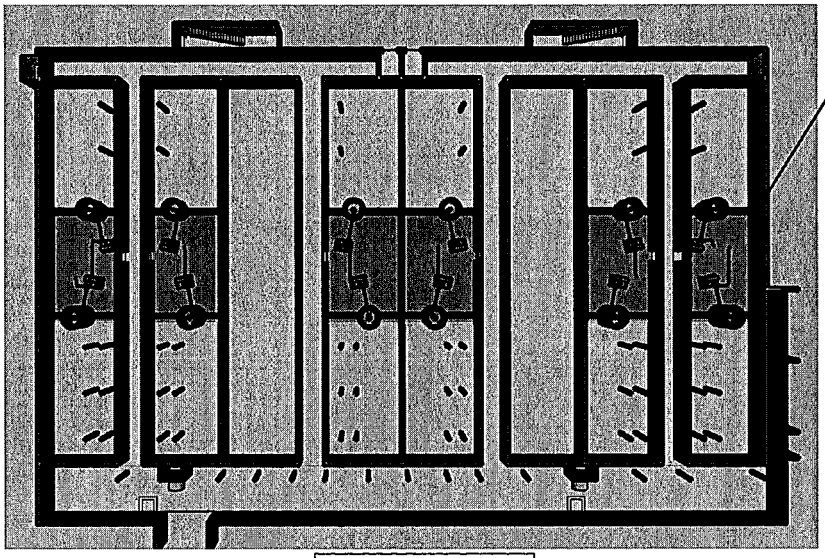
Grit Alternative No. 1 – Retrofit With Vortex Basins



Intermediate Plan View

CAROLLO / 2

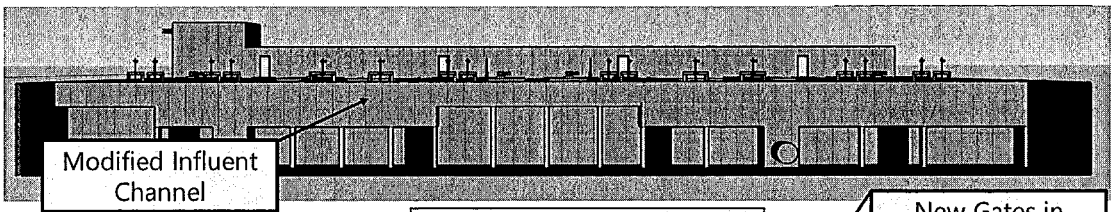
Grit Alternative No. 1 – Retrofit With Vortex Basins



New Grit Pumps and Pump Stations for all Vortex Basins

Lower Plan View

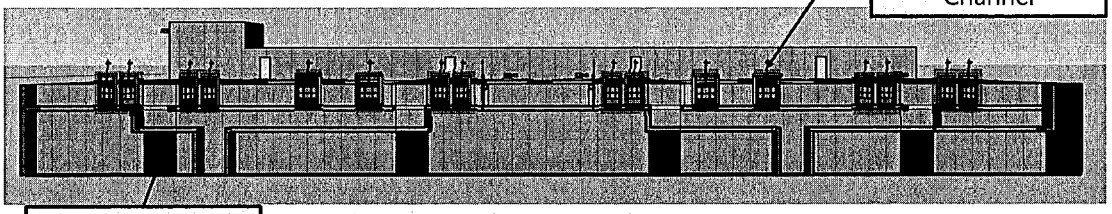
Grit Alternative No. 1 – Retrofit With Vortex Basins



Modified Influent Channel

Section – South Perspective

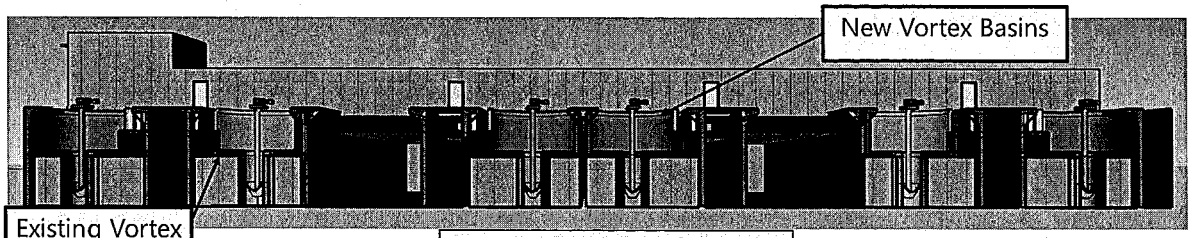
New Gates in Modified Influent Channel



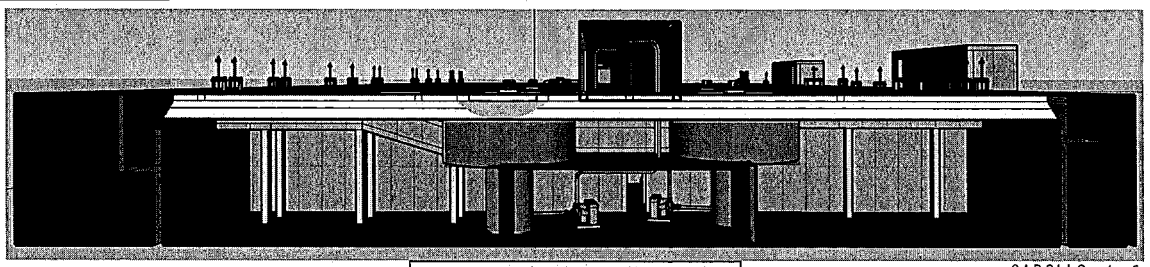
Maintain Access Tunnels

Influent Channel Section – South Perspective

Grit Alternative No. 1 – Retrofit With Vortex Basins



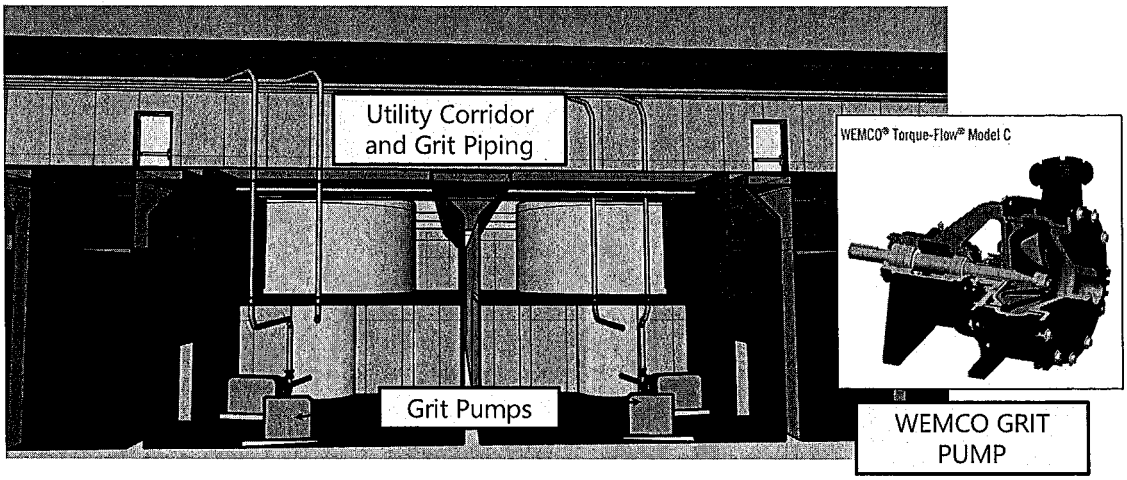
Section – South Perspective



Section – East Perspective

CAROLLO / 5

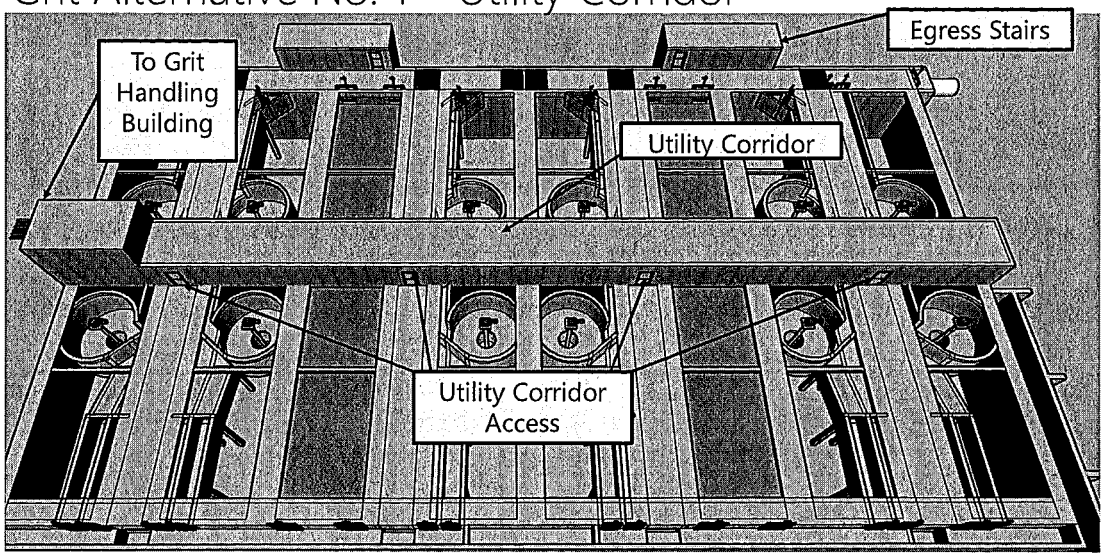
Grit Alternative No. 1 – New Grit Pump Stations



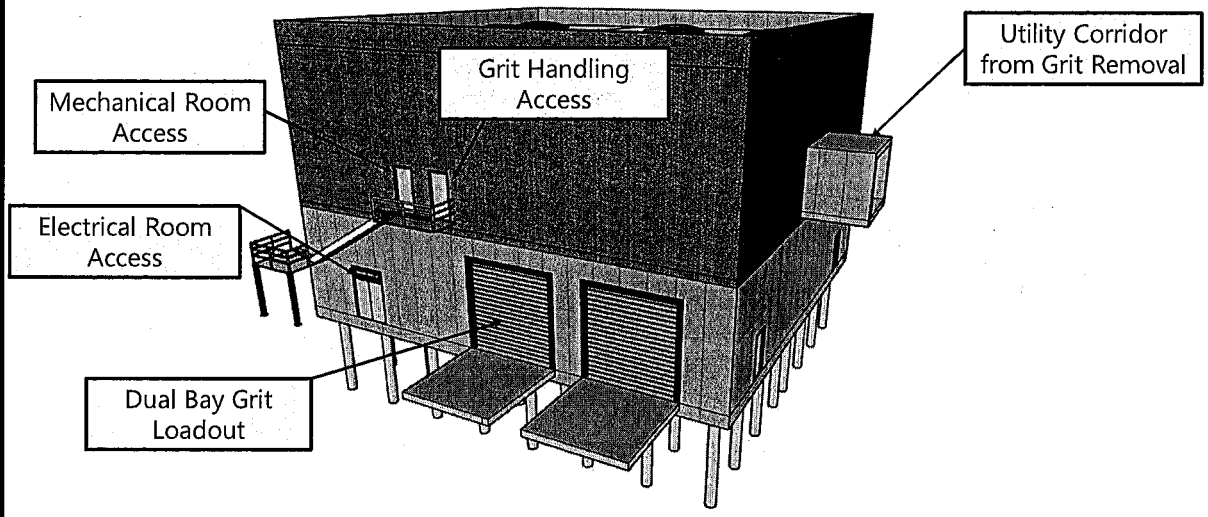
Section – South Perspective

CAROLLO / 6

Grit Alternative No. 1 – Utility Corridor

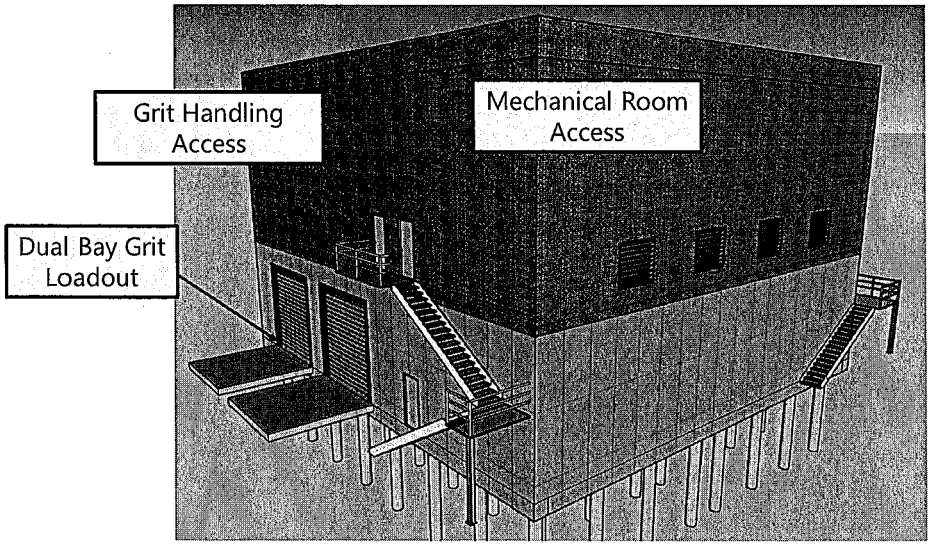


Grit Alternative No. 1 – Grit Handling Building



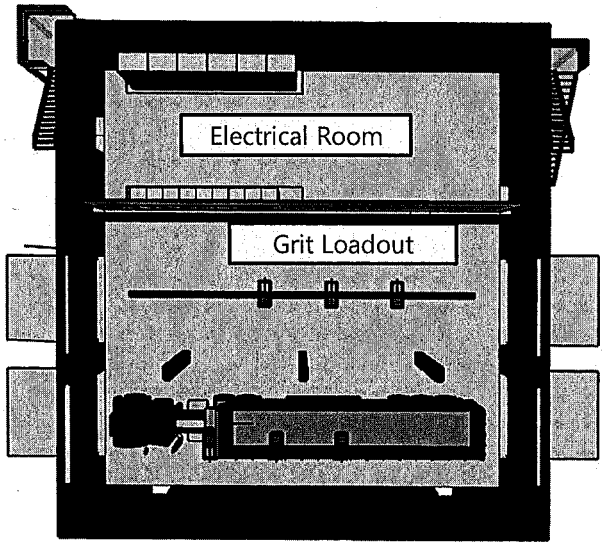
Grit Handling Building - Southeast Perspective

Grit Alternative No. 1 – Grit Handling Building Exterior



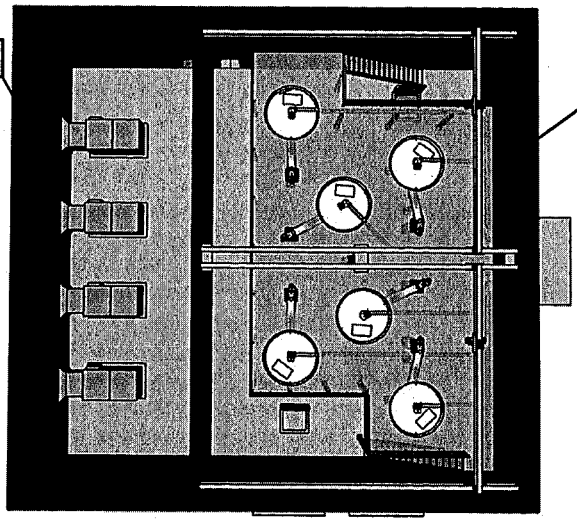
Grit Handling Building - Northwest Perspective

Grit Alternative No. 1 – Grit Handling Building



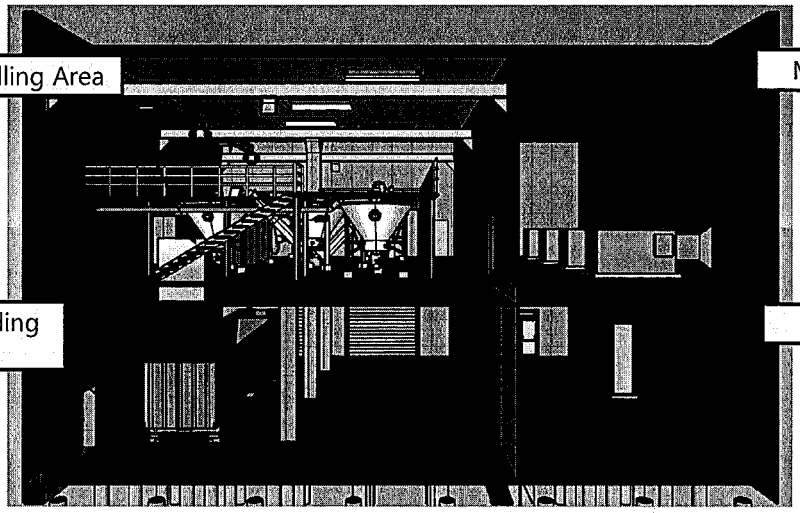
Grit Handling Building – Lower Level Plan View

Grit Alternative No. 1 – Grit Handling Building



Grit Handling Building – Intermediate Level

Grit Alt. No. 1 – Grit Handling Building Overall Section



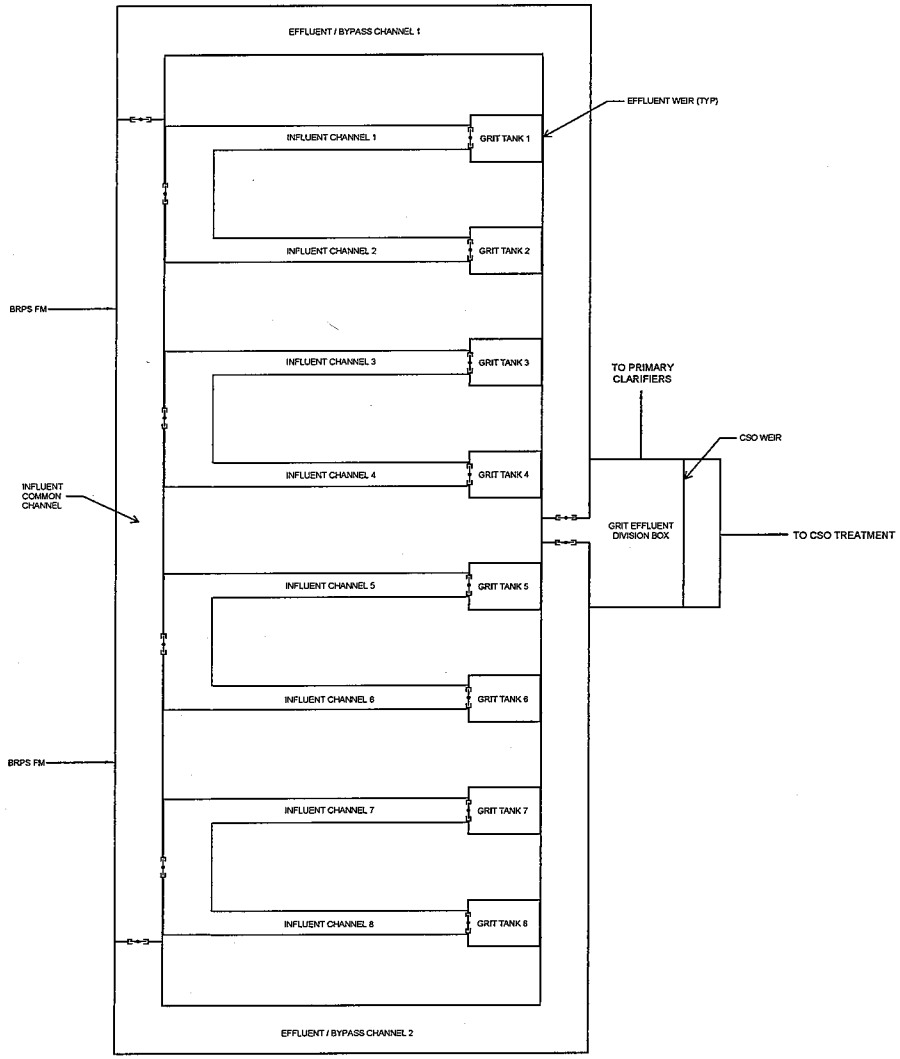
Grit Handling Building – North Section

APPENDIX B

GRIT ALTERNATIVE NO. 2

GENERAL NOTES:

1. NOT ALL VALVES, PIPING, AND APPURTENANCES SHOWN.



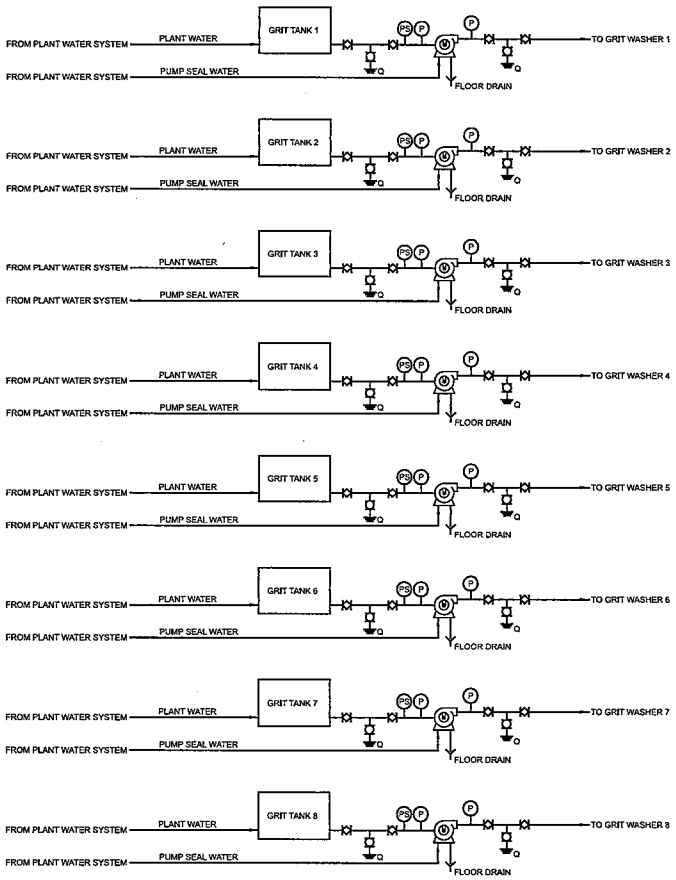
KC WATER BRWWTP
GRIT SYSTEM UPGRADE PROJECT

GRIT ALTERNATIVE NO. 2

PROCESS FLOW DIAGRAM
GRIT REMOVAL

carollo

User: svcFW Plot Date: 19-JAN-2024 7:08:16 AM File: E:\ICS\forPDFWorking\9747\277707_5\202359_FIG 1.dgn



GENERAL NOTES:

1. NOT ALL VALVES, PIPING, AND APPURTENANCES SHOWN.

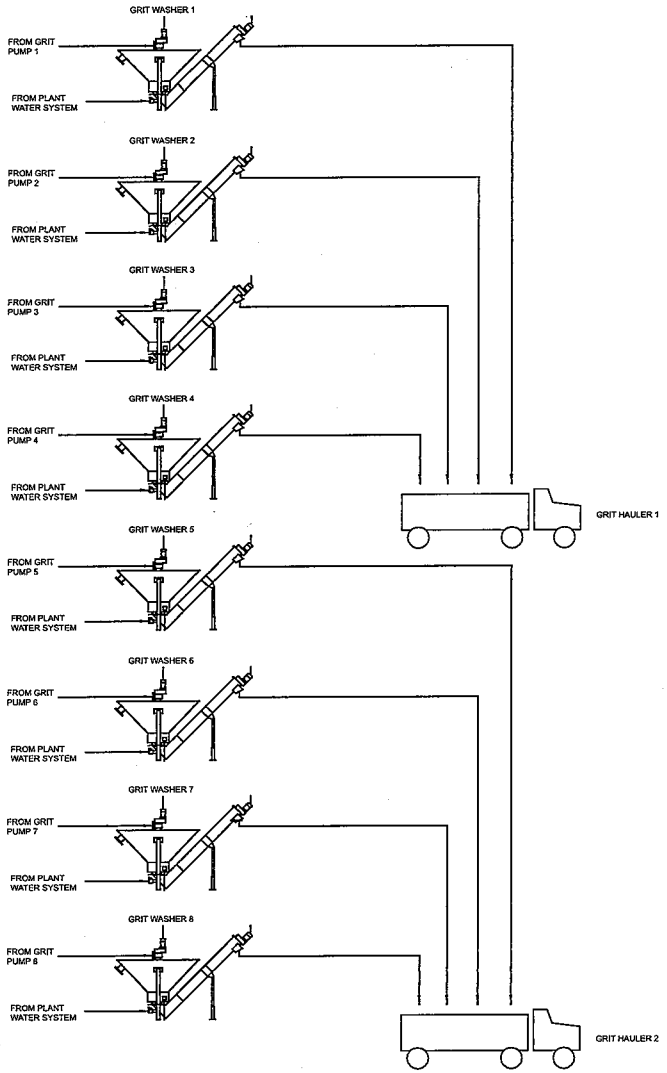
KC WATER BRWWTP
GRIT SYSTEM UPGRADE PROJECT

GRIT ALTERNATIVE NO. 2

PROCESS FLOW DIAGRAM
GRIT REMOVAL

carollo

User: svcPW Plot Date: 19-JAN-2024 7:08:45 AM File: E:\ICS\forPDFWorking\97471277707_101202359_FIG 5.dgn



GENERAL NOTES:

1. NOT ALL VALVES, PIPING, AND APPERTENANCES SHOWN.

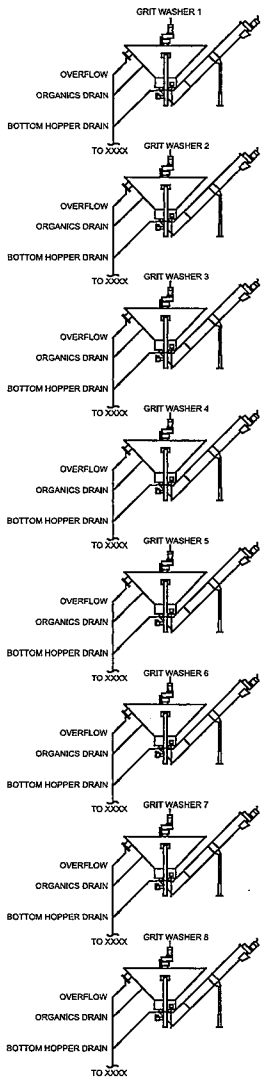
KC WATER BRWWTP
GRIT SYSTEM UPGRADE PROJECT

GRIT ALTERNATIVE NO. 2

PROCESS FLOW DIAGRAM
GRIT HANDLING - WASHER

carollo

User: svcPW Plot Date: 19-JAN-2024 7:08:53 AM File: E:\ICS\for\PDFWorking\9747\277707_11\202359_FIG 6.dgn



GENERAL NOTES:

1. NOT ALL VALVES, PIPING, AND APPURTENANCES SHOWN.

KC WATER BRWWTP
GRIT SYSTEM UPGRADE PROJECT

GRIT ALTERNATIVE NO. 2

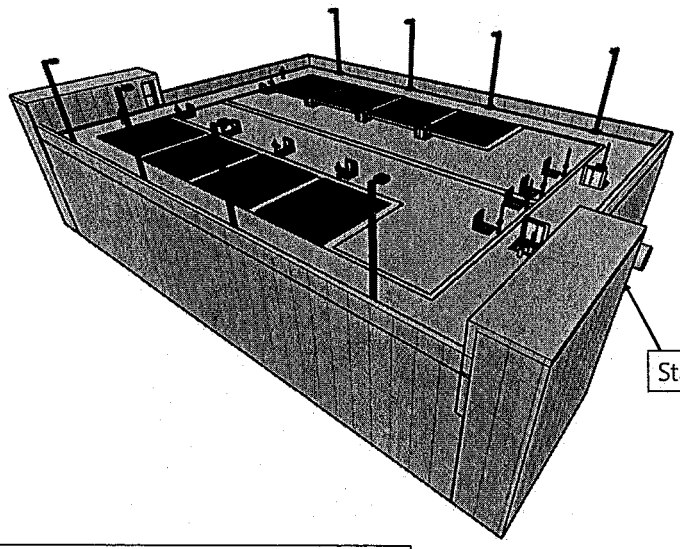
PROCESS FLOW DIAGRAM
GRIT HANDLING - DRAINAGE

carollo

User: svcPW Plot Date: 19-JAN-2024 7:08:54 AM File: E:\ICS\orPDFWorking\9747\277707_13\202359_FIG 7.dgn

Grit Alternative No. 2 – New Multi-tray Basins Overview

Multi-tray Units (8)



Stair Access

Grit Basins and Pump Station – Southwest Perspective

CAROLLO / 1

Grit Alternative No. 2 – New Multi-tray Basins

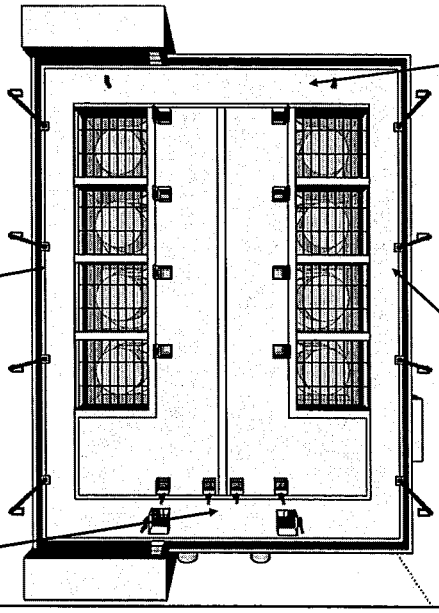
Multi-tray Units (8)

Effluent Channel

Bypass/Effluent Channel

Bypass Channel

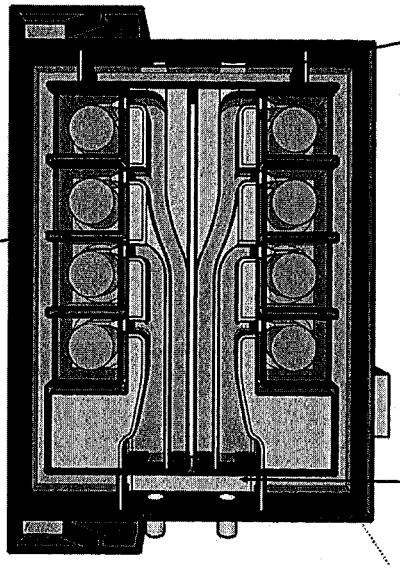
Influent Channel



Upper Plan View

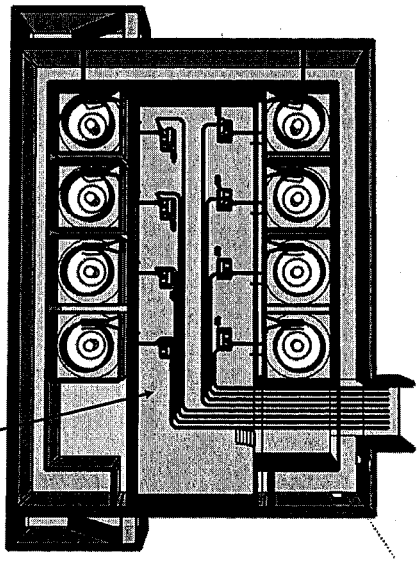
CAROLLO / 2

Grit Alternative No. 2 – New Multi-tray Basins



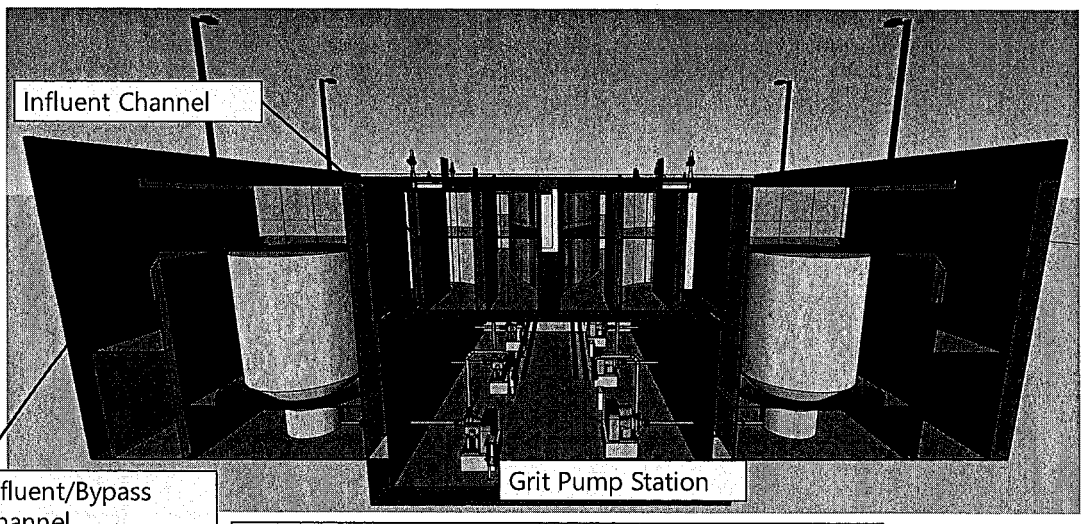
Intermediate Plan View

Grit Alternative No. 2 – New Multi-tray Basins



Lower Plan View

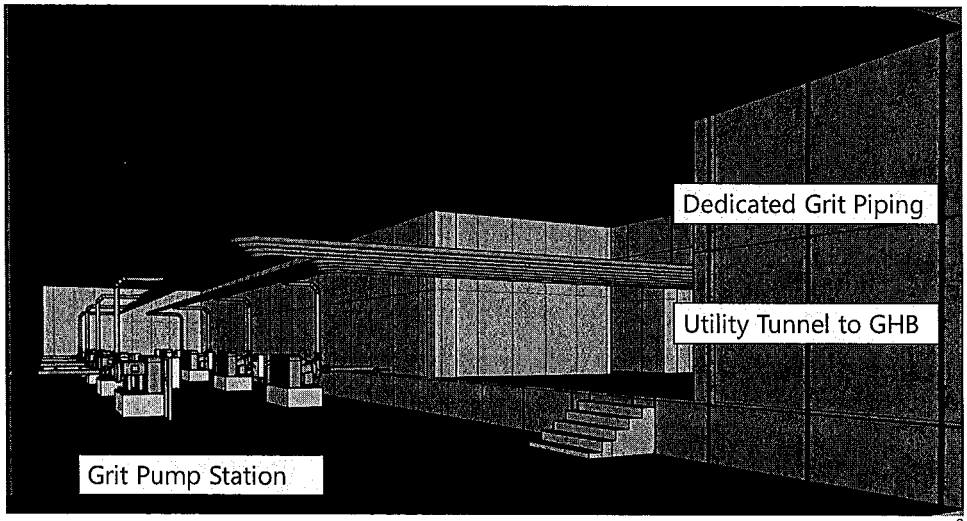
Grit Alternative No. 2 – New Multi-tray Basins



Basin and Pump Station Section – South Perspective

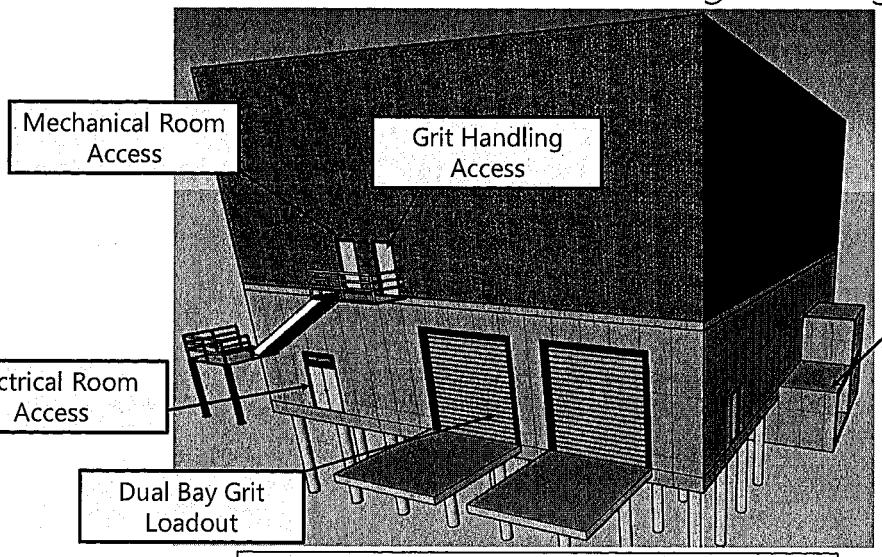
CAROLLO / 5

Grit Alternative No. 2 – New Grit Pump Station



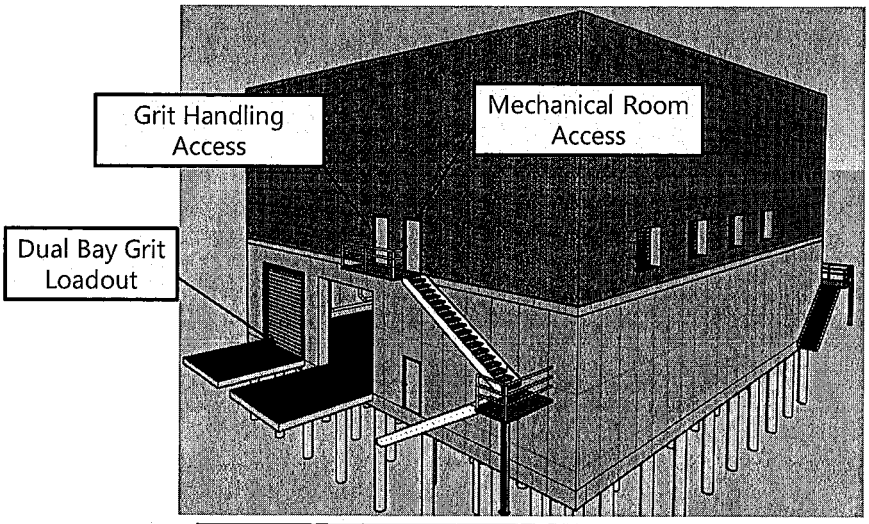
CAROLLO / 6

Grit Alternative No. 2 – Grit Handling Building Exterior



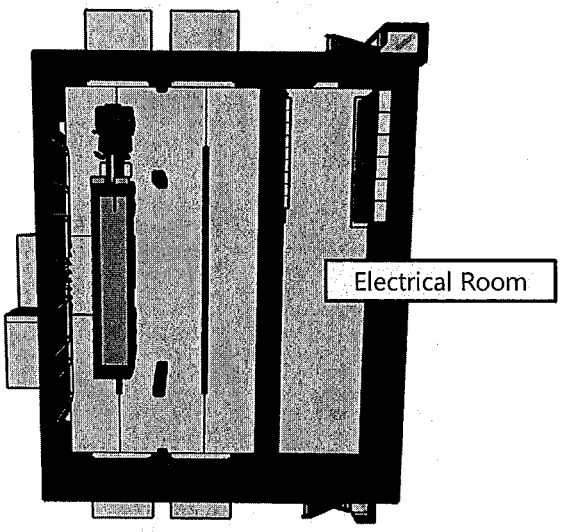
Grit Handling Building - Southeast Perspective

Grit Alternative No. 2 – Grit Handling Building Exterior



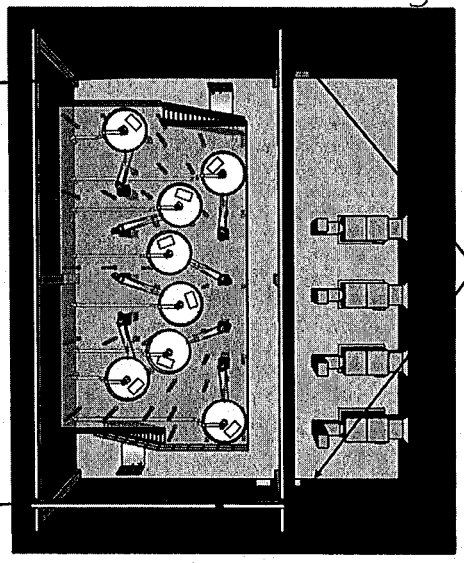
Grit Handling Building - Northwest Perspective

Grit Alternative No. 2 – Grit Handling Building



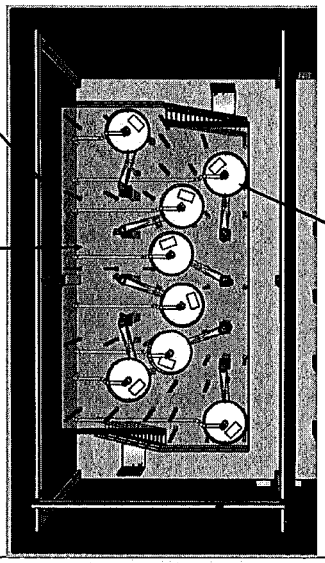
Grit Handling Building – Lower Level Plan View

Grit Alternative No. 2 – Grit Handling Building



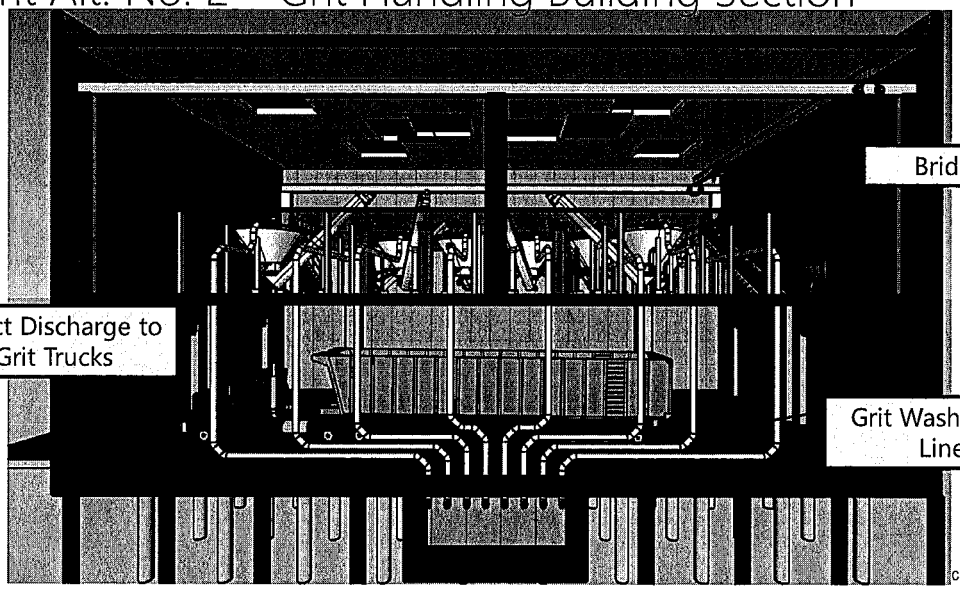
Grit Handling Building – Intermediate Level

Grit Alternative No. 2 – Grit Handling Room



Grit Handling Room Plan View – Platform Level

Grit Alt. No. 2 – Grit Handling Building Section



INDUSTRIAL HYGIENE PROJECT OVERSIGHT REPORT
June 21st, 2022

Prepared by:

ECOSAFE
Environmental Services, Inc.
215 W 18th St, Suite 150, Kansas City, Missouri 64108

For:

Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

Project:

Industrial Hygiene Project Oversight Report
Blue River Wastewater Treatment Plant
60-inch Force Main Project
7300 Hawthorne Road
Kansas City, Missouri 64120

June 21, 2022

CLIENT: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

PROJECT: Industrial Hygiene Project Oversight Report
Blue River Wastewater Treatment Plant
60-inch Force Main Project
7300 Hawthorne Road
Kansas City, Missouri 64120

ECOSAFE PROJECT NO.: 2022.364.1EES

REPORT PREPARED BY: Jessica Raley

Jessica Raley
Missouri Air Sampling Professional
Certification # 7000032922MOAS21387
Asbestos Project Designer
Certification # 7011032522MOPDI21387
Asbestos Supervisor
Certification # 7011040822MOSl21387

CONTACT INFORMATION:

EcoSafe Environmental Services, Inc.
215 W 18th Street, Suite 150
Kansas City, MO 64108
Tel: (816) 598-4111 / (270) 315-0057
E-mail: Jessica@EcoSafeKC.com

Attachments:

1. Weekly Project Oversight Summary
2. Daily Log
3. PCM Analytical Results
4. Photo Log
5. Personnel Certifications

Attachment 1: Weekly Project Oversight Summary

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

June 21, 2022

RE: Weekly Industrial Hygiene Project Oversight Report
Blue River Wastewater Treatment Plant
60-inch Force Main Project
7300 Hawthorne Road
Kansas City, Missouri 64120

Dear Mr. Nitcher,

EcoSafe Environmental Services Inc. is pleased to provide you with this weekly update report regarding the on-going project referenced above. EcoSafe provided project oversight and Phase Contrast Microscopy (PCM) on-site air monitoring during asbestos abatement activities from Wednesday, June 15, 2022 through Thursday, June 16, 2022 at the property location referenced above.

The asbestos abatement activities included asbestos-containing coating removal on the 60-inch force main pipe in the tunnel of the referenced property by the abatement contractor AT Abatement Services, Inc. During asbestos removal operations, EcoSafe performed industrial hygiene project oversight-surveillance and documented that all engineering controls and work practices were acceptable and within industry standards (see Attachment 2: Daily Logs for specific details).

EcoSafe collected a total of EIGHTEEN (18) phase contrast microscopy (PCM) air samples during this week. This included samples totaling: ONE (1) inside work area (IWA), FOUR (4) outside work area (OWA), THREE (3) negative air machine (NEG), FOUR (4) work shift personal (PERS), TWO (2) 30-minute excursion (EXC), and included FOUR (4) quality control blank samples. All sampling pumps were calibrated before and after all air sampling collection. The samples were then analyzed on-site per the NIOSH 7400 method.

Sincerely,

Jessica Raley 06/21/2022

Jessica Raley | DATE
Missouri Air Sampling Professional
Certification #7000032922MOAS21387
Asbestos Project Designer
Certification # 7011032522MOPDI21387

Attachment 2: Daily Log

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

PROJECT DAILY LOG

Client: Greg Nitcher
A.T. Abatement Services
4915 Stillwell Street
Kansas City, MO 64120

EcoSafe Project #: 2022.364.1EES
A.T. Abatement Project #: 22210017
Date: Wednesday, June 15, 2022

Project Location: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, Missouri 64120

Daily Scope of Work:

5:45 a.m. – EcoSafe Environmental Services, Inc. (EcoSafe) ASP, Jessica Raley, and AT Abatement Services, Inc. (ATA) workers Mitch Jones and Tyler Gooch, along with ATA supervisor, Tim Sullins, arrived on site.
5:50 a.m. – EcoSafe ASP was informed by ATA supervisor the containment was still in progress of being built and asbestos abatement on the 60-inch force main in the tunnel would begin in two hours.
8:00 a.m. – EcoSafe ASP performed a pre-abatement walk-through of containment prior to abatement activities with ATA supervisor. One area of detached poly on the bottom of the south wall was detected that needed to be resecured with tape/adhesive. ATA supervisor confirmed the workers would correct issue before abatement began.
8:35 a.m. – EcoSafe ASP attached a personal air pump to each worker, Mitch Jones, and Tyler Gooch, to act as a work shift personal (PERS) sample.
8:40 a.m – ATA worker began ACM coating removal, with personal air samples turned on and monitoring the workers' breathing zones.
9:00 a.m. – EcoSafe ASP began setting up air monitoring samples, including outside work area (OWA), negative air machine (NEG) and inside work area (IWA).
9:00 a.m. – EcoSafe ASTs, Sarah Miller and Elizabeth Snyder, arrived on site.
9:20 a.m. – EcoSafe ASP and ASTs entered containment and observed workers removing ACM coating using the abrasive blasting equipment. The workers were following proper engineering controls and work practices that met county, city, state, and federal regulations.
11:30 a.m. – EcoSafe and ATA left jobsite for lunch.
12:30 p.m. – EcoSafe and ATA returned to jobsite from lunch.
12:30 p.m. – EcoSafe ASP met with ATA supervisor for an update on the scope of work for the rest of the workday. ASP was informed the workers would continue removing the ACM coating. The workers were on schedule to begin bagging ACM and loading out tomorrow afternoon.
12:35 p.m. – EcoSafe ASP attached a personal pump to each worker, Mitch Jones, and Tyler Gooch, to act as a 30-minute excursion sample (EXC) during the height of asbestos abatement.
12:40 p.m. – ATA workers continued ACM coating abatement inside of the containment.

12:50 p.m. – EcoSafe ASP informed ATA supervisor of a moderate water leak inside of the cleanroom. ATA supervisor was aware of the issue and was in the process of correcting the leak. ATA supervisor advised the water was not contaminated water emitting from the containment, but instead was the clean water for the shower due to an issue with the seal on the hose.
1:05 p.m. – EcoSafe ASP collected the EXC sample from each worker and started the previous PERS sample.
2:30 p.m. – EcoSafe ASP informed ATA supervisor the water in the shower was not operational. ATA supervisor entered the cleanroom to begin correcting the issues.
3:00 p.m. – EcoSafe ASP and ASTs entered the containment to observe ATA workers performing abatement. EcoSafe notated the workers were continuing to use abrasive blasting equipment on the pipe while following all engineering controls and work practices met county, city, state, and federal regulations.
3:30 p.m. – EcoSafe ASP, Sarah Tuttle Scherr, arrived on site.
3:35 p.m. – EcoSafe ASP, Jessica Raley, and ASTs, Sarah Miller, and Elizabeth Snyder, left jobsite for the day.
3:55 p.m. – EcoSafe ASP began collecting PERS, OWA, IWA and NEG air samples.
4:00 p.m. – ATA workers began end of day clean-up.
4:30 p.m. – EcoSafe and ATA left jobsite for the day.

PROJECT DAILY LOG

Date: Wednesday, June 15, 2022

Engineering Controls:	Worker Tools:	Personal Protective Equipment:
X Decontamination Unit X Three Stage X Shower X Critical Barriers X Barrier Tape X Load Out □ Monometer □ Wastewater Filter X Control Curtains X Signs Other: _____	□ Hand Pressure Tools X Negative Air Machines How Many: 6 X HEPA Vacuums □ Amended Water □ Encapsulant □ Glove Bags XLadders X Mechanical Tools Specify: Amphi Blast	X Full Suit □ Double Suit X Boots X Gloves □ Half Mask APR X Full Face APR □ Powered APR □ Supplied Air Respirator □ SCBA X HEPA Cartridges □ Chemical Cartridges Other: _____

ECOSAFE ON-SITE PERSONNEL:
JESSICA RALEY —AIR SAMPLING PROFESSIONAL
SARAH TUTTLE SCHERR—AIR SAMPLING PROFESSIONAL
SARAH MILLER—AIR SAMPLING TECHNICIAN
ELIZABETH SNYDER —AIR SAMPLING TECHNICIAN

A.T. ABATEMENT SERVICES ON-SITE PERSONNEL:
SUPERVISOR: TIM SULLINS
NUMBER OF WORKERS: 2
NAMES OF WORKERS: MITCH JONES & TYLER GOOCH

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

PROJECT DAILY LOG

Client: Greg Nitcher
A.T. Abatement Services
4915 Stillwell Street
Kansas City, MO 64120

EcoSafe Project #: 2022.364.1EES
A.T. Abatement Project #: 22210017
Date: Thursday, June 16, 2022

Project Location: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, Missouri 64120

Daily Scope of Work:

6:00 a.m. – EcoSafe Environmental Services, Inc. (EcoSafe) ASP, Jessica Raley, and AT Abatement Services, Inc. (ATA) workers Mitch Jones and Tyler Gooch, along with ATA supervisor, Tim Sullins, arrived on site.
6:05 a.m. – EcoSafe ASP met with ATA supervisor to discuss the plan for the daily abatement activities. The workers would continue ACM coating removal on the 60-inch main force in the tunnel.
6:10 a.m. – EcoSafe ASP performed a pre-abatement walk-through of jobsite prior to abatement activities. No issues inside of the containment were notated and the abatement activities were approved to begin.
6:25 a.m. – EcoSafe ASP began setting up air monitoring samples, including outside work area (OWA) and negative air machine (NEG).
6:40 a.m. – ATA workers began ACM coating removal.
7:00 a.m. – EcoSafe ASP informed ATA supervisor the water in the shower was not operational. ATA supervisor was aware and advised the cleanroom shower water hose would remain off until the workers showered out for lunch and end of day cleanup.
7:30 a.m. – EcoSafe ASP began performing on-site PCM analysis for the air monitoring samples from the previous workday.
8:00 a.m. – EcoSafe ASTs, Sarah Miller and Elizabeth Snyder, arrived on site.
8:30 a.m. – EcoSafe ASP finished analyzing PCM samples and informed ATA supervisor of the results. The IWA samples were occluded due to normal abatement actives inside containment and would not be ran again. The NEG sample from negative air machine #2 was moderately occluded, while machine #1 was not. EcoSafe ASP suggested replacing the negative air machine pre-filters more often and checking the HEPA filter to confirm the filter was still properly in place. The OWA and NEG samples were under the permissible exposure limit and met clearance criteria.

10:00 a.m. – EcoSafe ASP and ASTs entered the containment and observed the workers following safe work practices and proper engineering controls that met county, city, state and federal regulations.
11:10 a.m. – EcoSafe ASP confirmed the cleanroom shower was operational prior to lunch cleanup.
11:15 a.m. – EcoSafe and ATA left jobsite for lunch.
12:15 p.m. – EcoSafe and ATA returned to jobsite from lunch.
12:40 p.m. – ATA workers continued ACM coating removal.
12:45 p.m. – EcoSafe ASP met with ATA supervisor to discuss the scope of work for the remaining workday. The workers were on track to continue asbestos abatement on the 60-inch force main until later this afternoon, when the workers would begin bagging the ACM coating.
1:30 p.m. – EcoSafe ASTs left the jobsite for the day
2:00 p.m. – EcoSafe ASP attached a personal pump to each worker, Mitch Jones, and Tyler Gooch, to monitor their breathing zones.
2:15 p.m. – EcoSafe ASP entered the containment and observed workers bagging ACM coating, using proper wet methods. EcoSafe ASP observed one area of poly that had separated from the wall. ASP informed ATA supervisor and workers who began correcting the issue immediately.
2:45 p.m. – EcoSafe ASP conducted a walk-through of the exterior containment and notated multiple small areas of poly that were separated from the tape. These areas of poly contained blasting material on the exterior side of the containment. EcoSafe ASP informed ATA supervisor, who then had the workers re-seal the poly and HEPA vacuum.
3:45 p.m. – EcoSafe ASP began collecting the PERS, OWA and NEG and air samples.
4:00 p.m. – ATA workers began end of day clean up. EcoSafe AST confirmed the cleanroom shower was operational prior to workers exiting containment.
4:30 p.m. – ATA left jobsite for the day. EcoSafe ASP began on-site PCM analysis.
5:00 p.m. – EcoSafe ASP finished analyzing the PCM samples. All samples, PERS, OWA and NEG, were under the permissible exposure limit and met clearance criteria.
5:15 p.m. – EcoSafe ASP left jobsite for the day.

PROJECT DAILY LOG

Date: Thursday, June 16, 2022

Engineering Controls:	Worker Tools:	Personal Protective Equipment:
X Decontamination Unit X Three Stage X Shower X Critical Barriers X Barrier Tape X Load Out □ Monometer □ Wastewater Filter X Control Curtains X Signs Other: _____	□ Hand Pressure Tools X Negative Air Machines How Many: 6 X HEPA Vacuums □ Amended Water □ Encapsulant □ Glove Bags XLadders X Mechanical Tools Specify: Amphi Blast	X Full Suit □ Double Suit X Boots X Gloves □ Half Mask APR X Full Face APR □ Powered APR □ Supplied Air Respirator □ SCBA X HEPA Cartridges □ Chemical Cartridges Other: _____

ECOSAFE ON-SITE PERSONNEL:
JESSICA RALEY —AIR SAMPLING PROFESSIONAL
SARAH MILLER—AIR SAMPLING TECHNICIAN
ELIZABETH SNYDER —AIR SAMPLING TECHNICIAN

A.T. ABATEMENT SERVICES ON-SITE PERSONNEL:
SUPERVISOR: TIM SULLINS
NUMBER OF WORKERS: 2
NAMES OF WORKERS: MITCH JONES & TYLER GOOCH

Attachment 3: PCM Analytical Results

ECOSAFE
Environmental Services, Inc.

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street Kansas
City, MO 64210

Project: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, MO 64120

Collection Date: Wednesday, 06/15/2022

Date Analyzed: Thursday, 06/16/2022

Project #: 2022.364.1EES

AT Abatement Project #: 2210017

Abatement Activity: Asbestos Containing Material (ACM) Coating Removal

Sample ID	Sample Type /Location	Time On	Time Off	Time On	Time Off	Minutes	Average Flow Rate	Volume (Liter)	Fiber Count	Fibers/mm^2	Fibers/cc
7300-IWA-1	PCM Inside Work Area: East Corner	9:29	4:15	—	—	406	4 L	1,624 L	5.0 /100	6.37	0.0015
7300-OWA-1	PCM Outside Work Area: Cleanroom Entrance	8:57	4:29	—	—	452	4 L	1,808 L	OCCLUDED	OCCLUDED	OCCLUDED
7300-NEG-1	PCM Negative Air Machine: Machine # 1	9:20	4:24	—	—	424	4 L	1,696 L	1.0/100	1.27	0.0003
7300-NEG-2	PCM Negative Air Machine: Machine # 2	9:20	4:24	—	—	424	4 L	1,696 L	10.5/100	13.38	0.0030
7300-PERS-1	PCM Work Shift Personal: Tyler Gooch	8:51	1:00	1:37	4:20	412	2 L	824 L	OCCLUDED	OCCLUDED	OCCLUDED
7300-PERS-2	PCM Work Shift Personal: Mitch Jones	8:50	1:00	1:35	4:20	415	2 L	830 L	OCCLUDED	OCCLUDED	OCCLUDED
7300-EXC-1	PCM 30-Minute Excursion: Tyler Gooch	1:01	1:31	—	—	30	2 L	60 L	OCCLUDED	OCCLUDED	OCCLUDED
7300-EXC-2	PCM 30-Minute Excursion: Mitch Jones	1:02	1:32	—	—	30	2 L	60 L	OCCLUDED	OCCLUDED	OCCLUDED
7300-BLK-1	PCM Control—Field Blank	—	—	—	—	—	—	—	00/100	0.00	0.0000
7300-BLK-2	PCM Control—Lab Blank	—	—	—	—	—	—	—	00/100	0.00	0.0000

Jessica Raley 06/16/2022
Jessica Raley | DATE
Missouri Air Sampling Professional
Certification # 7000032922MOAS21387

OWA—Outside Work Area	CLNR—Clean Room
IWA—Inside Work Area	BGO—Bag Out
HEPA—Negative Air Exhaust	CLR—Clearance
STEL—Short Term Exposure Limit	AMB—Ambient (exterior)
PERS—Work Shift Personal	BKGD—Background
PCM—Phase Contrast Microscopy	BLK—Blank

PCM Clearance Criteria: 0.01 F/cc
Permissible Exposure Limit: 0.1 F/cc

ECOSAFE
Environmental Services, Inc.

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street Kansas
City, MO 64210

Project: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, MO 64120

Collection Date: Thursday, 06/16/2022

Date Analyzed: Thursday, 06/16/2022

Project #: 2022.364.1EES

AT Abatement Project #: 2210017

Abatement Activity: Asbestos Containing Material (ACM) Coating Removal

Sample ID	Sample Type /Location	Time On	Time Off	Time On	Time Off	Minutes	Average Flow Rate	Volume (Liter)	Fiber Count	Fibers/mm^2	Fibers/cc
7300-OWA-1	PCM Outside Work Area: Inside Cleanroom	6:41	3:42	—	—	541	4 L	2,164 L	3.5 /100	4.46	0.0008
7300-OWA-2	PCM Outside Work Area: Load-Out Entrance	6:52	3:40	—	—	528	4 L	2,112 L	1.5 /100	1.91	0.0003
7300-OWA-3	PCM Outside Work Area: Cleanroom Entrance	6:44	1:53	—	—	429	4 L	1,716 L	2.0/100	2.55	0.0006
7300-NEG-1	PCM Negative Air Machine: Machine # 3	6:50	3:30	—	—	520	4 L	2,080 L	1.0/100	1.27	0.0002
7300-PERS-1	PCM Work Shift Personal: Tyler Gooch	1:55	4:25	—	—	150	2 L	300 L	5.5/100	7.01	0.0090
7300-PERS-2	PCM Work Shift Personal: Mitch Jones	1:57	4:25	—	—	148	2 L	296 L	17/100	21.66	0.0282
7300-BLK-1	PCM Control—Field Blank	—	—	—	—	—	—	—	00/100	0.00	0.0000
7300-BLK-2	PCM Control—Lab Blank	—	—	—	—	—	—	—	00/100	0.00	0.0000

Jessica Raley 06/16/2022
Jessica Raley | DATE
Missouri Air Sampling Professional
Certification # 7000032922MOAS21387

OWA—Outside Work Area	CLNR—Clean Room
IWA—Inside Work Area	BGO—Bag Out
HEPA—Negative Air Exhaust	CLR—Clearance
STEL—Short Term Exposure Limit	AMB—Ambient (exterior)
PERS—Work Shift Personal	BKGD—Background
PCM—Phase Contrast Microscopy	BLK—Blank

PCM Clearance Criteria: 0.01 F/cc
Permissible Exposure Limit: 0.1 F/cc

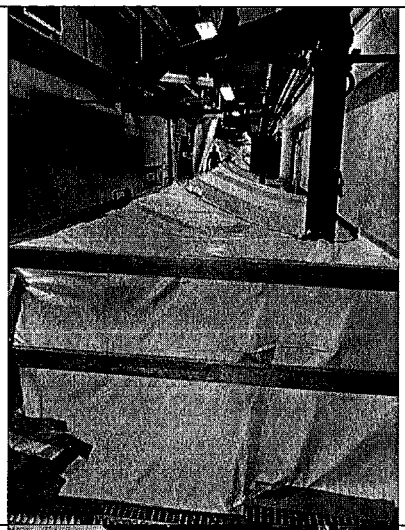
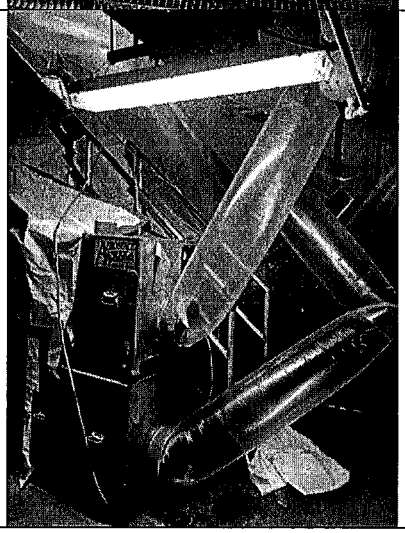
Attachment 4: Photo Log

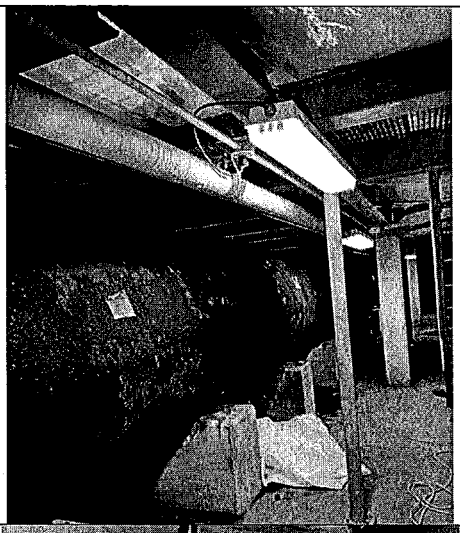
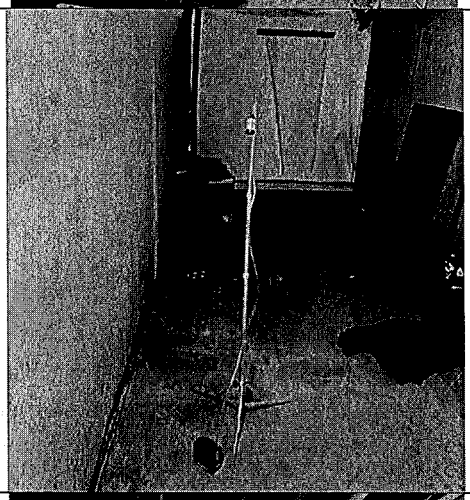
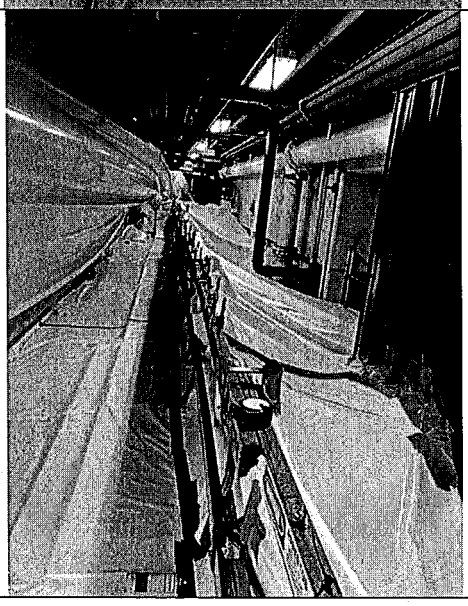
ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

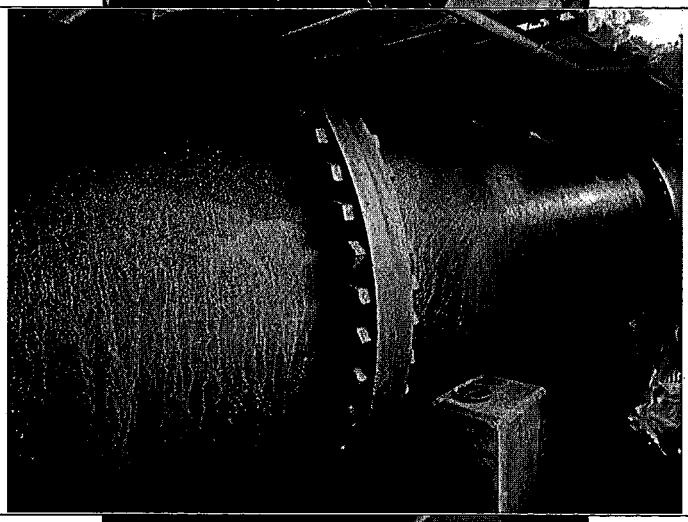
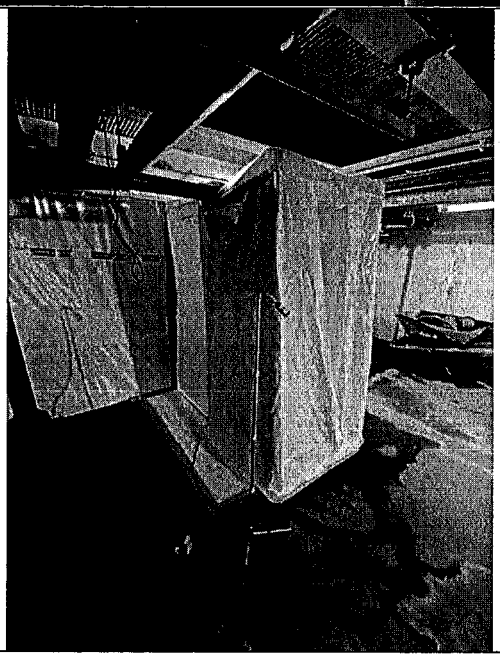
Photographic Documentation

Client: AT Abatement Services, Inc.
Site Name: Blue River Wastewater Treatment Plant
Location: 7300 Hawthorne Rd, Kansas City, MO 64120

Prepared by: Jessica Raley
Project Number: 22210017
Dates: 06/15/2022-06/16/2022

Photograph No. 1 **Date:** 06/15/2022 **Description:** Secured Containment			
Photograph No. 2 **Date:** 06/15/2022 **Description:** Negative Air Machines			

Photograph No. 3 **Date:** 06/15/2022 **Description:** 60-inch Force Main Pipe, Pre-Abatement		
Photograph No. 4 **Date:** 06/15/2022 **Description:** Air Sample – OWA: Cleanroom Entrance		
Photograph No. 5 **Date:** 06/16/2022 **Description:** Secured Containment		

Photograph No. 6 **Date:** 06/16/2022 **Description:** Bagging ACM Coating	
Photograph No. 7 **Date:** 06/16/2022 **Description:** 60-inch Force Main, During Abatement	
Photograph No. 8 **Date:** 06/16/2022 **Description:** Air Sample – OWA: Load-Out Entrance	

Attachment 5: Personnel Certifications

CERTIFICATION NUMBER:

7000032922MOAS21387

THIS CERTIFIES

Jessica Raley

HAS COMPLETED THE CERTIFICATION

REQUIREMENTS FOR

Air Sampling Professional



APPROVED **03/29/2022**

Director of Air Pollution Control Program

CERTIFICATION NUMBER:

7011032522MOPDI21387

THIS CERTIFIES

Jessica Raley

HAS COMPLETED THE CERTIFICATION

REQUIREMENTS FOR

Project Designer



APPROVED: **03/29/2022**

EXPIRES **03/29/2023**

TRAINING DATE: **03/25/2022**

Director of Air Pollution Control Program

CERTIFICATION NUMBER:

7011040822MOSI21387

THIS CERTIFIES

Jessica Raley

HAS COMPLETED THE CERTIFICATION

REQUIREMENTS FOR

Supervisor

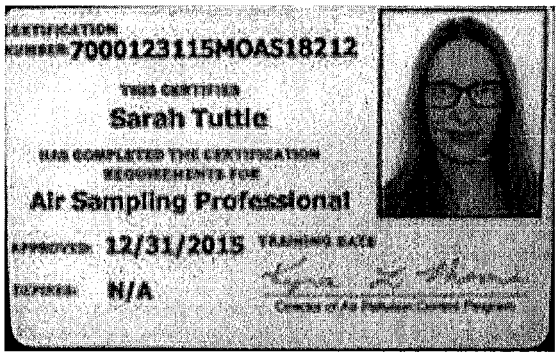


APPROVED **06/23/2022**

EXPIRES: **04/08/2023**

TRAINING DATE **04/08/2022**

Director of Air Pollution Control Program


CERTIFICATION NUMBER 7000123115MOAS18212
THIS CERTIFIES
Sarah Tuttle
HAS COMPLETED THE CERTIFICATION REQUIREMENTS FOR
Air Sampling Professional
APPROVED: 12/31/2015
TRAINING DATE
EXPIRES: N/A

TITAN ENVIRONMENTAL SERVICES
CONSULTING & TESTING
ABATEMENT & DEMOLITION

A FULL SERVICE ENVIRONMENTAL CONSULTING AND TESTING FIRM

Certificate of Completion

Sarah Miller

HAS SUCCESSFULLY COMPLETED
THE SAMPLING & EVALUATION OF AIRBORNE ASBESTOS DUST
A NIOSH 582 EQUIVALENCY COURSE

CERTIFICATE #: NIOSH582-4510287

LOCATION: KANSAS CITY, KS

KARLA GRANGER, PROGRAM COORDINATOR

JUNE 6-10, 2022

TITAN
CONSULTING & TESTING
ENVIRONMENTAL SERVICES
ABATEMENT & DEMOLITION

A FULL SERVICE ENVIRONMENTAL CONSULTING AND TESTING FIRM

Certificate of Completion

Elizabeth Snyder

HAS SUCCESSFULLY COMPLETED
THE SAMPLING & EVALUATION OF AIRBORNE ASBESTOS DUST
A NIOSH 582 EQUIVALENCY COURSE

CERTIFICATE #: NIOSH582-4514054

LOCATION: KANSAS CITY, KS

KARLA GRANGER, PROGRAM COORDINATOR

JUNE 6-10, 2022

INDUSTRIAL HYGIENE PROJECT OVERSIGHT REPORT
June 28th, 2022

Prepared by:

ECOSAFE
Environmental Services, Inc.
215 W 18th St, Suite 150, Kansas City, Missouri 64108

For:

Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

Project:

Industrial Hygiene Project Oversight Report
Blue River Wastewater Treatment Plant
60-inch Force Main Project
7300 Hawthorne Road
Kansas City, Missouri 64120

June 28, 2022

CLIENT: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

PROJECT: Industrial Hygiene Project Oversight Report
Blue River Wastewater Treatment Plant
60-inch Force Main Project
7300 Hawthorne Road
Kansas City, Missouri 64120

ECOSAFE PROJECT NO.: 2022.364.2EES

REPORT PREPARED BY: Jessica Raley

Jessica Raley
Missouri Air Sampling Professional
Certification # 7000032922MOAS21387
Asbestos Project Designer
Certification # 7011032522MOPDI21387
Asbestos Supervisor
Certification # 7011040822MOSI21387

CONTACT INFORMATION:

EcoSafe Environmental Services, Inc.
215 W 18th Street, Suite 150
Kansas City, MO 64108
Tel: (816) 598-4111 / (270) 315-0057
E-mail: Jessica@EcoSafeKC.com

Attachments:

1. Weekly Project Oversight Summary
2. Daily Logs
3. PCM Analytical Results
4. Photo Log
5. Personnel Certifications

Attachment 1: Weekly Project Oversight Summary

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

June 28, 2022

RE: Weekly Industrial Hygiene Project Oversight Report
Blue River Wastewater Treatment Plant
60-inch Force Main Project
7300 Hawthorne Road
Kansas City, Missouri 64120

Dear Mr. Nitcher,

EcoSafe Environmental Services Inc. is pleased to provide you with this weekly update report regarding the on-going project referenced above. EcoSafe provided project oversight and Phase Contrast Microscopy (PCM) on-site air monitoring during asbestos abatement activities from Monday, June 20, 2022 through Thursday, June 23, 2022 at the property location referenced above.

The asbestos abatement activities included asbestos-containing coating removal on the 60-inch force main pipe in the tunnel of the referenced property by the abatement contractor AT Abatement Services, Inc. During asbestos removal operations, EcoSafe performed industrial hygiene project oversight-surveillance and documented that all engineering controls and work practices were acceptable and within industry standards (see Attachment 2: Daily Logs for specific details).

EcoSafe collected a total of THIRTY-ONE (31) phase contrast microscopy (PCM) air samples during this week. This included samples totaling: TWELVE (12) outside work area (OWA), SEVEN (7) negative air machine (NEG), TWO (2) work shift personal (PERS), TWO (2) 30-minute excursion (EXC), and included EIGHT (8) quality control blank samples. All sampling pumps were calibrated before and after all air sampling collection. The samples were then analyzed on-site per the NIOSH 7400 method.

Sincerely,

Jessica Raley 06/28/2022
Jessica Raley | DATE
Missouri Air Sampling Professional
Certification #7000032922MOAS21387
Asbestos Project Designer
Certification # 7011032522MOPDI21387

Attachment 2: Daily Log

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

PROJECT DAILY LOG

Client: Greg Nitcher
AT Abatement Services, Inc,
4915 Stillwell Street
Kansas City, MO 64120

EcoSafe Project #: 2022.364.2EES
A.T. Abatement Project #: 22210017
Date: Monday, June 20, 2022

Project Location: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, Missouri 64120

Daily Scope of Work:

6:00 a.m. – EcoSafe Environmental Services, Inc. (EcoSafe) ASP, Jessica Raley, ATA Abatement Services, Inc. (ATA) workers Mitch Jones and Tyler Gooch, and ATA supervisor, Tim Sullins, arrived on site.
6:15 a.m. – EcoSafe ASP met with ATA supervisor to discuss the plan for abatement activities. EcoSafe ASP was informed that the workers would start preparing the designated ACM dumpster for load-out. The workers would then continue to bag ACM coating until mid-day when they would begin loading-out the ACM bags into the dumpster.
6:25 a.m. – EcoSafe ASP attached a personal air sample to each worker, Mitch Jones and Tyler Gooch, to monitor their breathing zones during asbestos abatement activities.
6:30 a.m. – EcoSafe ASP performed a pre-abatement walk-through of the containment prior to abatement activities. EcoSafe ASP notated four areas of poly that had separated due to humidity and moisture within the containment. Each of these issues were communicated to the ATA supervisor and workers who began correcting issues before beginning abatement activities.
6:40 a.m. – EcoSafe ASP began setting up OWA air samples. One sample was positioned on the main level, near areas of concern from continuous poly separation to monitor possible fiber release.
8:00 a.m. – EcoSafe ASP entered containment and observed ATA workers bagging ACM coating prior to load-out. The workers were following safe work practices and proper engineering controls.
10:30 a.m. – EcoSafe ASP conducted an exterior containment walk-through and observed three areas of detached poly on the main level, with blasting material on the top side of the containment. EcoSafe ASP notified ATA supervisor who informed ASP the issue would be resolved, and the material would be HEPA vacuumed.
11:30 a.m. – EcoSafe and ATA left jobsite for lunch.
12:30 p.m. – EcoSafe and ATA returned to jobsite from lunch.

12:35 p.m. – EcoSafe ASP met with ATA supervisor to discuss the plan for the rest of the workday. ATA supervisor advised the workers finished double bagging the ACM and would begin loading-out to the designated dumpster shortly.
12:55 p.m. – EcoSafe ASP attached a personal pump to each worker, Mitch Jones and Tyler Gooch, to act as a 30-minute excursion sample (EXC).
1:00 p.m. - ATA began loading-out ACM bags into the designated dumpster. EcoSafe ASP observed the workers following safe work practices and proper engineering controls while conducting load-out activities.
1:40 p.m. – EcoSafe ASP collected the EXC sample from each worker and resumed the previous PERS sample from the day.
3:30 p.m. – EcoSafe ASP began collecting PERS and OWA air samples. EcoSafe ASP began on-site PCM analysis for the daily samples.
4:00 p.m. – ATA workers began end of day clean-up.
4:20 p.m. – EcoSafe ASP finished analyzing the PCM samples. All samples, PERS, EXC and OWA were under the permissible exposure limit and met clearance criteria.
4:30 p.m. – EcoSafe and ATA left jobsite for the day.

PROJECT DAILY LOG

Date: Monday, June 20, 2022

Engineering Controls:	Worker Tools:	Personal Protective Equipment:
X Decontamination Unit X Three Stage X Shower X Critical Barriers X Barrier Tape X Load Out □ Monometer □ Wastewater Filter X Control Curtains X Signs Other: _____	□ Hand Pressure Tools X Negative Air Machines How Many: 6 X HEPA Vacuums □ Amended Water □ Encapsulant □ Glove Bags XLadders X Mechanical Tools Specify: Amphi Blast	X Full Suit □ Double Suit X Boots X Gloves □ Half Mask APR X Full Face APR □ Powered APR □ Supplied Air Respirator □ SCBA X HEPA Cartridges □ Chemical Cartridges Other: _____

ECOSAFE ON-SITE PERSONNEL:
JESSICA RALEY —AIR SAMPLING PROFESSIONAL

A.T. ABATEMENT SERVICES ON-SITE PERSONNEL:

SUPERVISOR: TIM SULLINS
NUMBER OF WORKERS: 2
NAMES OF WORKERS: MITCH JONES & TYLER GOOCH

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

PROJECT DAILY LOG

Client: Greg Nitcher
AT Abatement Services, Inc,
4915 Stillwell Street
Kansas City, MO 64120

EcoSafe Project #: 2022.364.2EES
A.T. Abatement Project #: 22210017
Date: Tuesday, June 21, 2022

Project Location: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, Missouri 64120

Daily Scope of Work:

6:00 a.m. – EcoSafe Environmental Services, Inc. (EcoSafe) ASP, Jessica Raley, AT Abatement Services, Inc. (ATA) worker Tyler Gooch, and ATA supervisor, Tim Sullins, arrived on site.
6:10 a.m. – EcoSafe ASP met with ATA supervisor to discuss the daily plan for abatement activities. EcoSafe ASP was informed that the worker would continue ACM coating removal on the 60-inch force main pipe in the tunnel. ACM removal was expected to continue until Thursday, when bagging ACM coating would start.
6:15 a.m. – EcoSafe ASP performed a pre-abatement walk-through of the containment prior to abatement activities. EcoSafe ASP notated two areas of poly that had separated from the wall. Each of these issues were communicated to the ATA supervisor and workers who began correcting issues before beginning abatement activities.
6:40 a.m. – EcoSafe ASP began setting up outside work area (OWA) and negative air machine (NEG) air samples. One sample was positioned on the main level, near areas of concern from poly separation to monitor fiber release.
8:30 a.m. – EcoSafe ASP entered containment and observed ATA worker removing ACM coating with the Amphi Blast, following safe work practices and proper engineering controls.
10:00 a.m. – EcoSafe ASP observed the poly in the cleanroom detaching from the corner of the ceiling. EcoSafe ASP informed ATA supervisor.
11:15 a.m. – EcoSafe ASP conducted pre-lunch containment walk-through and determined that there were no deficiencies, and the containment was secure.
11:30 a.m. – EcoSafe and ATA left jobsite for lunch.
12:30 p.m. – EcoSafe and ATA returned to jobsite from lunch.
12:45– EcoSafe ASP and ATA supervisor discussed the scope of work for the rest of the day. The worker would continue to remove ACM coating.

1:35 a.m. – EcoSafe ASP entered the containment to check on the progress of the ACM coating removal. EcoSafe ASP observed the worker following proper engineering controls and work practices that met county, city, state, and federal regulations.
3:00 p.m. – EcoSafe ASP conducted an exterior containment walk-through and notated separated areas of poly/tape with blasting material and water on top of the poly. ATA supervisor informed worker to pause ACM coating removal until the areas were HEPA vacuumed and the holes in containment were corrected.
3:30 p.m. – EcoSafe ASP began collecting OWA and NEG air samples. When collected the samples, EcoSafe notated that the NEG sample was on the floor instead of the machine. This sample was not analyzed.
4:00 p.m. – ATA workers began end of day clean-up. EcoSafe ASP began on-site PCM analysis for the daily samples.
4:30 p.m. – ATA left jobsite for the day.
4:40 p.m. – EcoSafe ASP finished analyzing the PCM samples. The OWA samples located at the entrance of the load-out and the main level had higher than average fiber counts. All OWA samples were under the permissible exposure limit and met clearance criteria.
4:45 p.m. – EcoSafe and ATA left jobsite for the day.

PROJECT DAILY LOG

Date: Tuesday, June 21, 2022

Engineering Controls:	Worker Tools:	Personal Protective Equipment:
X Decontamination Unit X Three Stage X Shower X Critical Barriers X Barrier Tape X Load Out □ Monometer □ Wastewater Filter X Control Curtains X Signs Other: _____	□ Hand Pressure Tools X Negative Air Machines How Many: 6 X HEPA Vacuums □ Amended Water □ Encapsulant □ Glove Bags XLadders X Mechanical Tools Specify: Amphi Blast	X Full Suit □ Double Suit X Boots X Gloves □ Half Mask APR X Full Face APR □ Powered APR □ Supplied Air Respirator □ SCBA X HEPA Cartridges □ Chemical Cartridges Other: _____

ECOSAFE ON-SITE PERSONNEL:
JESSICA RALEY —AIR SAMPLING PROFESSIONAL

A.T. ABATEMENT SERVICES ON-SITE PERSONNEL:
SUPERVISOR: TIM SULLINS
NUMBER OF WORKERS: 1
NAMES OF WORKERS: TYLER GOOCH

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

PROJECT DAILY LOG

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

EcoSafe Project #: 2022.364.2EES
A.T. Abatement Project #: 22210017
Date: Wednesday, June 22, 2022

Project Location: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, Missouri 64120

Daily Scope of Work:

6:00 a.m. – EcoSafe Environmental Services, Inc. (EcoSafe) ASP, Jessica Raley, AT Abatement Services, Inc. (ATA) workers Tyler Gooch and Mitch Jones, and ATA supervisor, Tim Sullins, arrived on site.
6:05 a.m. – EcoSafe ASP and ATA supervisor discussed the scope of work for the day. ATA supervisor advised the ACM coating removal would continue on the 60-inch force main in the tunnel.
6:10 – EcoSafe ASP informed ATA supervisor yesterday's OWA samples located at the entrance of the load-out and the main level had high fiber counts.
6:15 a.m. – EcoSafe ASP performed a pre-abatement walk-through of jobsite prior to abatement activities. EcoSafe ASP observed ATA workers re-securing poly. EcoSafe ASP informed ATA supervisor and workers of two areas with loose poly/tape that were corrected.
6:30 a.m. – EcoSafe ASP began setting up outside work area (OWA) and negative air machine (NEG) air samples.
9:00 a.m. – EcoSafe ASP entered containment and observed one ATA worker removing ACM coating with the Amphi Blast and the other worker cleaning up loose ACM. Each worker was following proper engineering controls and work practices that met county, city, state, and federal regulations.
10:15 a.m. – EcoSafe ASP informed ATA supervisor loose blasting material and water was on the top side of the containment. ATA supervisor was aware, and workers were in the process of correcting.
11:00 a.m. – ATA supervisor instructed the workers to conduct a pre-lunch containment walk-through and correct any issues. Negative air machine pre-filters were changed.
11:30 a.m. – EcoSafe and ATA left jobsite for lunch.
12:30 p.m. – EcoSafe and ATA returned to jobsite from lunch.

12:50 p.m. – EcoSafe ASP met with ATA supervisor to discuss the plan for the rest of the day and remaining week. ATA workers were scheduled to continue ACM coating removal until tomorrow midday when they would start bagging the loose ACM in preparation for load-out on the following Monday.
2:00 p.m. – EcoSafe ASP conducted an exterior containment walk-through and notated no deficiencies.
3:45 p.m. – EcoSafe ASP began collecting OWA and NEG air samples.
4:00 p.m. – ATA workers began end of day clean-up. EcoSafe ASP began on-site PCM analysis for the daily samples.
4:30 p.m. – ATA left jobsite for the day.
4:35 p.m. – EcoSafe ASP finished analyzing the PCM samples. The OWA sample located on the main level, above the containment, was occluded and unable to be analyzed. The OWA sample located in the cleanroom was slightly occluded and had above average fiber counts for this area. The OWA readable samples were under the permissible exposure limit and met clearance criteria.
4:45 p.m. – EcoSafe left jobsite for the day.

PROJECT DAILY LOG

Date: Wednesday, June 22, 2022

Engineering Controls:	Worker Tools:	Personal Protective Equipment:
X Decontamination Unit X Three Stage X Shower X Critical Barriers X Barrier Tape X Load Out □ Monometer □ Wastewater Filter X Control Curtains X Signs Other: _____	□ Hand Pressure Tools X Negative Air Machines How Many: 6 X HEPA Vacuums □ Amended Water □ Encapsulant □ Glove Bags XLadders X Mechanical Tools Specify: Amphi Blast	X Full Suit □ Double Suit X Boots X Gloves □ Half Mask APR X Full Face APR □ Powered APR □ Supplied Air Respirator □ SCBA X HEPA Cartridges □ Chemical Cartridges Other: _____

ECOSAFE ON-SITE PERSONNEL:
JESSICA RALEY —AIR SAMPLING PROFESSIONAL

A.T. ABATEMENT SERVICES ON-SITE PERSONNEL:

SUPERVISOR: TIM SULLINS
NUMBER OF WORKERS: 2
NAMES OF WORKERS: MITCH JONES & TYLER GOOCH

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

PROJECT DAILY LOG

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

EcoSafe Project #: 2022.364.2EES
A.T. Abatement Project #: 22210017
Date: Thursday, June 23, 2022

Project Location: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, Missouri 64120

Daily Scope of Work:

6:00 a.m. – EcoSafe Environmental Services, Inc. (EcoSafe) ASP, Jessica Raley, AT Abatement Services, Inc, (ATA) workers Tyler Gooch and Mitch Jones, and ATA supervisor, Tim Sullins, arrived on site.
6:10 a.m. – EcoSafe ASP and ATA supervisor met to discuss the scope of work for the day. The workers would be continuing the ACM coating removal would continue on the 60-inch force main in the tunnel, until 2:00 p.m. when they would begin bagging the ACM for weekend cleanup.
6:15 a.m. – EcoSafe ASP informed ATA supervisor about yesterday's OWA sample.
6:20 a.m. – EcoSafe ASP performed a pre-abatement walk-through of the containment prior to abatement activities. No deficiencies were observed, and the abatement was approved to begin.
6:35 a.m. – EcoSafe ASP began setting up outside work area (OWA) and negative air machine (NEG) air samples.
9:00 a.m. – ATA workers were continuing to remove ACM coating with the Amphi Blast and cleaning up the loose ACM in preparation for bagging this afternoon.
9:10 a.m. – EcoSafe ASP turned off the load-out and main level sampling pumps due to dust and debris from surrounding work from other trades.
9:30 a.m. – ATA project manager, Mark Yarnell, arrived on site to drop off a Triger Deadman replacement so each worker could use the Amphi Blast simultaneously.
10:15 a.m. – EcoSafe ASP conducted a containment walk-through and noted no deficiencies.
11:30 a.m. – EcoSafe and ATA left jobsite for lunch.
12:30 p.m. – EcoSafe and ATA returned to jobsite from lunch.
12:50 p.m. – EcoSafe ASP met with ATA supervisor to discuss the plan for the rest of the day. The workers were continuing with ACM coating removal and were on track to stop removal at 2:00 p.m. to begin bagging the ACM.
2:15 p.m. – EcoSafe ASP entered the containment and observed the workers bagging loose ACM coating while following proper engineering controls and work practices.
3:50 p.m. – EcoSafe ASP began collecting OWA and NEG air samples.

4:00 p.m. – ATA workers began end of day clean-up. EcoSafe ASP began on-site PCM analysis for the daily samples.
4:30 p.m. – ATA left jobsite for the day.
4:40 p.m. – EcoSafe ASP finished analyzing the PCM samples. The NEG sample on negative air machine #2 had significantly elevated fiber counts, 28.5/100. All samples were under the permissible exposure limit and met clearance criteria.
4:50 p.m. – EcoSafe left jobsite for the day.

PROJECT DAILY LOG

Date: Thursday, June 23, 2022

Engineering Controls:	Worker Tools:	Personal Protective Equipment:
X Decontamination Unit X Three Stage X Shower X Critical Barriers X Barrier Tape X Load Out □ Monometer □ Wastewater Filter X Control Curtains X Signs Other: _____	□ Hand Pressure Tools X Negative Air Machines How Many: 6 X HEPA Vacuums □ Amended Water □ Encapsulant □ Glove Bags XLadders X Mechanical Tools Specify: Amphi Blast	X Full Suit □ Double Suit X Boots X Gloves □ Half Mask APR X Full Face APR □ Powered APR □ Supplied Air Respirator □ SCBA X HEPA Cartridges □ Chemical Cartridges Other: _____

ECOSAFE ON-SITE PERSONNEL:
JESSICA RALEY —AIR SAMPLING PROFESSIONAL

A.T. ABATEMENT SERVICES ON-SITE PERSONNEL:

SUPERVISOR: TIM SULLINS
NUMBER OF WORKERS: 2
NAMES OF WORKERS: MITCH JONES & TYLER GOOCH

Attachment 3: PCM Analytical Results

ECOSAFE
Environmental Services, Inc.

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64210

Collection Date: Monday, 06/20/2022
Date Analyzed: Monday, 06/20/2022
Project #: 2022.364.2EES
A.T. Abatement Project #: 2210017

Project: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, MO 64120

Abatement Activity: Asbestos Containing Material (ACM) Coating Removal

Sample ID	Sample Type /Location	Time On	Time Off	Time On	Time Off	Minutes	Average Flow Rate	Volume (Liter)	Fiber Count	Fibers/mm²	Fibers/cc
7300-OWA-1	PCM Outside Work Area: Main Level, Above Containment	6:57	3:59	—	—	542	4 L	2,168 L	1.5/100	1.91	0.0003
7300-OWA-2	PCM Outside Work Area: Load-Out Entrance	6:37	4:00	—	—	563	4 L	2,252 L	3.5/100	4.46	0.0008
7300-OWA-3	PCM Outside Work Area: Inside Cleanroom	6:24	4:02	—	—	578	4 L	2,312 L	0.5/100	0.64	0.0001
7300-PERS-1	PCM Work Shift Personal: Mitch Jones	6:30	12:50	1:30	4:00	530	2 L	1,060 L	10.5/100	13.38	0.0049
7300-PERS-2	PCM Work Shift Personal: Tyler Gooch	6:35	12:53	1:29	4:03	532	2 L	1,064 L	9.5/100	12.10	0.0044
7300-EXC-1	PCM 30-Minute Excursion: Mitch Jones	12:50	1:30	—	—	40	2 L	80 L	1.0/100	1.27	0.0061
7300-EXC-2	PCM 30-Minute Excursion: Tyler Gooch	12:53	1:29	—	—	36	2 L	72 L	2.5/100	3.18	0.0170
7300-BLK-1	PCM Control—Field Blank	—	—	—	—	—	—	—	00/100	0.00	0.0000
7300-BLK-2	PCM Control—Lab Blank	—	—	—	—	—	—	—	00/100	0.00	0.0000

Jessica Raley 06/20/2022
Jessica Raley | DATE
Missouri Air Sampling Professional
Certification # 7000032922MOAS21387

OWA—Outside Work Area	CLNR—Clean Room
IWA—Inside Work Area	BGO—Bag Out
HEPA—Negative Air Exhaust	CLR—Clearance
STEL—Short Term Exposure Limit	AMB—Ambient (exterior)
PERS—Work Shift Personal	BKGD—Background
PCM—Phase Contrast Microscopy	BLK—Blank

PCM Clearance Criteria: 0.01 F/cc
Permissible Exposure Limit: 0.1 F/cc

ECOSAFE
Environmental Services, Inc.

Client: Greg Nitcher
A.T. Abatement Services
4915 Stillwell Street
Kansas City, MO 64210

Collection Date: Tuesday, 06/21/2022
Date Analyzed: Tuesday, 06/21/2022
Project #: 2022.364.2EES
A.T. Abatement Project #: 2210017

Project: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, MO 64120

Abatement Activity: Asbestos Containing Material (ACM) Coating Removal

Sample ID	Sample Type /Location	Time On	Time Off	Minutes	Average Flow Rate	Volume (Liter)	Fiber Count	Fibers/mm^2	Fibers/cc
7300-OWA-1	PCM Outside Work Area: Main Level-Above Containment	6:31	4:06	575	4 L	2,300 L	21/100	26.75	0.0045
7300-OWA-2	PCM Outside Work Area: Load Out Entrance	6:26	4:04	578	4 L	2,312 L	16/100	20.38	0.0034
7300-OWA-3	PCM Outside Work Area: Inside Cleanroom	6:24	4:13	589	4 L	2,356 L	6.5/100	8.28	0.0014
7300-NEG-1	PCM Negative Air Exhaust: Machine #2	6:32	4:05	573	2 L	1,146 L	N/A	N/A	N/A
7300-BLK-1	PCM Control—Field Blank	—	—	—	—	—	00/100	0.00	0.0000
7300-BLK-2	PCM Control—Lab Blank	—	—	—	—	—	00/100	0.00	0.0000

Jessica Raley 06/21/2022
Jessica Raley | DATE
Missouri Air Sampling Professional
Certification # 7000032922MOAS21387

OWA—Outside Work Area	CLNR—Clean Room
IWA—Inside Work Area	BGO—Bag Out
NAG—Negative Air Exhaust	CLR—Clearance
STEL—Short Term Exposure Limit	AMB—Ambient (exterior)
PERS—Work Shift Personal	BKGD—Background
PCM—Phase Contrast Microscopy	BLK—Blank

PCM Clearance Criteria: 0.01 F/cc
Permissible Exposure Limit: 0.1 F/cc

ECOSAFE
Environmental Services, Inc.

Client: Greg Nitcher
A.T. Abatement Services
4915 Stillwell Street
Kansas City, MO 64210

Collection Date: Wednesday, 06/22/2022
Date Analyzed: Wednesday, 06/22/2022
Project #: 2022.364.2EES
A.T. Abatement Project #: 2210017

Project: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, MO 64120

Abatement Activity: Asbestos Containing Material (ACM) Coating Removal

Sample ID	Sample Type /Location	Time On	Time Off	Minutes	Average Flow Rate	Volume (Liter)	Fiber Count	Fibers/mm²	Fibers/cc
7300-OWA-1	PCM Outside Work Area: Main Level-Above Containment	6:29	3:46	557	4 L	2,228 L	OCCLUDED	OCCLUDED	OCCLUDED
7300-OWA-2	PCM Outside Work Area: Load Out Entrance	6:28	3:47	559	4 L	2,236 L	5/100	6.37	0.0011
7300-OWA-3	PCM Outside Work Area: Inside Cleanroom	6:22	3:49	567	4 L	2,312 L	18.5/100	23.57	0.0040
7300- NEG-1	PCM Negative Air Exhaust: Machine #2	6:32	3:40	548	4 L	2,192 L	7.5/100	9.55	0.0017
7300- NEG-2	PCM Negative Air Exhaust: Machine #6	6:40	3:40	540	4 L	2,160 L	0/100	0.00	0.0000
7300-NEG-3	PCM Negative Air Exhaust: Machine #4	6:41	3:40	539	4 L	2,156 L	0.5/100	0.64	0.0001
7300-BLK-1	PCM Control—Field Blank	—	—	—	—	—	00/100	0.00	0.0000
7300-BLK-2	PCM Control—Lab Blank	—	—	—	—	—	00/100	0.00	0.0000

Jessica Raley 06/22/2022
Jessica Raley | DATE
Missouri Air Sampling Professional
Certification # 7000032922MOAS21387

OWA—Outside Work Area	CLNR—Clean Room
IWA—Inside Work Area	BGO—Bag Out
HEPA—Negative Air Exhaust	CLR—Clearance
STEL—Short Term Exposure Limit	AMB—Ambient (exterior)
PERS—Work Shift Personal	BKGD—Background
PCM—Phase Contrast Microscopy	BLK—Blank

PCM Clearance Criteria: 0.01 F/cc
Permissible Exposure Limit: 0.1 F/cc

ECOSAFE
Environmental Services, Inc.

Client: Greg Nitcher
A.T. Abatement Services
4915 Stillwell Street
Kansas City, MO 64210

Collection Date: Thursday, 06/23/2022
Date Analyzed: Thursday, 06/23/2022
Project #: 2022.364.2EES
A.T. Abatement Project #: 2210017

Project: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, MO 64120

Abatement Activity: Asbestos Containing Material (ACM) Coating Removal

Sample ID	Sample Type /Location	Time On	Time Off	Minutes	Average Flow Rate	Volume (Liter)	Fiber Count	Fibers/mm^2	Fibers/cc
7300-OWA-1	PCM Outside Work Area: Main Level-Above Containment	6:40	9:48	188	4 L	752 L	5.5/100	7.01	0.0036
7300-OWA-2	PCM Outside Work Area: Load Out	6:38	9:48	190	4 L	760 L	0.5/100	0.64	0.0003
7300-OWA-3	PCM Outside Work Area: Inside Clean Room	6:36	3:37	541	4 L	2,164 L	1.5/100	1.91	0.0003
7300-NEG-1	PCM Negative Air Exhaust: Machine #2	6:43	3:48	545	4 L	2,180 L	28.5/100	36.31	0.0064
7300- NEG-2	PCM Negative Air Exhaust: Machine #5	6:43	3:48	545	4 L	2,180 L	0/100	0.00	0.0000
7300- NEG-3	PCM Negative Air Exhaust: Machine #3	6:45	3:48	543	4 L	2,172 L	0.5/100	0.64	0.0001
7300-BLK-1	PCM Control—Field Blank	—	—	—	—	—	00/100	0.00	0.0000
7300-BLK-2	PCM Control—Lab Blank	—	—	—	—	—	00/100	0.00	0.0000

Jessica Raley 06/23/2022
Jessica Raley | DATE
Missouri Air Sampling Professional
Certification # 7000032922MOAS21387

OWA—Outside Work Area	CLNR—Clean Room
IWA—Inside Work Area	BGO—Bag Out
HEPA—Negative Air Exhaust	CLR—Clearance
STEL—Short Term Exposure Limit	AMB—Ambient (exterior)
PERS—Work Shift Personal	BKGD—Background
PCM—Phase Contrast Microscopy	BLK—Blank

PCM Clearance Criteria: 0.01 F/cc
Permissible Exposure Limit: 0.1 F/cc

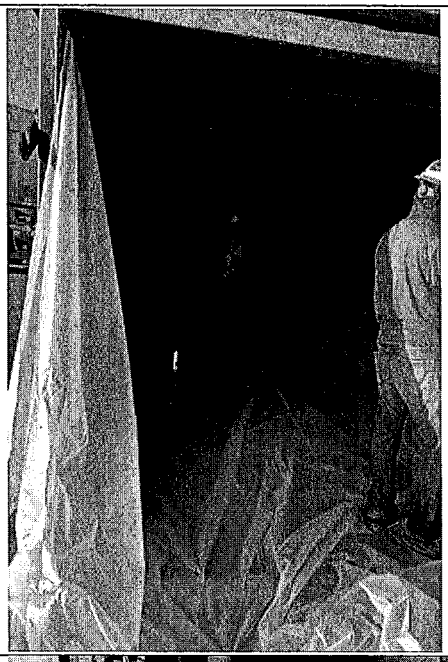
Attachment 4: Photo Log

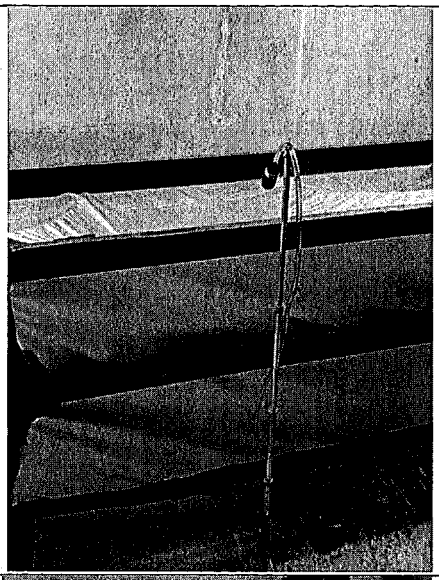
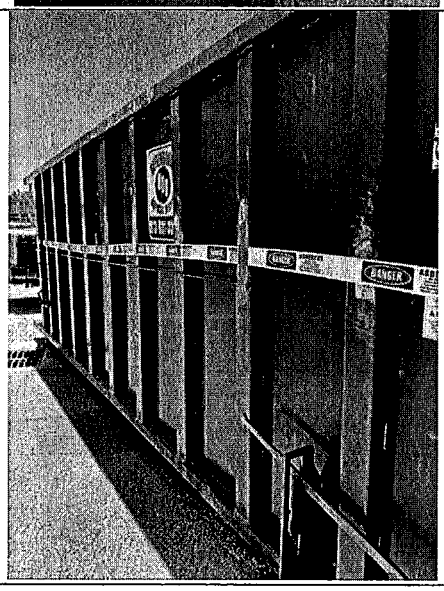
ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

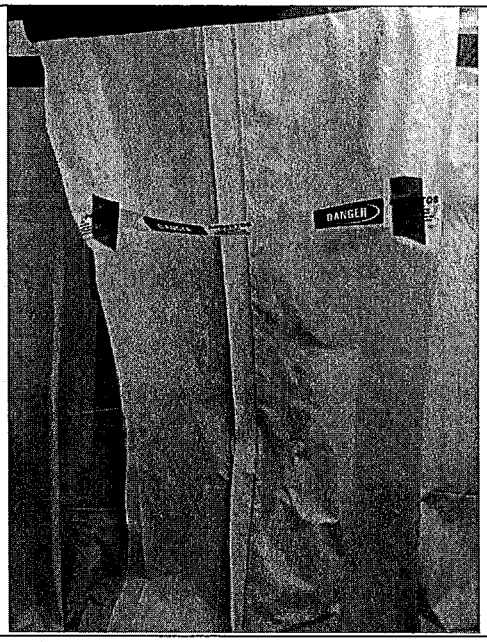
Photographic Documentation

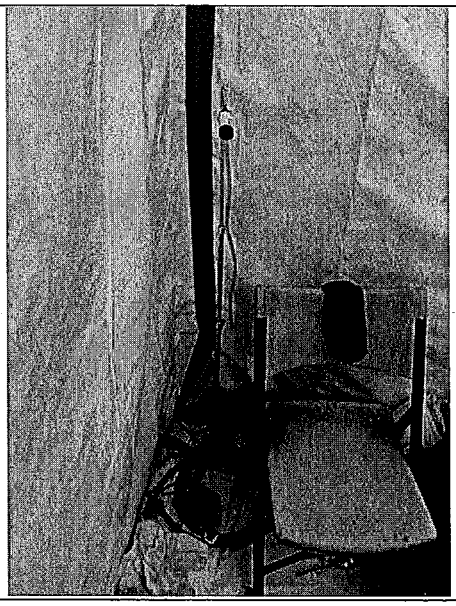
Client: AT Abatement Services, Inc.
Site Name: Blue River Wastewater Treatment Plant
Location: 7300 Hawthorne Rd, Kansas City, MO 64120

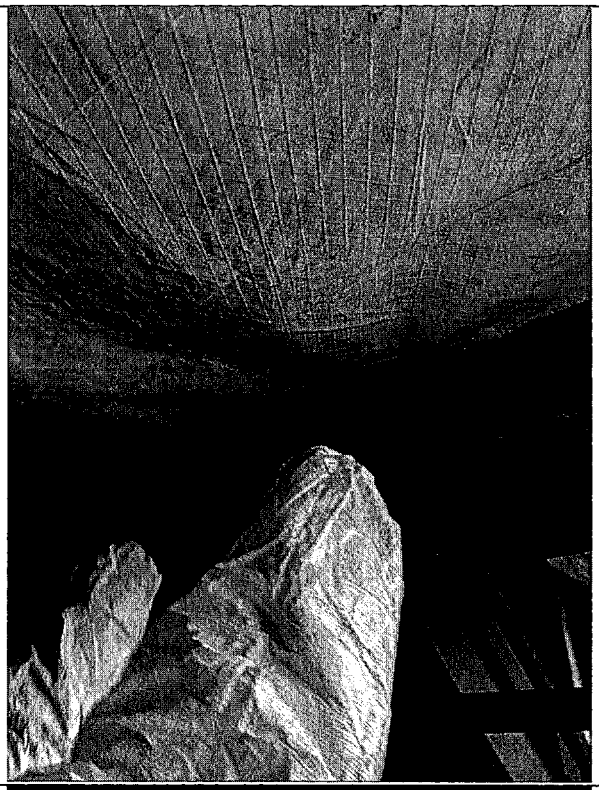
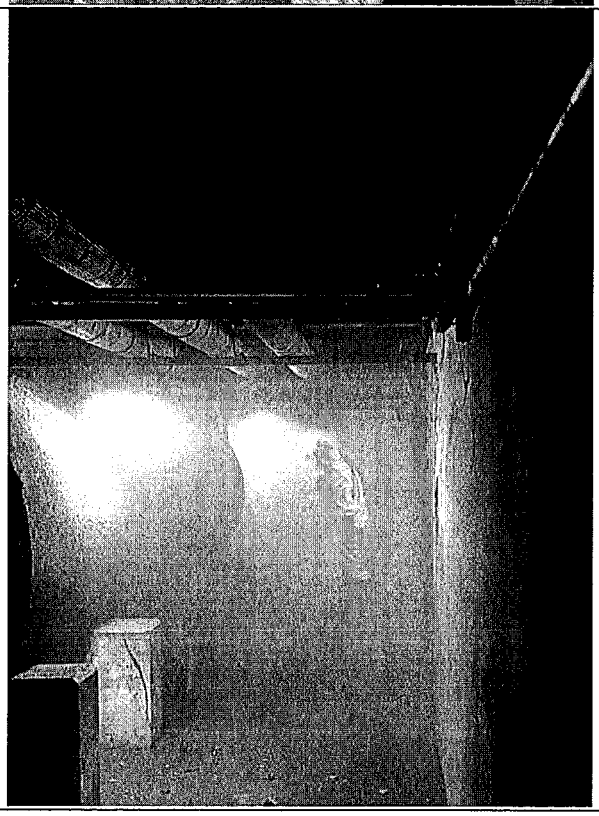
Prepared by: Jessica Raley
Project Number: 22210017
Dates: 06/20/2022-06/23/2022

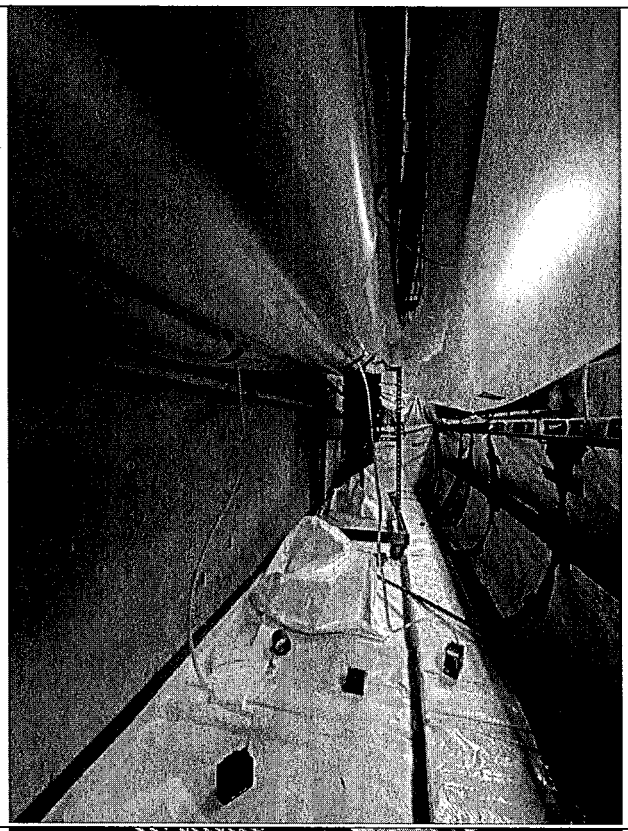
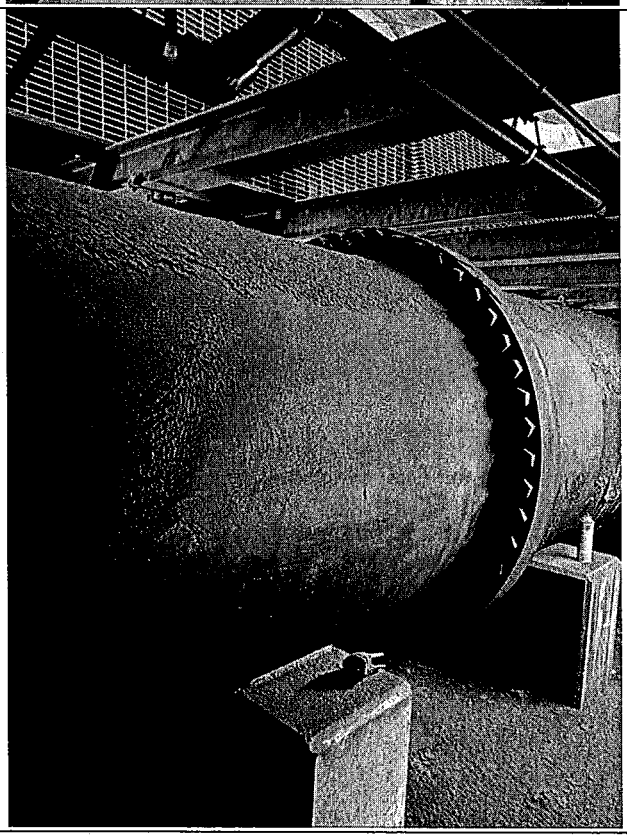
Photograph No. 1 **Date:** 06/20/2022 **Description:** Secured Containment	
Photograph No. 2 **Date:** 06/20/2022 **Description:** Bagging Loose ACM Coating	

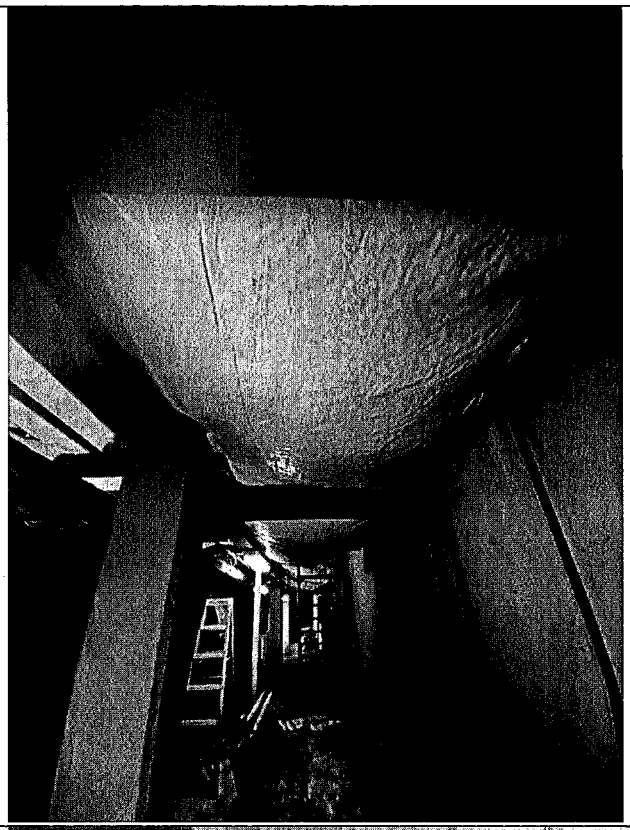
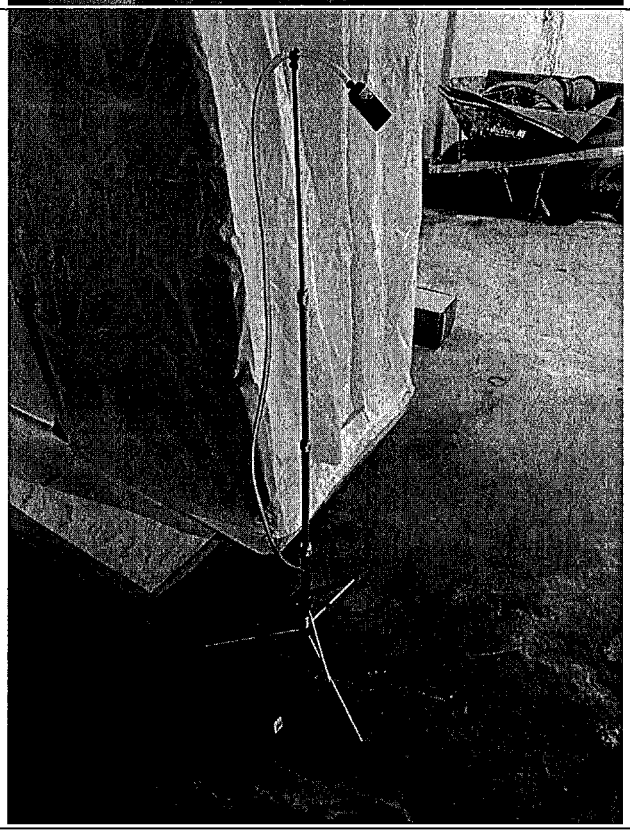
Photograph No. 3 **Date:** 06/20/2022 **Description:** Air Sample – OWA: Main Level	
Photograph No. 4 **Date:** 06/21/2022 **Description:** Load-Out Dumpster with Proper Signage	

Photograph No. 5 **Date:** 06/21/2022 **Description:** Sufficient Negative Pressure and Proper Signage	

Photograph No. 6 **Date:** 06/21/2022 **Description:** Air Sample – OWA: Cleanroom	

Photograph No. 7 **Date:** 06/22/2022 **Description:** Securing Containment	
Photograph No. 8 **Date:** 06/22/2022 **Description:** During ACM Coating Removal	

Photograph No. 9 **Date:** 06/22/2022 **Description:** Air Sample – NEG: Negative Air Machine Exhaust	
Photograph No. 10 **Date:** 06/23/2022 **Description:** 60-in Force Main Pipe During Abatement	

Photograph No. 11 **Date:** 06/23/2022 **Description:** Secured Containment	
Photograph No. 12 **Date:** 06/23/2022 **Description:** Air Sample – OWA: Load-Out Entrance	

Attachment 5: Personnel Certifications

CERTIFICATION NUMBER:

7000032922MOAS21387

THIS CERTIFIES

Jessica Raley

HAS COMPLETED THE CERTIFICATION

REQUIREMENTS FOR

Air Sampling Professional



APPROVED **03/29/2022**

Director of Air Pollution Control Program

CERTIFICATION NUMBER:

7011032522MOPDI21387

THIS CERTIFIES

Jessica Raley

HAS COMPLETED THE CERTIFICATION

REQUIREMENTS FOR

Project Designer



APPROVED: **03/29/2022**

EXPIRES **03/29/2023**

TRAINING DATE: **03/25/2022**

Director of Air Pollution Control Program

CERTIFICATION NUMBER:

7011040822MOSI21387

THIS CERTIFIES

Jessica Raley

HAS COMPLETED THE CERTIFICATION

REQUIREMENTS FOR

Supervisor



APPROVED **06/23/2022**

EXPIRES: **04/08/2023**

TRAINING DATE **04/08/2022**

Director of Air Pollution Control Program

INDUSTRIAL HYGIENE PROJECT OVERSIGHT REPORT
July 06, 2022

Prepared by:

ECOSAFE
Environmental Services, Inc.
215 W 18th St, Suite 150, Kansas City, Missouri 64108

For:

Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

Project:

Industrial Hygiene Project Oversight Report
Blue River Wastewater Treatment Plant
60-inch Force Main Project
7300 Hawthorne Road
Kansas City, Missouri 64120

July 06, 2022

CLIENT: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

PROJECT: Industrial Hygiene Project Oversight Report
Blue River Wastewater Treatment Plant
60-inch Force Main Project
7300 Hawthorne Road
Kansas City, Missouri 64120

ECOSAFE PROJECT NO.: 2022.364.3EES

REPORT PREPARED BY: Jessica Raley

Jessica Raley
Missouri Air Sampling Professional
Certification # 7000032922MOAS21387
Asbestos Project Designer
Certification # 7011032522MOPDI21387
Asbestos Supervisor
Certification # 7011040822MOSl21387

CONTACT INFORMATION:

EcoSafe Environmental Services, Inc.
215 W 18th Street, Suite 150
Kansas City, MO 64108
Tel: (816) 598-4111 / (270) 315-0057
E-mail: Jessica@EcoSafeKC.com

Attachments:

1. Weekly Project Oversight Summary
2. Daily Logs
3. PCM Analytical Results
4. Photo Log
5. Personnel Certifications

Attachment 1: Weekly Project Oversight Summary

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

July 06, 2022

RE: Weekly Industrial Hygiene Project Oversight Report
Blue River Wastewater Treatment Plant
60-inch Force Main Project
7300 Hawthorne Road
Kansas City, Missouri 64120

Dear Mr. Nitcher,

EcoSafe Environmental Services Inc. is pleased to provide you with this weekly update report regarding the on-going project referenced above. EcoSafe provided project oversight and Phase Contrast Microscopy (PCM) on-site air monitoring during asbestos abatement activities from Monday, June 27, 2022 through Thursday, June 30, 2022 at the property location referenced above.

The asbestos abatement activities included asbestos-containing coating removal on the 60-inch force main pipe in the tunnel of the referenced property by the abatement contractor AT Abatement Services, Inc. During asbestos removal operations, EcoSafe performed industrial hygiene project oversight-surveillance and documented that all engineering controls and work practices were acceptable and within industry standards (see Attachment 2: Daily Logs for specific details).

EcoSafe collected a total of TWENTY-SIX (26) phase contrast microscopy (PCM) air samples during this week. This included samples totaling: ELEVEN (11) outside work area (OWA), SEVEN (7) negative air machine (NEG), and included EIGHT (8) quality control blank samples. All sampling pumps were calibrated before and after all air sampling collection. The samples were then analyzed on-site per the NIOSH 7400 method.

Sincerely,

Jessica Raley 07/06/2022
Jessica Raley | DATE
Missouri Air Sampling Professional
Certification #7000032922MOAS21387
Asbestos Project Designer
Certification # 7011032522MOPDI21387

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

PROJECT DAILY LOG

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

EcoSafe Project #: 2022.364.3EES
A.T. Abatement Project #: 22210017
Date: Monday, June 27, 2022

Project Location: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, Missouri 64120

Daily Scope of Work:

6:00 a.m. – EcoSafe Environmental Services, Inc. (EcoSafe) ASP, Jessica Raley, AT Abatement Services, Inc. (ATA) workers Tyler Gooch and Mitch Jones, and ATA supervisor, Tim Sullins, arrived on site.
6:05 a.m. – EcoSafe ASP and ATA supervisor met to discuss the daily scope of work. The workers would continue ACM coating removal on the 60-inch force main in the tunnel. ATA supervisor estimated the abatement on this section of pipe in the first containment would be completed this week.
6:10 a.m. – ATA workers began pre-abatement walk-through to correct any containment issues that occurred over the weekend.
6:15 a.m. – EcoSafe ASP informed ATA supervisor about the samples from the previous workday. EcoSafe ASP advised the fiber counts were 28.5/100 for negative air machine #2, High fiber counts on this machine have been an ongoing issue. EcoSafe ASP suggested re-positioning the HEPA filter or replacing the filter/machine. ATA supervisor advised he would permanently turn off the negative air machine #2 to avoid excess fiber release into the outside work area.
6:30 a.m. – EcoSafe ASP performed a pre-abatement walk-through of the containment prior to abatement activities. No deficiencies were observed, and the abatement was approved to begin.
7:00 a.m. – ATA workers continued to prepare equipment for the ACM coating removal.
8:00 a.m. – EcoSafe ASP began setting up outside work area (OWA) and negative air machine exhaust (NEG) air samples.
8:30 a.m. – ATA workers began ACM coating removal.
10:40 a.m. – EcoSafe ASP conducted an exterior containment walk-through and observed two areas of water on top of the poly, on the west side of the containment. ATA workers HEPA vacuumed these areas and secured the containment.
11:30 a.m. – EcoSafe and ATA left jobsite for lunch.
12:30 p.m. – EcoSafe and ATA returned to jobsite from lunch

12:45 p.m. – EcoSafe ASP performed a containment walk-through after lunch and noted no deficiencies.
1:45 p.m. – EcoSafe ASP met with ATA supervisor to discuss the plan for the rest of the day. The workers were continuing with ACM coating removal. Later in the week, the workers would begin using a needle tool or lower powered Amphi Blast to remove/detail certain areas of ACM coating on the pipe.
3:30 p.m. – EcoSafe ASP began collecting OWA and NEG air samples.
4:00 p.m. – ATA workers began end of day clean-up. EcoSafe ASP began on-site PCM analysis for the daily samples.
4:30 p.m. – ATA left jobsite for the day. EcoSafe ASP finished analyzing the PCM samples. All samples were under the permissible exposure limit and met clearance criteria.
4:45 p.m. – EcoSafe left jobsite for the day.

PROJECT DAILY LOG

Date: Monday, June 27, 2022

Engineering Controls:	Worker Tools:	Personal Protective Equipment:
X Decontamination Unit X Three Stage X Shower X Critical Barriers X Barrier Tape X Load Out □ Monometer □ Wastewater Filter X Control Curtains X Signs Other: _____	□ Hand Pressure Tools X Negative Air Machines How Many: 6 X HEPA Vacuums □ Amended Water □ Encapsulant □ Glove Bags XLadders X Mechanical Tools Specify: Amphi Blast	X Full Suit □ Double Suit X Boots X Gloves □ Half Mask APR X Full Face APR □ Powered APR □ Supplied Air Respirator □ SCBA X HEPA Cartridges □ Chemical Cartridges Other: _____

ECOSAFE ON-SITE PERSONNEL:
JESSICA RALEY —AIR SAMPLING PROFESSIONAL

A.T. ABATEMENT SERVICES ON-SITE PERSONNEL:

SUPERVISOR: TIM SULLINS
NUMBER OF WORKERS: 2
NAMES OF WORKERS: MITCH JONES & TYLER GOOCH

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

PROJECT DAILY LOG

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

EcoSafe Project #: 2022.364.3EES
A.T. Abatement Project #: 22210017
Date: Tuesday, June 28, 2022

Project Location: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, Missouri 64120

Daily Scope of Work:

6:00 a.m. – EcoSafe Environmental Services, Inc. (EcoSafe) ASP, Jessica Raley, A.T. Abatement (ATA) workers Tyler Gooch and Mitch Jones, along with ATA supervisor, Tim Sullins, arrived on site.
6:10 a.m. – EcoSafe ASP and ATA supervisor met to discuss the scope of work. The workers would continue ACM coating removal on the 60-inch force main in the tunnel.
6:25 a.m. – EcoSafe ASP performed a pre-abatement walk-through of the containment prior to abatement activities. Any deficiencies that were observed were corrected by ATA workers Abatement was approved to begin.
6:40 a.m. – EcoSafe ASP began setting up outside work area (OWA) and negative air machine exhaust (NEG) air samples.
6:45 a.m. – ATA workers began ACM coating removal.
10:00 a.m. – Greg Nitcher, arrived on site to conduct a containment walk-through with ATA supervisor and EcoSafe ASP.
11:20 a.m. – ATA workers continued ACM coating removal on the sides 60-inch force main pipe. ATA supervisor advised the workers were on track to start removal on top of the pipe by the end of the day.
11:30 a.m. – EcoSafe and ATA left jobsite for lunch.
12:30 p.m. – EcoSafe and ATA returned to jobsite from lunch
2:00 p.m. – EcoSafe ASP met with ATA supervisor to discuss the scope of work for the remaining workday. ATA workers would continue ACM coating removal on sides of the pipe and begin the top removal tomorrow.
3:25 p.m. – EcoSafe ASP began collecting OWA and NEG air samples.
3:45 p.m. – EcoSafe ASP began on-site PCM analysis for the daily samples.
4:00 p.m. – ATA workers began end of day clean-up.

4:20 p.m. –EcoSafe ASP finished analyzing the PCM samples. All samples were under the permissible exposure limit and met clearance criteria.
4:30 p.m. – ATA and EcoSafe left jobsite for the day.

PROJECT DAILY LOG

Date: Tuesday, June 28, 2022

Engineering Controls:	Worker Tools:	Personal Protective Equipment:
X Decontamination Unit X Three Stage X Shower X Critical Barriers X Barrier Tape X Load Out □ Monometer □ Wastewater Filter X Control Curtains X Signs Other: _____	□ Hand Pressure Tools X Negative Air Machines How Many: 6 X HEPA Vacuums □ Amended Water □ Encapsulant □ Glove Bags XLadders X Mechanical Tools Specify: Amphi Blast	X Full Suit □ Double Suit X Boots X Gloves □ Half Mask APR X Full Face APR □ Powered APR □ Supplied Air Respirator □ SCBA X HEPA Cartridges □ Chemical Cartridges Other: _____

ECOSAFE ON-SITE PERSONNEL:
JESSICA RALEY —AIR SAMPLING PROFESSIONAL

A.T. ABATEMENT SERVICES ON-SITE PERSONNEL:

SUPERVISOR: TIM SULLINS
NUMBER OF WORKERS: 2
NAMES OF WORKERS: MITCH JONES & TYLER GOOCH

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

PROJECT DAILY LOG

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

EcoSafe Project #: 2022.364.3EES
A.T. Abatement Project #: 22210017
Date: Wednesday, June 29, 2022

Project Location: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, Missouri 64120

Daily Scope of Work:

6:00 a.m. – EcoSafe Environmental Services, Inc. (EcoSafe) ASP, Jessica Raley, ATA Abatement Services, Inc. (ATA) workers Tyler Gooch and Mitch Jones, and ATA supervisor, Tim Sullins, arrived on site.
6:20 a.m. – EcoSafe ASP performed a pre-abatement walk-through of the containment prior to abatement activities. ATA workers were correcting all poly and tape separations. No other deficiencies were observed. Abatement was approved to begin.
6:30 a.m. – EcoSafe ASP began setting up outside work area (OWA) and negative air machine exhaust (NEG) air samples.
6:40 a.m. – ATA workers began ACM coating removal.
6:45 a.m. – EcoSafe ASP met with ATA supervisor to discuss the scope of work for the day. The workers were continuing ACM coating removal on the top of the 60-inch force main in the tunnel. ATA supervisor estimated the abatement would be completed today and bagging would begin tomorrow. Loading-out ACM bags was estimated to start next week.
8:00 a.m. – EcoSafe AST, Sarah Miller, arrived on site.
10:00 a.m. – EcoSafe ASP and AST entered containment and observed workers removing ACM coating using proper engineering controls and work practices that met county, city, state, and federal regulations.
11:30 a.m. – EcoSafe AST and ATA left jobsite for lunch. EcoSafe ASP left jobsite for the day.
12:30 p.m. – EcoSafe AST and ATA returned to jobsite from lunch.
12:45 p.m. – EcoSafe AST performed a containment walk-through after lunch and noted a small tear in the top of the containment. EcoSafe AST informed ATA supervisor of the tear. ATA workers corrected the poly before abatement work resumed.
2:00 p.m. – EcoSafe AST met with ATA supervisor to discuss the scope of work for the rest of the workday. ATA supervisor advised the workers were finished blasting and would start

cleaning and bagging for the rest of the day. ATA supervisor estimated bag-out would begin Tuesday, July 5th.
3:25 p.m. – EcoSafe AST began collecting OWA and NEG air samples.
3:45 p.m. – EcoSafe AST began on-site PCM analysis for the daily samples.
4:00 p.m. – ATA workers began end of day clean-up.
4:20 p.m. –EcoSafe AST finished analyzing the PCM samples. All samples were under the permissible exposure limit and met clearance criteria.
4:30 p.m. – ATA and EcoSafe left jobsite for the day.

PROJECT DAILY LOG

Date: Wednesday, June 29, 2022

Engineering Controls:	Worker Tools:	Personal Protective Equipment:
X Decontamination Unit X Three Stage X Shower X Critical Barriers X Barrier Tape X Load Out □ Monometer □ Wastewater Filter X Control Curtains X Signs Other: _____	□ Hand Pressure Tools X Negative Air Machines How Many: 6 X HEPA Vacuums □ Amended Water □ Encapsulant □ Glove Bags XLadders X Mechanical Tools Specify: Amphi Blast	X Full Suit □ Double Suit X Boots X Gloves □ Half Mask APR X Full Face APR □ Powered APR □ Supplied Air Respirator □ SCBA X HEPA Cartridges □ Chemical Cartridges Other: _____

ECOSAFE ON-SITE PERSONNEL:
JESSICA RALEY —AIR SAMPLING PROFESSIONAL
SARAH MILLER - AIR SAMPLING TECHNICIAN

A.T. ABATEMENT SERVICES ON-SITE PERSONNEL:

- **SUPERVISOR:** TIM SULLINS
  NUMBER OF WORKERS: 2
  NAMES OF WORKERS: MITCH JONES & TYLER GOOCH

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

PROJECT DAILY LOG

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

EcoSafe Project #: 2022.364.3EES
A.T. Abatement Project #: 22210017
Date: Thursday, June 30, 2022

Project Location: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, Missouri 64120

Daily Scope of Work:

6:00 a.m. – EcoSafe Environmental Services, Inc. (EcoSafe) ASP, Jessica Raley, A.T. Abatement (ATA) workers Tyler Gooch and Mitch Jones, and ATA supervisor, Tim Sullins, arrived on site.
6:10 a.m. – EcoSafe ASP and ATA supervisor met to discuss the scope of work for the day. The workers were continuing to bag ACM coating. Loading out and detailing was estimated to begin next week.
6:15 a.m. – EcoSafe ASP performed a pre-abatement walk-through of the containment prior to abatement activities. All deficiencies observed were corrected by workers. Abatement was approved to begin.
6:35 a.m. – EcoSafe ASP began setting up outside work area (OWA) and negative air machine exhaust (NEG) air samples.
9:00 a.m. – EcoSafe ASP entered containment and observed workers bagging ACM while using proper engineering controls and work practices that met county, city, state, and federal regulations.
10:50 a.m. – EcoSafe ASP conducted exterior containment walk-through and noted one area of poly separating from the wall. ATA supervisor was informed, and workers began correcting.
11:30 a.m. – EcoSafe and ATA left jobsite for lunch.
12:30 p.m. – EcoSafe and ATA returned to jobsite from lunch.
1:15 p.m. – ATA supervisor advised the workers were on track to finish bagging the following Monday and begin load-out.
2:45 p.m. – EcoSafe ASP entered containment to check on progress. ATA workers were continuing to bag ACM. EcoSafe ASP observed workers using proper engineering controls and work practices.
3:30 p.m. – EcoSafe ASP began collecting OWA and NEG air samples.
3:50 p.m. – EcoSafe ASP began on-site PCM analysis for the daily samples.

4:00 p.m. – ATA workers began end of day clean-up.
4:25 p.m. –EcoSafe ASP finished analyzing the PCM samples. All samples were under the permissible exposure limit and met clearance criteria.
4:30 p.m. – ATA and EcoSafe left jobsite for the day.

PROJECT DAILY LOG

Date: Thursday, June 30, 2022

Engineering Controls:	Worker Tools:	Personal Protective Equipment:
X Decontamination Unit X Three Stage X Shower X Critical Barriers X Barrier Tape X Load Out □ Monometer □ Wastewater Filter X Control Curtains X Signs Other: _____	□ Hand Pressure Tools X Negative Air Machines How Many: 6 X HEPA Vacuums □ Amended Water □ Encapsulant □ Glove Bags XLadders X Mechanical Tools Specify: Amphi Blast	X Full Suit □ Double Suit X Boots X Gloves □ Half Mask APR X Full Face APR □ Powered APR □ Supplied Air Respirator □ SCBA X HEPA Cartridges □ Chemical Cartridges Other: _____

ECOSAFE ON-SITE PERSONNEL:
JESSICA RALEY —AIR SAMPLING PROFESSIONAL

A.T. ABATEMENT SERVICES ON-SITE PERSONNEL:

SUPERVISOR: TIM SULLINS
NUMBER OF WORKERS: 2
NAMES OF WORKERS: MITCH JONES & TYLER GOOCH

Attachment 3: PCM Analytical Results

ECOSAFE
Environmental Services, Inc.

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64210

Collection Date: Monday, 06/27/2022
Date Analyzed: Monday, 06/27/2022
Project #: 2022.364.3EES
A.T. Abatement Project #: 2210017

Project: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, MO 64120

Abatement Activity: Asbestos Containing Material (ACM) Coating Removal

Sample ID	Sample Type /Location	Time On	Time Off	Minutes	Average Flow Rate	Volume (Liter)	Fiber Count	Fibers/mm^2	Fibers/cc
7300- OWA-1	PCM Outside Work Area: Above Containment	8:05	3:39	454	4 L	1,816 L	3.5/100	4.46	0.0009
7300-OWA-2	PCM Outside Work Area: Load Out	7:55	3:39	464	4 L	1,856 L	1.5/100	1.91	0.0004
7300- OWA-3	PCM Outside Work Area: Clean Room	8:03	3:41	458	4 L	1,832 L	1.0/100	1.27	0.0003
7300-NEG-1	Negative Air Machine: Machine #1	7:48	3:36	468	4 L	1,872 L	1.0/100	1.27	0.0003
7300-NEG-2	Negative Air Machine: Machine #3	7:48	3:36	468	4 L	1,872 L	0/100	0.00	0.0000
7300-BLK-1	PCM Control—Field Blank	—	—	—	—	—	00/100	0.00	0.0000
7300-BLK-2	PCM Control—Lab Blank	—	—	—	—	—	00/100	0.00	0.0000

Jessica Raley 06/27/2022
Jessica Raley | DATE
Missouri Air Sampling Professional
Certification # 7000032922MOAS21387

OWA—Outside Work Area	CLNR—Clean Room
IWA—Inside Work Area	BGO—Bag Out
NAG—Negative Air Exhaust	CLR—Clearance
STEL—Short Term Exposure Limit	AMB—Ambient (exterior)
PERS—Work Shift Personal	BKGD—Background
PCM—Phase Contrast Microscopy	BLK—Blank

PCM Clearance Criteria: 0.01 F/cc
Permissible Exposure Limit: 0.1 F/cc

ECOSAFE
Environmental Services, Inc.

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64210

Collection Date: Tuesday, 06/28/2022
Date Analyzed: Tuesday, 06/28/2022
Project #: 2022.364EES
A.T. Abatement Project #: 2210017

Project: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, MO 64120

Abatement Activity: Asbestos Containing Material (ACM) Coating Removal

Sample ID	Sample Type /Location	Time On	Time Off	Minutes	Average Flow Rate	Volume (Liter)	Fiber Count	Fibers/mm^2	Fibers/cc
7300-OWA-1	PCM Outside Work Area: Main Level-Above Containment	6:53	3:19	506	4 L	2,024 L	20.5/100	26.11	0.0050
7300-OWA-2	PCM Outside Work Area: Load Out	7:02	3:21	499	4 L	1,996 L	8.0/100	10.19	0.0020
7300-OWA-3	PCM Outside Work Area: Clean Room	6:30	3:24	534	4 L	2,136 L	3.0/100	3.82	0.0007
7300-NEG-1	PCM Negative Air Exhaust: Machine #4	6:56	3:24	508	2 L	1,016 L	0.0/100	0.00	0.0000
7300-NEG-2	PCM Negative Air Exhaust: Machine #6	6:58	3:24	506	2 L	1,012 L	5.0/100	6.37	0.0024
7300-BLK-1	PCM Control—Field Blank	—	—	—	—	—	00/100	0.00	0.0000
7300-BLK-2	PCM Control—Lab Blank	—	—	—	—	—	00/100	0.00	0.0000

Jessica Raley 06/28/2022
Jessica Raley | DATE
Missouri Air Sampling Professional
Certification # 7000032922MOAS21387

OWA—Outside Work Area	CLNR—Clean Room
IWA—Inside Work Area	BGO—Bag Out
NAG—Negative Air Exhaust	CLR—Clearance
STEL—Short Term Exposure Limit	AMB—Ambient (exterior)
PERS—Work Shift Personal	BKGD—Background
PCM—Phase Contrast Microscopy	BLK—Blank

PCM Clearance Criteria: 0.01 F/cc
Permissible Exposure Limit: 0.1 F/cc

ECOSAFE
Environmental Services, Inc.

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64210

Collection Date: Wednesday, 06/29/2022
Date Analyzed: Wednesday, 06/29/2022
Project #: 2022.364.3EES
A.T. Abatement Project #: 2210017

Project: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, MO 64120

Abatement Activity: Asbestos Containing Material (ACM) Coating Removal

Sample ID	Sample Type /Location	Time On	Time Off	Minutes	Average Flow Rate	Volume (Liter)	Fiber Count	Fibers/mm²	Fibers/cc
7300-OWA-1	PCM Outside Work Area: Main Level-Above Containment	6:56	3:25	509	4 L	2,036 L	OCCLUDED	OCCLUDED	OCCLUDED
7300-OWA-2	PCM Outside Work Area: Clean Room	6:41	3:37	536	4 L	2,144 L	3/100	3.82	0.0007
7300-NEG-1	PCM Negative Air Exhaust: Machine #1	6:48	3:25	517	2 L	1,034 L	1.5/100	1.91	0.0007
7300-NEG-2	PCM Negative Air Exhaust: Machine #3	6:48	3:25	517	2 L	1,012 L	0.0/100	0.00	0.0000
7300-BLK-1	PCM Control—Field Blank	—	—	—	—	—	00/100	0.00	0.0000
7300-BLK-2	PCM Control—Lab Blank	—	—	—	—	—	00/100	0.00	0.0000

Jessica Raley 06/29/2022
Jessica Raley | DATE
Missouri Air Sampling Professional
Certification # 7000032922MOAS21387

OWA—Outside Work Area	CLNR—Clean Room
IWA—Inside Work Area	BGO—Bag Out
NAG—Negative Air Exhaust	CLR—Clearance
STEL—Short Term Exposure Limit	AMB—Ambient (exterior)
PERS—Work Shift Personal	BKGD—Background
PCM—Phase Contrast Microscopy	BLK—Blank

PCM Clearance Criteria: 0.01 F/cc
Permissible Exposure Limit: 0.1 F/cc

ECOSAFE
Environmental Services, Inc.

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64210

Collection Date: Thursday, 06/30/2022
Date Analyzed: Thursday, 06/30/2022
Project #: 2022.364.3EES
A.T. Abatement Project #: 2210017

Project: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, MO 64120

Abatement Activity: Asbestos Containing Material (ACM) Coating Removal

Sample ID	Sample Type /Location	Time On	Time Off	Minutes	Average Flow Rate	Volume (Liter)	Fiber Count	Fibers/mm^2	Fibers/cc
7300-OWA-1	PCM Outside Work Area: Main Level-Above Containment	6:23	3:30	547	4 L	2,188 L	1.0/100	1.27	0.0003
7300-OWA-2	PCM Outside Work Area: Load Out	6:26	3:35	549	4 L	2,196 L	3.0/100	3.82	0.0007
7300-OWA-3	PCM Outside Work Area: Clean Room	6:27	3:36	549	4 L	2,196 L	6.0/100	7.64	0.0013
7300-NEG-1	PCM Negative Air Exhaust: Machine #2	6:43	3:25	522	4 L	2,088 L	0.0/100	0.00	0.0000
7300-BLK-1	PCM Control—Field Blank	—	—	—	—	—	00/100	0.00	0.0000
7300-BLK-2	PCM Control—Lab Blank	—	—	—	—	—	00/100	0.00	0.0000

Jessica Raley 06/30/2022
Jessica Raley | DATE
Missouri Air Sampling Professional
Certification # 7000032922MOAS21387

OWA—Outside Work Area	CLNR—Clean Room
IWA—Inside Work Area	BGO—Bag Out
HEPA—Negative Air Exhaust	CLR—Clearance
STEL—Short Term Exposure Limit	AMB—Ambient (exterior)
PERS—Work Shift Personal	BKGD—Background
PCM—Phase Contrast Microscopy	BLK—Blank

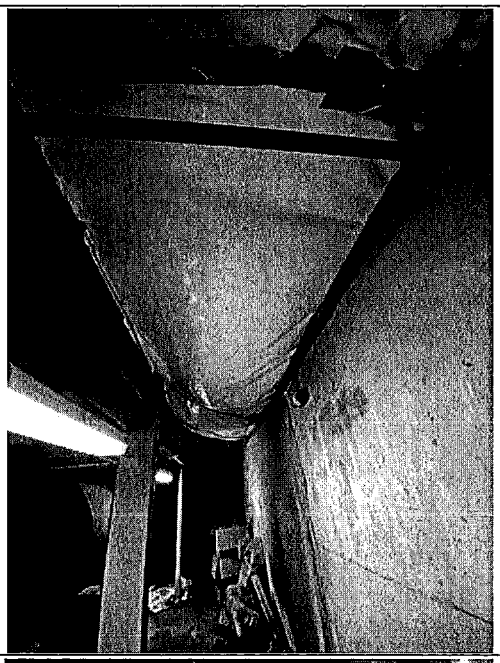
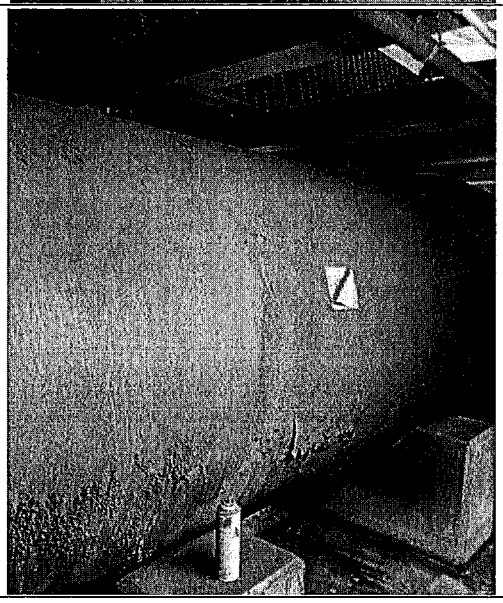
PCM Clearance Criteria: 0.01 F/cc
Permissible Exposure Limit: 0.1 F/cc

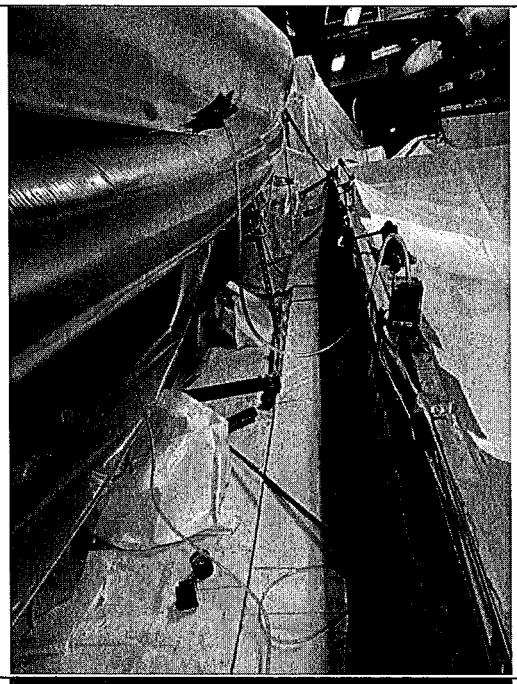
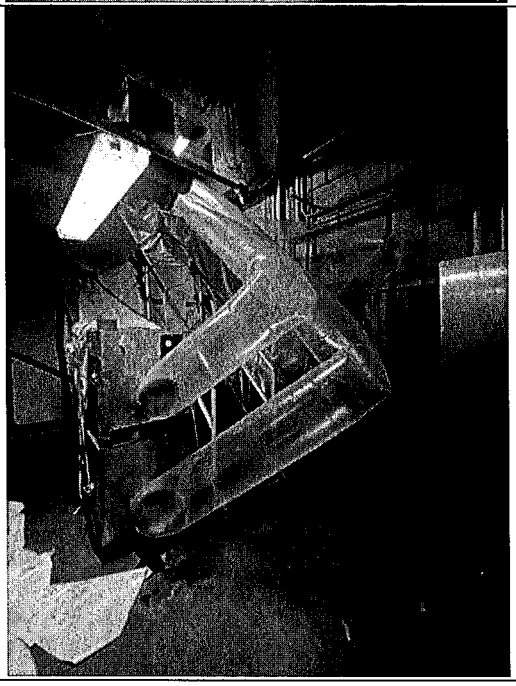
ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

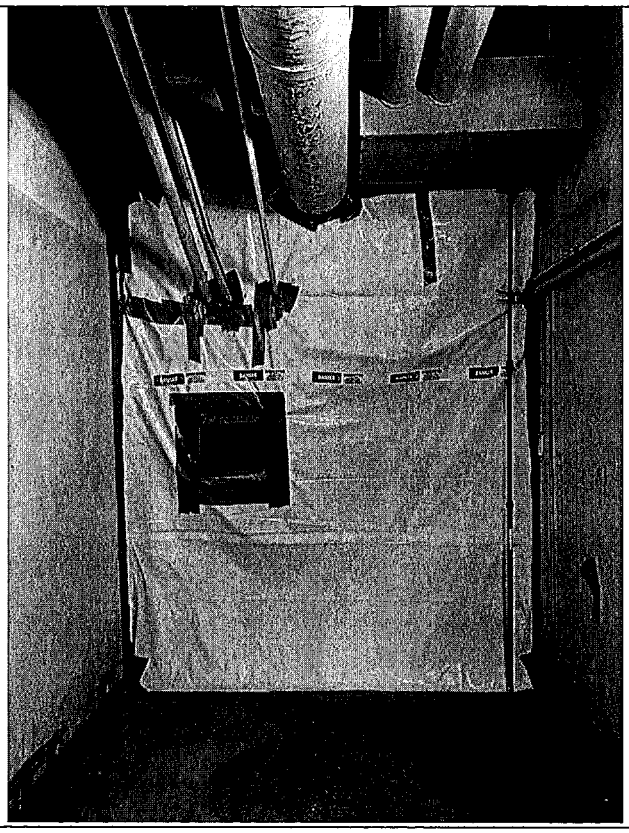
Photographic Documentation

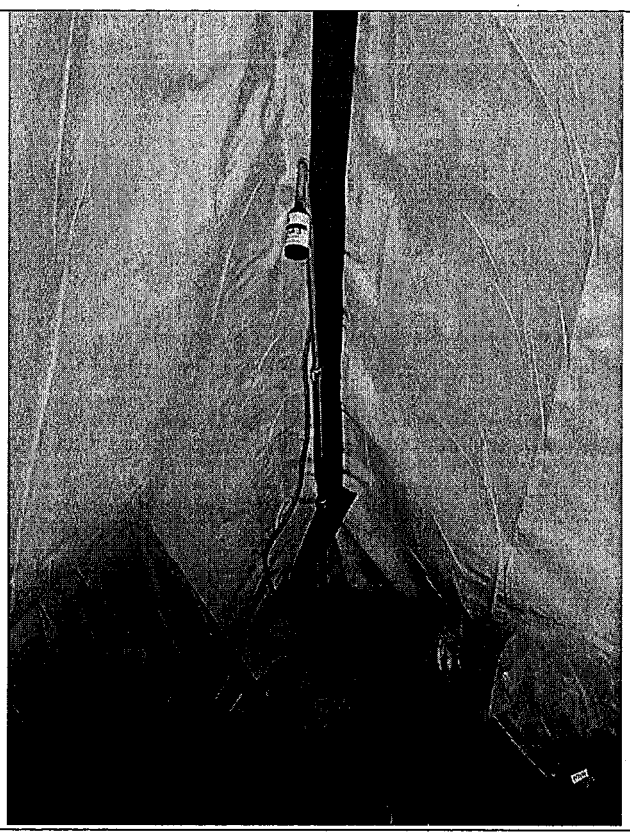
Client: AT Abatement Services, Inc.
Site Name: Blue River Wastewater Treatment Plant
Location: 7300 Hawthorne Rd, Kansas City, MO 64120

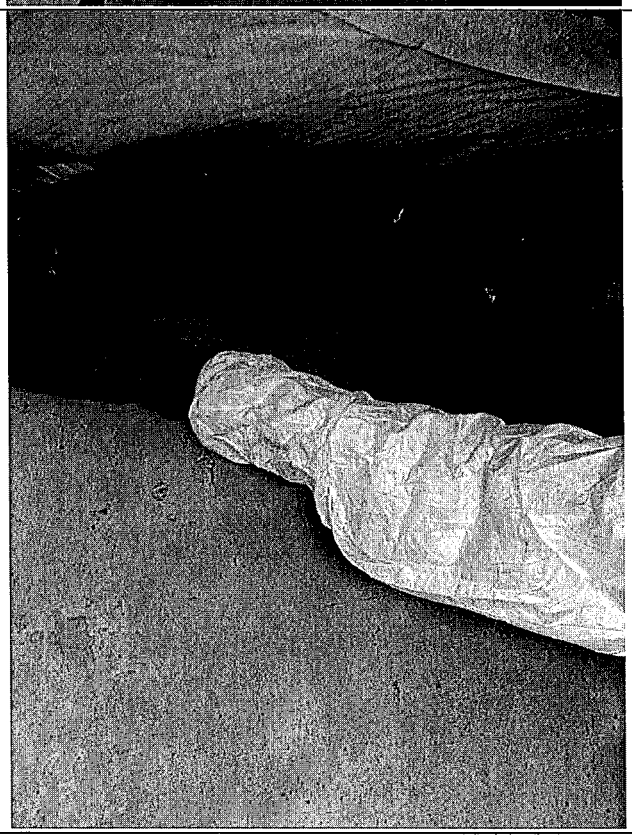
Prepared by: Jessica Raley
Project Number: 22210017
Dates: 06/27/2022-06/30/2022

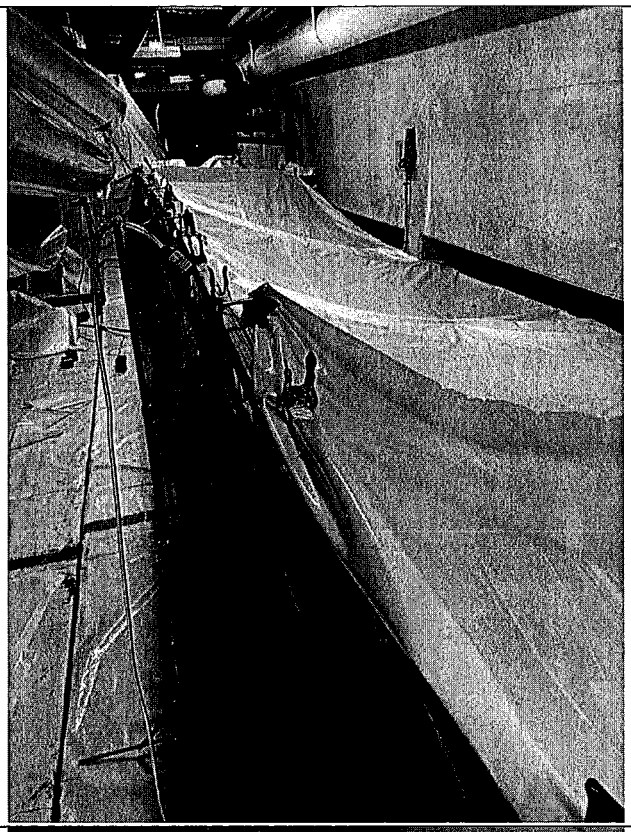
Photograph No. 1 **Date:** 06/27/2022 **Description:** Secured Containment	
Photograph No. 2 **Date:** 06/27/2022 **Description:** 60-in Force Main Pipe During-Abatement	

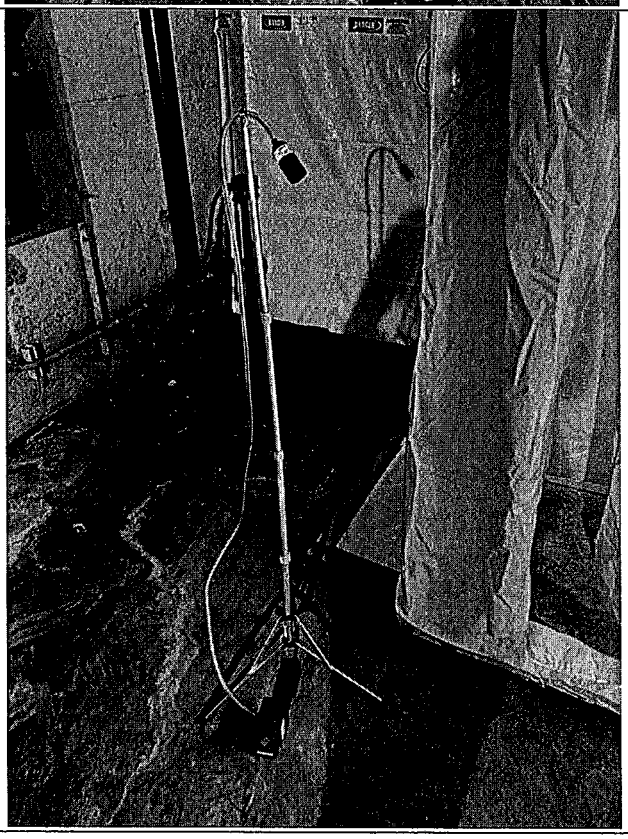
Photograph No. 3 **Date:** 06/27/2022 **Description:** Air Sample – NEG: Negative Air Machine Exhaust	
Photograph No. 4 **Date:** 06/28/2022 **Description:** Negative Air Machines Running Properly	

Photograph No. 5 **Date:** 06/28/2022 **Description:** Secured Containment with Proper Signage and Window	

Photograph No. 6 **Date:** 06/28/2022 **Description:** Air Sample – OWA: Cleanroom	

Photograph No. 7 **Date:** 06/29/2022 **Description:** Sufficient Negative Pressure and Proper Signage	
Photograph No. 8 **Date:** 06/29/2022 **Description:** Securing Containment	

Photograph No. 9 **Date:** 06/29/2022 **Description:** Air Sample – OWA: Main Level, Above Containment		
Photograph No. 10 **Date:** 06/30/2022 **Description:** During Asbestos Bagging		

Photograph No. 11 **Date:** 06/30/2022 **Description:** Asbestos Bags and Warning Labels, During-Bagging	
Photograph No. 12 **Date:** 06/30/2022 **Description:** Air Sample – OWA: Load-Out Entrance	

Attachment 5: Personnel Certifications

CERTIFICATION NUMBER:

7000032922MOAS21387

THIS CERTIFIES

Jessica Raley

HAS COMPLETED THE CERTIFICATION

REQUIREMENTS FOR

Air Sampling Professional



APPROVED **03/29/2022**

Director of Air Pollution Control Program

CERTIFICATION NUMBER:

7011032522MOPDI21387

THIS CERTIFIES

Jessica Raley

HAS COMPLETED THE CERTIFICATION

REQUIREMENTS FOR

Project Designer



APPROVED: **03/29/2022**

EXPIRES **03/29/2023**

TRAINING DATE: **03/25/2022**

Director of Air Pollution Control Program

CERTIFICATION NUMBER:

7011040822MOSI21387

THIS CERTIFIES

Jessica Raley

HAS COMPLETED THE CERTIFICATION

REQUIREMENTS FOR

Supervisor



APPROVED **06/23/2022**

EXPIRES: **04/08/2023**

TRAINING DATE **04/08/2022**

Director of Air Pollution Control Program

TITAN
CONSULTING & TESTING
ENVIRONMENTAL SERVICES
ABATEMENT & DEMOLITION

A FULL SERVICE ENVIRONMENTAL CONSULTING AND TESTING FIRM

Certificate of Completion

Sarah Miller

HAS SUCCESSFULLY COMPLETED
THE SAMPLING & EVALUATION OF AIRBORNE ASBESTOS DUST
A NIOSH 582 EQUIVALENCY COURSE

CERTIFICATE #: NIOSH582-4510287

LOCATION: KANSAS CITY, KS

KARLA GRANGER, PROGRAM COORDINATOR

JUNE 6-10, 2022

INDUSTRIAL HYGIENE PROJECT OVERSIGHT REPORT
July 12, 2022

Prepared by:

ECOSAFE
Environmental Services, Inc.
215 W 18th St, Suite 150, Kansas City, Missouri 64108

For:

Greg Nitcher
AT Abatement Services, Inc
4915 Stillwell Street
Kansas City, MO 64120

Project:

Industrial Hygiene Project Oversight Report
Blue River Wastewater Treatment Plant
60-inch Force Main Project
7300 Hawthorne Road
Kansas City, Missouri 64120

July 12, 2022

CLIENT: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

PROJECT: Industrial Hygiene Project Oversight Report
Blue River Wastewater Treatment Plant
60-inch Force Main Project
7300 Hawthorne Road
Kansas City, Missouri 64120

ECOSAFE PROJECT NO.: 2022.364.4EES

REPORT PREPARED BY: Jessica Raley

Jessica Raley
Missouri Air Sampling Professional
Certification # 7000032922MOAS21387
Asbestos Project Designer Certification # 7011032522MOPDI21387 **Asbestos Supervisor**
Certification # 7011040822MOSI21387

CONTACT INFORMATION:

EcoSafe Environmental Services, Inc.
215 W 18th Street, Suite 150 Kansas City, MO 64108
Tel: (816) 598-4111 / (270) 315-0057 E-mail:
Jessica@EcoSafeKC.com

Attachments:

1. Weekly Project Oversight Summary
2. Daily Logs
3. PCM Analytical Results
4. Photo Log
5. Personnel Certifications

Attachment 1: Weekly Project Oversight Summary

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

July 12, 2022

RE: Weekly Industrial Hygiene Project Oversight Report
Blue River Wastewater Treatment Plant
60-inch Force Main Project
7300 Hawthorne Road
Kansas City, Missouri 64120

Dear Mr. Nitcher,

EcoSafe Environmental Services Inc. is pleased to provide you with this weekly update report regarding the on-going project referenced above. EcoSafe provided project oversight and Phase Contrast Microscopy (PCM) on-site air monitoring during asbestos abatement activities from Tuesday, July 05, 2022 through Thursday, July 07, 2022 at the property location referenced above.

The asbestos abatement activities included asbestos-containing coating removal on the 60-inch force main pipe in the tunnel of the referenced property by the abatement contractor AT Abatement Services, Inc. During asbestos removal operations, EcoSafe performed industrial hygiene project oversight-surveillance and documented that all engineering controls and work practices were acceptable and within industry standards (see Attachment 2: Daily Logs for specific details).

EcoSafe collected a total of EIGHTEEN (18) phase contrast microscopy (PCM) air samples during this week. This included samples totaling: NINE (9) outside work area (OWA), THREE (3) negative air machine (NEG), and included SIX (6) quality control blank samples. All sampling pumps were calibrated before and after all air sampling collection. The samples were then analyzed on-site per the NIOSH 7400 method.

Sincerely,

Jessica Raley 07/12/2022
Jessica Raley | DATE
Missouri Air Sampling Professional
Certification #7000032922MOAS21387
Asbestos Project Designer Certification
7011032522MOPDI21387

Attachment 2: Daily Logs

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

PROJECT DAILY LOG

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

EcoSafe Project #: 2022.364.4EES
A.T. Abatement Project #: 22210017
Date: Tuesday, July 05, 2022

Project Location: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, Missouri 64120

Daily Scope of Work:

6:00 a.m. – EcoSafe Environmental Services, Inc. (EcoSafe) ASP, Jessica Raley, AT Abatement Services, Inc. (ATA) workers Tyler Gooch and Mitch Jones, and ATA supervisor, Tim Sullins, arrived on site.
6:10 a.m. – EcoSafe ASP and ATA supervisor met to discuss the SOW for the day. The workers would continue removing and bagging any remaining ACM coating on the 60-inch force main in the tunnel. ATA supervisor estimated the workers would begin loading out ACM debris tomorrow.
6:20 a.m. – EcoSafe ASP performed a pre-abatement walk-through of the containment prior to abatement activities. Any deficiencies observed were communicated to ATA supervisor and workers. After the containment was secured, the abatement activities were approved to begin.
6:35 a.m. – EcoSafe ASP began setting up outside work area (OWA) and negative air machine exhaust (NEG) air samples.
7:00 a.m. – ATA workers began abatement activities.
10:15 a.m. – EcoSafe ASP entered the containment and observed workers detailing while using proper engineering controls and work practices that met county, city, state, and federal regulations. 11:30 a.m. – EcoSafe and ATA left jobsite for lunch.
12:30 p.m. – EcoSafe and ATA returned to jobsite from lunch
12:40 p.m. – EcoSafe ASP met with ATA supervisor to discuss the work for the remainder of the day. ATA workers were continuing to detail and were on track to start cleaning next week.
2:25 p.m. – EcoSafe ASP entered containment to conduct a walk-through. Three areas of poly had separated from the wall. ATA workers were informed and began correcting issues.
3:45 p.m. – EcoSafe ASP began collecting OWA and NEG air samples.
3:55 p.m. – ATA workers began end of day clean-up. EcoSafe ASP began on-site PCM analysis for the daily samples.
4:25 p.m. - EcoSafe ASP finished analyzing the PCM samples. All samples were under the permissible exposure limit and met clearance criteria.
4:30 p.m. – EcoSafe and ATA left jobsite for the day.

PROJECT DAILY LOG
Date: Tuesday, July 05, 2022

Engineering Controls:	Worker Tools:	Personal Protective Equipment:
X Decontamination Unit X Three Stage X Shower X Critical Barriers X Barrier Tape X Load Out □ Monometer □ Wastewater Filter X Control Curtains X Signs Other:	X Hand and Pressure Tools X Negative Air Machines How Many: 6 □ X HEPA Vacuums Amended Water Encapsulant Glove Bags X Ladders X Mechanical Tools Specify: Amphi Blast	X Full Suit □ Double Suit X Boots X Gloves □ Half Mask APR X Full Face APR □ Powered APR □ Supplied Air Respirator SCBA X HEPA Cartridges Chemical Cartridges Other: _____

ECOSAFE ON-SITE PERSONNEL:
JESSICA RALEY —AIR SAMPLING PROFESSIONAL

A.T. ABATEMENT SERVICES ON-SITE PERSONNEL:

SUPERVISOR: TIM SULLINS
NUMBER OF WORKERS: 2
NAMES OF WORKERS: MITCH JONES & TYLER GOOCH

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

PROJECT DAILY LOG

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

EcoSafe Project #: 2022.364.4EES
A.T. Abatement Project #: 22210017
Date: Wednesday, July 06, 2022

Project Location: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, Missouri 64120

Daily Scope of Work:

6:00 a.m. – EcoSafe Environmental Services, Inc. (EcoSafe) ASP, Jessica Raley, A.T. Abatement (ATA) workers Tyler Gooch, Mitch Jones, Hugo Solaries, Martin Silva, and ATA supervisor, Tim Sullins, arrived on site.
6:15 a.m. – EcoSafe ASP and ATA supervisor met to discuss the work for the day. The workers would continue ACM coating removal on the 60-inch force main and begin loading out ACM bags.
6:20 a.m. – EcoSafe ASP entered containment and performed a pre-abatement walk-through of the containment prior to abatement activities. ATA workers were actively correcting any containment breaches. All observed deficiencies were corrected prior to abatement activities.
6:45 a.m. – EcoSafe ASP began setting up outside work area (OWA) and negative air machine exhaust (NEG) air samples.
9:00 a.m. – ATA workers began loading-out ACM bags into the designated ACM dumpster.
9:15 a.m. – EcoSafe ASP inspected ACM dumpster and informed ATA workers and supervisor of the poly separation from the dumpster walls. ATA worker corrected the issue before any additional ACM bags were loaded into the dumpster.
10:15 a.m. – EcoSafe ASP observed workers loading-out ACM bags from the containment to the OWA and ACM dumpster using proper engineering controls and work practices that met county, city, state, and federal regulations.
11:30 a.m. – EcoSafe and ATA left jobsite for lunch.
12:30 p.m. – EcoSafe and ATA returned to jobsite from lunch.
1:30 p.m. – EcoSafe ASP and ATA supervisor met to discuss the remaining workday SOW. The workers were finishing loading-out ACM bags.
1:45 p.m. – EcoSafe ASP entered the containment to perform a walk-through. ATA supervisor was informed the cleanroom needed attention. ATA workers were advised to clean this area after showering out at the end of the day.
3:55 p.m. – EcoSafe ASP began collecting OWA and NEG air samples.

4:10 p.m. – ATA workers began end of day clean-up. EcoSafe ASP began on-site PCM analysis for the daily samples.
4:30 p.m. – ATA left jobsite for the day.
4:45 p.m. –EcoSafe ASP finished analyzing the PCM samples. All samples were under the permissible exposure limit and met clearance criteria.
4:50 p.m. – EcoSafe left jobsite for the day.

PROJECT DAILY LOG
Date: Wednesday, July 06, 2022

Engineering Controls:	Worker Tools:	Personal Protective Equipment:
X Decontamination Unit X Three Stage X Shower X Critical Barriers X Barrier Tape X Load Out □ Monometer □ Wastewater Filter X Control Curtains X Signs Other:	X Hand and Pressure Tools X Negative Air Machines How Many: 6 □ X HEPA Vacuums Amended Water Encapsulant Glove Bags X Ladders X Mechanical Tools Specify: Amphi Blast	X Full Suit □ Double Suit X Boots X Gloves □ Half Mask APR X Full Face APR □ Powered APR □ Supplied Air Respirator SCBA X HEPA Cartridges Chemical Cartridges Other: _____

ECOSAFE ON-SITE PERSONNEL:
JESSICA RALEY —AIR SAMPLING PROFESSIONAL

A.T. ABATEMENT SERVICES ON-SITE PERSONNEL:

SUPERVISOR: TIM SULLINS
NUMBER OF WORKERS: 4
NAMES OF WORKERS: MITCH JONES, TYLER GOOCH, HUGO SOLARES, MARTIN SILVA

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

PROJECT DAILY LOG

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

EcoSafe Project #: 2022.364.4EES
A.T. Abatement Project #: 22210017
Date: Thursday, July 07, 2022

Project Location: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, Missouri 64120

Daily Scope of Work:

6:00 a.m. – EcoSafe Environmental Services, Inc. (EcoSafe) ASP, Jessica Raley, ATA Abatement Services, Inc. (ATA) workers Tyler Gooch, Mitch Jones, Hugo Solaries, Martin Silva, and ATA supervisor, Tim Sullins, arrived on site.
6:10 a.m. – EcoSafe ASP met with ATA supervisor to discuss the scope of work for the day. The workers would continue detailing the containment.
6:15 a.m. – EcoSafe ASP performed a pre-abatement walk-through of the containment prior to abatement activities. All observed deficiencies were corrected before abatement activities were approved to begin.
6:30 a.m. – EcoSafe ASP began setting up outside work area (OWA) and negative air machine exhaust (NEG) air samples.
10:00 a.m. – EcoSafe AST, Sarah Miller, arrived on site. Two OWA sample were collected.
10:20 a.m. – EcoSafe ASP and AST conducted an interior containment walk-through and observed ATA workers detailing the work area using proper engineering controls and work practices that met county, city, state, and federal regulations.
10:45 a.m. – EcoSafe ASP left jobsite for the day.
11:30 a.m. – EcoSafe and ATA left jobsite for lunch.
12:30 p.m. – EcoSafe and ATA returned to jobsite from lunch
12:45 p.m. – EcoSafe AST performed a containment walk-through after lunch and noted two small deficiencies on the main level, above containment. One section of tape had begun lifting and one section of poly had torn. ATA supervisor was notified, and deficiencies were corrected.
1:45 p.m. – EcoSafe AST met with ATA supervisor to discuss the plan for the rest of the day. The workers were continuing with ACM removal/detailing of certain areas of ACM coating on the pipe and bagging ACM waste.

2:30 p.m. – EcoSafe AST performed an interior containment walk-through and observed areas of the pipe that had been detailed. ATA workers were bagging ACM waste using proper engineering controls and work practices that met county, city, state, and federal regulations.
3:30 p.m. – EcoSafe AST began collecting the remaining OWA and NEG air samples.
4:00 p.m. – ATA workers began end of day clean-up. EcoSafe AST began on-site PCM analysis for the daily samples.
4:30 p.m. – ATA left jobsite for the day. EcoSafe ASP finished analyzing the PCM samples. All samples were under the permissible exposure limit and met clearance criteria.
4:45 p.m. – EcoSafe left jobsite for the day.

PROJECT DAILY LOG
Date: Thursday, July 07, 2022

Engineering Controls:	Worker Tools:	Personal Protective Equipment:
X Decontamination Unit X Three Stage X Shower X Critical Barriers X Barrier Tape X Load Out □ Monometer □ Wastewater Filter X Control Curtains X Signs Other:	X Hand and Pressure Tools X Negative Air Machines How Many: 6 □ X HEPA Vacuums Amended Water Encapsulant Glove Bags X Ladders X Mechanical Tools Specify: Amphi Blast	X Full Suit □ Double Suit X Boots X Gloves □ Half Mask APR X Full Face APR □ Powered APR □ Supplied Air Respirator SCBA X HEPA Cartridges Chemical Cartridges Other: _____

ECOSAFE ON-SITE PERSONNEL:
JESSICA RALEY —AIR SAMPLING PROFESSIONAL
SARAH MILLER — AIR SAMPLING TECHNICIAN

A.T. ABATEMENT SERVICES ON-SITE PERSONNEL:

SUPERVISOR: TIM SULLINS
NAMES OF WORKERS: MITCH JONES, TYLER GOOCH, HUGO SOLARES, MARTIN SILVA

Attachment 3: PCM Analytical Results

ECOSAFE
Environmental Services, Inc.

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street Kansas
City, MO 64210

Collection Date: Tuesday, 07/05/2022
Date Analyzed: Tuesday, 07/05/2022
Project #: 2022.364.4EES
A.T. Abatement Project #: 2210017

Project: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, MO 64120

Abatement Activity: Asbestos Containing Material (ACM) Coating Removal

Sample ID	Sample Type /Location	Time On	Time Off	Minutes	Average Flow Rate	Volume Liter	Fiber Count	Fibers/mm²	Fibers/cc
7300-OWA-1	PCM Outside Work Area: Main Level-Above Containment	6:32	3:50	558	4 L	2,352 L	2.0/100	2.55	0.0004
7300-OWA-2	PCM Outside Work Area: Load Out	6:45	3:48	543	4 L	2,172 L	1.5/100	1.91	0.0003
7300-OWA-3	PCM Outside Work Area: Clean Room	6:49	3:47	538	4 L	2,152 L	2.0/100	2.55	0.0005
7300-NAE-1	PCM Negative Air Exhaust: Machine #2	6:50	3:46	536	4 L	2,144 L	1.0/100	1.27	0.0002
7300-BLK-1	PCM Control—Field Blank	—	—		—	—	00/100	0.00	0.0000
7300-BLK-2	PCM Control—Lab Blank	—	—		—	—	00/100	0.00	0.0000

Jessica Raley 07/05/2022
Jessica Raley | DATE
Missouri Air Sampling Professional
Certification # 7000032922MOAS21387

OWA—Outside Work Area	CLNR—Clean Room
IWA—Inside Work Area	BGO—Bag Out
NAE—Negative Air Exhaust	CLR—Clearance
STEL—Short Term Exposure Limit	AMB—Ambient (exterior)
PERS—Work Shift Personal	BKGD—Background
PCM—Phase Contrast Microscopy	BLK—Blank

PCM Clearance Criteria: 0.01 F/cc
Permissible Exposure Limit: 0.1 F/cc

ECOSAFE
Environmental Services, Inc.

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street Kansas
City, MO 64210

Collection Date: Wednesday, 07/06/2022
Date Analyzed: Wednesday, 07/06/2022
Project #: 2022.364.4EES
A.T. Abatement Project #: 2210017

Project: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, MO 64120

Abatement Activity: Asbestos Containing Material (ACM) Coating Removal

Sample ID	Sample Type /Location	Time On	Time Off	Minutes	Average Flow Rate	Volume Liter	Fiber Count	Fibers/mm²	Fibers/cc
7300-OWA-1	PCM Outside Work Area: Main Level-Above Containment	6:44	4:11	567	4 L	2,268 L	2.0/100	2.55	0.0004
7300-OWA-2	PCM Outside Work Area: Load Out	6:50	4:13	563	4 L	2,252 L	1.0/100	1.27	0.0002
7300-OWA-3	PCM Outside Work Area: Clean Room	6:53	4:10	557	4 L	2,228 L	4.0/100	5.10	0.0009
7300-NAE-1	PCM Negative Air Exhaust: Machine #2	6:41	4:10	569	4 L	2,276 L	0.0/100	0.00	0.0000
7300-BLK-1	PCM Control—Field Blank	—	—		—	—	00/100	0.00	0.0000
7300-BLK-2	PCM Control—Lab Blank	—	—		—	—	00/100	0.00	0.0000

Jessica Raley 07/06/2022
Jessica Raley | DATE
Missouri Air Sampling Professional
Certification # 7000032922MOAS21387

OWA—Outside Work Area	CLNR—Clean Room
IWA—Inside Work Area	BGO—Bag Out
NAE—Negative Air Exhaust	CLR—Clearance
STEL—Short Term Exposure Limit	AMB—Ambient (exterior)
PERS—Work Shift Personal	BKGD—Background
PCM—Phase Contrast Microscopy	BLK—Blank

PCM Clearance Criteria: 0.01 F/cc
Permissible Exposure Limit: 0.1 F/cc

ECOSAFE
Environmental Services, Inc.

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street Kansas
City, MO 64210

Collection Date: Thursday, 07/07/2022
Date Analyzed: Thursday, 07/07/2022
Project #: 2022.364.4EES
A.T. Abatement Project #: 2210017

Project: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, MO 64120

Abatement Activity: Asbestos Containing Material (ACM) Coating Removal

Sample ID	Sample Type /Location	Time On	Time Off	Minutes	Average Flow Rate	Volume Liter	Fiber Count	Fibers/mm²	Fibers/cc
7300-OWA-1	PCM Outside Work Area: Main Level-Above Containment	6:45	10:00	195	4 L	780 L	1.0/100	1.27	0.0006
7300-OWA-2	PCM Outside Work Area: Load Out	6:44	3:47	543	4 L	2,172 L	OCCLUDED	OCCLUDED	OCCLUDED
7300-OWA-3	PCM Outside Work Area: Clean Room	6:33	10:00	207	4 L	828 L	0.0/100	0.00	0.0000
7300-NAE-1	PCM Negative Air Exhaust: Machine #3	6:48	3:51	543	4 L	2,172 L	0.0/100	0.00	0.0000
7300-BLK-1	PCM Control—Field Blank	—	—	—	—	—	0.0/100	0.00	0.0000
7300-BLK-2	PCM Control—Lab Blank	—	—	—	—	—	0.0/100	0.00	0.0000

Sarah Miller 07/07/2022
Sarah Miller | DATE
Air Sampling Technician
Certification # NIOSH582-4510287

OWA—Outside Work Area	CLNR—Clean Room
IWA—Inside Work Area	BGO—Bag Out
NAE—Negative Air Exhaust	CLR—Clearance
STEL—Short Term Exposure Limit	AMB—Ambient (exterior)
PERS—Work Shift Personal	BKGD—Background
PCM—Phase Contrast Microscopy	BLK—Blank

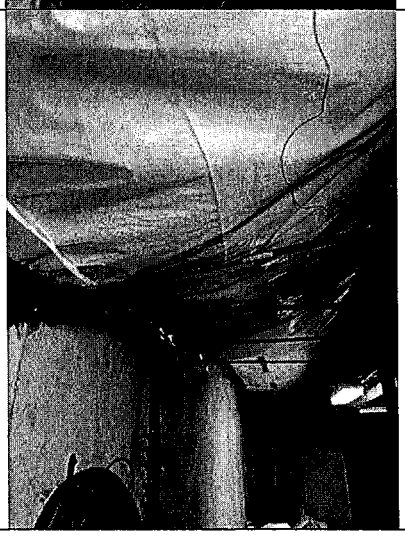
PCM Clearance Criteria: 0.01 F/cc
Permissible Exposure Limit: 0.1 F/cc

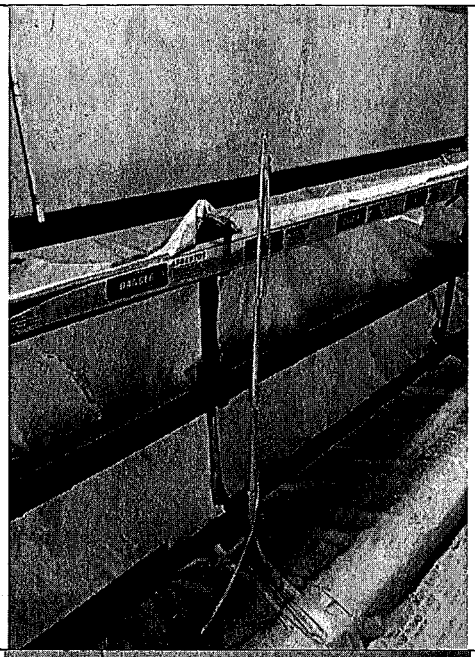
ECOSAFE
Environmental Services, Inc.

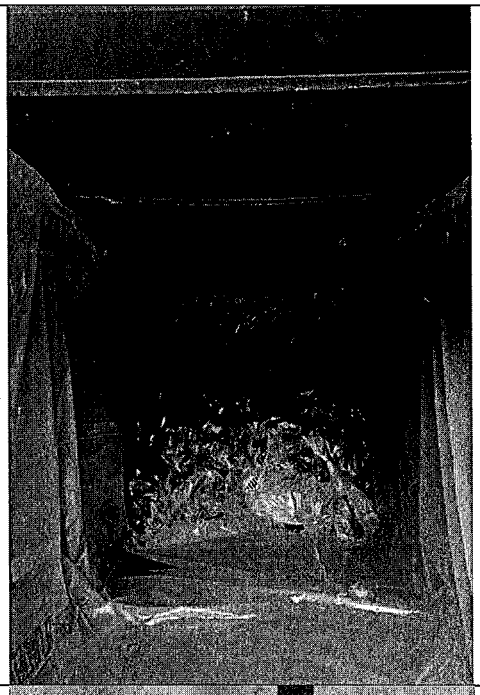
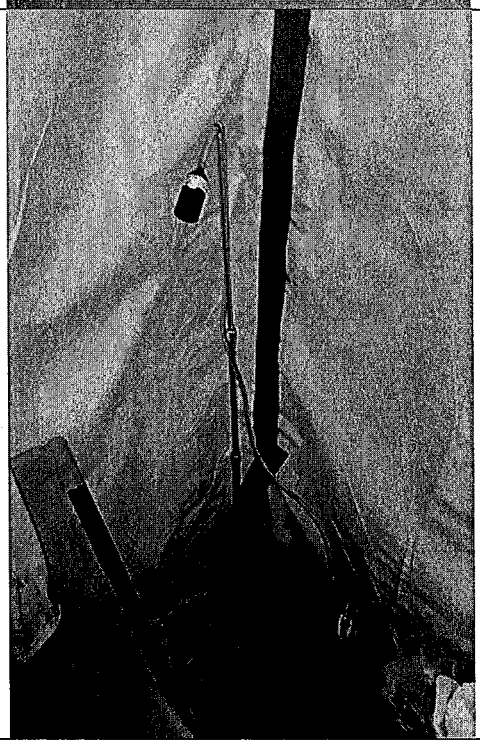
Photographic Documentation

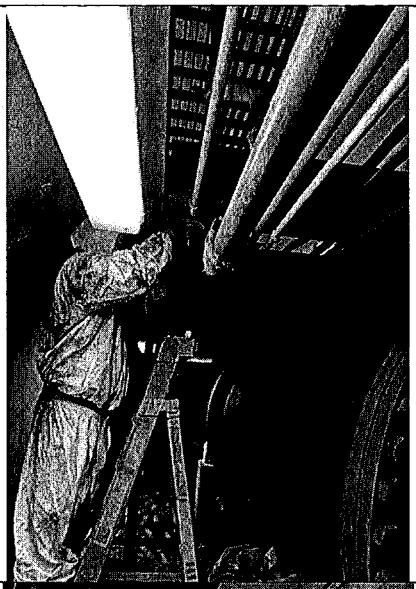
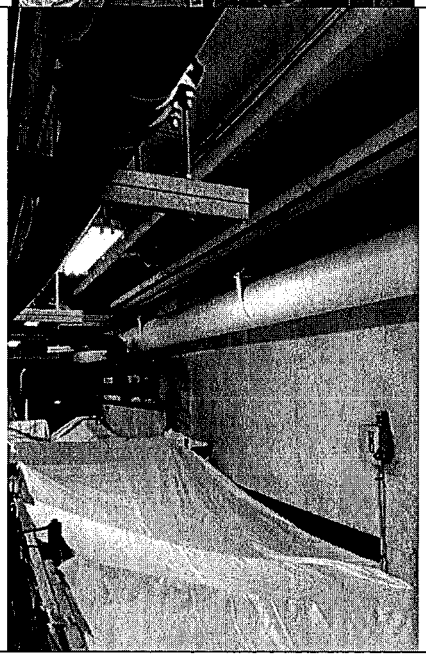
Client: A.T. Abatement Services
Site Name: Blue River Wastewater Treatment Plant
Location: 7300 Hawthorne Rd, Kansas City, MO 64120

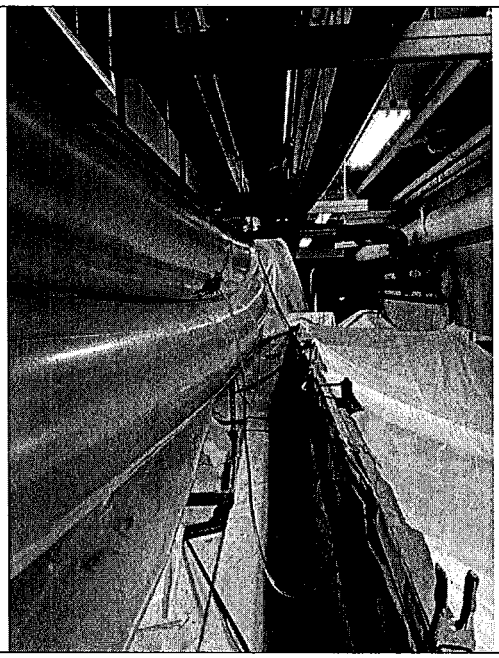
Prepared by: Jessica Raley
Project Number: 22210017
Dates: 07/05/2022-07/07/2022

Photograph No. 1 **Date:** 07/05/2022 **Description:** Negative Air Machines	
Photograph No. 2 **Date:** 07/05/2022 **Description:** Secured Containment	

Photograph No. 3 **Date:** 07/05/2022 **Description:** Air Sample – OWA: Main Level, Above Containment		
Photograph No. 4 **Date:** 07/06/2022 **Description:** Loading-Out ACM Bags		

Photograph No. 5 **Date:** 07/06/2022 **Description:** ACM Bags: ACM Dumpster		
Photograph No. 6 **Date:** 07/06/2022 **Description:** Air Sample – OWA: Cleanroom		

Photograph No. 7 **Date:** 07/07/2022 **Description:** Detailing 60-inch Force Main	
Photograph No. 8 **Date:** 07/07/2022 **Description:** Secured Containment: Main Level	

Photograph No. 9 **Date:** 07/07/2022 **Description:** Air Sample – NEG	

Attachment 5: Personnel Certifications

CERTIFICATION NUMBER:

7000032922MOAS21387

THIS CERTIFIES

Jessica Raley

HAS COMPLETED THE CERTIFICATION

REQUIREMENTS FOR

Air Sampling Professional



APPROVED **03/29/2022**

Director of Nr Pollution Control Program

CERTIFICATION NUMBER:

7011032522MOPDI21387

THIS CERTIFIES

Jessica Raley

HAS COMPLETED THE CERTIFICATION

REQUIREMENTS FOR

Project Designer



AP PROVED: **03/29/2022**

EXPIRES **03/29/2023**

TRAINING DATE: 03/25/2022

Director of Air Pollution Control Program

CERTIFICATION NUMBER:

7011040822MOSI21387

THIS CERTIFIES

Jessica Raley

HAS COMPLETED THE CERTIFICATION

REQUIREMENTS FOR

Supervisor



APPROVED **06/23/2022**

TRAINING DATE **04/08/2022**

EXPIRES: **04/08/2023**

Director of AJr Pollution Control Program

TITAN ENVIRONMENTAL SERVICES
CONSULTING & TESTING
ABATEMENT & DEMOLITION

A FULL SERVICE ENVIRONMENTAL CONSULTING AND TESTING FIRM

Certificate of Completion

Sarah Miller

HAS SUCCESSFULLY COMPLETED
THE SAMPLING & EVALUATION OF AIRBORNE ASBESTOS DUST
A NIOSH 582 EQUIVALENCY COURSE

CERTIFICATE #: NIOSH582-4510287

LOCATION: KANSAS CITY, KS

KARLA GRANGER, PROGRAM COORDINATOR

JUNE 6-10, 2022

INDUSTRIAL HYGIENE PROJECT OVERSIGHT REPORT July 21, 2022

Prepared by:

ECOSAFE
Environmental Services, Inc.
215 W 18th St, Suite 150, Kansas City, Missouri 64108

For:

Greg Nitcher
AT Abatement Services, Inc
4915 Stillwell Street
Kansas City, MO 64120

Project:

Industrial Hygiene Project Oversight Report
Blue River Wastewater Treatment Plant
60-inch Force Main Project
7300 Hawthorne Road
Kansas City, Missouri 64120

July 21, 2022

CLIENT: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

PROJECT: Industrial Hygiene Project Oversight Report
Blue River Wastewater Treatment Plant
60-inch Force Main Project
7300 Hawthorne Road
Kansas City, Missouri 64120

ECOSAFE PROJECT NO.: 2022.364.5EES

REPORT PREPARED BY: Jessica Raley

Jessica Raley
Missouri Air Sampling Professional
Certification # 7000032922MOAS21387
Asbestos Project Designer
Certification # 7011032522MOPDI21387
Asbestos Supervisor
Certification # 7011040822MOSI21387

CONTACT INFORMATION:

EcoSafe Environmental Services, Inc.
215 W 18th Street, Suite 150 Kansas City, MO 64108
Tel: (816) 598-4111 / (270) 315-0057 E-mail:
Jessica@EcoSafeKC.com

Attachments:

1. Weekly Project Oversight Summary
2. Daily Logs
3. PCM Analytical Results
4. Photo Log
5. Personnel Certifications

Attachment 1: Weekly Project Oversight Summary

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

July 21, 2022

RE: Weekly Industrial Hygiene Project Oversight Report
Blue River Wastewater Treatment Plant
60-inch Force Main Project
7300 Hawthorne Road
Kansas City, Missouri 64120

Dear Mr. Nitcher,

EcoSafe Environmental Services Inc. is pleased to provide you with this weekly update report regarding the on-going project referenced above. EcoSafe provided project oversight and Phase Contrast Microscopy (PCM) on-site air monitoring during asbestos abatement activities from Tuesday, July 05, 2022 through Thursday, July 07, 2022 at the property location referenced above.

The asbestos abatement activities included asbestos-containing coating removal on the 60-inch force main pipe in the tunnel of the referenced property by the abatement contractor AT Abatement Services, Inc. During asbestos removal operations, EcoSafe performed industrial hygiene project oversight-surveillance and documented that all engineering controls and work practices were acceptable and within industry standards (see Attachment 2: Daily Logs for specific details).

EcoSafe performed a final visual inspection of the abatement work areas. EcoSafe determined that all visible abated areas were clean and free of any suspect ACM materials and debris. Following the successful completion of the visual inspection, air samples were collected. All clearance samples were found to have fiber concentrations below the clearance criteria of 0.01 fibers per cubic centimeter of air. In conclusion, **the subject abatement work area is cleared for re-occupancy**. Please see PCM Analytical Results/Air Data Sheets for additional information.

EcoSafe collected a total of NINETEEN (19) phase contrast microscopy (PCM) air samples during this week. This included samples totaling: SIX (6) outside work area (OWA), TWO (2) negative air machine (NEG), FIVE (5) final air clearance, and included SIX (6) quality control blank samples. All sampling pumps were calibrated before and after all air sampling collection. The samples were then analyzed on-site per the NIOSH 7400 method.

Sincerely,

Jessica Raley 07/21/2022
Jessica Raley | DATE
Missouri Air Sampling Professional
Certification #7000032922MOAS21387
Asbestos Project Designer
Certification # 7011032522MOPDI21387

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

PROJECT DAILY LOG

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

EcoSafe Project #: 2022.364.5EES
A.T. Abatement Project #: 22210017
Date: Monday, July 11, 2022

Project Location: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, Missouri 64120

Daily Scope of Work:

6:00 a.m. – EcoSafe Environmental Services, Inc. (EcoSafe) and AT Abatement Services, Inc. (ATA) workers and supervisor arrived on site.
6:15 a.m. – ATA workers began inspecting containment and correcting areas of poly/tape that had separated over the weekend. EcoSafe ASP entered containment and performed a pre-abatement walk-through of the containment prior to abatement activities. ASP observed two gaps on the ceiling of the containment. ATA workers began correcting issues.
6:40 a.m. – EcoSafe ASP and ATA supervisor met to discuss the SOW for the day. The workers were continuing to detail the 60-inch force main in the tunnel. ATA supervisor estimated the workers would begin loading out ACM debris mid-morning. The containment was estimated to be ready for an air clearance this week.
6:45 a.m. – EcoSafe ASP began setting up outside work area (OWA) and negative air machine exhaust (NEG) air samples.
8:25 a.m. – EcoSafe ASP entered containment and observed workers detailing while using proper engineering controls and work practices that met county, city, state, and federal regulations.
10:20 a.m. – EcoSafe ASP performed exterior containment walk-through. All observed deficiencies were communicated with ATA supervisor who informed workers to begin correcting issues.
11:30 a.m. – EcoSafe and ATA left jobsite for lunch.
12:30 p.m. – EcoSafe and ATA returned to jobsite from lunch
1:00 p.m. – ATA workers began loading-out 50 ACM bags from the containment to the OWA and designated ACM dumpster. EcoSafe ASP observed ATA workers and supervisor using proper engineering controls and work practices that met county, city, state, and federal regulations during load-out activities.
3:20 p.m. – EcoSafe ASP began collecting OWA and NEG air samples.
3:25 p.m. – EcoSafe ASP began on-site PCM analysis for the daily samples.

4:00 p.m. – ATA workers began end of day clean-up. EcoSafe ASP finished analyzing the PCM samples. All samples were under the permissible exposure limit and met clearance criteria.
4:30 p.m. – EcoSafe and ATA left jobsite for the day.

PROJECT DAILY LOG
Date: Monday, July 11, 2022

Engineering Controls:	Worker Tools:	Personal Protective Equipment:
X Decontamination Unit X Three Stage X Shower X Critical Barriers X Barrier Tape X Load Out □ Monometer □ Wastewater Filter X Control Curtains X Signs Other:	X Hand and Pressure Tools X Negative Air Machines How Many: 6 □X HEPA Vacuums Amended Water Encapsulant Glove Bags X Ladders X Mechanical Tools Specify: Amphi Blast	X Full Suit □ Double Suit X Boots X Gloves □ Half Mask APR X Full Face APR □ Powered APR □ Supplied Air Respirator SCBA X HEPA Cartridges Chemical Cartridges Other: _____

ECOSAFE ON-SITE PERSONNEL:
JESSICA RALEY —AIR SAMPLING PROFESSIONAL

A.T. ABATEMENT SERVICES ON-SITE PERSONNEL:

SUPERVISOR: TIM SULLINS
NUMBER OF WORKERS: 4

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

PROJECT DAILY LOG

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

EcoSafe Project #: 2022.364.5EES
A.T. Abatement Project #: 22210017
Date: Tuesday, July 12, 2022

Project Location: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, Missouri 64120

Daily Scope of Work:

6:00 a.m. – EcoSafe Environmental Services, Inc. (EcoSafe) and AT Abatement Services, Inc. (ATA) workers and supervisor arrived on site.
6:05 a.m. – EcoSafe ASP and ATA supervisor met to discuss the SOW for the day. The workers were continuing to detail the 60-inch force main in the tunnel. The containment was estimated to be ready for an air clearance tomorrow.
6:15 a.m. – EcoSafe ASP entered containment and performed a pre-abatement walk-through of the containment prior to abatement activities. All observed loose areas of poly were actively being corrected by ATA workers.
6:25 a.m. – EcoSafe ASP began setting up outside work area (OWA) and negative air machine exhaust (NEG) air samples.
8:45 a.m. – EcoSafe ASP entered containment to check on progress. ATA workers were detailing utilizing HEPA vacuums, brushes, pressure washer and hand tools, while using proper engineering controls and work practices.
10:00 a.m. – EcoSafe ASP entered containment and conducted a walk-through. No containment issues were noted.
11:30 a.m. – EcoSafe and ATA left jobsite for lunch.
12:30 p.m. – EcoSafe and ATA returned to jobsite from lunch
1:00 p.m. – EcoSafe ASP entered containment and observed workers utilizing equipment to thoroughly clean and remove ACM coating from the containment and 60-inch Force Main.
2:45 p.m. – EcoSafe ASP conducted an exterior containment inspection and advised ATA workers of three areas of poly separation. The workers began correcting issues immediately.
3:15 p.m. – EcoSafe ASP began collecting OWA and NEG air samples.
3:45 p.m. – EcoSafe ASP began on-site PCM analysis for the daily samples.
4:00 p.m. – ATA workers began end of day clean-up.
4:25 p.m. - EcoSafe ASP finished analyzing the PCM samples. All samples were under the permissible exposure limit and met clearance criteria.
4:30 p.m. – EcoSafe and ATA left jobsite for the day.

PROJECT DAILY LOG
Date: Tuesday, July 12, 2022

Engineering Controls:	Worker Tools:	Personal Protective Equipment:
X Decontamination Unit X Three Stage X Shower X Critical Barriers X Barrier Tape X Load Out □ Monometer □ Wastewater Filter X Control Curtains X Signs Other:	X Hand and Pressure Tools X Negative Air Machines How Many: 6 □ X HEPA Vacuums Amended Water Encapsulant Glove Bags X Ladders X Mechanical Tools Specify: Amphi Blast	X Full Suit □ Double Suit X Boots X Gloves □ Half Mask APR X Full Face APR □ Powered APR □ Supplied Air Respirator SCBA X HEPA Cartridges Chemical Cartridges Other: _____

ECOSAFE ON-SITE PERSONNEL:
JESSICA RALEY —AIR SAMPLING PROFESSIONAL

A.T. ABATEMENT SERVICES ON-SITE PERSONNEL:

SUPERVISOR: TIM SULLINS
NUMBER OF WORKERS: 4

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

PROJECT DAILY LOG

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

EcoSafe Project #: 2022.364.5EES
A.T. Abatement Project #: 22210017
Date: Wednesday, July 13, 2022

Project Location: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, Missouri 64120

Daily Scope of Work:

6:00 a.m. – EcoSafe Environmental Services, Inc. (EcoSafe) and AT Abatement Services, Inc. (ATA) workers and supervisor arrived on site.
6:05 a.m. – EcoSafe ASP and ATA supervisor met to discuss the SOW for the day. The workers were finishing ACM coating detail on the 60-inch force main in the tunnel and would be ready for a final clearance by the end of today.
6:15 a.m. – EcoSafe entered containment and performed a pre-abatement walk-through of the containment prior to abatement activities. One area of poly had separated from the tape and was corrected by ATA worker.
6:50 a.m. – EcoSafe ASP informed ATA supervisor the cleanroom poly was falling down, and a water had leaked from the containment into the OWA. ATA supervisor advised each issue would be corrected.
7:00 a.m. – EcoSafe ASP conducted a pre-visual inspection and noted multiple areas that needed additional detailing and ACM removal. Each area was communicated with ATA supervisor.
8:15 a.m. – ATA PM, Mark Yarnell, arrived on site to discuss the plan for the week. ATA supervisor advised the containment was estimated to be ready for an air clearance this week. EcoSafe ASP advised ATA PM of the areas that needed extra attention before the visual clearance.
10:30 a.m. – EcoSafe entered containment to check on progress. The workers were continuing to remove ACM coating from the pipe, detail, and bag ACM debris. EcoSafe ASP observed ATA workers using proper engineering controls and work practices that met county, city, state, and federal regulations during these abatement activities.
11:30 a.m. – EcoSafe and ATA left jobsite for lunch.
12:30 p.m. – EcoSafe and ATA returned to jobsite from lunch

1:30 p.m. – EcoSafe ASP conducted another pre-visual inspection and noted improvement on detail and removal. EcoSafe ASP communicated areas of the pipe, including the bolts, that had remaining ACM coating and debris. ATA supervisor advised these areas would be corrected.
3:00 p.m. – EcoSafe ASP met with ATA supervisor who advised the containment would be ready for the visual and air clearance tomorrow.
4:00 p.m. – ATA workers began end of day clean-up.
4:30 p.m. – EcoSafe and ATA left jobsite for the day.

PROJECT DAILY LOG
Date: Wednesday, July 13, 2022

Engineering Controls:	Worker Tools:	Personal Protective Equipment:
X Decontamination Unit X Three Stage X Shower X Critical Barriers X Barrier Tape X Load Out □ Monometer □ Wastewater Filter X Control Curtains X Signs Other:	X Hand and Pressure Tools X Negative Air Machines How Many: 6 □ X HEPA Vacuums Amended Water Encapsulant Glove Bags X Ladders X Mechanical Tools Specify: Amphi Blast	X Full Suit □ Double Suit X Boots X Gloves □ Half Mask APR X Full Face APR □ Powered APR □ Supplied Air Respirator SCBA X HEPA Cartridges Chemical Cartridges Other: _____

ECOSAFE ON-SITE PERSONNEL:
JESSICA RALEY —AIR SAMPLING PROFESSIONAL

A.T. ABATEMENT SERVICES ON-SITE PERSONNEL:
SUPERVISOR: TIM SULLINS
NUMBER OF WORKERS: 5

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

PROJECT DAILY LOG

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

EcoSafe Project #: 2022.364.5EES
A.T. Abatement Project #: 22210017
Date: Thursday, July 14, 2022

Project Location: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, Missouri 64120

Daily Scope of Work:

6:00 a.m. – EcoSafe Environmental Services, Inc. (EcoSafe) and AT Abatement Services, Inc. (ATA) workers and supervisor arrived on site.
6:20 a.m. – EcoSafe ASP and ATA supervisor met to discuss the SOW for the day. ATA supervisor advised the containment was estimated to be ready for the final visual and air clearance by 11:30 a.m. today.
6:25 a.m. – EcoSafe ASP entered containment and performed a pre-abatement walk-through of the containment prior to abatement activities. No deficiencies were observed.
6:45 a.m. – EcoSafe ASP conducted a pre-visual inspection with ATA supervisor. Multiple areas of ACM coating and debris were observed inside of the containment attached to the pipe. ATA supervisor showed each area to the workers. EcoSafe ASP suggested more light inside of the containment to help with detail work.
7:10 a.m. – EcoSafe ASP observed ATA workers using proper engineering controls and work practices that met county, city, state, and federal regulations during detail.
7:50 a.m. – ATA PM, Mark Yarnell, and VP, Greg Nitcher, arrived on site to get an update and walk-through the containment. EcoSafe ASP communicated the areas that needed to be corrected before the final visual and air clearance could be conducted. ATA advised EcoSafe ASP these areas would be thoroughly abated and cleaned prior to the clearance.
8:50 a.m. – ATA and EcoSafe conducted a walk-through on the next areas of ACM coating abatement on a different section of the 60-in Force Main pipe. ATA workers were estimated to begin building containment early next week and start abatement mid-late next week.
10:30 a.m. – ATA workers and supervisor continued abatement and detailing activities inside of the tunnel on the 60-inch Force Main.
11:30 a.m. – EcoSafe and ATA left jobsite for lunch.
12:30 p.m. – EcoSafe and ATA returned to jobsite from lunch

12:40 p.m. – ATA supervisor advised the containment would be ready for the visual and air clearance tomorrow.
3:20 p.m. – EcoSafe ASP entered the containment to check on progress. ATA workers using proper engineering controls and work practices that met county, city, state, and federal regulations during detail activities. EcoSafe ASP noted areas that had been corrected and other areas being focused on
4:00 p.m. – ATA workers began end of day clean-up.
4:30 p.m. – EcoSafe and ATA left jobsite for the day.

PROJECT DAILY LOG

Date: Thursday, July 14, 2022

Engineering Controls:	Worker Tools:	Personal Protective Equipment:
X Decontamination Unit X Three Stage X Shower X Critical Barriers X Barrier Tape X Load Out □ Monometer □ Wastewater Filter X Control Curtains X Signs Other:	X Hand and Pressure Tools X Negative Air Machines How Many: 6 □ X HEPA Vacuums Amended Water Encapsulant Glove Bags X Ladders X Mechanical Tools Specify: Amphi Blast	X Full Suit □ Double Suit X Boots X Gloves □ Half Mask APR X Full Face APR □ Powered APR □ Supplied Air Respirator SCBA X HEPA Cartridges Chemical Cartridges Other: _____

ECOSAFE ON-SITE PERSONNEL:
JESSICA RALEY —AIR SAMPLING PROFESSIONAL

A.T. ABATEMENT SERVICES ON-SITE PERSONNEL:

SUPERVISOR: TIM SULLINS
NUMBER OF WORKERS: 5

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

PROJECT DAILY LOG

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

EcoSafe Project #: 2022.364.5EES
A.T. Abatement Project #: 22210017
Date: Friday, July 15, 2022

Project Location: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, Missouri 64120

Daily Scope of Work:

6:00 a.m. – EcoSafe Environmental Services, Inc. (EcoSafe) and AT Abatement Services, Inc. (ATA) workers and supervisor arrived on site.
6:05 a.m. – EcoSafe ASP and ATA supervisor met to discuss the SOW for the day. ATA supervisor and workers would be focused on final detailing and loading out remaining ACM bags.
6:15 a.m. – EcoSafe ASP entered containment and performed a pre-abatement walk-through of the containment prior to abatement activities. No deficiencies were observed.
8:30 a.m. – ATA supervisor and workers were continuing detail work on the 60-inch Force Main pipe. ATA supervisor estimated to begin loading out debris after lunch.
10:15 a.m. – EcoSafe ASP conducted exterior containment inspection. One area of loose poly was detached from the wall. This issue was communicated to ATA workers.
11:30 a.m. – EcoSafe and ATA left jobsite for lunch.
12:30 p.m. – EcoSafe and ATA returned to jobsite from lunch
12:50 p.m. – ATA workers began loading out bags into the load-out, which were transported from the outside work area to the designated ACM dumpster.
1:00 p.m. – EcoSafe ASP met with ATA supervisor who advised the workers were finishing detailing and would be ready for a final visual clearance in an hour.
2:15 p.m. – EcoSafe ASP entered the containment after being advised by the ATA supervisor the containment was ready for the visual clearance. EcoSafe ASP noted a few areas of ACM coating remaining on the 60-inch Force Main. These areas were corrected. The ACM debris was HEPA vacuumed after removal.
2:50 p.m. – EcoSafe ASP completed the visual clearance and determined the containment passed, meeting county, city, state, and federal regulations. ATA supervisor advised the workers would remove remaining equipment and begin encapsulating the pipe.
3:40 p.m. – ATA workers began encapsulating the 60-inch Force Main.

4:10 p.m. – EcoSafe ASP entered containment and confirmed the encapsulant was dry.
4:15 p.m. – EcoSafe ASP began setting up FIVE (5) final air clearance (CLR) samples spread throughout the containment, on the south and north side of the pipe.
4:30 p.m. – The remaining ATA workers left the jobsite for the day.
6:45 p.m. – EcoSafe ASP began collecting final air CLR samples.
7:10 p.m. – EcoSafe ASP began on-site PCM analysis.
7:45 p.m. - EcoSafe ASP finished analyzing the PCM samples. All clearance samples had fiber concentrations below the clearance criteria of 0.01 fibers per cubic centimeter of air. EcoSafe ASP informed ATA the abatement work area is cleared for re-occupancy and entry from other trades.
7:50 p.m. – EcoSafe began clean-up and equipment removal.
8:00 p.m. – EcoSafe left jobsite for the day.

PROJECT DAILY LOG
Date: Friday, July 15, 2022

Engineering Controls:	Worker Tools:	Personal Protective Equipment:
X Decontamination Unit X Three Stage X Shower X Critical Barriers X Barrier Tape X Load Out □ Monometer □ Wastewater Filter X Control Curtains X Signs Other:	X Hand and Pressure Tools X Negative Air Machines How Many: 6 □ X HEPA Vacuums Amended Water Encapsulant Glove Bags X Ladders X Mechanical Tools Specify: Amphi Blast	X Full Suit □ Double Suit X Boots X Gloves □ Half Mask APR X Full Face APR □ Powered APR □ Supplied Air Respirator SCBA X HEPA Cartridges Chemical Cartridges Other: _____

ECOSAFE ON-SITE PERSONNEL:
JESSICA RALEY —AIR SAMPLING PROFESSIONAL

A.T. ABATEMENT SERVICES ON-SITE PERSONNEL:

SUPERVISOR: TIM SULLINS
NUMBER OF WORKERS: 6

Attachment 3: PCM Analytical Results

ECOSAFE
Environmental Services, Inc.

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64210

Collection Date: Monday, 07/11/2022
Date Analyzed: Monday, 07/11/2022
Project #: 2022.364.5EES
A.T. Abatement Project #: 2210017

Project: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, MO 64120

Abatement Activity: Asbestos Containing Material (ACM) Coating Removal

Sample ID	Sample Type /Location	Time On	Time Off	Minutes	Average Flow Rate	Volume (Liter)	Fiber Count	Fibers/mm_2	Fibers/cc
7300-OWA-1	PCM Outside Work Area: Main Level-Above Containment	6:47	3:24	517	4 L	2,068L	10.5/100	13.38	0.0025
7300-OWA-2	PCM Outside Work Area: Load Out	6:49	3:21	512	4 L	2,048 L	3.0/100	3.82	0.0007
7300-OWA-3	PCM Outside Work Area: Clean Room	6:54	3:21	507	4 L	2,028 L	8.0/100	10.19	0.0019
7300-NAE-1	PCM Negative Air Exhaust: Machine #5	6:45	3:25	520	4 L	2,080 L	0.5/100	1.27	0.0002
7300-BLK-1	PCM Control—Field Blank	—	—	—	—	—	00/100	0.00	0.0000
7300-BLK-2	PCM Control—Lab Blank	—	—	—	—	—	00/100	0.00	0.0000

Jessica Raley 07/11/2022
Jessica Raley | DATE
Missouri Air Sampling Professional
Certification # 7000032922MOAS21387

OWA—Outside Work Area	CLNR—Clean Room
IWA—Inside Work Area	BGO—Bag Out
NAE—Negative Air Exhaust	CLR—Clearance
STEL—Short Term Exposure Limit	AMB—Ambient (exterior)
PERS—Work Shift Personal	BKGD—Background
PCM—Phase Contrast Microscopy	BLK—Blank

PCM Clearance Criteria: 0.01 F/cc
Permissible Exposure Limit: 0.1 F/cc

ECOSAFE
Environmental Services, Inc.

Client: Greg Nitcher
A.T. Abatement Services
4915 Stillwell Street
Kansas City, MO 64210

Collection Date: Tuesday, 07/12/2022
Date Analyzed: Tuesday, 07/12/2022
Project #: 2022.364.5EES
A.T. Abatement Project #: 2210017

Project: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, MO 64120

Abatement Activity: Asbestos Containing Material (ACM) Coating Removal

Sample ID	Sample Type /Location	Time On	Time Off	Minutes	Average Flow Rate	Volume (Liter)	Fiber Count	Fibers/mm²	Fibers/cc
7300-OWA-1	PCM Outside Work Area: Main Level-Above Containment	6:27	3:18	531	4 L	2,124 L	7.5/100	9.55	0.0017
7300-OWA-2	PCM Outside Work Area: Load Out	6:30	3:22	532	4 L	2,128 L	2.5/100	3.18	0.0006
7300-OWA-3	PCM Outside Work Area: Clean Room	6:32	3:22	530	4 L	2,120 L	5.0/100	6.37	0.0012
7300-NAE-1	PCM Negative Air Exhaust: Machine #6	6:25	3:18	533	4 L	2,132 L	2.0/100	2.55	0.0005
7300-BLK-1	PCM Control—Field Blank	—	—	—	—	—	00/100	0.00	0.0000
7300-BLK-2	PCM Control—Lab Blank	—	—	—	—	—	00/100	0.00	0.0000

Jessica Raley 07/12/2022
Jessica Raley | DATE
Missouri Air Sampling Professional
Certification # 7000032922MOAS21387

OWA—Outside Work Area	CLNR—Clean Room
IWA—Inside Work Area	BGO—Bag Out
NAE—Negative Air Exhaust	CLR—Clearance
STEL—Short Term Exposure Limit	AMB—Ambient (exterior)
PERS—Work Shift Personal	BKGD—Background
PCM—Phase Contrast Microscopy	BLK—Blank

PCM Clearance Criteria: 0.01 F/cc
Permissible Exposure Limit: 0.1 F/cc

ECOSAFE
Environmental Services, Inc.

Client: A.T. Abatement Services
4915 Stillwell Street
Kansas City, MO 64120

Project: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, MO 64120

Collection Date: Friday, 07/15/2022
Date Analyzed: Friday, 07/15/2022
Project #: 2022.364.5EES
A.T. Abatement Project #: 2210017

Abatement Activity: Asbestos Containing Material (ACM) Coating Removal

Sample ID	Sample Type /Location	Time On	Time Off	Minutes	Average Flow Rate	Volume (Liter)	Fiber Count	Fibers/mm^2	Fibers/cc
7300-CLR-1	PCM Clearance: West End, North Side	4:15	6:47	152	9L	1,368L	1.0/100	1.27	0.0004
7300-CLR-2	PCM Clearance: East End, North Side	4:19	6:47	148	9L	1,332L	2.5/100	3.18	0.0009
7300-CLR-3	PCM Clearance: East End, South Side	4:20	6:48	148	9L	1,332L	2.0/100	2.54	0.0007
7300-CLR-4	PCM Clearance: Middle, South Side	4:25	6:51	146	9L	1,314L	1.5/100	1.91	0.0006
7300-CLR-5	PCM Clearance: West End, South Side	4:28	6:52	144	9L	1,296L	1.0/100	1.27	0.0004
7300-BLK-1	PCM Control—Field Blank	—	—	—	—	—	00/100	0.00	0.0000
7300-BLK-2	PCM Control—Lab Blank	—	—	—	—	—	00/100	0.00	0.0000

Jessica Raley 07/15/2022
Jessica Raley | DATE
Missouri Air Sampling Professional
Certification # 7000032922MOAS21387

OWA—Outside Work Area	CLNR—Clean Room
IWA—Inside Work Area	BGO—Bag Out
HEPA—Negative Air Exhaust	CLR—Clearance
STEL—Short Term Exposure Limit	AMB—Ambient (exterior)
PERS—Work Shift Personal	BKGD—Background
PCM—Phase Contrast Microscopy	BLK—Blank

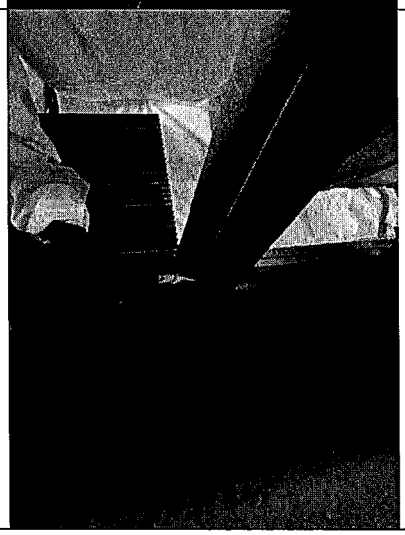
PCM Clearance Criteria: 0.01 F/cc
Permissible Exposure Limit: 0.1 F/cc

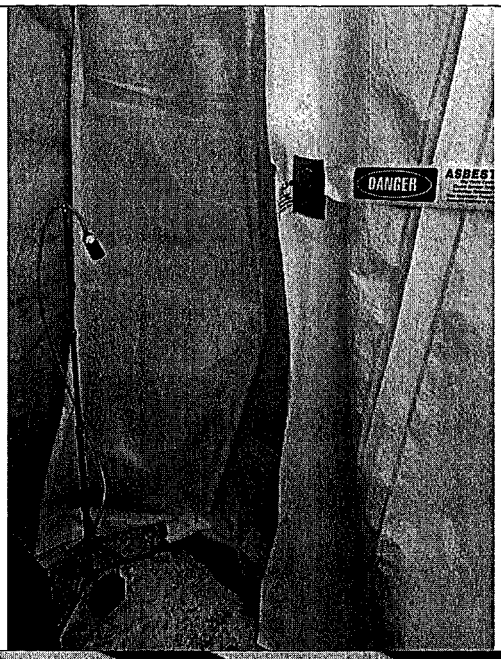
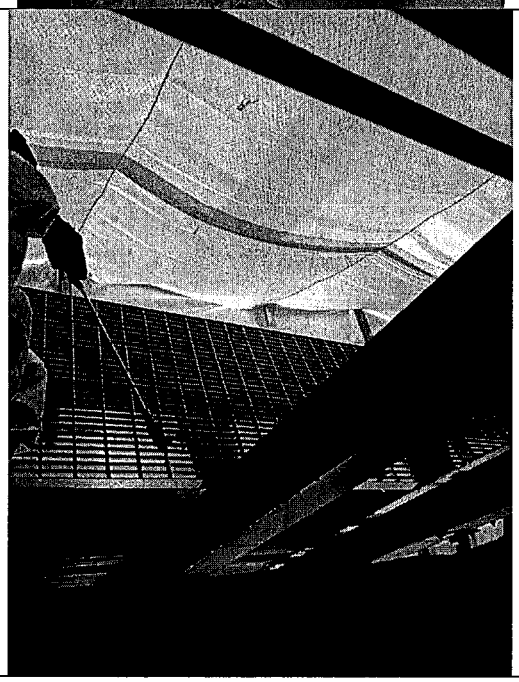
ECOSAFE
Environmental Services, Inc.

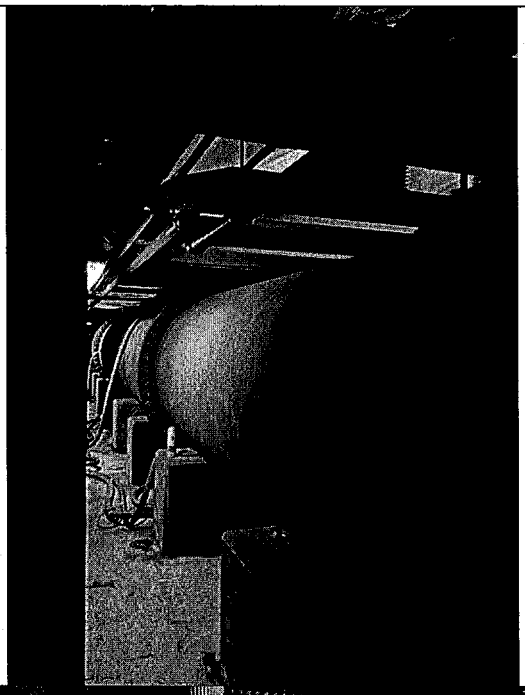
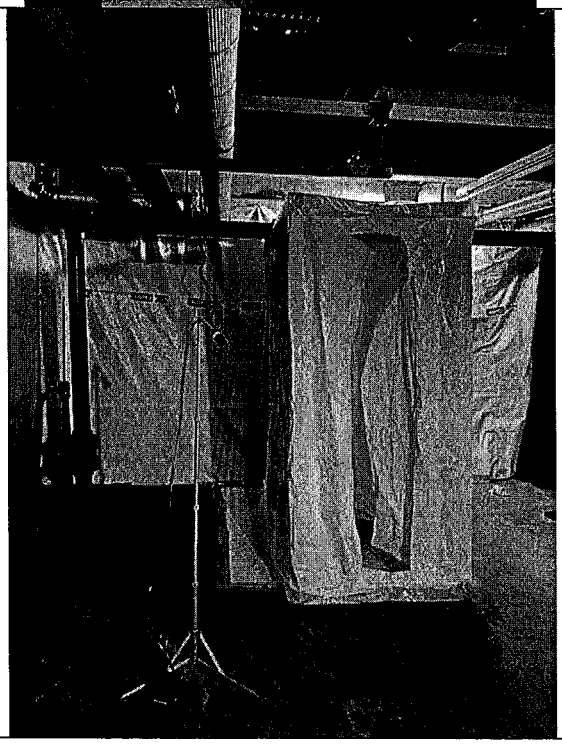
Photographic Documentation

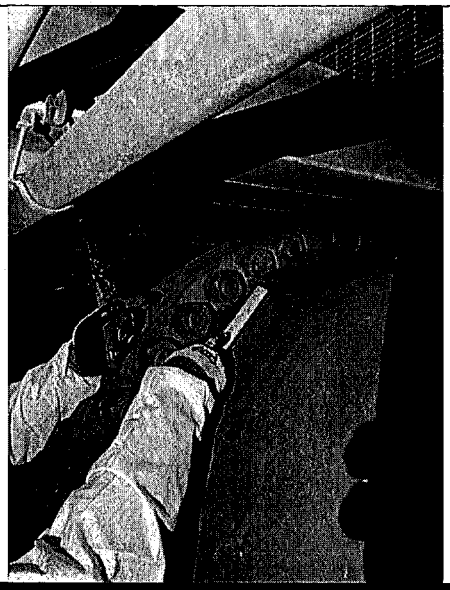
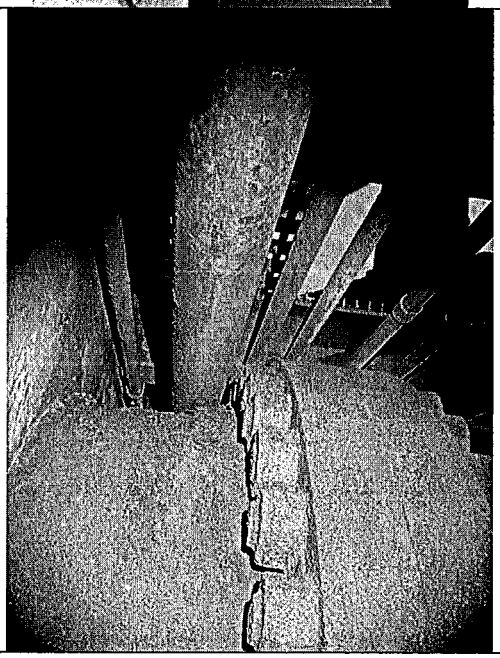
Client: A.T. Abatement Services
Site Name: Blue River Wastewater Treatment Plant
Location: 7300 Hawthorne Rd, Kansas City, MO 64120

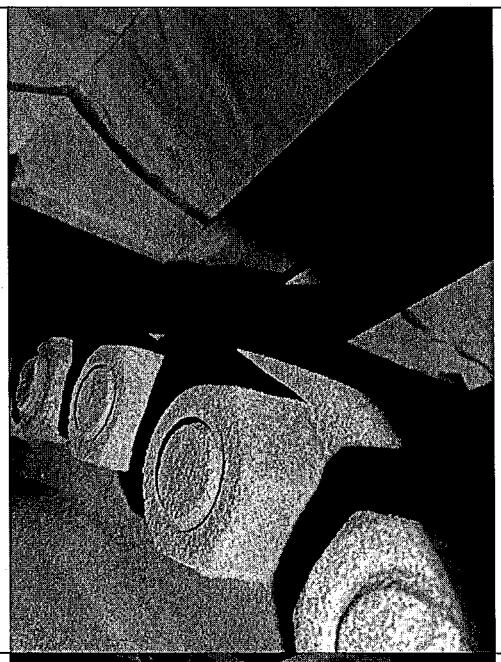
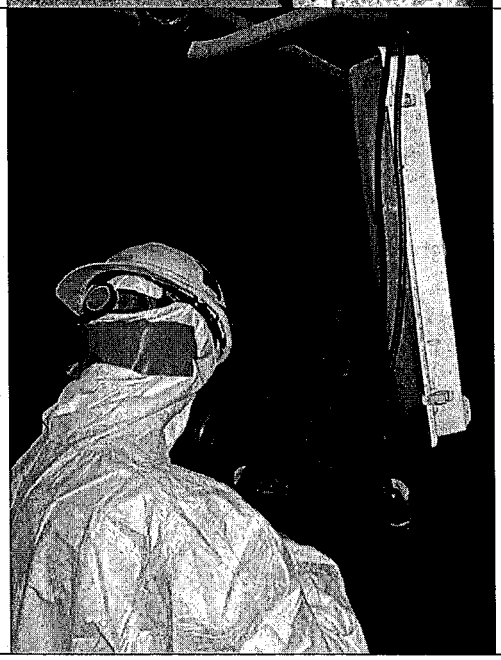
Prepared by: Jessica Raley
Project Number: 22210017
Dates: 07/11/2022-07/15/2022

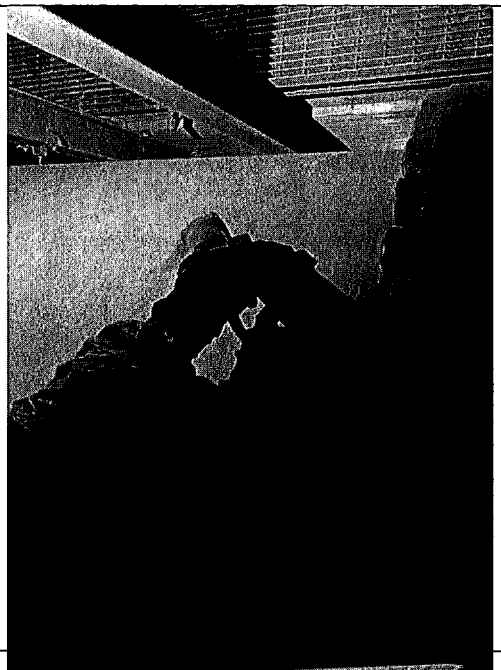
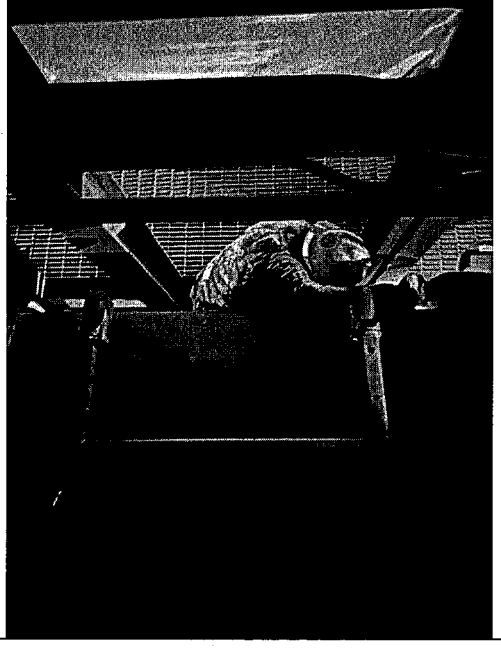
Photograph No. 1 **Date:** 07/11/2022 **Description:** Load-Out Bags	
Photograph No. 2 **Date:** 07/11/2022 **Description:** Detailing 60-inch Force Main	

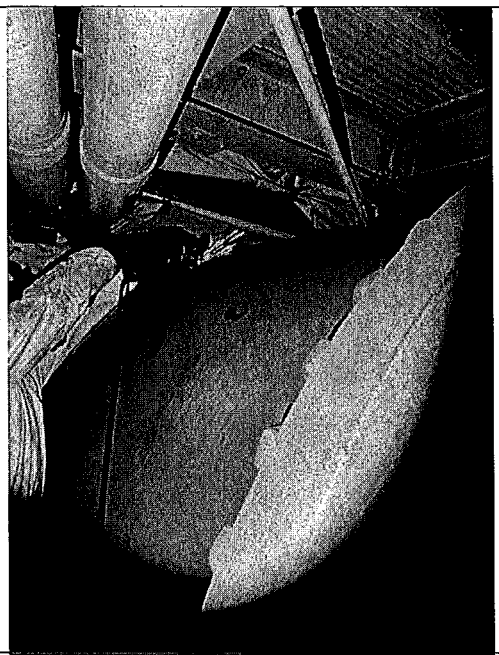
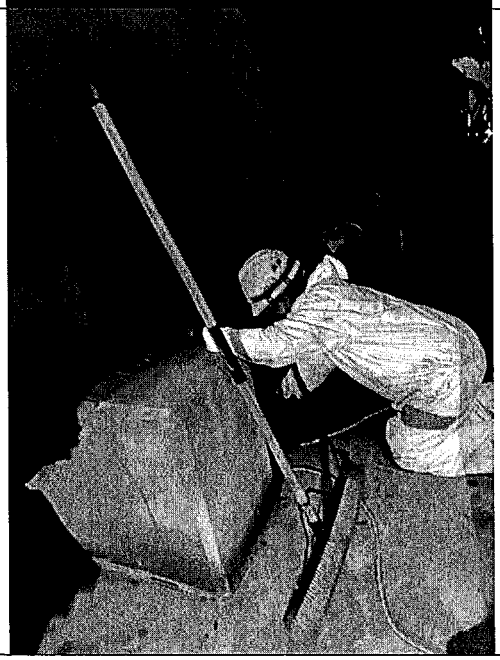
Photograph No. 3 **Date:** 07/11/2022 **Description:** Air Sample – OWA: Cleanroom		
Photograph No. 4 **Date:** 07/12/2022 **Description:** Detailing 60-inch Force Main		

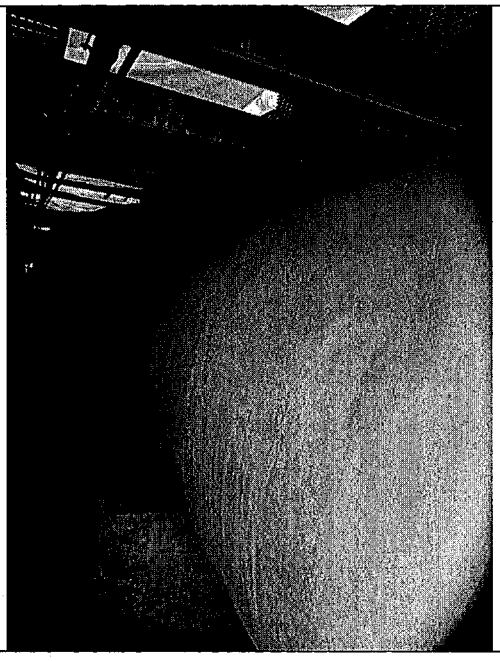
Photograph No. 5 **Date:** 07/12/2022 **Description:** 60-inch Force Main During Walk-Through	
Photograph No. 6 **Date:** 07/12/2022 **Description:** Air Sample – OWA: Load-Out	

Photograph No. 7 **Date:** 07/13/2022 **Description:** Detailing 60-inch Force Main	
Photograph No. 8 **Date:** 07/13/2022 **Description:** During Pre-Visual Inspection	

Photograph No. 9 **Date:** 07/14/2022 **Description:** During Pre-Visual Inspection			
Photograph No. 10 **Date:** 07/14/2022 **Description:** Removing ACM Coating from 60-inch Force Main			

Photograph No. 11 **Date:** 07/14/2022 **Description:** Removing ACM Coating from 60-inch Force Main		
Photograph No. 12 **Date:** 07/14/2022 **Description:** Detailing 60-inch Force Main		

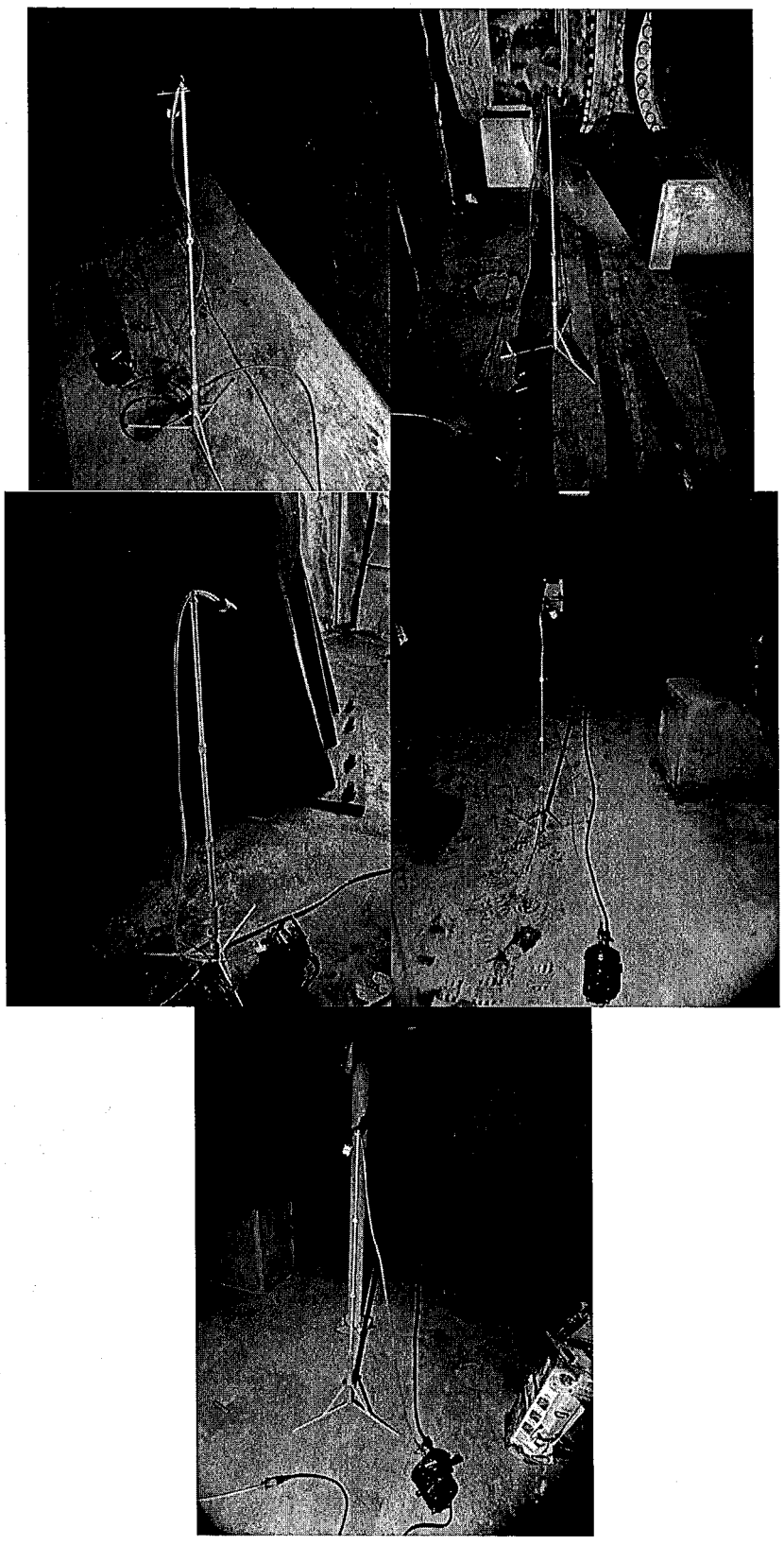
Photograph No. 13 **Date:** 07/15/2022 **Description:** Removing ACM Coating from 60-inch Force Main		
Photograph No. 14 **Date:** 07/15/2022 **Description:** Detailing 60-inch Force Main		

Photograph No. 15 **Date:** 07/15/2022 **Description:** 60-inch Force Main, Visual Clearance Passed	

Photograph No. 16

Date: 07/15/2022

Description: Final Air Clearance Samples



Attachment 5: Personnel Certifications

CERTIFICATION NUMBER:

7000032922MOAS21387

THIS CERTIFIES

Jessica Raley

HAS COMPLETED THE CERTIFICATION

REQUIREMENTS FOR

Air Sampling Professional



APPROVED **03/29/2022**

Director of Nr Pollution Control Program

CERTIFICATION NUMBER:

7011032522MOPDI21387

THIS CERTIFIES

Jessica Raley

HAS COMPLETED THE CERTIFICATION

REQUIREMENTS FOR

Project Designer



AP PROVED: **03/29/2022**

EXPIRES **03/29/2023**

TRAINING DATE: 03/25/2022

Director of Air Pollution Control Program

CERTIFICATION NUMBER:

7011040822MOSI21387

THIS CERTIFIES

Jessica Raley

HAS COMPLETED THE CERTIFICATION

REQUIREMENTS FOR

Supervisor



APPROVED **06/23/2022**

EXPIRES: **04/08/2023**

TRAINING DATE **04/08/2022**

Director of AJr Pollution Control Program

INDUSTRIAL HYGIENE PROJECT OVERSIGHT REPORT
August 11, 2022

Prepared by:

ECOSAFE
Environmental Services, Inc.
215 W 18th St, Suite 150, Kansas City, Missouri 64108

For:

Greg Nitcher
AT Abatement Services, Inc
4915 Stillwell Street
Kansas City, MO 64120

Project:

Industrial Hygiene Project Oversight Report
Blue River Wastewater Treatment Plant
60-inch Force Main Project
7300 Hawthorne Road
Kansas City, Missouri 64120

August 11, 2022

CLIENT: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

PROJECT: Industrial Hygiene Project Oversight Report
Blue River Wastewater Treatment Plant
60-inch Force Main Project
7300 Hawthorne Road
Kansas City, Missouri 64120

ECOSAFE PROJECT NO.: 2022.364.EES

REPORT PREPARED BY: Jessica Raley

Jessica Raley
Missouri Air Sampling Professional
Certification # 7000032922MOAS21387
Asbestos Project Designer
Certification # 7011032522MOPDI21387

CONTACT INFORMATION:

EcoSafe Environmental Services, Inc.
215 W 18th Street, Suite 150
Kansas City, MO 64108
Tel: (816) 598-4111 / (270) 315-0057
E-mail: Jessica@EcoSafeKC.com

Attachments:

1. Weekly Project Oversight Summary
2. Daily Log
3. PCM Analytical Results
4. Photo Log
5. Personnel Certifications

Attachment 1: Weekly Project Oversight Summary

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

August 11, 2022

RE: Weekly Industrial Hygiene Project Oversight Report
Blue River Wastewater Treatment Plant
60-inch Force Main Project
7300 Hawthorne Road
Kansas City, Missouri 64120

Dear Mr. Nitcher,

EcoSafe Environmental Services Inc. is pleased to provide you with this weekly update report regarding the on-going project referenced above. EcoSafe provided project oversight and Phase Contrast Microscopy (PCM) on-site air monitoring during asbestos abatement activities from Monday, July 25, 2022 through Friday, July 29, 2022 at the property location referenced above.

The asbestos abatement activities included asbestos-containing coating removal on the 60-inch force main pipe in the tunnel of the referenced property by the abatement contractor AT Abatement Services, Inc. During asbestos removal operations, EcoSafe performed industrial hygiene project oversight-surveillance and documented that all engineering controls and work practices were acceptable and within industry standards (see Attachment 2: Daily Logs for specific details).

EcoSafe collected a total of TWENTY-SEVEN (27) phase contrast microscopy (PCM) air samples during this week. This included samples totaling: TEN (10) outside work area (OWA), SEVEN (7) negative air machine (NEG), TWO (2) work shift personal (PERS), TWO (2) 30-minute excursion (EXC), and included SIX (6) quality control blank samples. All sampling pumps were calibrated before and after all air sampling collection. The samples were then analyzed on-site per the NIOSH 7400 method.

Sincerely,

Jessica Raley 08/11/2022
Jessica Raley | DATE
Missouri Air Sampling Professional
Certification #7000032922MOAS21387
Asbestos Project Designer
Certification # 7011032522MOPDI21387

Attachment 2: Daily Logs

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

PROJECT DAILY LOG

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

EcoSafe Project #: 2022.364.6EES
A.T. Abatement Project #: 22210017
Date: Monday, July 25, 2022

Project Location: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, Missouri 64120

Daily Scope of Work:

6:00 a.m. – EcoSafe Environmental Services, Inc. (EcoSafe) ASP, Jessica Raley, A.T. Abatement (ATA) workers and ATA supervisor, Tim Sullins, arrived on site.
6:20 a.m. – EcoSafe ASP and ATA supervisor met to discuss the scope of work for the day. The ACM coating removal was scheduled to begin in the morning.
7:30 a.m. – EcoSafe ASP prepared air sampling equipment, media and supplies in order to be prepared to begin air monitoring when abatement started. The planned air samples for the day were THREE (3) outside work area (OWA), TWO (2) negative air exhaust (NAE) and TWO (2) inside work area samples, dependent on the likelihood of occlusion in containment.
8:00 a.m. – ATA workers were continuing to prepare for abatement.
9:15 a.m. – ATA supervisor informed EcoSafe ASP the abatement would begin shortly when the 60-inch Force Main Pipe tunnel was available, after another trade prepared the tunnel to allow accessibility.
10:20 a.m. – EcoSafe ASP met with ATA supervisor who advised the 60-inch Force Main Pipe tunnel was not ready for ATA workers to access.
11:00 a.m. – EcoSafe ASP met with ATA supervisor and was informed the abatement would not begin today.
11:05 a.m. – ATA began end of workday clean-up.
11:15 a.m. – EcoSafe ASP collected air sampling equipment and supplies.
11:20 a.m. – ATA supervisor informed EcoSafe ASP the abatement was estimated to begin tomorrow and would be based on the accessibility of the containment, dependent on the outside trade to prepare the 60-inch Force Main Pipe tunnel.
11:30 a.m. – EcoSafe and ATA left jobsite for the day.

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

PROJECT DAILY LOG

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

EcoSafe Project #: 2022.364.6EES
A.T. Abatement Project #: 22210017
Date: Tuesday, July 26, 2022

Project Location: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, Missouri 64120

Daily Scope of Work:

6:00 a.m. – EcoSafe Environmental Services, Inc. (EcoSafe) ASP, Jessica Raley, AT Abatement Services, Inc. (ATA) workers and supervisor, Tim Sullins, arrived on site.
6:15 a.m. – EcoSafe ASP and ATA supervisor met to discuss the scope of work for the day. ATA now had access to the 60-inch Force Main tunnel and would begin containment preparation. The ACM coating removal was estimated to begin in the morning.
7:00 a.m. – EcoSafe ASP and ATA supervisor entered the containment, prior to abatement, to conduct a walk-through. EcoSafe ASP discussed the need for additional negative air machines based on the containment's approximate cubic square feet and air flow calculation. ATA supervisor advised they would install additional negative air machines in order to meet industry standards, along with local, state and federal regulations.
8:45 a.m. – EcoSafe ASP entered containment, prior to abatement, and observed workers preparing containment by securing poly to create critical barriers, including the load-out, cleanroom and outside work area containment perimeter.
10:00 a.m. – EcoSafe ASP informed ATA supervisor proper warning signage was not placed on the load-out or the negative air machine containment. ATA supervisor advised that a worker would install, and all warning signs would be posted before abatement began.
11:30 a.m. – EcoSafe and ATA left jobsite for lunch.
12:30 p.m. – EcoSafe and ATA returned to jobsite from lunch
1:30 p.m. – EcoSafe met with ATA supervisor to get an update on the abatement start time. ATA supervisor advised the abatement would begin shortly.
2:00 p.m. – EcoSafe ASP a performed a pre-abatement walk-through of containment prior to abatement activities. No deficiencies were observed. EcoSafe advised ATA supervisor abatement was approved to begin.
2:15 p.m. – ATA workers began ACM coating removal on the 60-inch Force Main Pipe.
4:00 p.m. – ATA workers began end of day clean-up.
4:30 p.m. – ATA and EcoSafe left jobsite for the day.

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

PROJECT DAILY LOG

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

EcoSafe Project #: 2022.364.6EES
A.T. Abatement Project #: 22210017
Date: Wednesday, July 27, 2022

Project Location: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, Missouri 64120

Daily Scope of Work:

6:00 a.m. – EcoSafe Environmental Services, Inc. (EcoSafe) ASP, Jessica Raley, AT Abatement Services, Inc. (ATA) workers and supervisor, Tim Sullins, arrived on site.
6:05 a.m. – EcoSafe ASP and ATA supervisor met to discuss the scope of work for the day. The ACM coating removal on the 60-inch Force Main Pipe in the tunnel would continue today, after EcoSafe's walk-through.
6:10 a.m. – EcoSafe ASP entered containment to perform a pre-abatement walk-through of containment prior to abatement activities. EcoSafe ASP observed the containment poly properly pulling in toward the containment, indicating sufficient negative pressure. EcoSafe ASP the pressure was too strong near the load-out, causing the inside of the containment to be visible. ATA worker began adding an additional flap and clamps, which helped seal the load-out.
6:30 a.m. – EcoSafe ASP began setting up air monitoring samples, including outside work area (OWA), and negative air exhaust (NEG) samples.
6:50 a.m. – EcoSafe completed pre-abatement walk-through and advised the containment met county, city, state, and federal regulations.
7:00 a.m. – EcoSafe attached personal air samples (PERS) to two workers, Mitch and Matt in order to monitoring their breathing zones, confirming their full-face respirators were sufficient, based on the PCM PEL data.
7:10 a.m. – ATA workers began ACM coating removal using abrasive blasting equipment.
9:00 a.m. – EcoSafe ASP conducted a walk-through of the exterior containment and observed one area of poly and tape starting to separate from the wall. EcoSafe ASP informed ATA supervisor, who then re-sealed the poly.
9:45 a.m. – ATA workers were continuing to conduct ACM coating removal, following proper engineering controls and work practices that met county, city, state, and federal regulations.
10:30 a.m. – Two negative air machine pre-filters had shifted from the tubes that connect the main containment with the negative air machine room containment. EcoSafe ASP observed a hole in one of the tubes, causing a minor amount of blasting material to exit the containment.

EcoSafe informed ATA supervisor who began HEPA vacuuming the area and re-securing the negative air machine tubes.
11:00 a.m. – EcoSafe ASP began 30-minute excursion (EXC) samples on Mitch and Matt.
11:30 a.m. – EcoSafe ASP collected 30-minute excursion (EXC) samples on Mitch and Matt.
11:30 a.m. – ATA left jobsite for lunch. EcoSafe ASP left jobsite for the day.
12:30 p.m. – ATA returned to jobsite from lunch
12:30 p.m. – EcoSafe AST, Sarah Miller, arrived on site.
12:40 p.m. – EcoSafe AST re-attached the personal air (PERS) samples to Mitch and Matt after lunch to continue monitoring their breathing zone.
1:00 p.m. – EcoSafe met with ATA supervisor to get an update on the scope of work for the day. The workers would continue blasting the 60-inch Force Main Pipe to remove ACM coating, ensuring proper engineering controls and work practices were being followed that met county, city, state, and federal regulations.
2:30 p.m. – EcoSafe AST conducted a walk-through of the exterior containment and noted no deficiencies.
3:45 p.m. – EcoSafe AST began collecting the OWA and NEG and air samples.
4:00 p.m. – ATA workers began end of day clean up. EcoSafe AST began on-site PCM analysis.
4:30 p.m. – ATA left jobsite for the day.
5:00 p.m. – EcoSafe AST finished analyzing the PCM samples. The NAE samples, and Matt's PERS and EXC samples were under the permissible exposure limit and met clearance criteria. The two OWA samples, and Mitch's PERS and EXC were occluded and unable to be analyzed from dust and debris in the tunnel.
5:15 p.m. – EcoSafe AST left jobsite for the day.

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

PROJECT DAILY LOG

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

EcoSafe Project #: 2022.364.3EES
A.T. Abatement Project #: 22210017
Date: Thursday, June 28, 2022

Project Location: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, Missouri 64120

Daily Scope of Work:

6:00 a.m. – EcoSafe Environmental Services, Inc. (EcoSafe) ASP, Jessica Raley, AT Abatement Services, Inc. (ATA) workers and supervisor, Tim Sullins, arrived on site.
6:10 a.m. – EcoSafe ASP and ATA supervisor met to discuss the scope of work for the day. ATA workers were scheduled to pause ACM coating removal on Fridays in order to focus on detailing bagging ACM. Today the workers were continuing ACM coating removal on the 60-inch Force Main Pipe in the tunnel.
6:15 a.m. – EcoSafe ASP entered containment to perform a pre-abatement walk-through of containment prior to abatement activities. EcoSafe ASP observed one of the critical barriers, covering an interior wall, was loose on the right side due to humidity on the concrete. ATA supervisor advised this would be corrected before abatement began. EcoSafe ASP confirmed each drain was plugged to ensure no contaminated ACM water would leave the containment without being HEPA vacuumed.
6:30 a.m. – EcoSafe ASP continued the pre-abatement walk-through on the exterior of the containment and noted two issues with critical barriers. ATA supervisor corrected and HEPA vacuumed area. Abatement was cleared to begin
9:15 a.m. – EcoSafe ASP conducted a walk-through of the exterior containment and noted no issues.
11:00 a.m. – EcoSafe ASP began setting up air monitoring samples, including inside work area (IWA), outside work area (OWA), and negative air exhaust (NEG) samples.
11:30 a.m. – ATA and EcoSafe ASP left jobsite for lunch.
12:30 p.m. – ATA and EcoSafe returned to jobsite from lunch
1:00 p.m. – EcoSafe met with ATA supervisor to get an update on the scope of work. The workers would not be detailing or bagging tomorrow, instead the focus would be on continuing ACM coating removal on 60-inch Force Main Pipe to remove ACM coating.

2:20 p.m. – ATA workers following proper engineering controls and work practices, following that met county, city, state, and federal regulations during ACM coating removal.
3:45 p.m. – EcoSafe AST conducted a walk-through of the exterior containment and noted no deficiencies were observed.
3:55 p.m. – EcoSafe AST began collecting the IWA, OWA and NEG and air samples.
4:00 p.m. – ATA workers began end of day clean up. EcoSafe AST began on-site PCM analysis.
4:30 p.m. – ATA left jobsite for the day.
5:00 p.m. – EcoSafe AST finished analyzing the PCM samples. All readable samples met permissible exposure limit and met clearance criteria. The OWA sample located in the basement and IWA sample located in the negative air machine containment were too occluded to read.
5:15 p.m. – EcoSafe AST left jobsite for the day.

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

PROJECT DAILY LOG

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

EcoSafe Project #: 2022.364.6EES
A.T. Abatement Project #: 22210017
Date: Friday, July 29, 2022

Project Location: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, Missouri 64120

Daily Scope of Work:

6:00 a.m. – EcoSafe Environmental Services, Inc. (EcoSafe) ASP, Jessica Raley, A.T. Abatement (ATA) workers and ATA supervisor, Tim Sullins, arrived on site.
6:05 a.m. – EcoSafe ASP met with ATA supervisor to discuss the scope of work. The workers were continuing ACM coating removal on the 60-inch Force Main Pipe in the tunnel.
6:10 a.m. – EcoSafe ASP performed a pre-abatement walk-through of the interior and exterior containment prior to abatement activities. ATA workers were correcting all poly and tape separations. Abatement was cleared to begin.
7:20 a.m. – EcoSafe ASP began setting up outside work area (OWA) and negative air exhaust (NAE) air samples.
9:00 a.m. – EcoSafe ASP conducted a walk-through of the exterior containment and observed a hole in the negative air tube. ATA supervisor was notified and began correcting issue.
10:00 a.m. – EcoSafe ASP left jobsite. EcoSafe AST, Sarah Miller, arrived on site.
10:20 a.m. – EcoSafe AST conducted an exterior containment walk-through and observed one small, unsecured critical barrier. ATA supervisor was notified and deficiency was corrected.
11:30 a.m. – EcoSafe and ATA left jobsite for lunch.
12:30 p.m. – EcoSafe and ATA returned to jobsite from lunch.
1:00 p.m. – EcoSafe AST performed a containment walk-through after lunch and noted no deficiencies.
2:00 p.m. – EcoSafe AST met with ATA supervisor to discuss the plan for the rest of the day. The workers were washing and cleaning areas of the pipe where ACM coating had been removed.
2:30 p.m. – EcoSafe AST performed an interior containment walk-through and observed two deficiencies. The interior shower barrier and the interior load out barrier had detached and fallen. ATA supervisor was notified and deficiencies were corrected.
3:30 p.m. – EcoSafe AST began collecting the OWA and NEG air samples.

4:00 p.m. – ATA workers began end of day clean-up. EcoSafe AST began on-site PCM analysis for the daily samples.
4:30 p.m. – ATA left jobsite for the day. EcoSafe ASP finished analyzing the PCM samples. All readable samples were under the permissible exposure limit and met clearance criteria. The OWA samples outside of the cleanroom and inside the load-out were occluded.
4:45 p.m. – EcoSafe left jobsite for the day.

Attachment 3: PCM Analytical Results

ECOSAFE
Environmental Services, Inc.

Client: Greg Nitcher
A.T. Abatement Services
4915 Stillwell Street
Kansas City, MO 64210

Collection Date: Wednesday, 07/27/2022
Date Analyzed: Wednesday, 07/27/2022
Project #: 2022.364.6EES
A.T. Abatement Project #: 2210017

Project: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, MO 64120

Abatement Activity: Asbestos Containing Material (ACM) Coating Removal

Sample ID	Sample Type /Location	Time On	Time Off	Time On	Time Off	Minutes	Average Flow Rate	Volume (Liter)	Fiber Count	Fibers/mm^2	Fibers/cc
7300-OWA-1	PCM Outside Work Area: Outside of Load-Out	10:52	4:06	—	—	314	4 L	1,256 L	OCCLUDED	OCCLUDED	OCCLUDED
7300-OWA-2	PCM Outside Work Area: Main Level, Above Containment	6:56	4:04	—	—	548	4 L	2,192 L	OCCLUDED	OCCLUDED	OCCLUDED
7300-NAE-1	PCM Negative Air Machine: Machine # 1	6:37	4:05	—	—	568	4 L	2,272 L	1.5/100	1.91	0.0003
7300-PERS-2	PCM Work Shift Personal: Mitch	6:52	10:47	12:42	4:05	438	4 L	1,752 L	OCCLUDED	OCCLUDED	OCCLUDED
7300-PERS-1	PCM Work Shift Personal: Matt	6:50	10:45	12:40	4:10	443	4 L	1,772 L	45/100	57.32	0.0115
7300-EXC-1	PCM 30-Minute Excursion: Mitch	10:52	11:23	—	—	31	4 L	124 L	OCCLUDED	OCCLUDED	OCCLUDED
7300-EXC-2	PCM 30-Minute Excursion: Matt	10:50	11:21	—	—	31	4 L	124 L	16.0/100	20.38	0.0633
7300-BLK-1	PCM Control—Field Blank	—	—	—	—	—	—	—	00/100	0.00	0.0000
7300-BLK-2	PCM Control—Lab Blank	—	—	—	—	—	—	—	00/100	0.00	0.0000

Jessica Raley 07/27/2022
Jessica Raley | DATE
Missouri Air Sampling Professional
Certification # 7000032922MOAS21387

OWA—Outside Work Area	CLNR—Clean Room
IWA—Inside Work Area	BGO—Bag Out
NAE—Negative Air Exhaust	CLR—Clearance
STEL—Short Term Exposure Limit	AMB—Ambient (exterior)
PERS—Work Shift Personal	BKGD—Background
PCM—Phase Contrast Microscopy	BLK—Blank

PCM Clearance Criteria: 0.01 F/cc
Permissible Exposure Limit: 0.1 F/cc

ECOSAFE
Environmental Services, Inc.

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64210

Project: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, MO 64120

Abatement Activity: Asbestos Containing Material (ACM) Coating Removal

Collection Date: Thursday, 07/28/2022
Date Analyzed: Thursday, 07/28/2022
Project #: 2022.364.6EES
A.T. Abatement Project #: 2210017

Sample ID	Sample Type /Location	Time On	Time Off	Minutes	Average Flow Rate	Volume (Liter)	Fiber Count	Fibers/mm_2	Fibers/cc
7300-OWA-1	PCM Outside Work Area: Basement Level, Containment Adjacent	11:15	3:51	276	4 L	1,104 L	OCCLUDED	OCCLUDED	OCCLUDED
7300-OWA-2	PCM Outside Work Area: Basement Level, Neg Airs Adjacent	1:21	3:50	149	4 L	596 L	5.0/100	6.37	0.0041
7300-OWA-3	PCM Outside Work Area: Main Level, Above Containment	1:22	3:50	148	4 L	592 L	2.0/100	2.55	0.0017
7300-OWA-4	PCM Outside Work Area: Clean Room	1:13	3:40	147	4 L	588 L	1.0/100	1.27	0.0008
7300-IWA-1	PCM Inside Work Area: Negative Air Machine Containment	11:22	3:51	269	4 L	1,076 L	OCCLUDED	OCCLUDED	OCCLUDED
7300-NAE-1	PCM Negative Air Exhaust: Machine #1	11:05	3:45	280	4 L	1,120 L	0.5/100	0.637	0.0002
7300-NAE-2	PCM Negative Air Exhaust: Machine #2	11:05	3:45	280	4 L	1,120 L	5.0/100	6.37	0.0022
7300-NAE-3	PCM Negative Air Exhaust: Machine #3	11:05	3:45	280	4 L	1,120 L	1.0/100	1.27	0.0004
7300-NAE-4	PCM Negative Air Exhaust: Machine #4	11:05	3:46	281	4 L	1,124 L	2.0/100	2.55	0.0009
7300-NAE-5	PCM Negative Air Exhaust: Machine #5	11:05	3:46	281	4 L	1,124 L	0.5/100	0.64	0.0002
7300-BLK-1	PCM Control—Field Blank	—	—	—	—	—	00/100	0.00	0.0000
7300-BLK-2	PCM Control—Lab Blank	—	—	—	—	—	00/100	0.00	0.0000

OWA—Outside Work Area	CLNR—Clean Room
IWA—Inside Work Area	BGO—Bag Out
NAE—Negative Air Exhaust	CLR—Clearance
STEL—Short Term Exposure Limit	AMB—Ambient (exterior)
PERS—Work Shift Personal	BKGD—Background
PCM—Phase Contrast Microscopy	BLK—Blank

PCM Clearance Criteria: 0.01 F/cc
Permissible Exposure Limit: 0.1 F/cc

Jessica Raley 07/28/2022
Jessica Raley | DATE
Missouri Air Sampling Professional
Certification # 7000032922MOAS21387

ECOSAFE
Environmental Services, Inc.

Client: A.T. Abatement Services
4915 Stillwell Street
Kansas City, MO 64120

Project: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, MO 64120

Collection Date: Friday, 07/29/2022
Date Analyzed: Friday, 07/29/2022
Project #: 2022.364.6EES
A.T. Abatement Project #: 2210017

Abatement Activity: Asbestos Containing Material (ACM) Coating Removal

Sample ID	Sample Type /Location	Time On	Time Off	Minutes	Average Flow Rate	Volume (Liter)	Fiber Count	Fibers/mm²	Fibers/cc
7300-OWA-1	PCM Outside Work Area: Outside of Cleanroom	7:24	3:43	499	4 L	1,996 L	OCCLUDED	OCCLUDED	OCCLUDED
7300-OWA-2	PCM Outside Work Area: Outside of Load Out	7:30	3:45	495	4 L	1,980 L	OCCLUDED	OCCLUDED	OCCLUDED
7300-OWA-3	PCM Outside Work Area: Inside of Cleanroom	7:35	3:42	487	4 L	1,948 L	12/100	15.29	0.0029
7300-OWA-4	PCM Outside Work Area: Main Level, Above Containment	7:42	3:48	486	4 L	1,944 L	6.5/100	8.28	0.0016
7300-NAE-1	PCM Negative Air Exhaust: Machine #4	7:36	3:47	491	4 L	1,964 L	1.0/100	1.27	0.0002
7300-BLK-1	PCM Control—Field Blank	—	—	—	—	00/100	—	0.00	0.0000
7300-BLK-2	PCM Control—Lab Blank	—	—	—	—	00/100	—	0.00	0.0000

Jessica Raley 07/29/2022
Jessica Raley | DATE
Missouri Air Sampling Professional
Certification # 7000032922MOAS21387

OWA—Outside Work Area	CLNR—Clean Room
IWA—Inside Work Area	BGO—Bag Out
HEPA—Negative Air Exhaust	CLR—Clearance
STEL—Short Term Exposure Limit	AMB—Ambient (exterior)
PERS—Work Shift Personal	BKGD—Background
PCM—Phase Contrast Microscopy	BLK—Blank

PCM Clearance Criteria: 0.01 F/cc
Permissible Exposure Limit: 0.1 F/cc

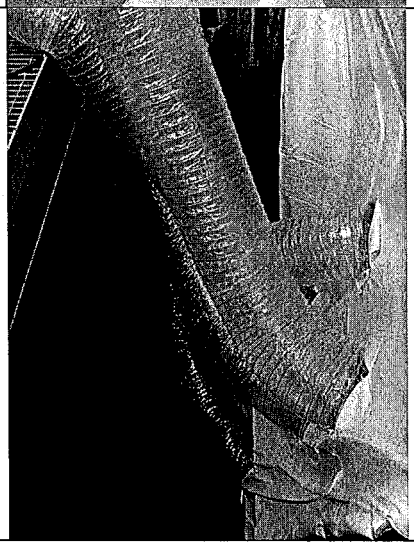
Attachment 4: Photo Log

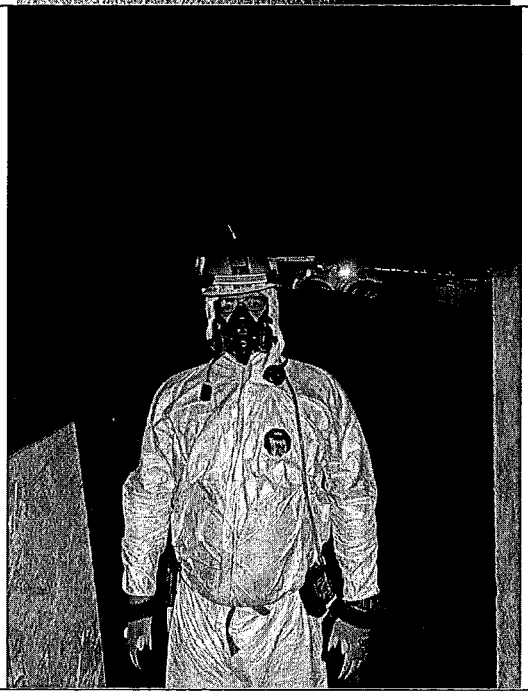
ECOSAFE
Environmental Services, Inc.

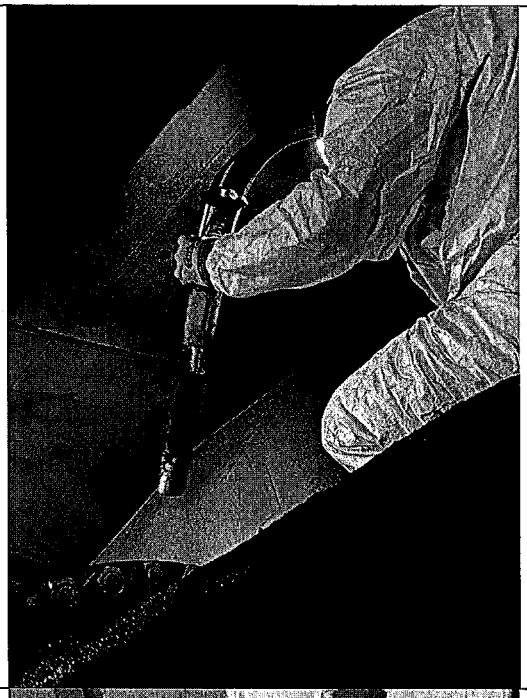
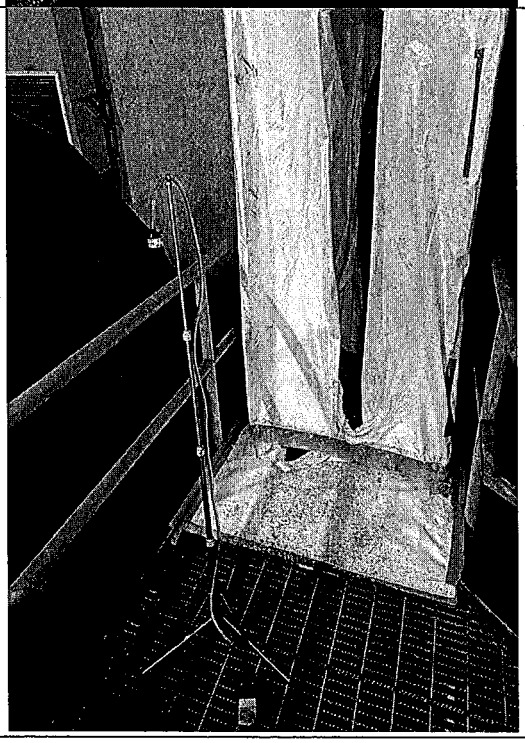
Photographic Documentation

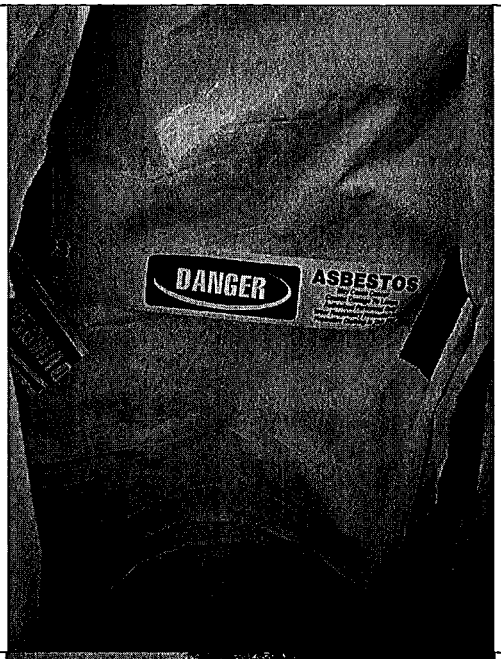
Client: AT Abatement Services, Inc.
Site Name: Blue River Wastewater Treatment Plant
Location: 7300 Hawthorne Rd, Kansas City, MO 64120

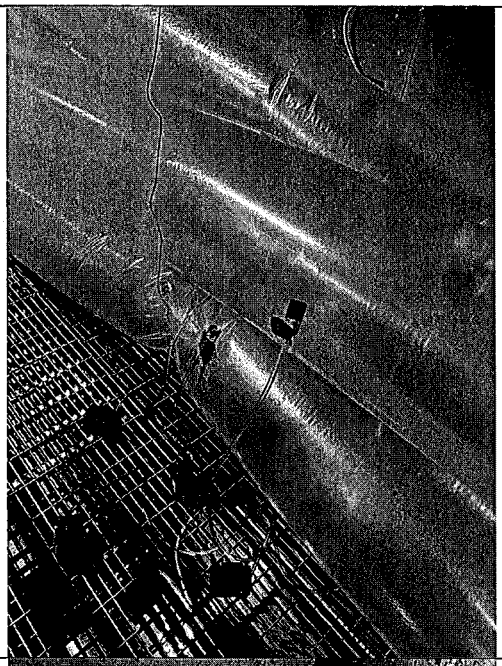
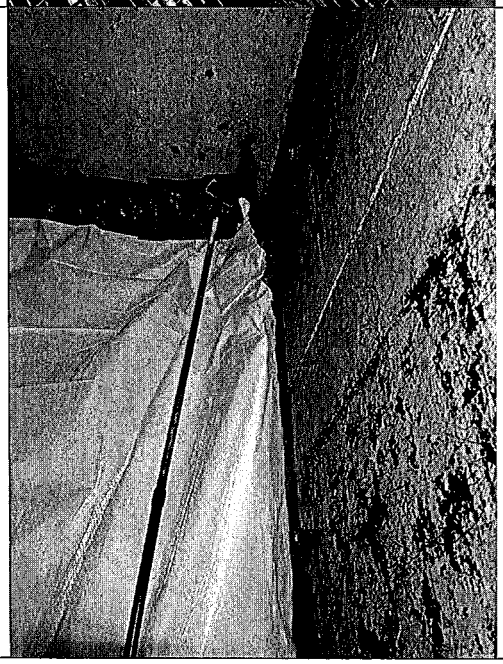
Prepared by: Jessica Raley
Project Number: 22210017
Dates: 07/25/2022-07/29/2022

Photograph No. 1 **Date:** 07/26/2022 **Description:** Containment Preparation Prior to Abatement: Load-Out			
Photograph No. 2 **Date:** 07/26/2022 **Description:** Negative Air Machines and Exhaust Tubes Installed Propertly			

Photograph No. 3 **Date:** 07/26/2022 **Description:** 60-inch Force Main Pipe Prior to ACM Coating Abatement	
Photograph No. 4 **Date:** 07/27/2022 **Description:** Air Sample: Personal Air Monitoring	

Photograph No. 5 **Date:** 07/27/2022 **Description:** 60-inch Force Main During ACM Coating Removal		
Photograph No. 6 **Date:** 07/27/2022 **Description:** Air Sample: OWA: Outside of Load-Out		

Photograph No. 7 **Date:** 07/28/2022 **Description:** Proper Signage Posted on Cleanroom Containment Entrance			
Photograph No. 8 **Date:** 07/28/2022 **Description:** Drain inside of Containment: Plug Installed to Prevent contaminated ACM Water to Exit Containment without HEPA Filtering			

Photograph No. 9 **Date:** 07/28/2022 **Description:** Air Sample: Negative Air Machin Exausts		
Photograph No. 10 **Date:** 07/29/2022 **Description:** Properly Sealed Critical Barriers Observed During Containment Walk-Through		

INDUSTRIAL HYGIENE PROJECT OVERSIGHT REPORT
August 18, 2022

Prepared by:

ECOSAFE
Environmental Services, Inc.
215 W 18th St, Suite 150, Kansas City, Missouri 64108

For:

Greg Nitcher
AT Abatement Services, Inc
4915 Stillwell Street
Kansas City, MO 64120

Project:

Industrial Hygiene Project Oversight Report
Blue River Wastewater Treatment Plant
60-inch Force Main Project
7300 Hawthorne Road
Kansas City, Missouri 64120

August 18, 2022

CLIENT: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

PROJECT: Industrial Hygiene Project Oversight Report
Blue River Wastewater Treatment Plant
60-inch Force Main Project
7300 Hawthorne Road
Kansas City, Missouri 64120

ECOSAFE PROJECT NO.: 2022.364.8EES

REPORT PREPARED BY: Jessica Raley

Jessica Raley
Missouri Air Sampling Professional
Certification # 7000032922MOAS21387
Asbestos Project Designer
Certification # 7011032522MOPDI21387
Asbestos Supervisor
Certification # 7011040822MOSl21387

CONTACT INFORMATION:

EcoSafe Environmental Services, Inc.
215 W 18th Street, Suite 150 Kansas City, MO 64108
Tel: (816) 598-4111 / (270) 315-0057 E-mail:
Jessica@EcoSafeKC.com

Attachments:

1. Weekly Project Oversight Summary
2. Daily Logs
3. PCM Analytical Results
4. Photo Log
5. Personnel Certifications

Attachment 1: Weekly Project Oversight Summary

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

August 18, 2022

RE: Weekly Industrial Hygiene Project Oversight Report
Blue River Wastewater Treatment Plant
60-inch Force Main Project
7300 Hawthorne Road
Kansas City, Missouri 64120

Dear Mr. Nitcher,

EcoSafe Environmental Services Inc. is pleased to provide you with this weekly update report regarding the on-going project referenced above. EcoSafe provided project oversight and Phase Contrast Microscopy (PCM) on-site air monitoring during asbestos abatement activities from Wednesday, August 10, 2022 through Thursday, August 11, 2022 at the property location referenced above.

The asbestos abatement activities included asbestos-containing coating removal on the 60-inch force main pipe in the tunnel of the referenced property by the abatement contractor AT Abatement Services, Inc. During asbestos removal operations, EcoSafe performed industrial hygiene project oversight-surveillance and documented that all engineering controls and work practices were acceptable and within industry standards (see Attachment 2: Daily Logs for specific details).

EcoSafe collected a total of FIFTEEN (15) phase contrast microscopy (PCM) air samples during this week. This included samples totaling: FIVE (5) outside work area (OWA), TWO (2) negative air machine (NEG), TWO (2) personal 8hr time-weighted average (PERS), TWO (2) 30-minute excursion (EXC) and included FOUR (4) quality control blank samples. All sampling pumps were calibrated before and after all air sampling collection. The samples were then analyzed on-site per the NIOSH 7400 method.

Sincerely,

Jessica Raley 08/18/2022
Jessica Raley | DATE
Missouri Air Sampling Professional
Certification #7000032922MOAS21387
Asbestos Project Designer
Certification # 7011032522MOPDI21387

Attachment 2: Daily Logs

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

PROJECT DAILY LOG

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

EcoSafe Project #: 2022.364.8EES
A.T. Abatement Project #: 22210017
Date: Wednesday, August 10, 2022

Project Location: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, Missouri 64120

Daily Scope of Work:

6:00 a.m. – EcoSafe Environmental Services, Inc. (EcoSafe) ASP, Jessica Raley, AT Abatement Services, Inc. (ATA) workers Tyler Gooch, Mitch Jones, Jermont Cepp, Justin Terrell, Elmer Romero, Hugo Sulins, Luciano Espinoza, and Matthew Larson, and ATA supervisor, Tim Sullins, arrived on site.
6:05 a.m. – EcoSafe ASP and ATA supervisor met to get an update on the progress from the previous days of the week. ATA supervisor advised the workers have focused on ACM coating removal on the 60-inch force main in the tunnel. Additional ATA workers were added to the project in order to assist with detailing during abatement. The scope of work for the day included a full day of blasting, detailing and bagging. Elmer Romero and Luciano were scheduled to leave at 2:30 p.m. ATA supervisor estimated the blasting would be completed by tomorrow afternoon.
6:10 a.m. – EcoSafe ASP attached a PERS sample to two workers, Jermont Cepp and Justin Terrell.
6:15 a.m. – EcoSafe ASP entered containment to perform the morning walk-through prior to abatement activities. EcoSafe ASP observed one area of separated poly and tape, and notified ATA supervisor. ATA workers began correcting issues.
6:30 a.m. – EcoSafe ASP performed an exterior containment walk-through and observed two areas of loose poly from the edge of the containment. The negative air machines located inside of the containment had two perforated exterior exhaust tubes. ATA worker began correcting and abatement was cleared to begin.
6:35 a.m. – EcoSafe ASP began setting up outside work area (OWA) and negative air machine (NEG) air samples.
7:30 a.m. – ATA worker, Justin Terrell, left jobsite for the day. ATA worker had PERS sample attached. Sample was discarded.
9:00 a.m. – EcoSafe ASP entered containment and observed workers removing ACM coating using proper engineering controls and work practices that met county, city, state, and federal regulations.

9:30 a.m. – ATA worker, Jermont Cepp, left jobsite for the day. ATA worker had PERS sample attached. Sample was discarded.
10:50 a.m. –Additional PERS samples were attached to two workers, Elmer Romero and Luciano Espinoza.
11:10 a.m. – EcoSafe ASP conducted exterior containment walk-through and observed two gaps between tape and poly on the basement level, adjacent to the negative air machine room. ATA worker began correcting and HEPA vacuuming area.
11:30 a.m. – ATA and EcoSafe left jobsite for lunch.
12:30 p.m. – ATA and EcoSafe returned to jobsite from lunch
12:45 p.m. – PERS samples were paused and 30-minute EXC samples were attached to two workers, Elmer Romero and Luciano Espinoza.
1:15 p.m. – 30-minute EXC samples were collected and PERS samples were resumed.
2:15 p.m. – EcoSafe ASP began collecting samples.
2:30 p.m. – ATA workers, Elmer Romero and Luciano Espinoza left jobsite for the day. EcoSafe ASP began on-site PCM analysis.
3:00 p.m. – EcoSafe ASP finished analyzing the PCM samples. All readable samples were under the permissible exposure limit and met clearance criteria. Both worker's PERS sampels were occluded, and Elmer Romero's EXC sample was also occluded. EcoSafe ASP left jobsite for the day.

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

PROJECT DAILY LOG

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

EcoSafe Project #: 2022.364.8EES
A.T. Abatement Project #: 22210017
Date: Thursday, August 12, 2022

Project Location: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, Missouri 64120

Daily Scope of Work:

6:00 a.m. – EcoSafe Environmental Services, Inc. (EcoSafe) ASP, Jessica Raley, AT Abatement Services, Inc. (ATA) workers Tyler Gooch, Mitch Jones, Elmer Romero, Hugo Sulins, Luciano Espinoza, Matthew Larson, Joshua M., and Keaton Tracey, and ATA supervisor, Tim Sullins, arrived on site.
6:10 a.m. – EcoSafe ASP and ATA supervisor met to discuss the scope of work for the day. ATA workers were scheduled to continue bagging ACM coating and possibly begin loading-out at the end of the day. There was an estimated 50 bags completed from yesterday. Elmer Romero, Luciano Espinoza, Joshua M., and Keaton Tracey were scheduled to leave at 2:30 p.m
6:20 a.m. – EcoSafe ASP performed an interior and exterior pre-abatement walk-through of the containment prior to abatement activities. ATA workers were resecuring the containment. No deficiencies were observed. Abatement activities were approved to begin.
6:35 a.m. – EcoSafe ASP began setting up outside work area (OWA) and negative air machine (NEG) air samples.
8:00 a.m. – ATA workers were observed using proper engineering controls and work practices that met county, city, state, and federal regulations while bagging ACM coating.
10:00 a.m. – ATA worker, Tyler Gooch, left jobsite for the day.
10:45 a.m. – EcoSafe ASP conducted exterior containment walk-through and observed a small area of blasting near the edge of the containment. No current holes or loose poly was detected. ATA worker began HEPA vacuuming the area.
11:00 a.m. – ATA worker changed the negative air machine pre-filters before lunch.
11:30 a.m. – EcoSafe and ATA left jobsite for lunch.
12:30 p.m. – EcoSafe and ATA returned to jobsite from lunch
1:15 p.m. – ATA PM, Mark Yarnell, arrived on site.
1:30 p.m. – EcoSafe ASP and ATA supervisor met with ATA PM to provide an update. ATA workers were continuing to bag ACM waste and were on track to begin loading out bags next week. Final visual and air clearances were estimated in two weeks.

2:00 p.m. – EcoSafe ASP began collecting samples.
2:15 p.m. – EcoSafe ASP began on-site PCM analysis.
2:30 p.m. – ATA workers, Elmer Romero, Luciano Espinoza, Joshua M., and Keaton Tracey left jobsite for the day.
2:45 p.m. – EcoSafe ASP finished analyzing the PCM samples. All samples were under the permissible exposure limit and met clearance criteria. EcoSafe ASP left jobsite for the day.

Attachment 3: PCM Analytical Results

ECOSAFE
Environmental Services, Inc.

Client: Greg Nitcher
A.T. Abatement Services
4915 Stillwell Street
Kansas City, MO 64210

Project: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, MO 64120

Collection Date: Wednesday, 08/10/2022
Date Analyzed: Wednesday, 08/10/2022
Project #: 2022.364.8EES
A.T. Abatement Project #: 2210017

Abatement Activity: Asbestos Containing Material (ACM) Coating Removal

Sample ID	Sample Type /Location	Time On	Time Off	Time On	Time Off	Minutes	Average Flow Rate	Volume (Liter)	Fiber Count	Fibers/mm^2	Fibers/cc
7300-OWA-1	PCM Outside Work Area: Inside Cleanroom	6:47	2:32	—	—	465	4 L	1,860 L	2.5/100	3.18	0.0007
7300-OWA-2	PCM Outside Work Area: Basement Level, Neg Airs Adj	6:32	2:21	—	—	469	4 L	1, 876 L	8.5/100	10.83	0.0022
7300-NAE-1	PCM Negative Air Machine: Machine # 3	6:25	2:20	—	—	475	4 L	1,900 L	1.0/100	1.27	0.0003
7300-PERS-1	PCM Work Shift Personal: Elmer	10:57	12:44	1:14	2:29	182	4 L	728 L	OCCLUDED	OCCLUDED	OCCLUDED
7300-PERS-2	PCM Work Shift Personal: Luciano	10:59	12:42	1:12	2:28	179	4 L	716 L	OCCLUDED	OCCLUDED	OCCLUDED
7300-EXC-1	PCM 30-Minute Excursion: Elmer	12:44	1:14	—	—	30	4 L	120 L	OCCLUDED	OCCLUDED	OCCLUDED
7300-EXC-2	PCM 30-Minute Excursion: Luciano	12:42	1:12	—	—	30	4 L	120 L	20.0/100	25.48	0.082
7300-BLK-1	PCM Control—Field Blank	—	—	—	—	—	—	—	00/100	0.00	0.0000
7300-BLK-2	PCM Control—Lab Blank	—	—	—	—	—	—	—	00/100	0.00	0.0000

Jessica Raley 08/10/2022
Jessica Raley | DATE
Missouri Air Sampling Professional
Certification # 7000032922MOAS21387

OWA—Outside Work Area	CLNR—Clean Room
IWA—Inside Work Area	BGO—Bag Out
NAE—Negative Air Exhaust	CLR—Clearance
STEL—Short Term Exposure Limit	AMB—Ambient (exterior)
PERS—Work Shift Personal	BKGD—Background
PCM—Phase Contrast Microscopy	BLK—Blank

PCM Clearance Criteria: 0.01 F/cc
Permissible Exposure Limit: 0.1 F/cc

ECOSAFE
Environmental Services, Inc.

Client: Greg Nitcher
A.T. Abatement Services
4915 Stillwell Street
Kansas City, MO 64210

Project: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, MO 64120

Abatement Activity: Asbestos Containing Material (ACM) Coating Removal

Collection Date: Thursday, 08/11/2022
Date Analyzed: Thursday, 08/11/2022
Project #: 2022.364.8EES
A.T. Abatement Project #: 2210017

Sample ID	Sample Type /Location	Time On	Time Off	Minutes	Average Flow Rate	Volume (Liter)	Fiber Count	Fibers/mm²	Fibers/cc
7300-OWA-1	PCM Outside Work Area: Clean Room	6:45	1:57	432	4 L	1,728 L	5.0/100	6.37	0.0014
7300-OWA-2	PCM Outside Work Area: Outside of Cleanroom	6:47	1:57	430	4 L	1,720 L	7.0/100	8.92	0.0020
7300-OWA-3	PCM Outside Work Area: Basement Level, Neg Airs Adj	6:35	1:52	437	4 L	1,748 L	3.0/100	3.82	0.0008
7300-NEG-1	PCM Negative Air Exhaust: Machine #6	6:32	1:52	440	4 L	1,760 L	0.5/100	0.63	0.0001
7300-BLK-1	PCM Control—Field Blank	—	—	—	—	—	00/100	0.00	0.0000
7300-BLK-2	PCM Control—Lab Blank	—	—	—	—	—	00/100	0.00	0.0000

Jessica Raley 08/11/2022
Jessica Raley | DATE
Missouri Air Sampling Professional
Certification # 7000032922MOAS21387

OWA—Outside Work Area	CLNR—Clean Room
IWA—Inside Work Area	BGO—Bag Out
HEPA—Negative Air Exhaust	CLR—Clearance
STEL—Short Term Exposure Limit	AMB—Ambient (exterior)
PERS—Work Shift Personal	BKGD—Background
PCM—Phase Contrast Microscopy	BLK—Blank

PCM Clearance Criteria: 0.01 F/cc
Permissible Exposure Limit: 0.1 F/cc

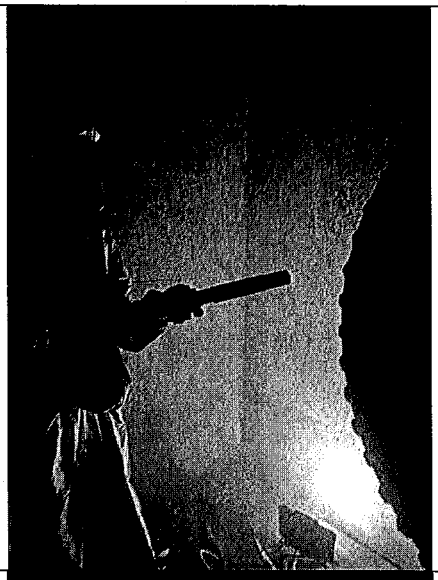
Attachment 4: Photo Log

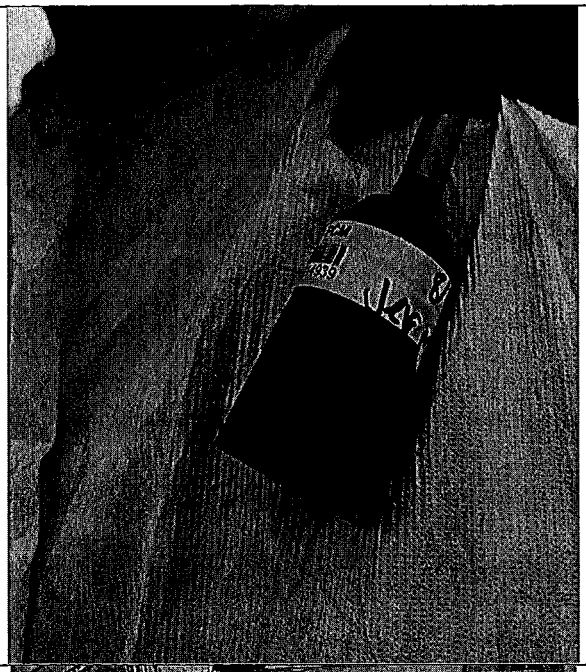
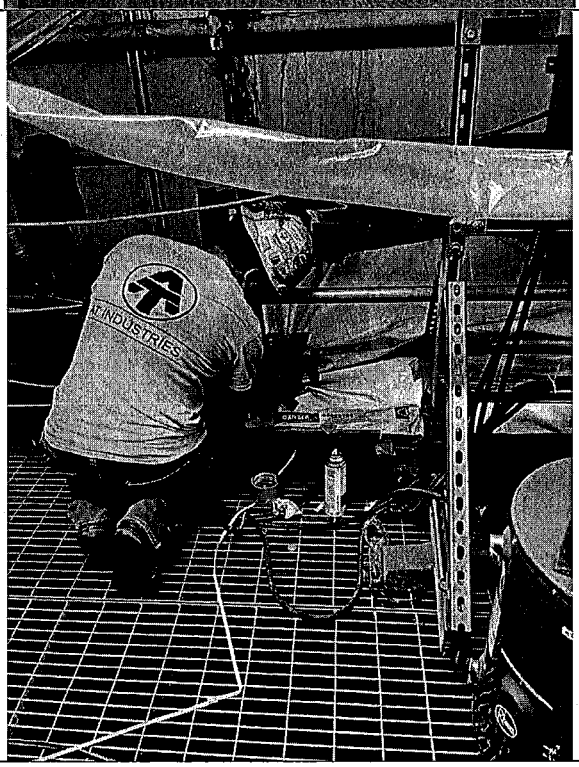
ECOSAFE
Environmental Services, Inc.

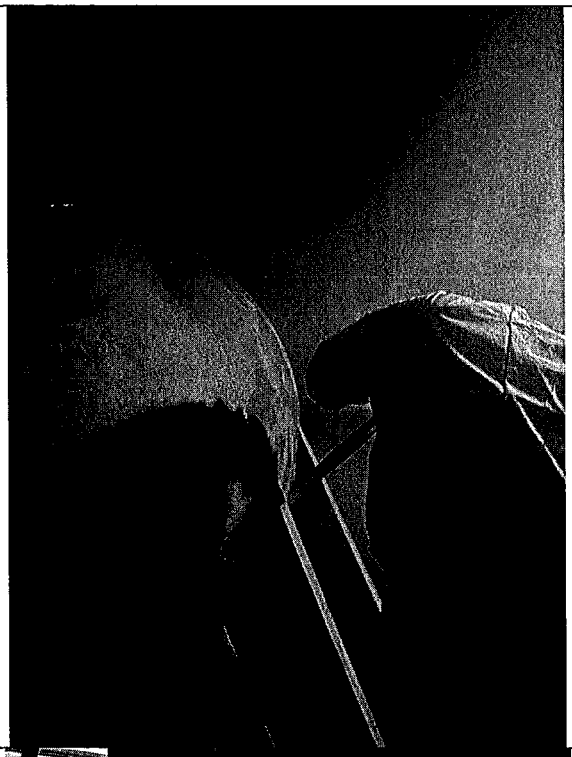
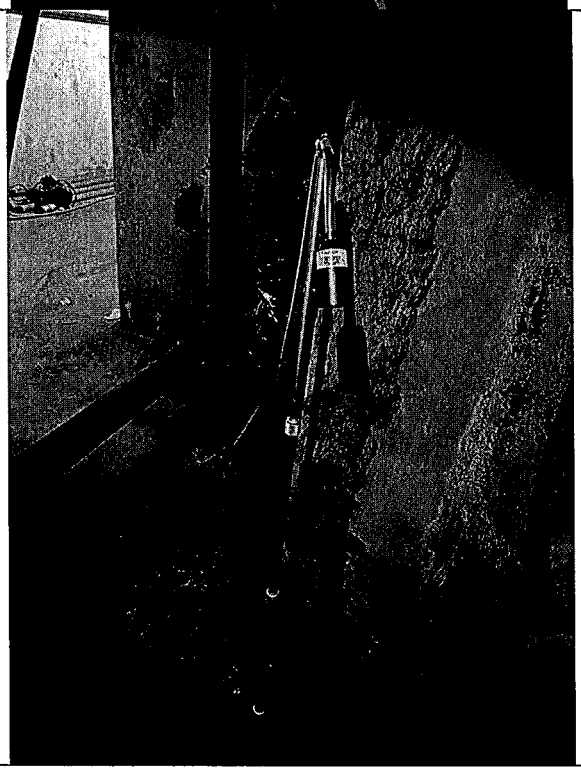
Photographic Documentation

Client: AT Abatement Services, Inc.
Site Name: Blue River Wastewater Treatment Plant
Location: 7300 Hawthorne Rd, Kansas City, MO 64120

Prepared by: Jessica Raley
Project Number: 22210017
Dates: 08/10/2022-08/11/2022

Photograph No. 1 **Date:** 08/10/2022 **Description:** 60-inch Force Main During ACM Coating Removal			
Photograph No. 2 **Date:** 08/10/2022 **Description:** Secure Containment with proper Signage			

Photograph No. 3 **Date:** 08/10/2022 **Description:** Air Sample – PERS: Personal Air Monitoring		
Photograph No. 4 **Date:** 08/11/2022 **Description:** Pre-Abatement Morning Walk Through: Resecuring Containment		

Photograph No. 5 **Date:** 08/11/2022 **Description:** 60-inch Force Main During ACM Coating Removal	
Photograph No. 6 **Date:** 08/11/2022 **Description:** Air Sample – OWA: Basement Level, Adjacent to Negative Air Machine Room	

Attachment 5: Personnel Certifications

CERTIFICATION NUMBER:

7000032922MOAS21387

THIS CERTIFIES

Jessica Raley

HAS COMPLETED THE CERTIFICATION

REQUIREMENTS FOR



Air Sampling Professional

APPROVED **03/29/2022**

Director of Nr Pollution Control Program

CERTIFICATION NUMBER:

7011032522MOPDI21387

THIS CERTIFIES

Jessica Raley

HAS COMPLETED THE CERTIFICATION

REQUIREMENTS FOR



Project Designer

AP PROVED: **03/29/2022**

EXPIRES **03/29/2023**

TRAINING DATE: 03/25/2022

Director of Air Pollution Control Program

CERTIFICATION NUMBER:

7011040822MOSI21387

THIS CERTIFIES

Jessica Raley

HAS COMPLETED THE CERTIFICATION

REQUIREMENTS FOR



Supervisor

APPROVED **06/23/2022**

TRAINING DATE **04/08/2022**

EXPIRES: **04/08/2023**

Director of AJr Pollution Control Program

ECOSAFE
Environmental Services, Inc.

Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

August 28th, 2022

RE: Blue River Wastewater Treatment Plant
60-inch Force Main Project
7300 Hawthorne Road
Kansas City, Missouri 64120
Asbestos Containing Material (ACM) Coating Removal
PCM Air Clearance Testing and On-site Laboratory Analysis

Dear Mr. Nitcher,

EcoSafe Environmental is pleased to provide you with this clearance letter in reference to our clearance air monitoring sampling event conducted on Wednesday, August 24th, 2022, at the property referenced above.

The asbestos abatement activities included asbestos containing coating removal within a contained and controlled area inside the tunnel at Blue River Wastewater Treatment Plant. The activities were performed by the abatement contractor AT Abatement Services, Inc. Prior to the collection of the clearance air samples, EcoSafe performed a visual inspection of the abatement work areas. EcoSafe determined that all visible abated areas were clean and free of any suspect ACM materials and debris. Following the successful completion of the visual inspection, air samples were collected.

EcoSafe collected FIVE (5) PCM (Phase Contrast Microscopy) clearance air samples in the designated abatement work area and included TWO (2) quality control blank samples. The sampling pumps were placed, and all sampling pumps were calibrated before and after air sampling collection. The samples were then analyzed off-site by Phase Contrast Microscopy (PCM) per the NIOSH 7400 method.

All clearance samples were found to have fiber concentrations below the clearance criteria of 0.01 fibers per cubic centimeter of air. In conclusion, the subject abatement work area is cleared for re-occupancy. Please see PCM Analytical Results/Air Data Sheets for additional information.

Sincerely,

Jessica Raley 08/28/2022

Jessica Raley | DATE
Missouri Air Sampling Professional
Certification # 7000032922MOAS21387

ECOSAFE
Environmental Services, Inc.

Client: AT Abatement Services, Inc.
4915 Stillwell St
Kansas City, MO 64210

Collection Date: Wednesday, 08/24/2022
Date Analyzed: Wednesday, 08/24/2022
Project #: 2022.364.10EES
A.T. Abatement Project #: 2210017

Project Location: Blue River Wastewater Treatment Plant
7300 Hawthorne Rd
Kansas City, MO 64210

Abatement Activity: Asbestos Containing Material (ACM) Pipe Coating Removal

Sample ID	Sample Type /Location	Time On	Time Off	Minutes	Average Flow Rate	Volume (Liter)	Fiber Count	Fibers/mm²	Fibers/cc
7300-CLR-1	PCM Clearance: Inside Containment	3:15	6:25	190	9 L	1,710 L	8/100	10.19	0.0023
7300-CLR-2	PCM Clearance: Inside Containment	3:17	6:25	188	9 L	1,692 L	5/100	6.37	0.0014
7300-CLR-3	PCM Clearance: Inside Containment	3:18	6:26	188	9 L	1,692 L	6/100	7.64	0.0017
7300-CLR-4	PCM Clearance: Inside Containment	3:20	6:26	186	9 L	1,674 L	5/100	6.37	0.0015
7300-CLR-5	PCM Clearance: Inside Containment	3:20	6:26	186	9 L	1,674 L	13/100	16.56	0.0038
7300-BLK-1	PCM Control—Field Blank	—	—	—	—	—	00/100	0.00	0.0000
7300-BLK-2	PCM Control—Lab Blank	—	—	—	—	—	00/100	0.00	0.0000

Jessica Raley 08/28/2022
Jessica Raley | DATE
Missouri Air Sampling Professional
Certification # 7000032922MOAS21387

OWA—Outside Work Area CLNR—Clean Room
IWA—Inside Work Area BGO—Bag Out
HEPA—Negative Air Exhaust CLR—Clearance
STEL—Short Term Exposure Limit AMB—Ambient
(exterior) PERS—Work Shift Personal BKGD—Background
PCM—Phase Contrast Microscopy BLK—Blank

PCM Clearance Criteria: 0.01 F/cc
Permissible Exposure Limit: 0.1 F/cc

INDUSTRIAL HYGIENE PROJECT OVERSIGHT REPORT August 25, 2022

Prepared by:

ECOSAFE
Environmental Services, Inc.
215 W 18th St, Suite 150, Kansas City, Missouri 64108

For:

Greg Nitcher
AT Abatement Services, Inc
4915 Stillwell Street
Kansas City, MO 64120

Project:

Industrial Hygiene Project Oversight Report
Blue River Wastewater Treatment Plant
60-inch Force Main Project
7300 Hawthorne Road
Kansas City, Missouri 64120

August 25, 2022

CLIENT: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

PROJECT: Industrial Hygiene Project Oversight Report
Blue River Wastewater Treatment Plant
60-inch Force Main Project
7300 Hawthorne Road
Kansas City, Missouri 64120

ECOSAFE PROJECT NO.: 2022.364.9EES

REPORT PREPARED BY: Jessica Raley

Jessica Raley
Missouri Air Sampling Professional
Certification # 7000032922MOAS21387
Asbestos Project Designer
Certification # 7011032522MOPDI21387
Asbestos Supervisor
Certification # 7011040822MOSl21387

CONTACT INFORMATION:

EcoSafe Environmental Services, Inc.
215 W 18th Street, Suite 150 Kansas City, MO 64108
Tel: (816) 598-4111 / (270) 315-0057 E-mail:
Jessica@EcoSafeKC.com

Attachments:

1. Weekly Project Oversight Summary
2. Daily Logs
3. PCM Analytical Results
4. Photo Log
5. Personnel Certifications

Attachment 1: Weekly Project Oversight Summary

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

August 25, 2022

RE: Weekly Industrial Hygiene Project Oversight Report
Blue River Wastewater Treatment Plant
60-inch Force Main Project
7300 Hawthorne Road
Kansas City, Missouri 64120

Dear Mr. Nitcher,

EcoSafe Environmental Services Inc. is pleased to provide you with this weekly update report regarding the on-going project referenced above. EcoSafe provided project oversight and Phase Contrast Microscopy (PCM) on-site air monitoring during asbestos abatement activities from Wednesday, August 17, 2022 through Thursday, August 18, 2022 at the property location referenced above.

The asbestos abatement activities included asbestos-containing coating removal on the 60-inch force main pipe in the tunnel of the referenced property by the abatement contractor AT Abatement Services, Inc. During asbestos removal operations, EcoSafe performed industrial hygiene project oversight-surveillance and documented that all engineering controls and work practices were acceptable and within industry standards (see Attachment 2: Daily Logs for specific details).

EcoSafe collected a total of TWELEVE (12) phase contrast microscopy (PCM) air samples during this week. This included samples totaling: SIX (6) outside work area (OWA), TWO (2) negative air machine (NEG), and included FOUR (4) quality control blank samples. All sampling pumps were calibrated before and after all air sampling collection. The samples were then analyzed on-site per the NIOSH 7400 method.

Sincerely,

Jessica Raley 08/25/2022
Jessica Raley | DATE
Missouri Air Sampling Professional
Certification #7000032922MOAS21387
Asbestos Project Designer
Certification # 7011032522MOPDI21387

Attachment 2: Daily Logs

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

PROJECT DAILY LOG

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

EcoSafe Project #: 2022.364.9EES
A.T. Abatement Project #: 22210017
Date: Wednesday, August 17, 2022

Project Location: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, Missouri 64120

Daily Scope of Work:

6:00 a.m. – EcoSafe Environmental Services, Inc. (EcoSafe) and AT Abatement Services, Inc. (ATA) workers and supervisor, Tim Sullins, arrived on site.
6:10 a.m. – EcoSafe ASP met with ATA supervisor to discuss the scope of work for the day. The workers were continuing to bag ACM coating and prepping dumpster for load-out activities. The workers had completed around 600 ACM bags and would begin loading out tomorrow. ATA supervisor estimated the containment would be ready for the final visual and air clearance by the end of next week.
6:25 a.m. – EcoSafe ASP conducted the pre-abatement walk-through in order to verify the containment was secure for abatement activities to begin. EcoSafe ASP noted a minor rip in the exterior negative air tubing leading from inside the containment into the negative air machine containment. ATA supervisor was advised and sent worker to correct issue and HEPA vacuum area. EcoSafe ASP noted that the negative air machine filter cover and tubing was disconnected, along with the occluded filter. ATA supervisor advised the cover and tubing would be resecured and the filter would be changed.
6:50 a.m. – EcoSafe ASP approved the containment for abatement activities.
7:00 a.m. – EcoSafe ASP began setting up outside work area (OWA) and negative air machine exhaust (NEG) air samples.
10:20 a.m. – ATA PM, Mark Yarnell arrived on-site.
10:30 a.m. – ATA PM and EcoSafe ASP entered containment to check progress of abatement. EcoSafe ASP observed workers using proper engineering controls and work practices that met county, city, state, and federal regulations during ACM bagging.
10:50 a.m. – ATA PM advised ATA supervisor additional light was needed in the tunnel.
11:30 a.m. – EcoSafe and ATA left jobsite for lunch.
12:30 p.m. – EcoSafe and ATA returned to jobsite from lunch
1:00 p.m. – EcoSafe ASP conducted exterior containment inspection before abatement activities resumed. No issues were noted. Abatement activities were approved to resume.
2:00 p.m. – EcoSafe ASP began collecting OWA and NEG air samples.

2:10 p.m. – EcoSafe ASP began on-site PCM analysis.
2:35 p.m. – EcoSafe ASP finished analyzing the PCM samples. All samples were under the permissible exposure limit and met clearance criteria. EcoSafe ASP left jobsite for the day.

ECOSAFE
Environmental Services, Inc.
215 W 18th Street, Suite 150, Kansas City, MO 64108

PROJECT DAILY LOG

Client: Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

EcoSafe Project #: 2022.364.9EES
A.T. Abatement Project #: 22210017
Date: Thursday, August 18, 2022

Project Location: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, Missouri 64120

Daily Scope of Work:

6:00 a.m. – EcoSafe Environmental Services, Inc. (EcoSafe) and AT Abatement Services, Inc. (ATA) workers and supervisor, Tim Sullins, arrived on site.
6:05 a.m. – EcoSafe ASP met with ATA supervisor to discuss the scope of work for the day. The workers were bagging ACM debris and detailing the 60-inch Force Main. ATA supervisor estimated the containment was on track for the final visual and air clearance for next Thursday.
6:15 a.m. – EcoSafe ASP conducted a morning, pre-abatement walk-through. EcoSafe ASP noted one area of detached poly on the main level, near the negative air exhaust tubes. ATA worker began securing the poly and HEPA vacuuming the surrounding area
6:25 a.m. – The containment was approved to begin abatement activities.
6:30 a.m. – EcoSafe ASP began setting up outside work area (OWA) and negative air machine exhaust (NEG) air samples.
9:45 a.m. – EcoSafe ASP conducted exterior containment. Minor areas of loose tape was detected and secured with additional tape and glue by ATA worker using proper engineering controls and work practices that met county, city, state, and federal regulations during ACM bagging.
10:50 a.m. – EcoSafe ASP confirmed the negative air machine pre-filter change schedule. ATA supervisor advised the filters were changed periodically and most recently changed yesterday morning and the Monday before.
11:30 a.m. – ATA and EcoSafe left jobsite for lunch.
12:30 p.m. – ATA and EcoSafe returned to jobsite from lunch.
1:30 p.m. – ATA supervisor and EcoSafe ASP met to discuss the scope of work for the following week. The workers were scheduled to finish bagging early in the week and focus on detailing in order to finish this portion of the 60-in Force Main pipe.
2:05 p.m. – EcoSafe ASP began collecting OWA and NEG air samples.
2:20 p.m. – EcoSafe ASP began on-site PCM analysis.
2:50 p.m. – EcoSafe ASP finished analyzing the PCM samples. All samples were under the permissible exposure limit and met clearance criteria. EcoSafe ASP left jobsite for the day.

Attachment 3: PCM Analytical Results

ECOSAFE
Environmental Services, Inc.

Client: Greg Nitcher
A.T. Abatement Services
4915 Stillwell Street
Kansas City, MO 64210

Project: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, MO 64120

Abatement Activity: Asbestos Containing Material (ACM) Coating Removal

Collection Date: Wednesday, 08/17/2022
Date Analyzed: Wednesday, 08/17/2022
Project #: 2022.364.9EES
A.T. Abatement Project #: 2210017

Sample ID	Sample Type /Location	Time On	Time Off	Minutes	Average Flow Rate	Volume (Liter)	Fiber Count	Fibers/mm^2	Fibers/cc
7300-OWA-1	PCM Outside Work Area: Outside of Cleanroom	7:11	2:14	423	4 L	1,692 L	1.0/100	1.27	0.0003
7300-OWA-2	PCM Outside Work Area: Clean Room	7:20	2:12	412	4 L	1,648 L	8.0/100	10.19	0.0024
7300-OWA-3	PCM Outside Work Area: Main Level, Above Containment	7:31	2:09	398	4 L	1,592 L	5.5/100	7.01	0.0017
7300-NEG-1	PCM Negative Air Exhaust: Machine #3	7:32	2:08	396	4 L	1,584 L	0.5/100	0.64	0.0002
7300-BLK-1	PCM Control—Field Blank	—	—	—	—	—	00/100	0.00	0.0000
7300-BLK-2	PCM Control—Lab Blank	—	—	—	—	—	00/100	0.00	0.0000

OWA—Outside Work Area	CLNR—Clean Room
IWA—Inside Work Area	BGO—Bag Out
HEPA—Negative Air Exhaust	CLR—Clearance
STEL—Short Term Exposure Limit	AMB—Ambient (exterior)
PERS—Work Shift Personal	BKGD—Background
PCM—Phase Contrast Microscopy	BLK—Blank

PCM Clearance Criteria: 0.01 F/cc
Permissible Exposure Limit: 0.1 F/cc

Jessica Raley 08/17/2022
Jessica Raley | DATE
Missouri Air Sampling Professional
Certification # 7000032922MOAS21387

ECOSAFE
Environmental Services, Inc.

Client: Greg Nitcher
A.T. Abatement Services
4915 Stillwell Street
Kansas City, MO 64210

Project: Blue River Wastewater Treatment Plant
7300 Hawthorne Road
Kansas City, MO 64120

Abatement Activity: Asbestos Containing Material (ACM) Coating Removal

Collection Date: Thursday, 08/18/2022
Date Analyzed: Thursday, 08/18/2022
Project #: 2022.364.9EES
A.T. Abatement Project #: 2210017

Sample ID	Sample Type /Location	Time On	Time Off	Minutes	Average Flow Rate	Volume (Liter)	Fiber Count	Fibers/mm^2	Fibers/cc
7300-OWA-1	PCM Outside Work Area: Outside of Cleanroom	7:02	2:11	429	4 L	1,716 L	3.0/100	3.82	0.0009
7300-OWA-2	PCM Outside Work Area: Clean Room	7:02	2:11	429	4 L	1,716 L	2.5/100	3.18	0.0007
7300-OWA-3	PCM Outside Work Area: Main Level, Above Containment	6:39	2:02	443	4 L	1,772 L	7.0/100	8.92	0.0019
7300-NEG-1	PCM Negative Air Exhaust: Machine #6	6:39	2:02	433	4 L	1,772 L	1.5/100	1.91	0.0004
7300-BLK-1	PCM Control—Field Blank	—	—	—	—	—	00/100	0.00	0.0000
7300-BLK-2	PCM Control—Lab Blank	—	—	—	—	—	00/100	0.00	0.0000

Jessica Raley 08/18/2022
Jessica Raley | DATE
Missouri Air Sampling Professional
Certification # 7000032922MOAS21387

OWA—Outside Work Area	CLNR—Clean Room
IWA—Inside Work Area	BGO—Bag Out
HEPA—Negative Air Exhaust	CLR—Clearance
STEL—Short Term Exposure Limit	AMB—Ambient (exterior)
PERS—Work Shift Personal	BKGD—Background
PCM—Phase Contrast Microscopy	BLK—Blank

PCM Clearance Criteria: 0.01 F/cc
Permissible Exposure Limit: 0.1 F/cc

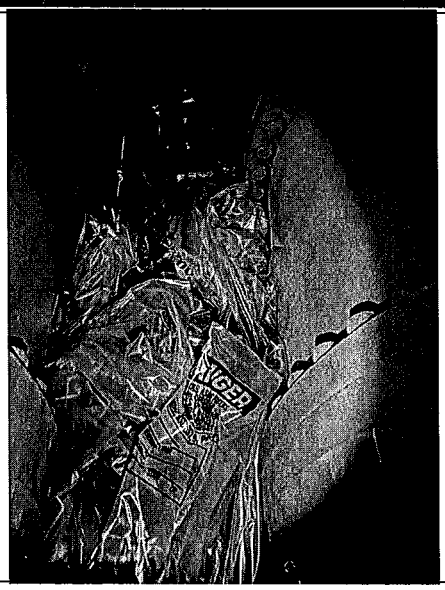
Attachment 4: Photo Log

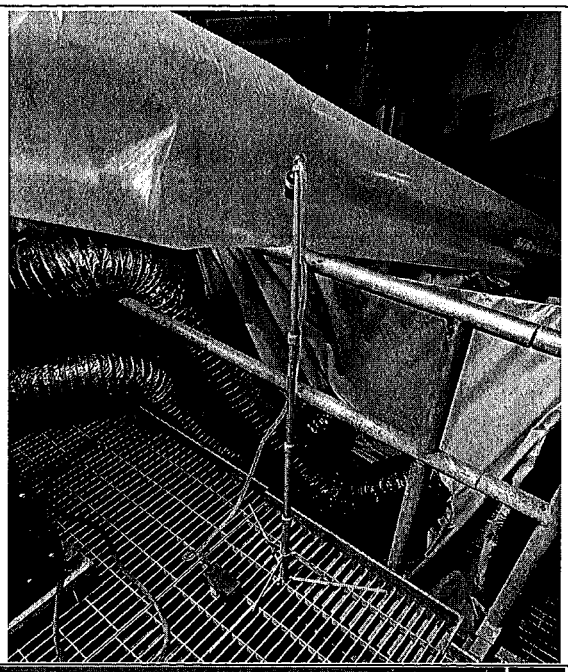
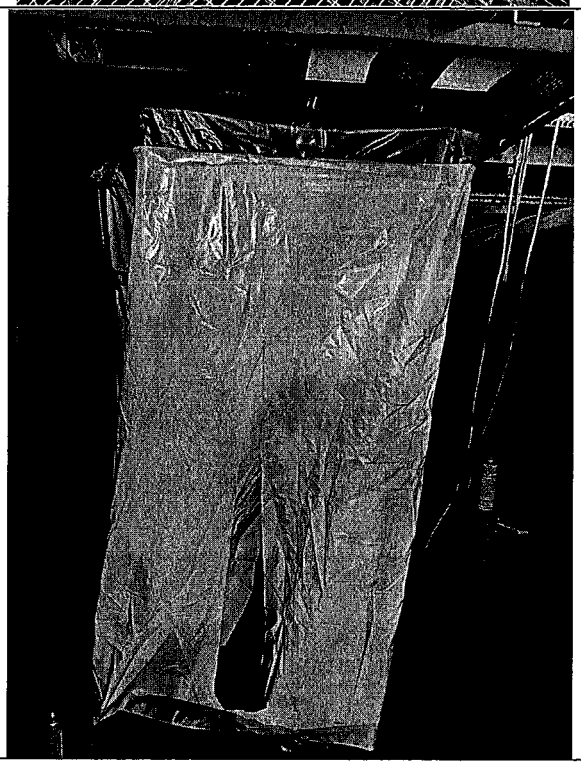
ECOSAFE
Environmental Services, Inc.

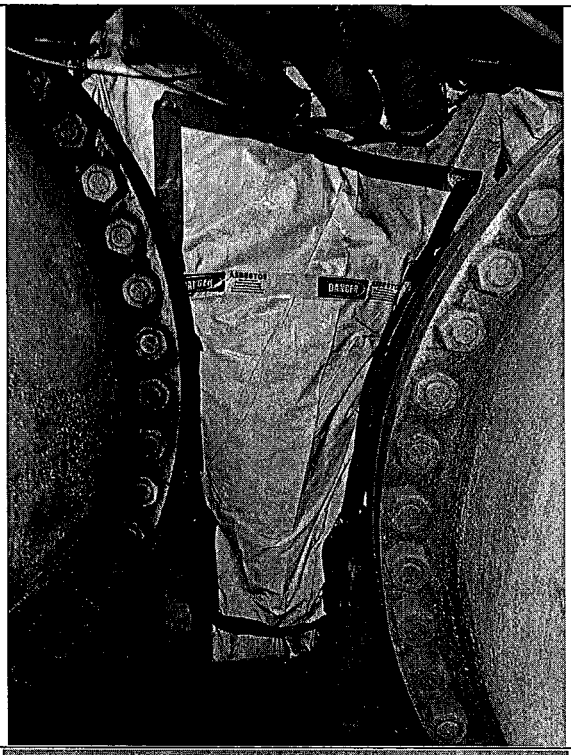
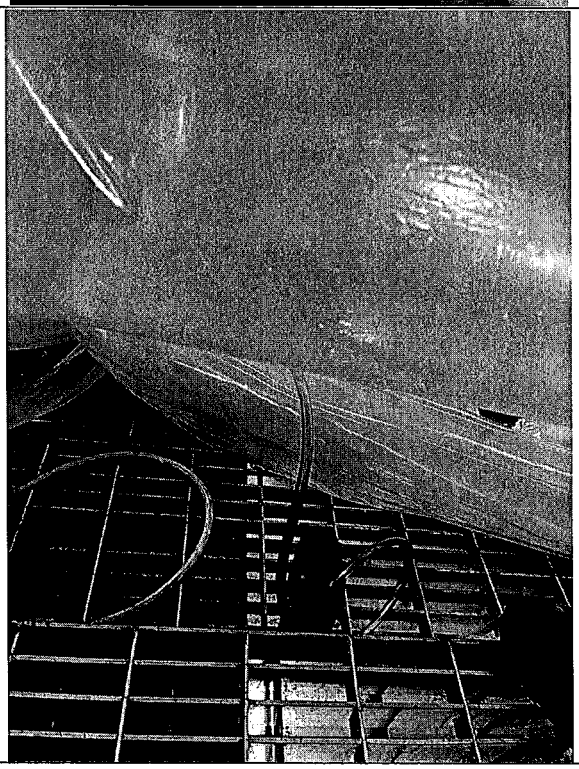
Photographic Documentation

Client: AT Abatement Services, Inc.
Site Name: Blue River Wastewater Treatment Plant
Location: 7300 Hawthorne Rd, Kansas City, MO 64120

Prepared by: Jessica Raley
Project Number: 22210017
Dates: 08/17/2022-08/18/2022

Photograph No. 1 **Date:** 08/17/2022 **Description:** Interior cleanroom inspection, proper supplies and signage	
Photograph No. 2 **Date:** 08/17/2022 **Description:** During-abatement activities: bagging ACM	

Photograph No. 3 **Date:** 08/17/2022 **Description:** Air Sample – OWA: Main Level, Above Containment	
Photograph No. 4 **Date:** 08/18/2022 **Description:** Negative air machine containment inspection	

Photograph No. 5 **Date:** 08/18/2022 **Description:** Secure exterior critical barriers in tunnel, adjacent to other trade's work area.	
Photograph No. 6 **Date:** 08/18/2022 **Description:** Air Sample – NEG: Negative Air Machine Exhaust #6	

Attachment 5: Personnel Certifications

CERTIFICATION NUMBER:

7000032922MOAS21387

THIS CERTIFIES

Jessica Raley

HAS COMPLETED THE CERTIFICATION

REQUIREMENTS FOR

Air Sampling Professional



APPROVED **03/29/2022**

Director of Nr Pollution Control Program

CERTIFICATION NUMBER:

7011032522MOPDI21387

THIS CERTIFIES

Jessica Raley

HAS COMPLETED THE CERTIFICATION

REQUIREMENTS FOR

Project Designer



AP PROVED: **03/29/2022**

EXPIRES **03/29/2023**

TRAINING DATE: 03/25/2022

Director of Air Pollution Control Program

CERTIFICATION NUMBER:

7011040822MOSI21387

THIS CERTIFIES

Jessica Raley

HAS COMPLETED THE CERTIFICATION

REQUIREMENTS FOR

Supervisor



APPROVED **06/23/2022**

TRAINING DATE **04/08/2022**

EXPIRES: **04/08/2023**

Director of AJr Pollution Control Program

ECOSAFE
Environmental Services, Inc.

Greg Nitcher
AT Abatement Services, Inc.
4915 Stillwell Street
Kansas City, MO 64120

September 28th, 2022

RE: Blue River Wastewater Treatment Plant
60-inch Force Main Project
7300 Hawthorne Road
Kansas City, Missouri 64120
Asbestos Containing Material (ACM) Coating Removal
PCM Air Clearance Testing and On-site Laboratory Analysis

Dear Mr. Nitcher,

EcoSafe Environmental is pleased to provide you with this clearance letter in reference to our clearance air monitoring sampling event conducted on Tuesday, September 27th, 2022, at the property referenced above.

The asbestos abatement activities included asbestos containing coating on pipes within a contained and controlled area inside the property listed above. The activities were performed by the abatement contractor AT Abatement Services, Inc. Prior to the collection of the clearance air samples, EcoSafe performed a visual inspection of the abatement work areas. EcoSafe determined that all visible abated areas were clean and free of any suspect ACM materials and debris. Following the successful completion of the visual inspection, air samples were collected.

EcoSafe collected FIVE (5) PCM (Phase Contrast Microscopy) clearance air samples in the designated abatement work area and included TWO (2) quality control blank samples. The sampling pumps were placed, and all sampling pumps were calibrated before and after air sampling collection. The samples were then analyzed off-site by Phase Contrast Microscopy (PCM) per the NIOSH 7400 method.

All clearance samples were found to have fiber concentrations below the clearance criteria of 0.01 fibers per cubic centimeter of air. In conclusion, the subject abatement work area is cleared for re-occupancy. Please see PCM Analytical Results/Air Data Sheets for additional information.

Sincerely,

Amanda Pierce 09/28/2022

Amanda Pierce | DATE
Missouri Air Sampling Professional
Certification # NIOSH582-7639581

ECOSAFE
Environmental Services, Inc.

Client: A.T. Abatement Services
4915 Stillwell Street
Kansas City, MO 64120

Project Location: Blue River Wastewater Plant
7300 Hawthorne Road
Kansas City, MO 64120

Collection Date: Tuesday, 09/27/2022
Date Analyzed: Tuesday, 09/27/2022
EcoSafe Project #: 2022.636EES
A.T. Abatement Project #: 2210017

Abatement Activity: Asbestos Containing Material (ACM) Pipe Coating Removal

Sample ID	Sample Type /Location	Time On	Time Off	Minutes	Average Flow Rate	Volume (Liter)	Fiber Count	Fibers/mm²	Fibers/cc
7300-CLR-1	PCM Clearance: North Entrance: Main Level	6:00	8:20	140	9 L	1,260 L	5.0/100	6.37	0.0019
7300-CLR-2	PCM Clearance: North Entrance: Second Level	6:00	8:20	140	9 L	1,260 L	6.0/100	7.64	0.0023
7300-CLR-3	PCM Clearance: West, Middle: Main Level	6:00	8:20	140	9 L	1,260 L	8.0/100	10.19	0.0031
7300-CLR-4	PCM Clearance: West: Main Level	6:00	8:20	140	9 L	1,260 L	6.0/100	7.64	0.0023
7300-CLR-5	PCM Clearance: West: Bottom/Tunnel Level	6:00	8:20	140	9 L	1,260 L	12.0/100	15.27	0.0047
7300-BLK-1	PCM Control—Lab Blank	—	—	—	—	—	00/100	0.00	0.0000
7300-BLK-2	PCM Control—Lab Blank	—	—	—	—	—	00/100	0.00	0.0000

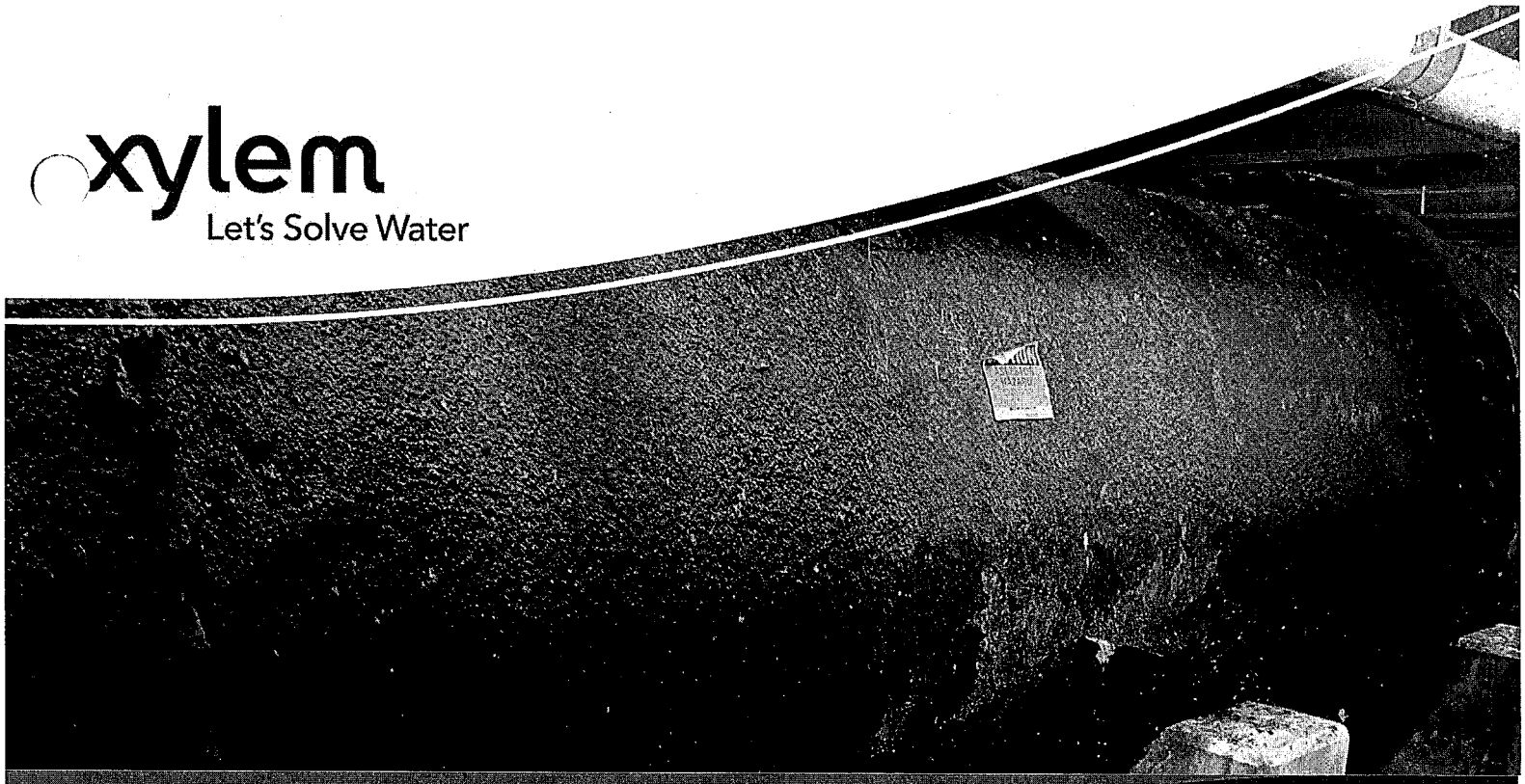
Amanda Pierce 09/28/2022

Amanda Pierce | DATE
Missouri Air Sampling Professional
Certification # NIOSH582-7639581

OWA—Outside Work Area	CLNR—Clean Room
IWA—Inside Work Area	BGO—Bag Out
HEPA—Negative Air Exhaust	CLR—Clearance
STEL—Short Term Exposure Limit	AMB—Ambient (exterior)
PERS—Work Shift Personal	BKGD—Background
PCM—Phase Contrast Microscopy	BLK—Blank

PCM Clearance Criteria: 0.01 F/cc
Permissible Exposure Limit: 0.1 F/cc

xylem
Let's Solve Water



Engineering Report
Blue River Wastewater Treatment Plant
60-inch Cast Iron Force Mains
Garney Construction and Kansas City Water

Version 1.0 – January 2023

pure TECHNOLOGIES
a xylem brand

3040 Route 22 West, Suite 130 | Branchburg, NJ, USA 08876 | Tel: +1 (908) 526-6600 | **puretechltd.com**

pure TECHNOLOGIES
a xylem brand

Quality Assurance and Quality Control Statements

This report has been prepared and reviewed in accordance with the Quality Assurance and Quality Control procedures of Pure Technologies, a Xylem brand:

Zachary Brenners — January 23, 2023
Project Manager — Date

Editorial Review Statement

This report has been prepared and reviewed for editorial content in accordance with the Quality Assurance and Quality Control procedures of Pure Technologies, a Xylem brand:

Linda Konopka — January 20, 2023
Editorial Reviewer — Date

Technical Review Statement

This report has been prepared and reviewed for technical correctness in accordance with the Quality Assurance and Quality Control procedures of Pure Technologies, a Xylem brand:

Ashan McNealy, P.E. — January 23, 2023
Technical Reviewer — Date

Contractual Review Statement

This report has been reviewed for contractual completeness in accordance with the Quality Assurance and Quality Control procedures of Pure Technologies, a Xylem brand:

Wayne Lindsay — January 23, 2023
Contractual Reviewer — Date

Confidentiality Clause

This report contains confidential commercial information regarding proprietary equipment, methods, and data analysis, which is the property of Pure Technologies, a Xylem brand. It is for the sole use of the Garney Construction, Kansas City Water, and its engineering consultants, and is not to be distributed to third parties without the express written consent of Pure Technologies, a Xylem brand.

Table of Contents

Executive Summary 1

1. Pipe Wall Thickness Inspection Results 3
   - 1.1. INCOTEST Results 3
   - 1.2. Ultrasonic Thickness Gauge (UT Gauge) – Attempt Discussion 4
2. Transient Pressure Monitor Results 6
3. Structural Analysis 7
   - 3.1. AWWA C101 Design Check 7
   - 3.2. Finite Element Analysis (FEA) 8
     - 3.2.1. FEA Curve 9
4. Conclusions and Recommendations 10
   - 4.1. Conclusions 10
     - 4.1.1. Discussion of Wall Loss 10
     - 4.1.2. FEA Curve 10
   - 4.2. Recommendations 10
     - 4.2.1. Line 1 10
     - 4.2.2. Line 2 10

Appendices

APPENDIX A - INCOTEST Results
APPENDIX B - TPM Report
APPENDIX C - AWWA C101 Design Check Results
APPENDIX D - FEA Curve for 60-inch CIP

Executive Summary

Pure Technologies, a Xylem brand (Pure Technologies), was contracted by Garney Construction to provide a condition assessment of two (2) 60-inch diameter cast iron pipe (CIP) parallel force mains at the Blue River Wastewater Treatment Plant (WWTP). The facility and the force mains are owned and operated by Kansas City Water. The steps taken to perform the condition assessment included:

- Inspection/Data collection:
  - Measurement of the wall thickness of ten (10) pipe sticks to determine location and extent of any pipe wall deterioration.
    - INCOTEST – used to get relative pipe wall thickness
    - Ultrasonic Thickness Gauge – used to tie relative pipe wall thickness to actual wall thickness
  - Transient pressure monitoring to detect any short duration transient (high pressure) events.
- Structural Analysis:
  - Perform an AWWA C101 design check of the CIP. Determines the wall thickness required to meet the AWWA C101 standard for applicable conditions.
  - Perform a finite element analysis (FEA) for the pipe segment with the most significant wall deterioration. FEA provides a Yield Limit for the pipe segment based on internal pressure and a linear measurement of pipe wall loss.
- Providing recommendations based on the inspection results and structural analysis (provided on next page)

The following conclusions were made by Pure Technologies:

Discussion of Wall Loss

The inspected pipes in Line 1 show limited wall loss, with no thinning of the pipe walls exceeding 26 percent.

Line 2 showed more wall loss, specifically at the invert of Pipes 6 and 7, and to a lesser extent at the invert of Pipe 8. Note that invert measurements were not taken on Pipes 9 and 10 due to construction materials that obstructed access. It is reasonable to assume that the wall loss at the invert of the pipes of Line 2, pipes 6, 7, and 8, is on the internal surface of the pipe wall, likely caused by solids traveling on the bottom of the pipe and wearing the internal surface.

FEA Curve

Applying the FEA Curve, and using a conservative pressure of 237 psi, all of the pipe segments are still below the Yield Limit.

The following recommendations are made by Pure Technologies:

Line 1

Line 1, Pipes 1-5, appear to be in good shape with a maximum wall loss of 26 percent observed. Applying this to the FEA Curve shows that this line is well within the Yield Limit. Reinspection of the line can be done in 10 to 15 years.

Line 2

Line 2, Pipes 6-10, appear to be susceptible to wall loss at the invert of the pipes. It is recommended that this line be reinspected in five (5) to seven (7) years to verify that the rate of corrosion at the invert has remained steady. An internal inspection to view the invert is also recommended. If significant corrosion is observed, a coating system for the internal surface of Line 2 may be beneficial to extend the life of the pipes in Line 2.

1. Pipe Wall Thickness Inspection Results

1.1. INCOTEST Results

On September 13 and 14, 2022, Pure Technologies and its subcontractor performed a nondestructive INCOTEST on 10 pipe sticks, or approximately 120 linear feet, of the 60-inch CIP in the Blue River WWTP. This test provided data on the relative remaining pipe wall on the force mains. This relative pipe wall percentage is based on test locations on each pipe tested and getting an average of 100 percent of pipe wall as the base wall thickness. All percentages are relative to that nominal wall thickness used. Figure 1.1 displays the specific pipe sticks tested. The resulting INCOTEST for each pipe stick is included in Appendix A. Note that there is a lot of data to present for each pipe so the PDF will need to be zoomed in to see the relative thickness values being presented. See Figure 1.2 (next page) for an example INCOTEST result.

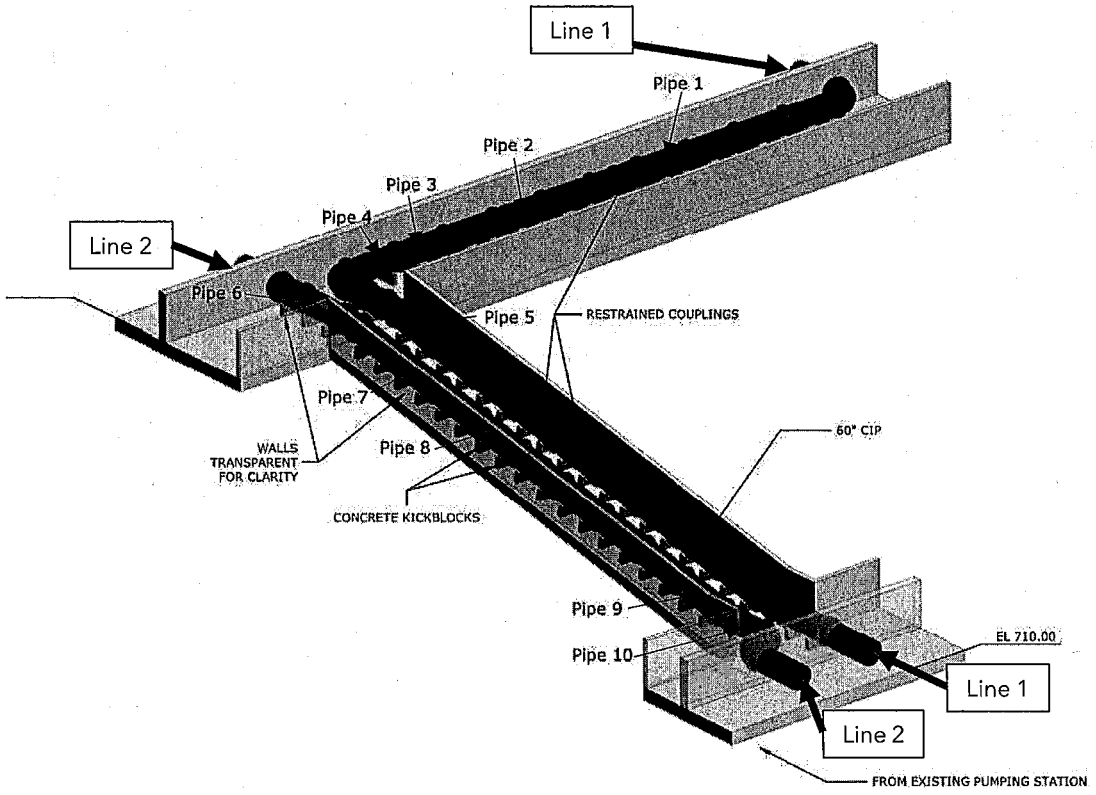


Figure 1.1: Pipe Callouts for INCOTEST and Line Labels (Line 1 and Line 2)

Pipes 1 through 5 are herein referred to as Line 1, and Pipes 6 through 10 are herein referred to as Line 2. On Line 1, the lowest pipe wall reading was seen as 74 percent and was detected on the invert of Pipe 3. On Line 2, the lowest pipe was reading was seen as 51 percent and was detected on Pipe 6. On average, Line 2 had lower readings on the invert than Line 1, with an average low reading of 68 percent. Support blocks prevented the INCOTEST from being performed on sections of each of the pipe sections. On Pipes 9 and 10, there were obstructions

preventing readings from being taken at the invert. Based on the invert readings from the other pipes on Line 2, it could be presumed the readings from the invert of Pipes 9 and 10 could be lower, with likely low readings in the 50-60 percent. Appendix A contains the results of the INCOTEST of each of the 10 pipes.

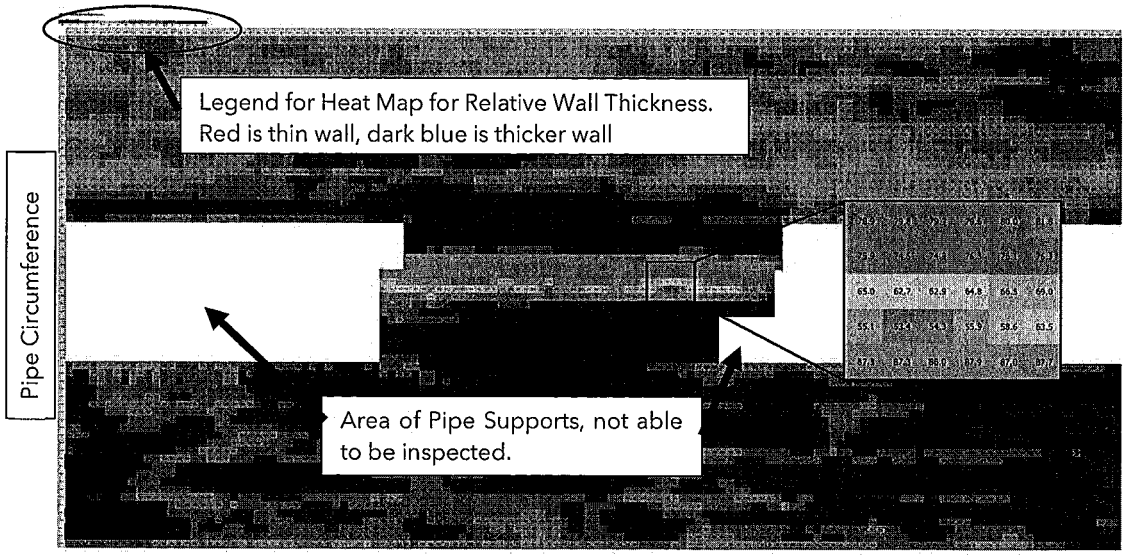


Figure 1.2: Sample Result of INCOTEST, note the zoomed in relative thickness values for a thin section of the pipe. Note: PDF will need to be zoomed in to see relative thickness values.

1.2. Ultrasonic Thickness Gauge (UT Gauge) – Attempt Discussion

In order to obtain actual wall thickness measurements that can be utilized for design checks and FEA development, the INCOTEST results, which is a relative wall thickness, need to be tied to an actual wall thickness, as measured by a UT gauge. Obtaining one UT measurement per pipe segment is sufficient to obtain required thickness data to run.

Two UT gauges were utilized during the INCOTEST pipe wall thickness inspection, but neither were able to collect pipe wall thickness on any of the pipe segments. A third UT gauge was utilized on November 11, 2022. This gauge was fitted with a lower frequency transducer, which lowers the sound attenuation through materials such as cast iron. However, this gauge was not able to obtain wall thickness measurements, as well.

In order to use the INCOTEST data for the structural analysis, an actual wall thickness needs to be assigned to the pipe. Because the UT gauges did not collect this data, an AWWA C101 thickness standard was used. The thinnest CIP prescribed by AWWA C101 is 1.39 inches. Therefore, in order to be conservative, this number was used in conjunction with the INCOTEST results to develop the assumed wall thicknesses. An example of the thinnest location found on the pipe shows a minimum wall thickness of 0.717 inches.

- Example: INCOTEST minimum thickness result of 51.6%, multiplied by an assumed thickness of 1.39 inches results in a pipe wall that is 0.717 inches thick.

A stamp on the outside of the pipe, indicated the pipe manufacturer (U.S. Pipe) and the plant at which the pipe was manufactured, Δ signifies the pipe was made at the U.S. Pipe Bessemer Plant in Alabama. Representatives from U.S. Pipe confirmed the material to be cast iron but did not have input on the design or class of the pipe. In order to be conservative, as stated above, the minimum thickness of cast iron (1.39 inches, for class 50) was assumed for the design check and FEA analysis. See Figure 1.3 for a picture of the manufacturer's information. See Figure 1.4 for the pipe wall thickness information for cast iron pipe.

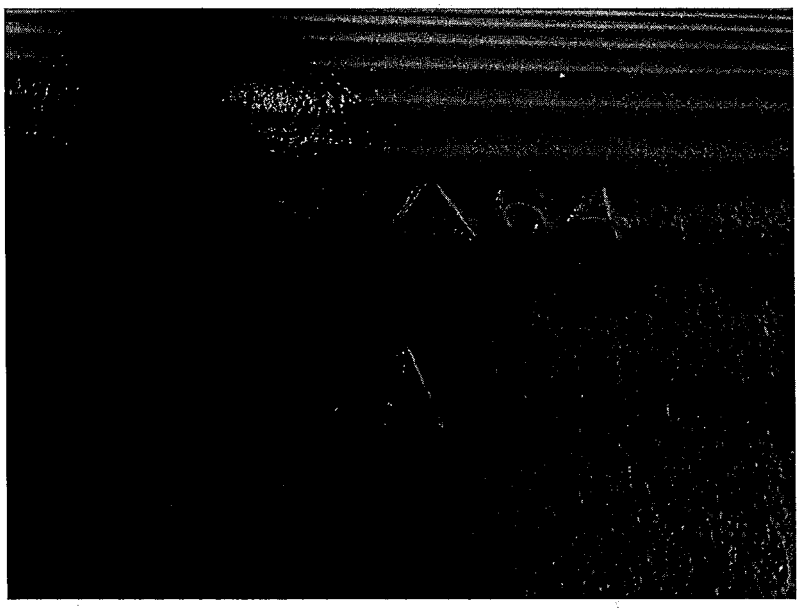


Figure 1.3: Pipe Manufacturers Information on Pipe Exterior

STANDARD DIMENSIONS OF BELLS, SOCKETS, SPIGOT BEADS and OUTSIDE DIAMETERS of PIT CAST PIPE also WEIGHTS OF BELLS AND OF SPIGOT BEADS

Nominal Diam.	Thickness of pipe		Outside Diam. of Pipe	DIMENSIONS OF BELLS						Wt. of Bell	Wt. of Spigot Bead
	From	To		Diam. of Socket	Thickness of Joint L	Depth of Socket d	a	b	c		
60	1.39	1.45	62.80	63.50	.50	5.50	2.25	3.40	1.70	1021	7.0
	1.48	1.75	63.40	64.40	.50	5.50	2.25	3.70	1.90	1146	7.7
	1.76	2.15	64.20	65.20	.50	5.50	2.25	4.20	2.25	1383	7.8
	2.16	2.45	64.82	65.82	.50	5.50	2.25	4.70	2.60	1647	7.9

Figure 1.4: Standard Wall Thickness for 60-inch Diameter CIP (1.39 inches)

2. Transient Pressure Monitor Results

As part of the hydraulic analysis, an LPR-31i-300 transient pressure monitor (TPM) was installed on the discharge line on Pumps 3 and 7 as shown in Figure Figure 2.1. The TPM was placed on the discharge of Pump 3, but was relocated to Pump 7 when Pump 3 was going to be shut down. The TPM was installed from September 15 to October 19, 2022.

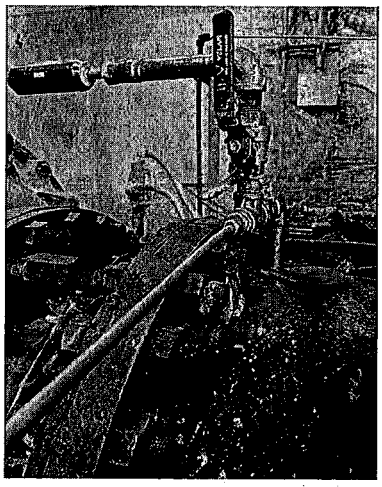


Figure 2.1: LPR-31i-300 Monitoring Location

Maximum, minimum, and average pressures were recorded by the pressure logger at 4-minute intervals. The overall maximum, minimum, and average pressures recorded during the monitoring period are shown in Table 2.1.

Table 2.1: Recordings of Interest

Maximum (psi)	Minimum (psi)	Average (psi)	Standard Deviation (psi)
24.8	-1.2	10.1	1.7

Of all the pressure samples recorded, 68.3 percent are between 8.4 psi and 11.8 psi, and 95.4 percent are between 6.6 psi and 13.5 psi.

A detailed TPM report is found in Appendix B of this report.

3. Structural Analysis

3.1. AWWA C101 Design Check

In 1902, the Standard Specification for Cast Iron Pipe and Special Casting was adopted by the New England Water Works Association (NEWWA). In 1908, the AWWA adopted the Standard Specification for Cast Iron Pipe and Special Casting with some revisions. In 1939, the American Standard Practice Manual for the Computation of Strength and Thickness of Cast Iron Pipe (A21.1) was issued. Discussion and interpretations of the method of design of CIP were published in 1939. As a result of these publications and general acceptance of A21.1, a substantial volume of CIP was designed by the new method and furnished to manufacturer's standards between 1939 and 1953. A standard (A21.2) for pit cast pipe with 11/31 iron strength also was issued in 1939. Work on the standard for centrifugally cast pipe with 18/40 iron strength was started after the design was completed in 1953 but was not formally issued until 1953 due to WWII. In 1957, a revision of A21.1 was issued. Later, as a result of Sectional Committee A21 work, revisions of the CIP standards A21.6 (AWWA C106), A21.7, A21.8 (AWWA C108) and A21.9 were issued in 1962.

Pure Technologies uses the AWWA C101 design standard to evaluate the structural integrity of CIP under its current working condition. An AWWA C101 analysis compares a pipe's current thickness or design thickness with calculated minimum required thickness to resist two different criteria:

1. Case 1: Trench load[1] (earth load but no truck load) with internal pressure (working pressure plus surge pressure)
2. Case 2: Trench load[1] (earth load plus truck load) with internal pressure (working pressure plus surge pressure)

[1]*Note that for the Blue River WWTP 60-inch CIP Force Mains, there is no trench load, as the pipe is contained in a pipe chase.*

If the calculated thickness is lower than the current/design thickness, the pipe meets the minimum requirement for that specific criterion. If not, it fails to meet the minimum requirement. A factor of safety of 2.5 is considered in C101.

As the only structural component of a CIP is the actual cast iron wall itself, any loss of cross-sectional area due to corrosion has an immediate impact on the overall strength of the pipe. Calculating the critical thickness and comparing that to the measured thicknesses for each pipe can determine the maximum allowable corrosion in the damaged pipe.

An AWWA C101 design check was performed using the maximum pressure observed in the main by the TPM (24.8 psi), an assumed surge of 70 psi, which is very conservative for this pipe, and the factor of safety of 2.5, mentioned above. The operating plus surge pressure with a 2.5 safety factor is 237 psi.

- (24.8+70) 2.5 = 237 psi

The results of the AWWA C101 design check can be found in Figure 3.1.

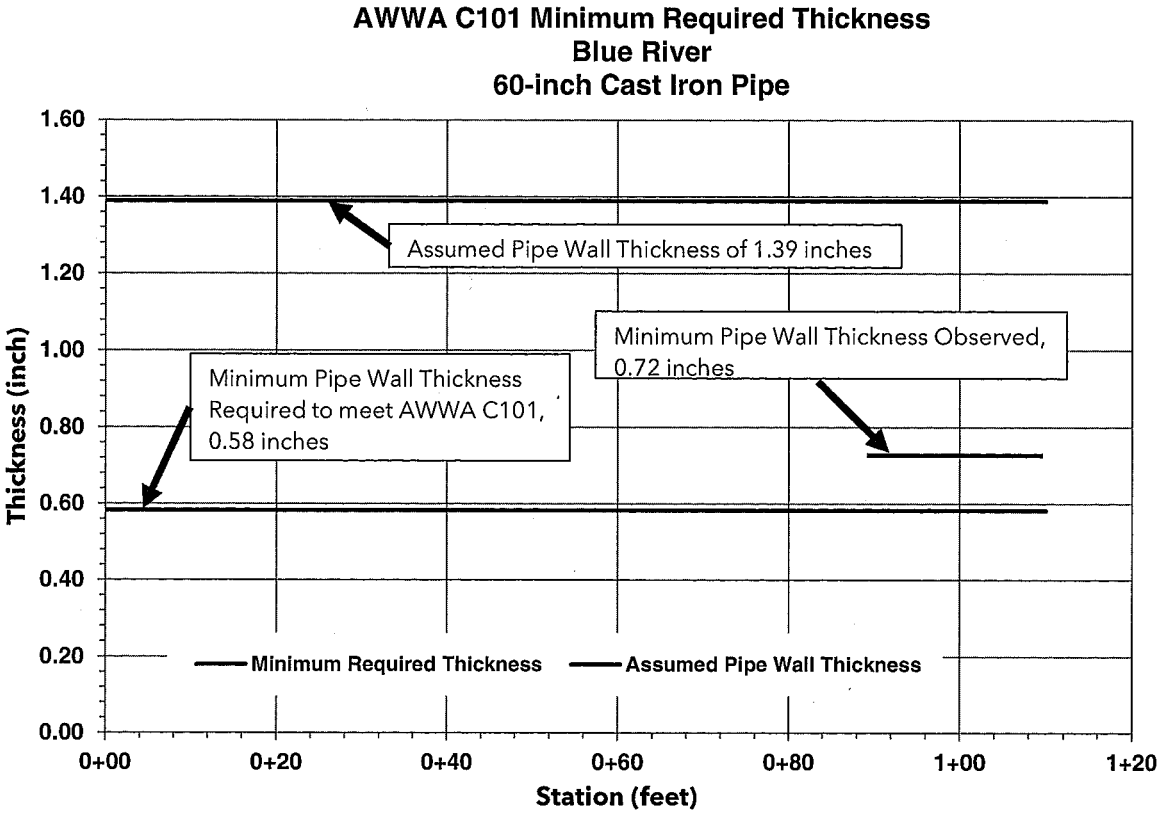


Figure 3.1: AWWA C101 Output Graph

Note that the minimum required thickness of 0.58 inches is less than half of the minimum pipe wall thickness typical for cast iron pipe. The section of main with the thinnest detected wall was 51.6% as thick as the nominal thickness, which was assumed to be 1.39 inches, for a thickness of 0.72 inches. Therefore, AWWA C101 is met for both the nominal pipe thickness of 1.39 inches and for the minimum pipe wall thickness detected of 0.72 inches.

3.2. Finite Element Analysis (FEA)

The goal of the FEA is to provide yield limits for the pipes with variable pressure and variable length of the corroded area. Yield lines based on 20, 40, 60, and 80 percent corrosion are placed on the graph with the pressure on the y-axis and the length of the corroded area on the x-axis. The curve was developed by running the FEA analyses at various corrosion levels (20, 40, 60, and 80 percent) and varying corrosion lengths along the main and determining the pressure at which the pipe yields. The colored curves on the graph are the plots of the yield points determined by the FEA analyses.

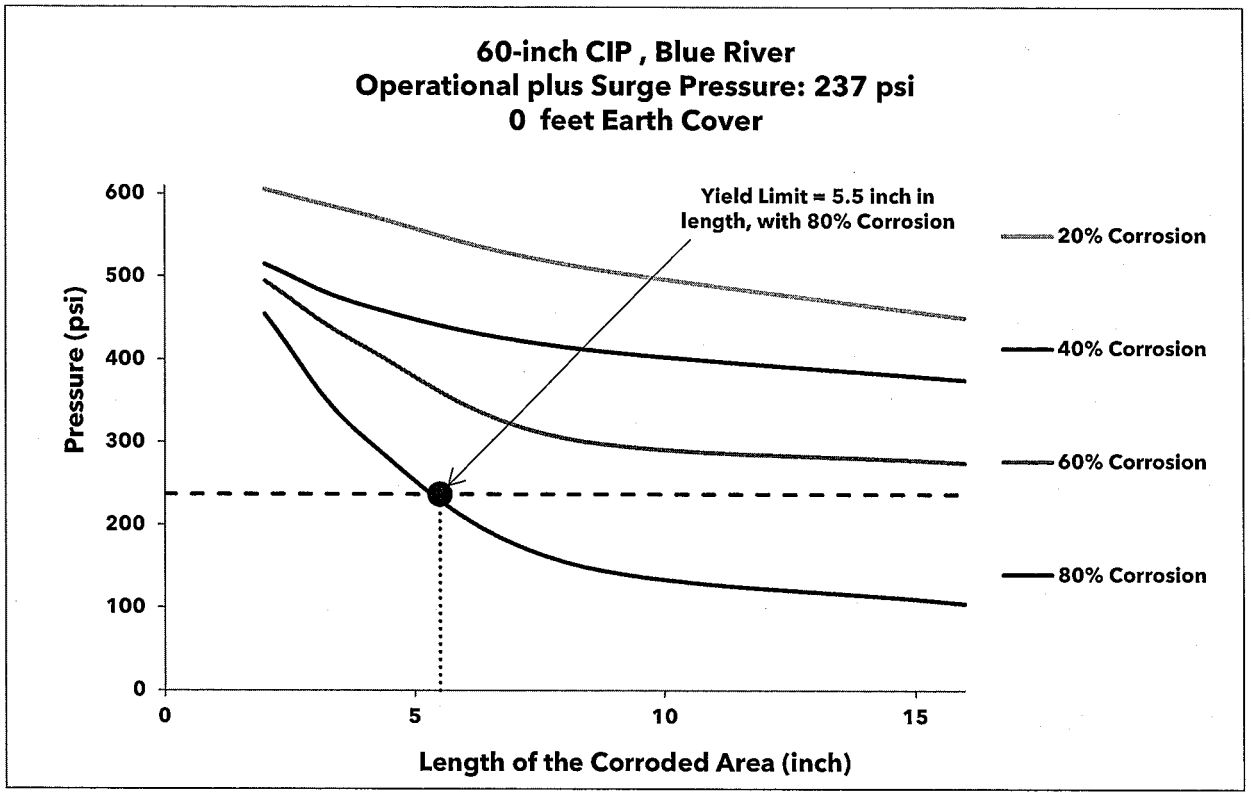


Figure 3.2: FEA Curve - Yield Curves Based on Set Corrosion Percentages at varying

3.2.1. FEA Curve

The FEA Curve indicates that pipes with less than 60 percent corrosion on this main are operating below their Yield Limits. Pipes 6 and 7 had some of the most significant wall loss, but they were still below 50 percent wall loss in the thinnest areas. The fact that the pressure is likely well below 237 psi at all times means that there is still significant capacity for these mains to perform as intended.

4. Conclusions and Recommendations

4.1. Conclusions

4.1.1. Discussion of Wall Loss

The inspected pipes in Line 1 show limited wall loss, with no thinning of the pipe walls exceeding 26 percent.

Line 2 showed more wall loss, specifically at the invert of Pipes 6 and 7, and to a lesser extent at the invert of Pipe 8. Note that invert measurements were not taken on Pipes 9 and 10 due to construction materials that obstructed access. It is reasonable to assume that the wall loss at the invert of the pipes of Line 2, pipes 6, 7, and 8, is on the internal surface of the pipe wall, likely caused by solids traveling on the bottom of the pipe and wearing the internal surface.

4.1.2. FEA Curve

Applying the FEA Curve, and using a conservative pressure of 237 psi, the pipe is still below the Yield Limit.

4.2. Recommendations

4.2.1. Line 1

Line 1, Pipes 1-5, appear to be in good shape with a maximum wall loss of 26 percent observed. Applying this to the FEA Curve shows that this line is well within the Yield Limit. Reinspection of the line can be done in 10 to 15 years.

4.2.2. Line 2

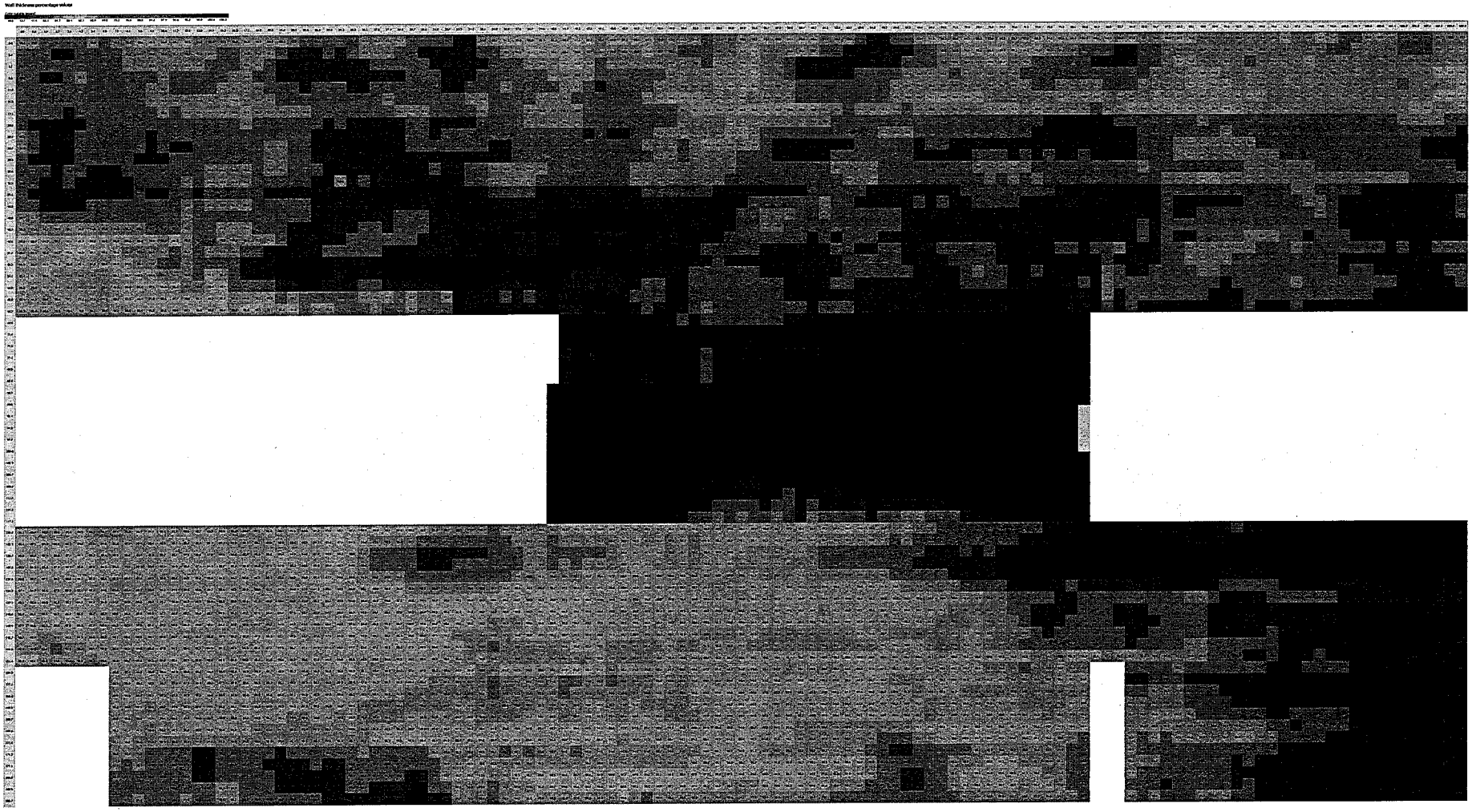
Line 2, Pipes 6-10, appear to be susceptible to wall loss at the invert of the pipes. It is recommended that this line be reinspected in five to seven years to verify that the rate of corrosion at the invert has remained steady. An internal inspection to view the invert is also recommended. If significant corrosion is observed, a coating system for the internal surface of Line 2 may be beneficial to extend the life of the pipes in Line 2.

pure TECHNOLOGIES
a xylem brand

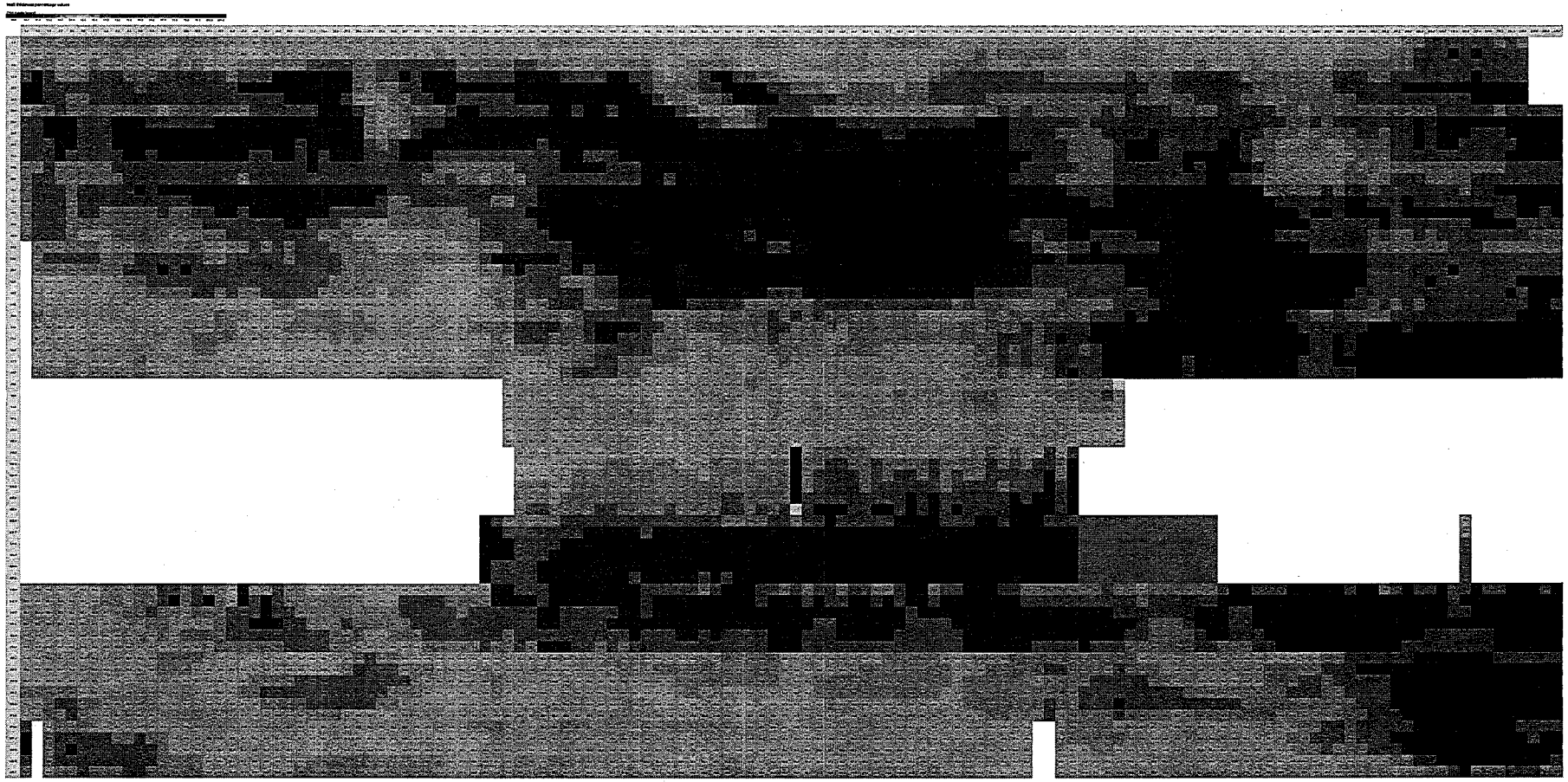
APPENDIX A

INCOTEST RESULTS

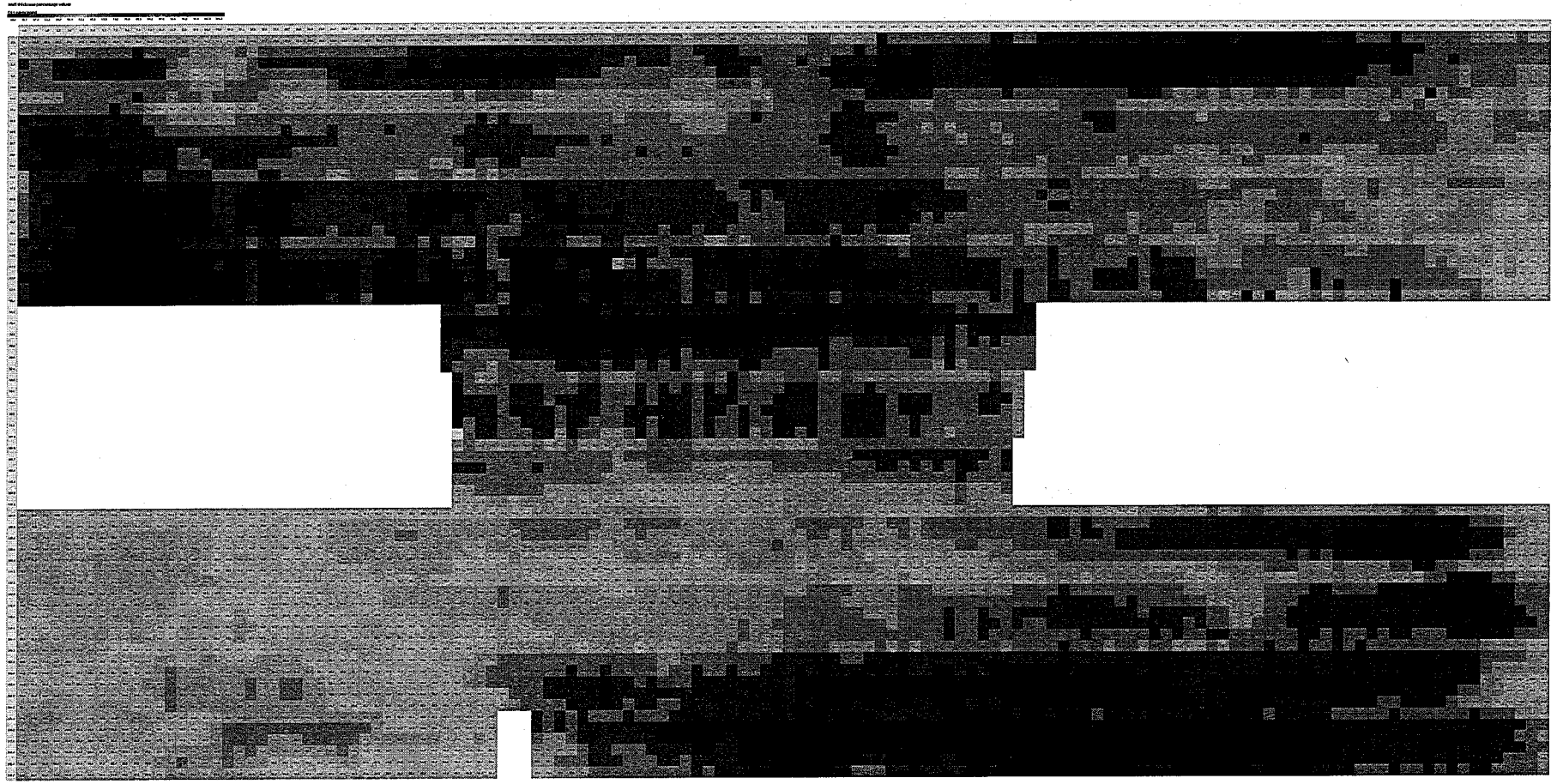
Pipe 1



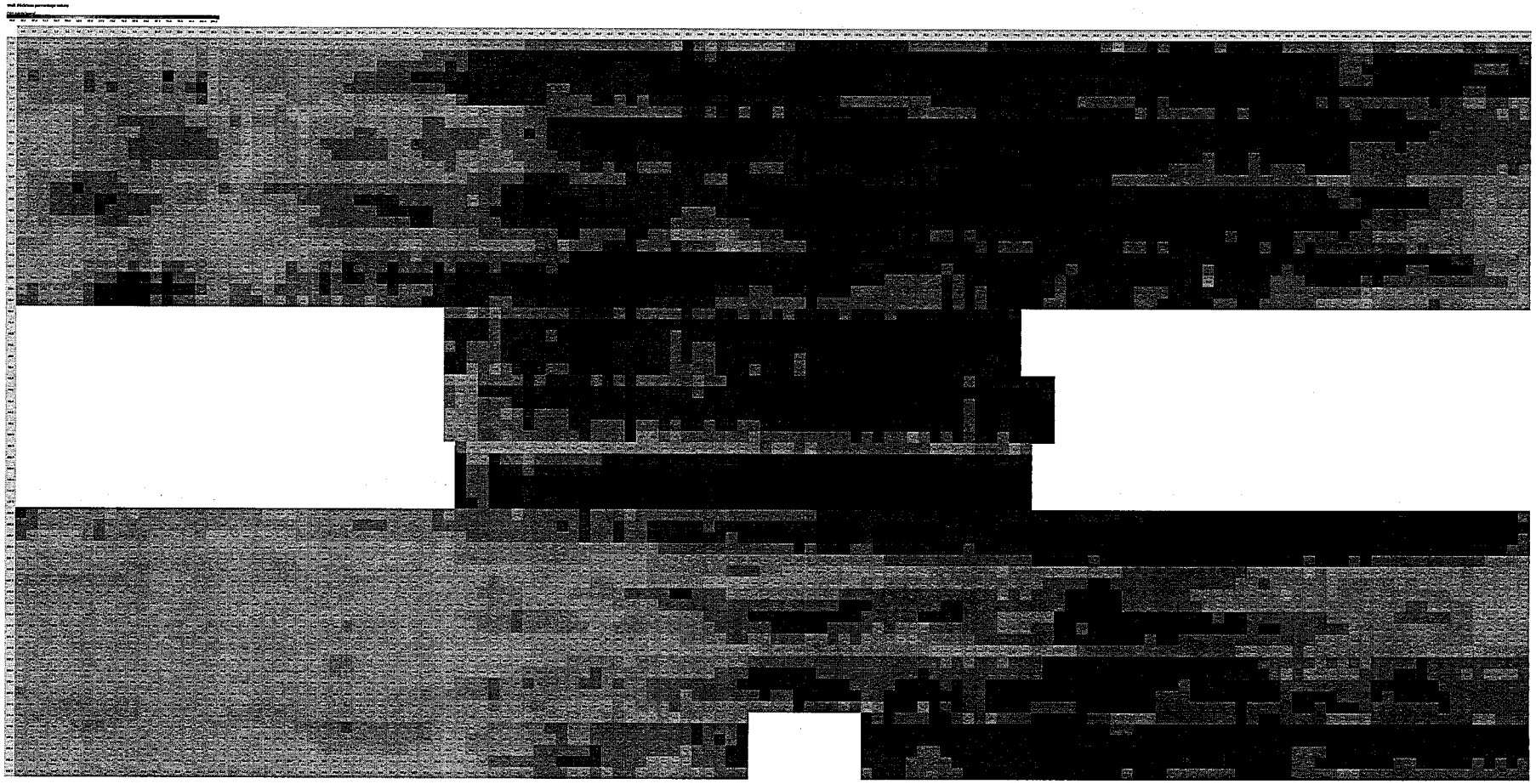
Pipe 2



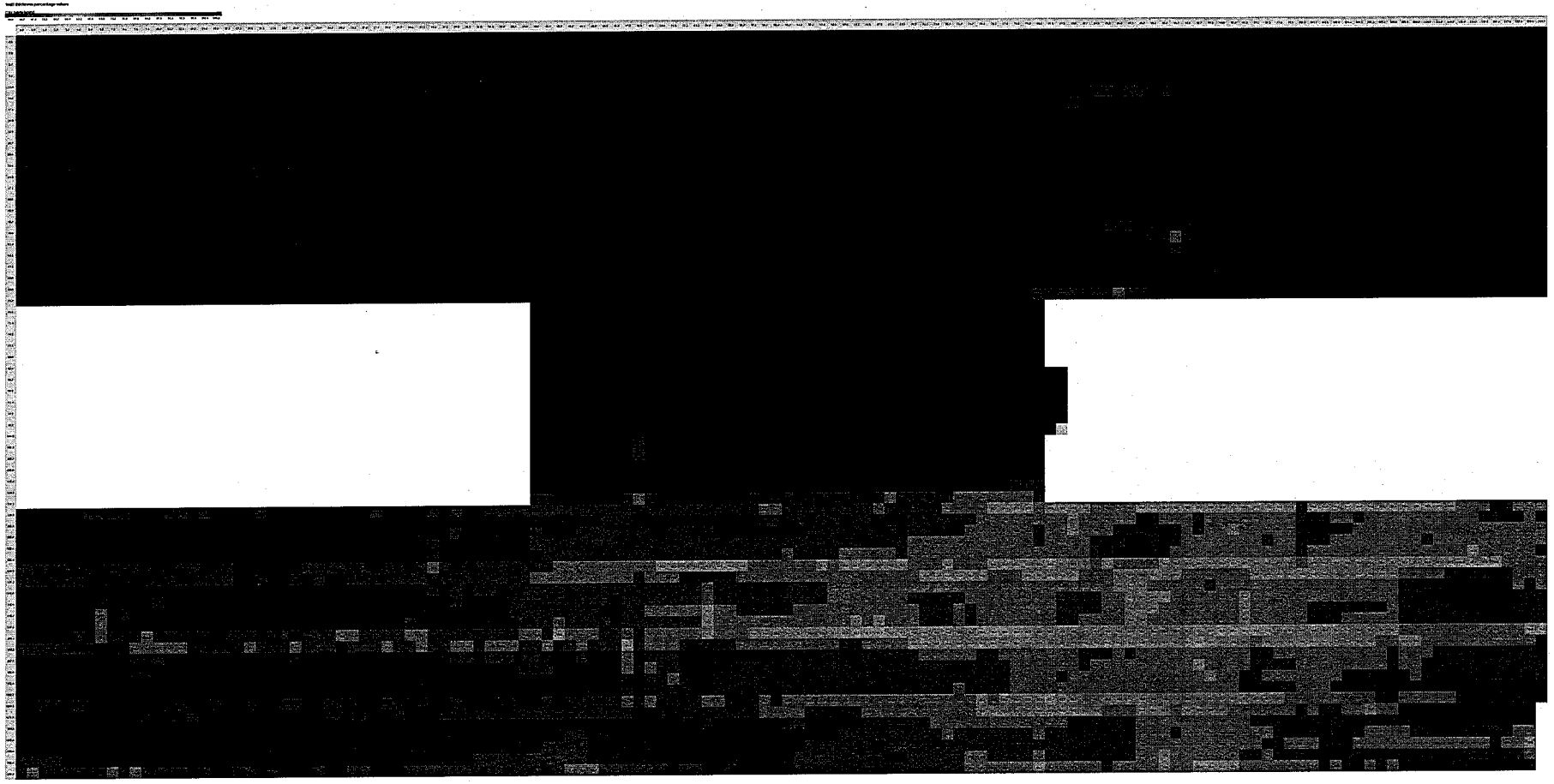
Pipe 3



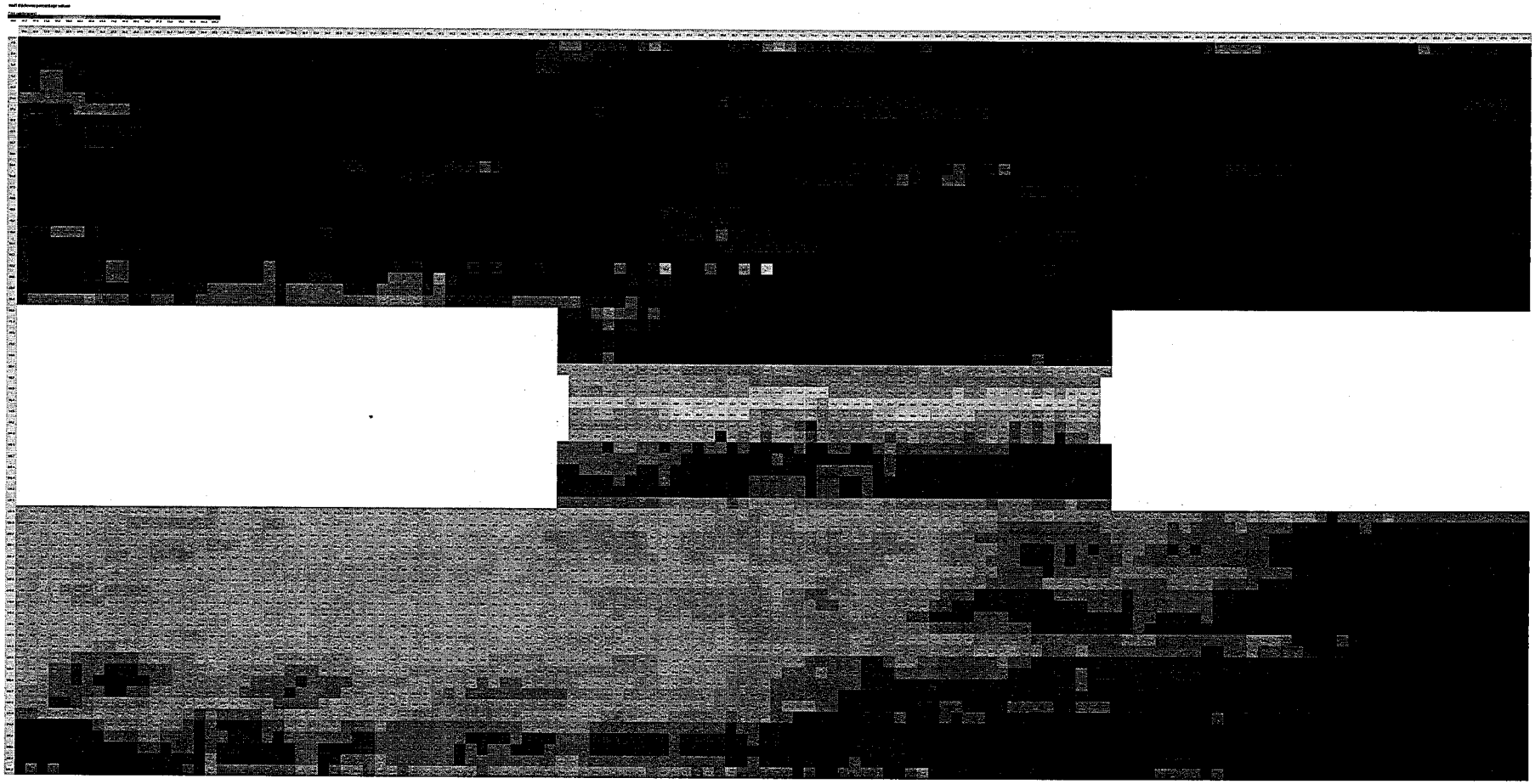
Pipe 4



Pipe 5



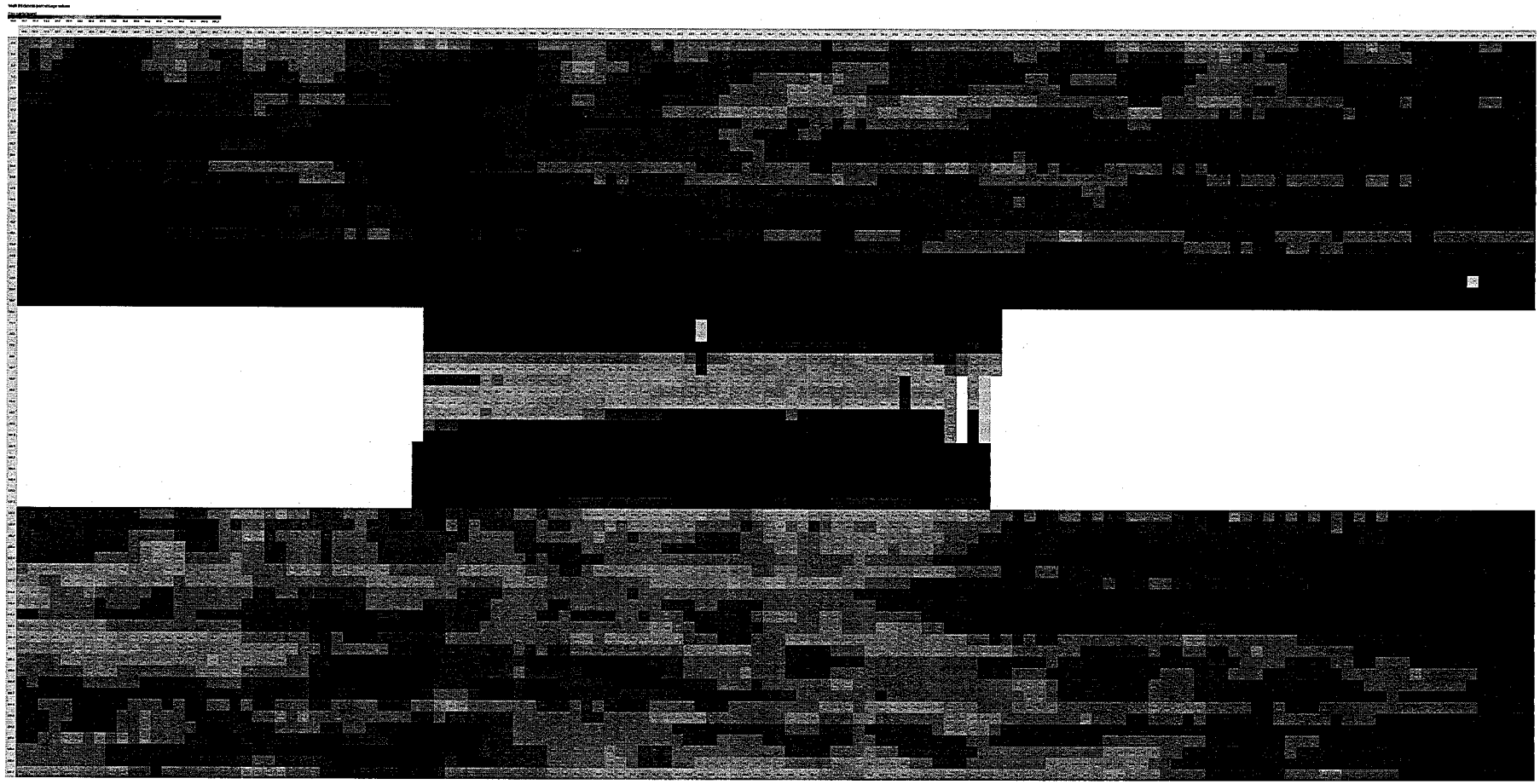
Pipe 6



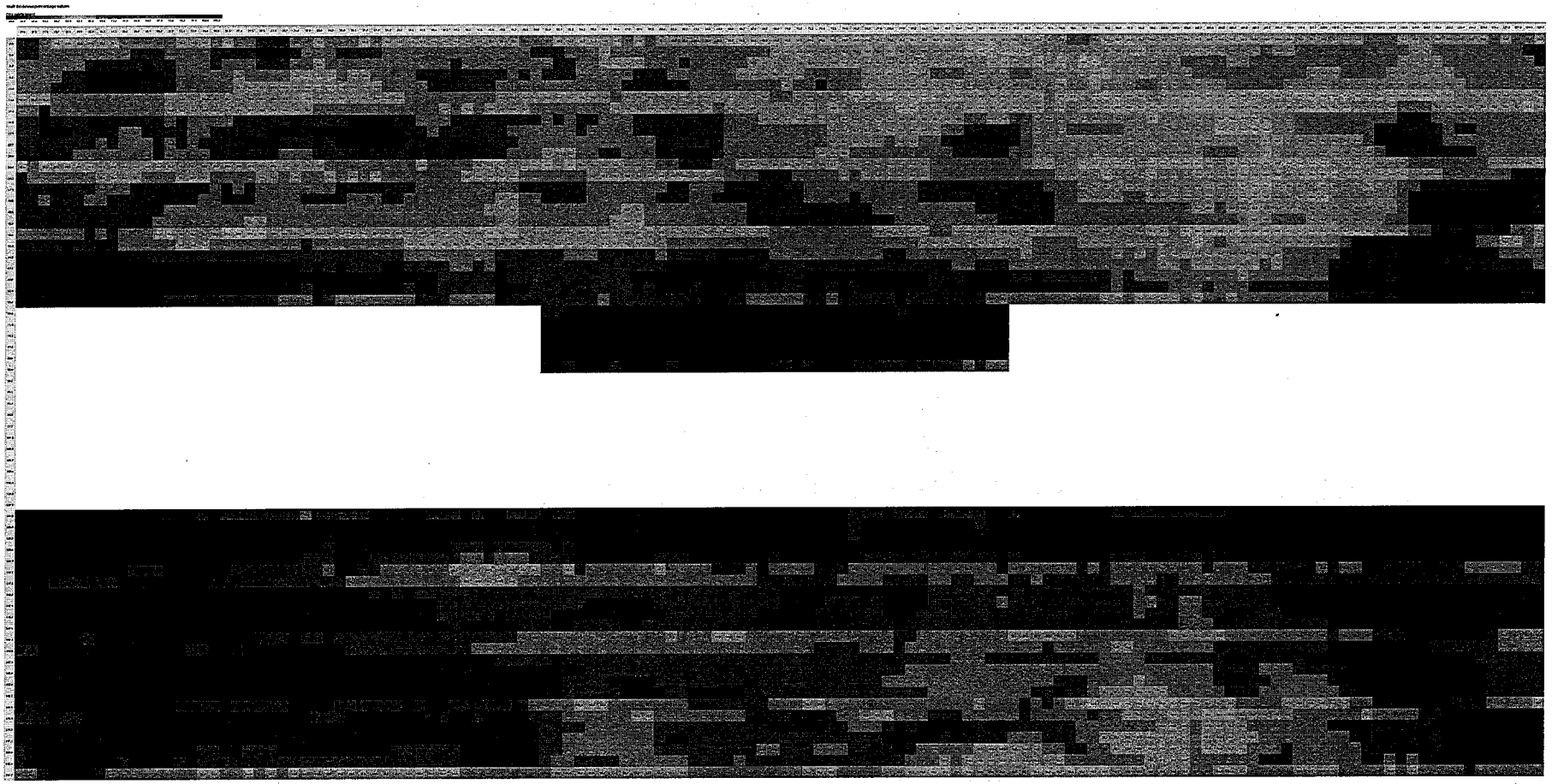
Pipe 7



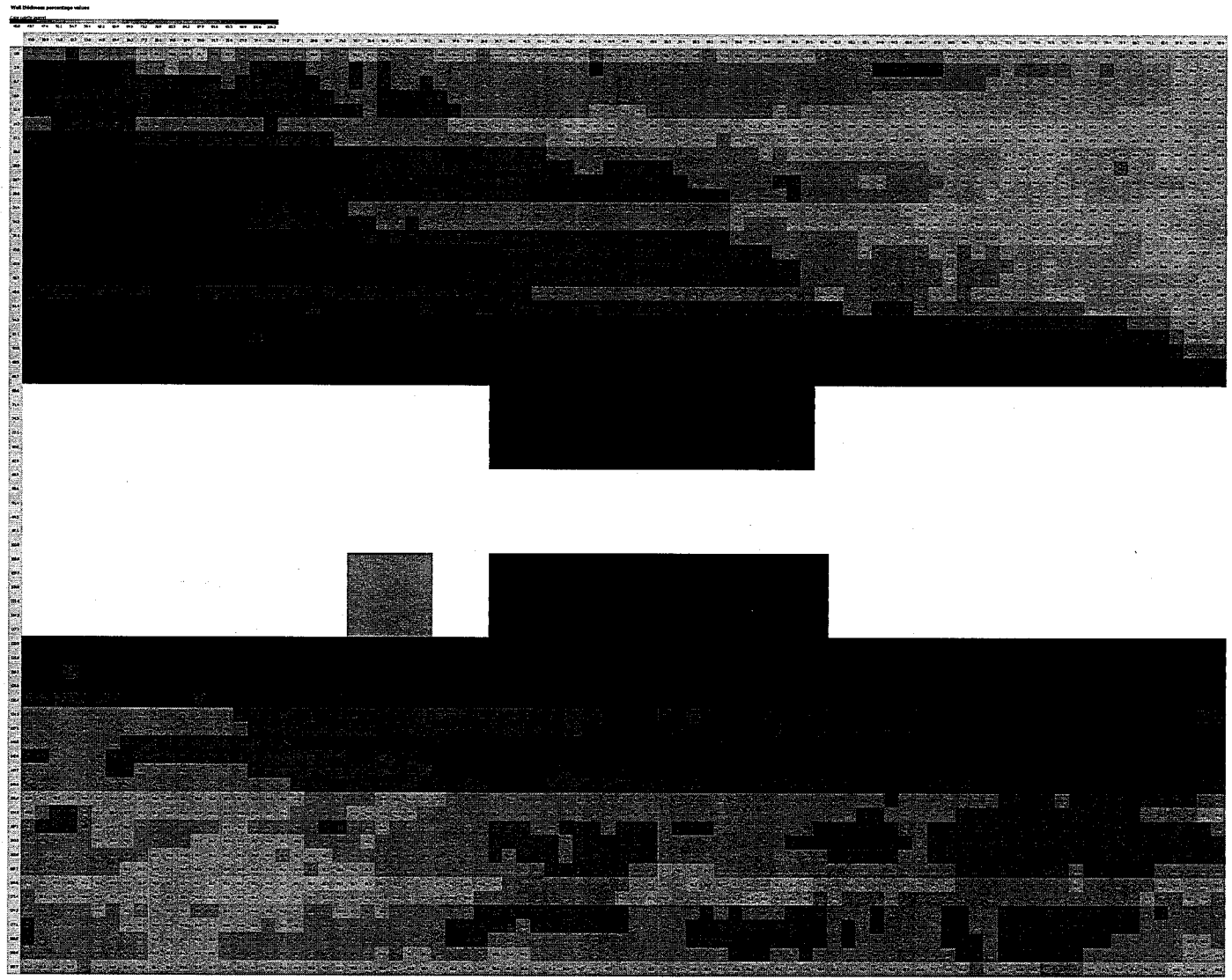
Pipe 8



Pipe 9



Pipe 10



pure TECHNOLOGIES
a xylem brand

APPENDIX B

TPM Report

1. Pressure Monitoring and Hydraulic Analysis

1.1 Methodology

A Hydraulic Evaluation is conducted in order to understand the operational and surge pressures within a pipeline. When pipe wall degradation is combined with surge pressures, the likelihood of pipe failure can be significantly increased. Evaluation of the pump station operation, such as pump startup mode, typical and peak flows, operating and surge pressures, and surge protection, can provide important information on the stresses imparted on the pipeline.

Hydraulic pressure transients occur in pipelines when the steady-state conditions of the system change due to pressure and/or flow disturbances (e.g., the rapid closure of a valve, pump start-up/shutdown, gas pockets). The magnitude of a transient is related to several factors including the flow rate within the pipeline, the time (how fast) in which the change in steady-state condition occurs, and pipe hoop rigidity. During a transient event, the kinetic energy of the flow momentum is converted into potential energy, a rise in pressure, and strain energy in the pipe walls with the propagation of pressure waves. The resultant pressure transient is superimposed on the existing, steady-state pressure within the pipeline. Gas pockets combined with pressure transients can also have a significant impact on the structural integrity of the pipeline as vacuum conditions may be created. The rapid collapse of these gas pocket vacuum regions may cause cavitation as the transient passes, resulting in mechanical wear on the pipe wall and thereby increasing the risk of failure if the structural capacity has been compromised.

Conventional pressure monitors collect data in intervals of seconds or minutes while transients may occur in fractions of seconds and may be missed by traditional equipment. The LPR-31i-300 pressure monitor, utilized on this project, continuously samples pressure at a high rate and records data every few minutes under normal operating conditions; however, when a transient pressure event is detected in the pipeline, the device records at the high sample rate of 20Hz to provide an accurate recording of the pressure transient event.

1.2 Results

A hydraulic evaluation of the subject pipeline was conducted to understand the operational and surge pressures. Pressure data was collected for a total of 34 days, from September 15, 2022, to October 19, 2022, in order to identify the hydraulic stresses acting on the pipeline.

As part of the hydraulic analysis, an LPR-31i-300 was installed on the discharge line on pump 3 for about a week and later on pump 7 similar to the setup shown in Figure 1.1.

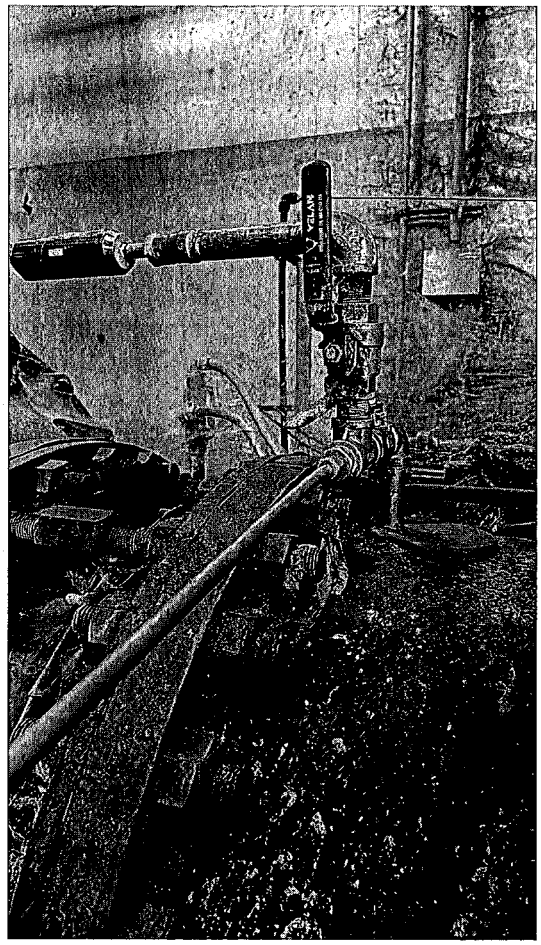


Figure 1.1: LPR-31i-300 Monitoring Location

Maximum, minimum, and average pressures were recorded by the pressure logger at 4-minute intervals. The overall maximum, minimum, and average pressures recorded during the monitoring period are shown in Table 1.1 below.

Table 1.1: Recordings of Interest

Maximum (psi)	Minimum	Average	Standard Deviation
24.8	-1.2	10.1	1.7

Of all the pressure samples recorded, 68.3% are between 8.4 psi and 11.8 psi, and 95.4% are between 6.6 psi and 13.5 psi.

A chart of the pressures recorded over the full monitoring period is included in Figure 1.2. Maximum pressures in a given 4-minute recording interval are plotted along red lines, minimum pressures are plotted along blue lines, and average pressures are plotted along green lines.

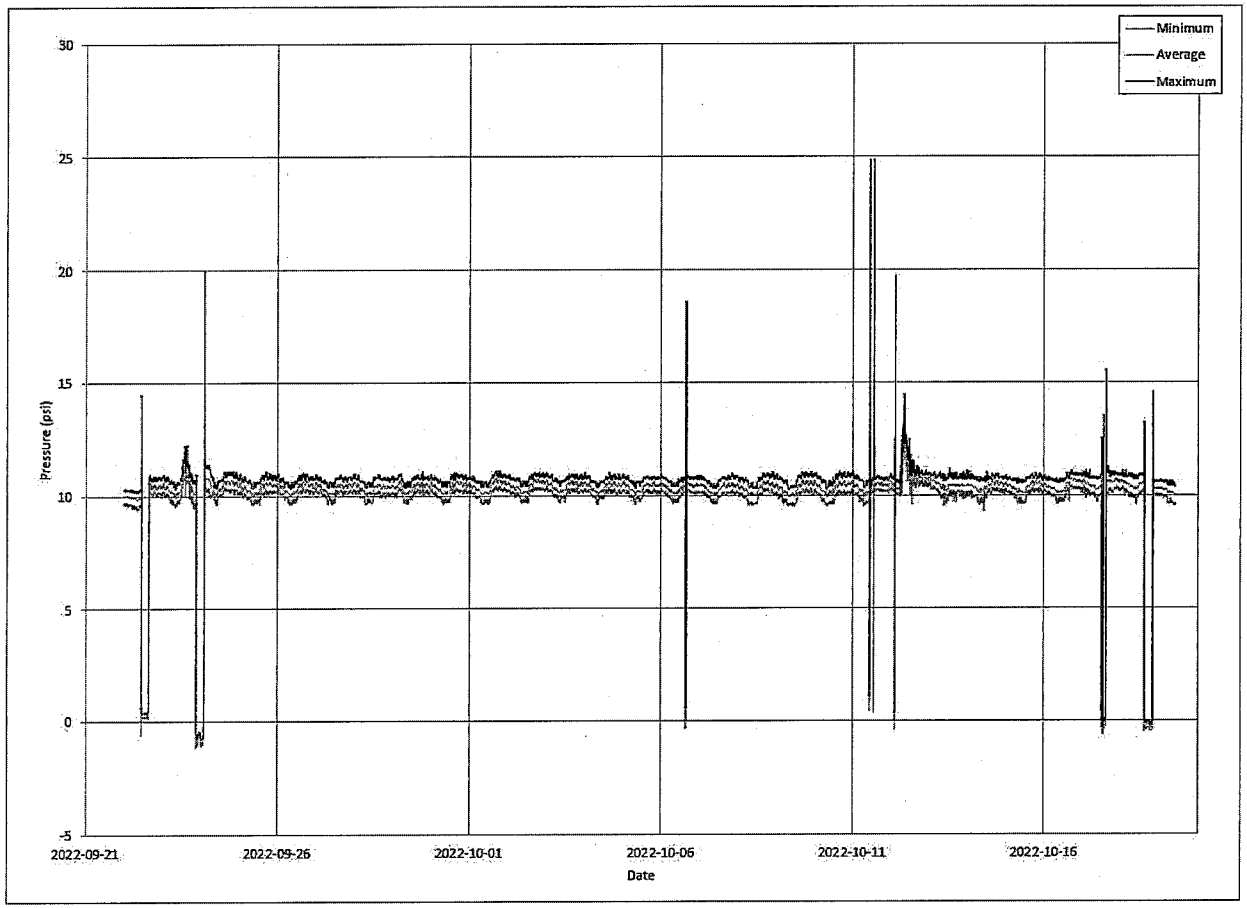


Figure 1.2: Pressure Recordings for Blue River WWTP Force Mains (Pump 7 Discharge)

To translate the recorded pressures from the installation location along the downstream length of the force main, basic assumptions about the transmission of the transient pressures were made:

1. Observed transient pressures are superimposed on the steady-state pressure at each point along the pipeline.

2. The observed transient amplitude (above the background steady-state pressure) is consistent along the length of the pipeline.

3. Dynamic losses along the length of the pipeline are neglected; the static elevation pressure differences are assumed to govern and are used in the translation of the recorded pressures.

Hydraulic surge modeling may be performed to refine these assumptions, or additional transient pressure monitoring locations may be selected based on these initial findings if there are areas of particular concern.

The maximum recorded pressure of 24.8 psi occurred on October 11, 2022. Based on the observed system operating pattern, the maximum pressure appears to correlate with a pump operations on and off. SCADA should be reviewed to confirm this. The transient pressure logger was installed on the 60-inch force main, where the crown elevation of the pipe is approximately 728.0 feet above MSL. The low point of the force main is approximately 711.5 feet above MSL. Based on these elevations and the maximum recorded pressure, the maximum pressure in the force main during the monitoring period with normal operations (non-inspection) at the low point would have been approximately 32.0 psi.

The minimum recorded pressure of -1.2 psi occurred on September 23, 2022 and appears to be associated with pump shutoff. SCADA should be reviewed to confirm this. The high point of the force main is 738.5 feet above MSL. Based on the elevations and assumptions stated above, the minimum pressure in the force main during the monitoring period was approximately -5.7 psi.

A sample week of transient pressure data is shown in Figure 1.3 and a sample day is shown in Figure 1.4. Figure 1.5 shows the day that the minimum pressure over the monitoring period was recorded. Figure 1.6 shows the day that the maximum pressure over the monitoring period was recorded.

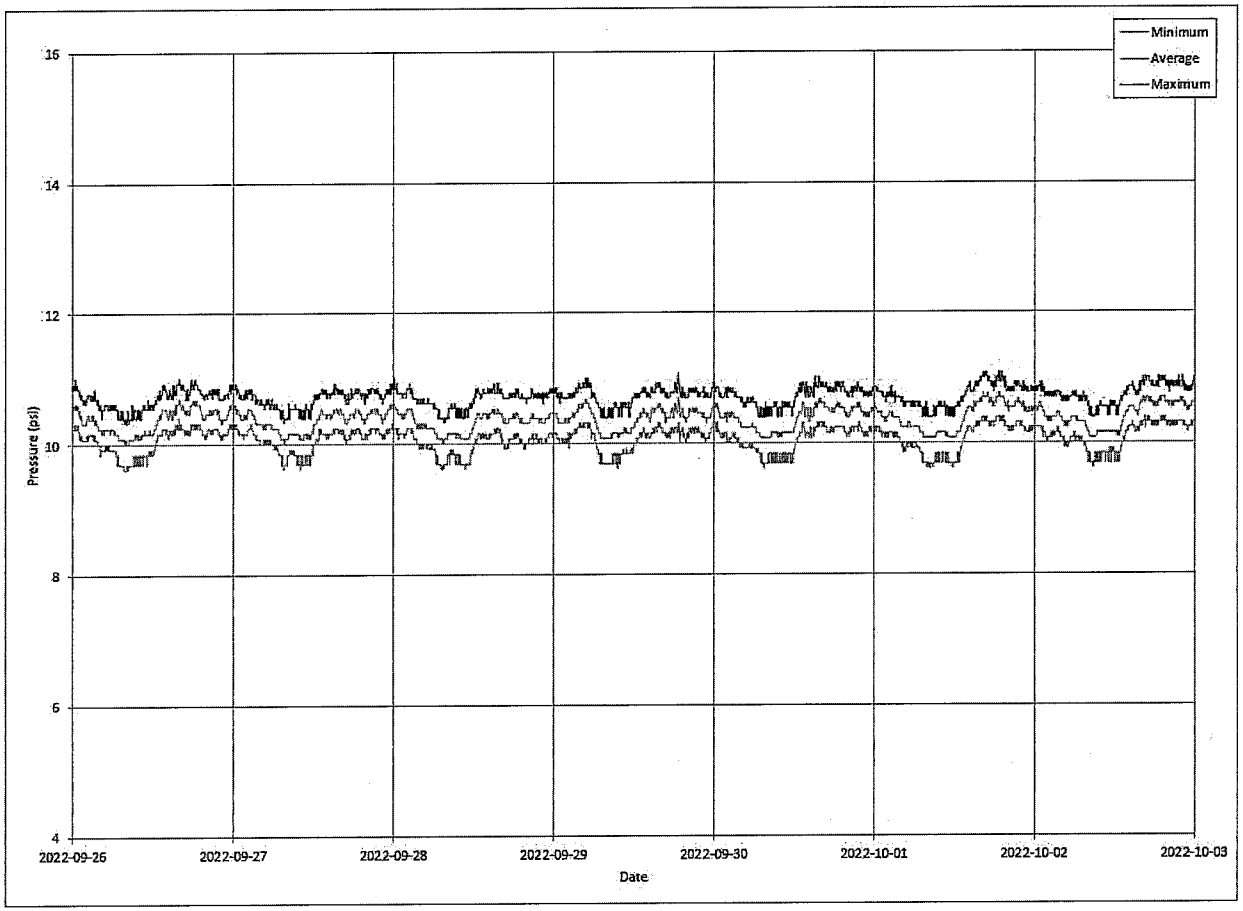


Figure 1.3: Blue River WWTP Force Mains Pressure Recordings: September 26, 2022 to October 2, 2022

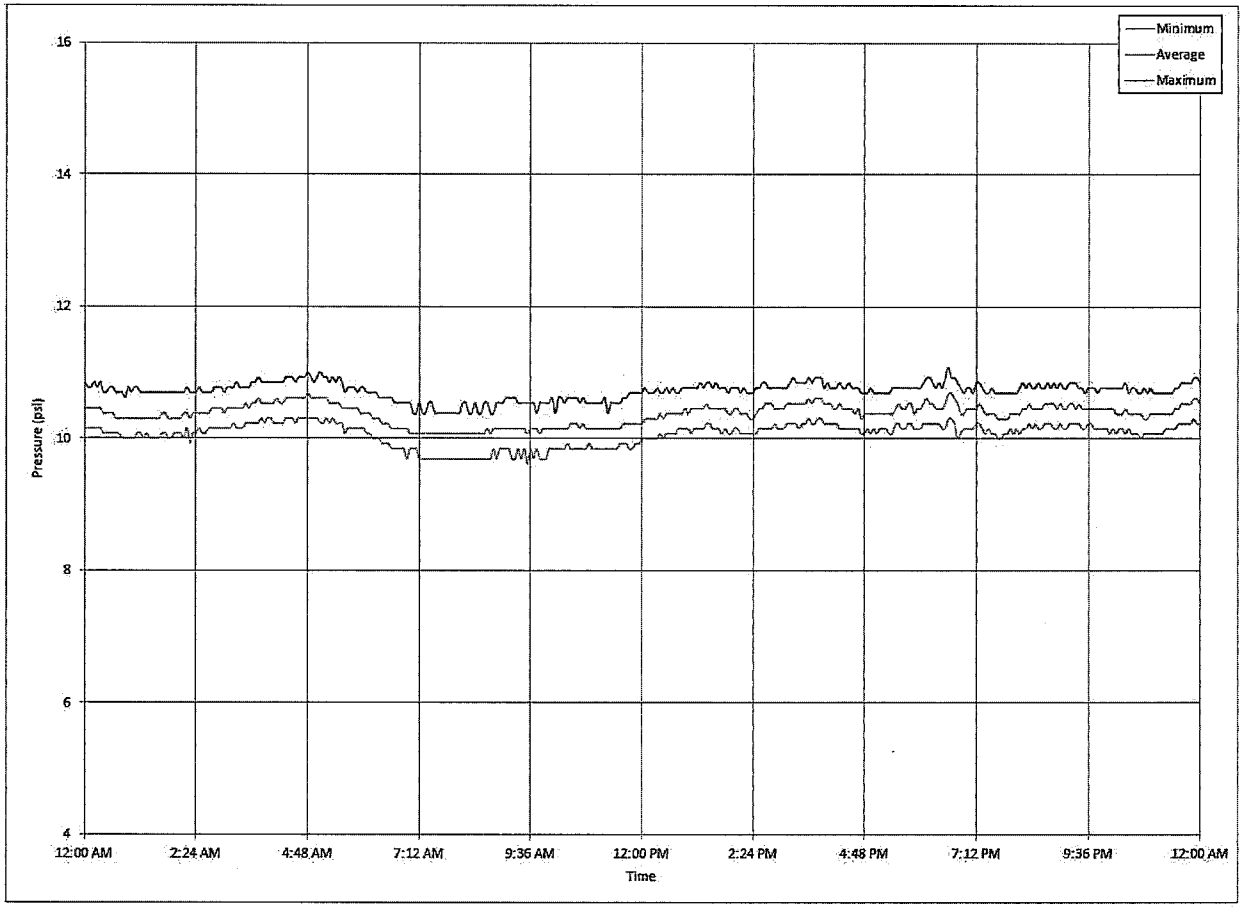


Figure 1.4: Blue River WWTP Force Mains Pressure Recordings: September 29, 2022

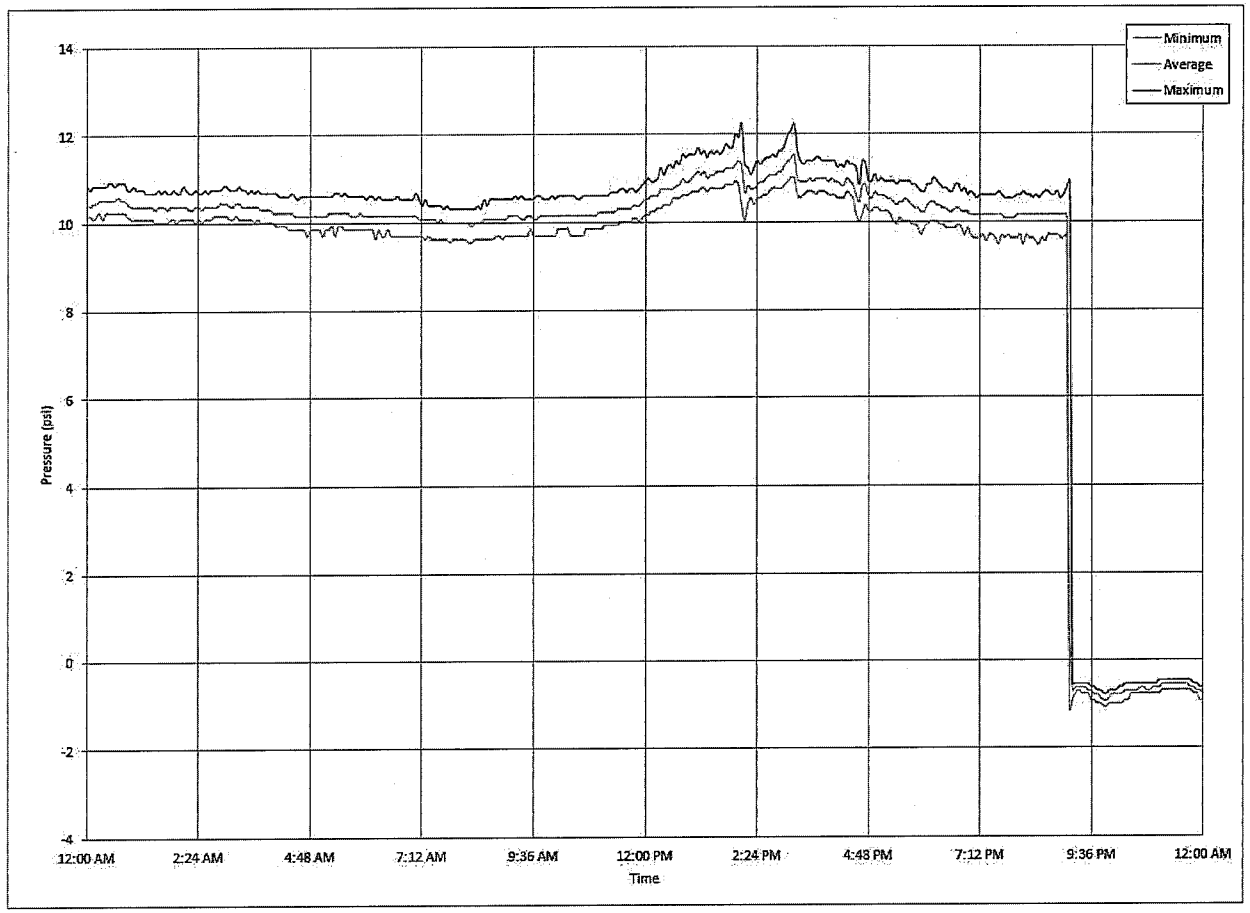


Figure 1.5: Blue River WWTP Force Mains Minimum Pressure Recording: September 23, 2022

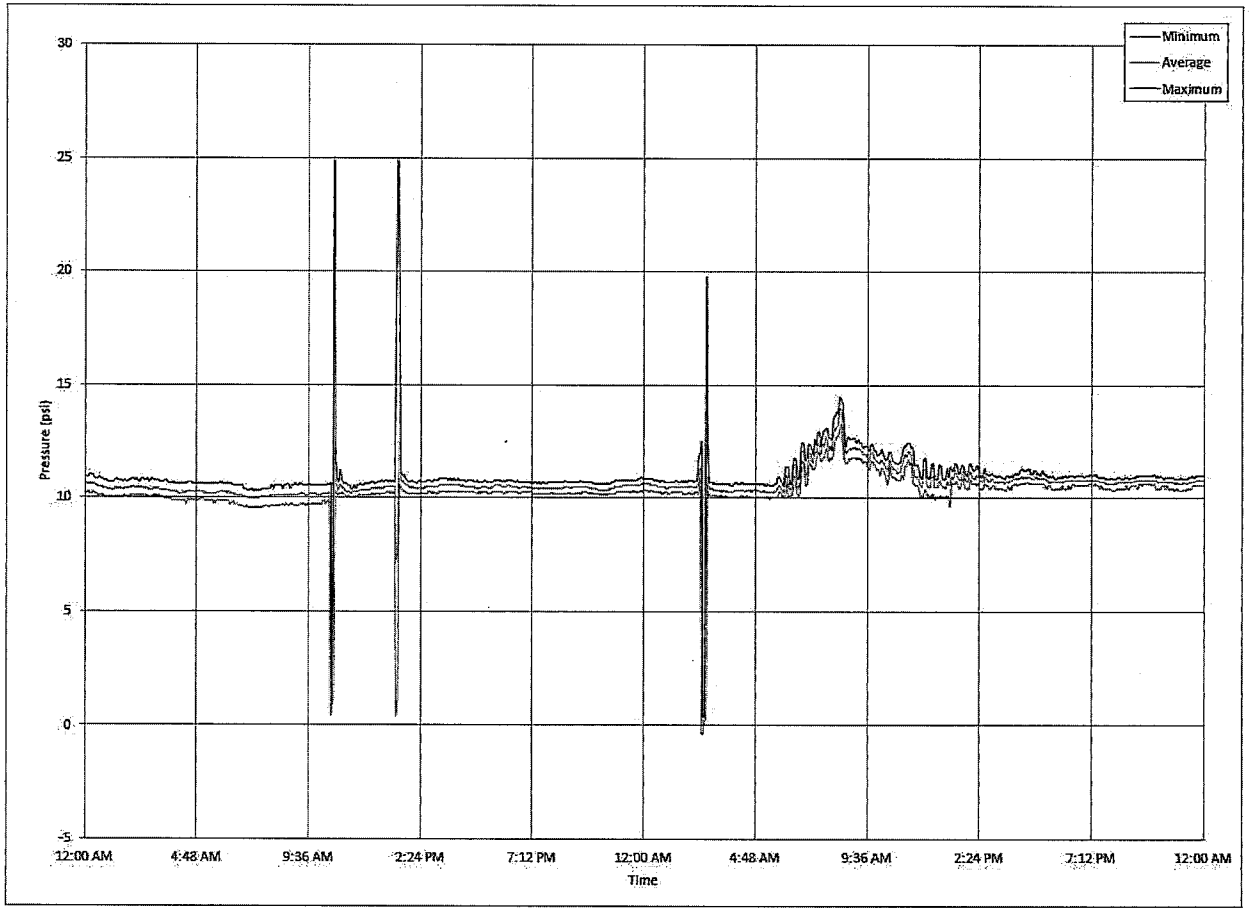
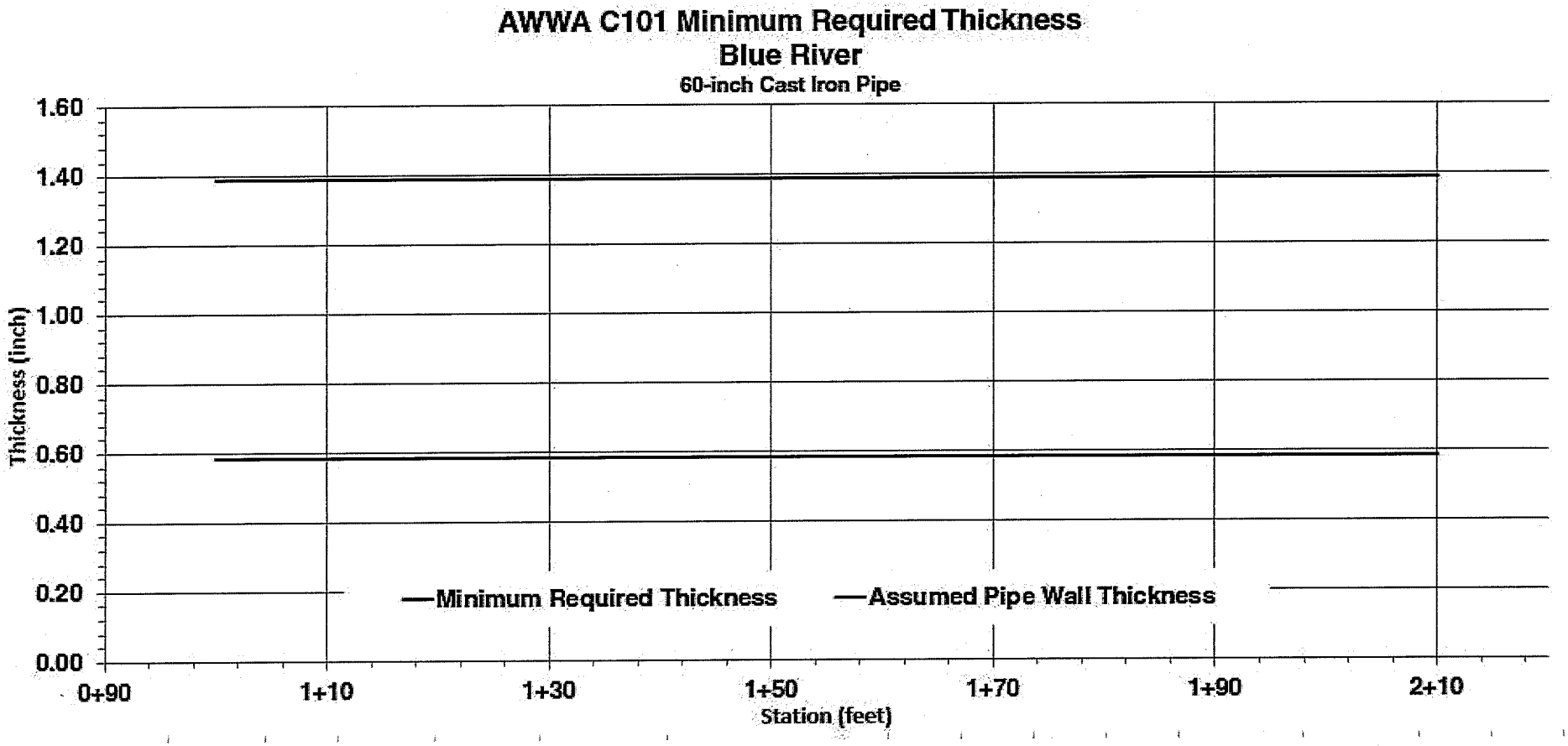


Figure 1.6: Blue River WWTP Force Mains Maximum Pressure Recording: October 11, 2022

Based on the observed trend at Blue River WWTP Force Mains, a design check will be performed to ensure the line is operating under its constrained parameters. This should be performed on normal operations of approximately 0 to 20 psi per day. Some negative pressures were also experienced during the monitoring period. SCADA should be evaluated to determine the cause and prevent them from occurring again in the future. These damaging negative pressure events can grow in magnitude as they travel down the pipeline. Additional monitoring at high points along the line would refine the approximations.

APPENDIX C

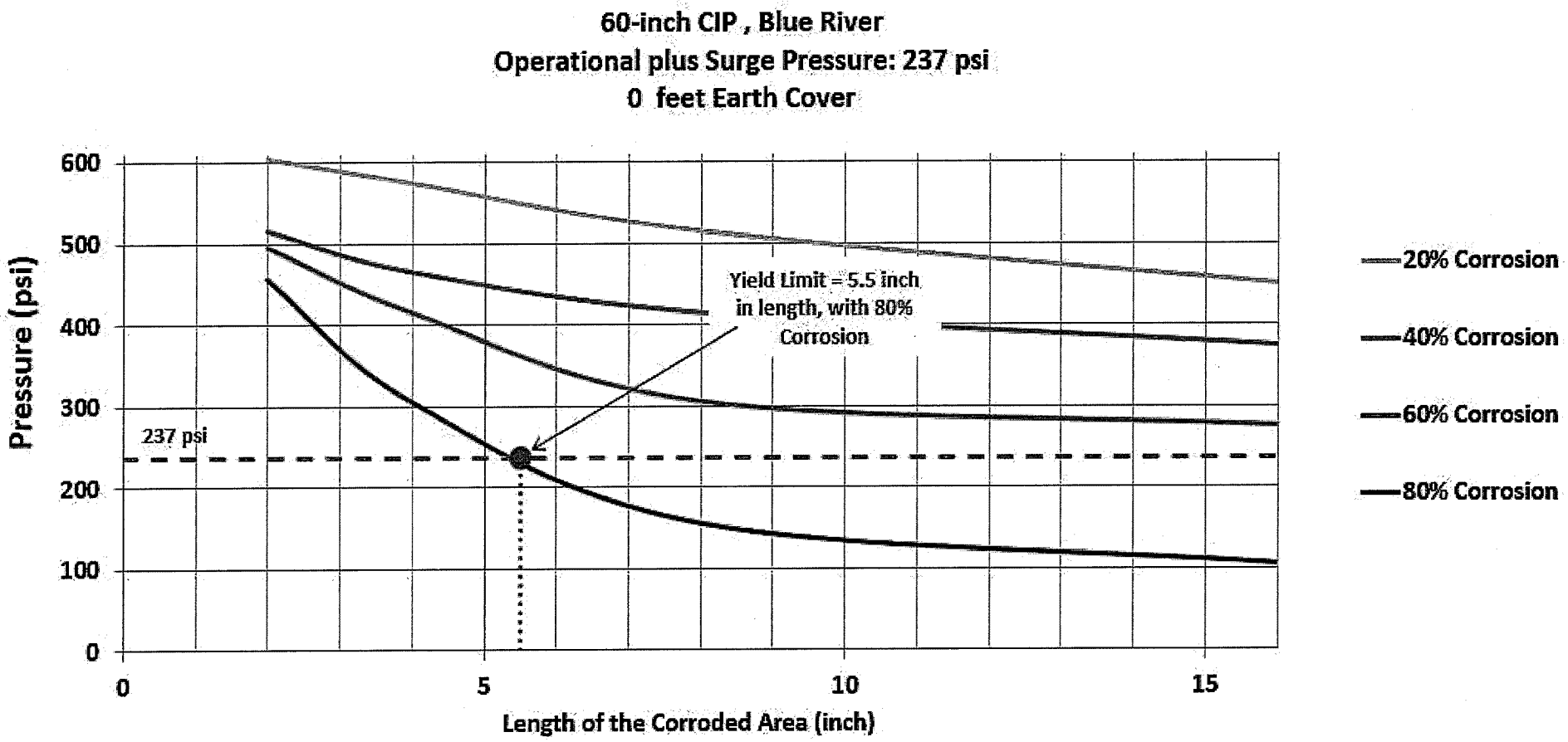
AWWA C101 Design Check Results


AWWA C101 Minimum Required Thickness
Blue River
60-inch Cast Iron Pipe
Thickness (inch)
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
0+90
1+10
1+30
1+50
1+70
1+90
2+10
Station (feet)
Minimum Required Thickness
Assumed Pipe Wall Thickness

pure TECHNOLOGIES
a xylem brand

APPENDIX D

FEA Curve for 60-inch CIP


60-inch CIP , Blue River
Operational plus Surge Pressure: 237 psi
0 feet Earth Cover
Pressure (psi)
600
500
400
300
200
100
0
237 psi
Yield Limit = 5.5 inch in length, with 80% Corrosion
0
5
10
15
Length of the Corroded Area (inch)
20% Corrosion
40% Corrosion
60% Corrosion
80% Corrosion

ATTACHMENT D: Project Technical Requirements

KC WATER
SERVICES

Blue River Wastewater Treatment Plant Facility Plan and Improvements Design FY 2024



TECHNICAL MEMORANDUM 1

Grit System Improvements Conceptual Design

FINAL / September 2024

carollo

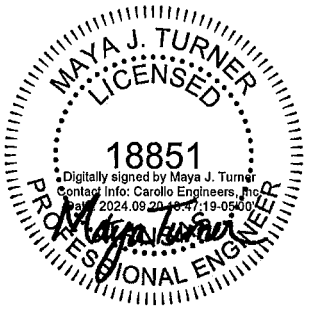
KC WATER
SERVICES

Blue River Wastewater Treatment Plant Facility Plan and Improvements Design FY 2024

TECHNICAL MEMORANDUM 1

Grit System Improvements Conceptual Design

FINAL / September 2024



903 EAST 104TH STREET, SUITE 230 ▪ KANSAS CITY, MISSOURI 64131 ▪ P 816-942-5027

Contents

TM 1 GRIT SYSTEM IMPROVEMENTS PROJECT CONCEPTUAL DESIGN

1.1 Introduction 1-1
1.1.1 Objectives 1-1
1.1.2 Organization 1-1
1.2 Existing Facility Overview 1-2
1.2.1 Grit Removal and Grit Handling Facilities 1-3
1.3 Basis of Design 1-6
1.3.1 Flows 1-6
1.3.2 Process Regulatory Guidelines 1-7
1.4 Proposed Grit Improvements 1-7
1.4.1 Grit Removal Alternatives Overview 1-7
1.4.2 Grit Handling Alternatives 1-11
1.4.3 Grit Alternative No. 1 1-13
1.4.4 Grit Alternative No. 2 1-22
1.5 Discipline Design 1-33
1.5.1 Civil Design Codes and Standards 1-33
1.5.2 Geotechnical Design 1-34
1.5.3 Architectural Design 1-34
1.5.4 Structural Design 1-36
1.5.5 Building Mechanical Design 1-38
1.5.6 Electrical Design 1-40
1.5.7 Instrumentation and Control Design 1-46
1.6 Envision™ Assessment 1-50
1.6.1 Sustainable Project Management 1-50
1.6.2 Tiered Sustainable Assessment 1-51
1.7 Cost Estimate Summary 1-52
1.8 Recommendations 1-53
1.8.1 Next Steps 1-53

Appendices

APPENDIX A GRIT ALTERNATIVE NO. 1 - DIAGRAMS AND FIGURES
APPENDIX B GRIT ALTERNATIVE NO. 2 - DIAGRAMS AND FIGURES
APPENDIX C GRIT ALTERNATIVE NO. 2 - CONCEPTUAL DESIGN HYDRAULIC CALCULATIONS
APPENDIX D DRAFT GEOTECHNICAL DESKTOP STUDY REPORT
APPENDIX E PRELIMINARY LOAD STUDY
APPENDIX F I&C DRAWINGS
APPENDIX G ENVISION WORKSHEETS
APPENDIX H DESIGN CRITERIA SUMMARY

Tables

Table 1.1	Existing Grit Removal Design Criteria	1-4
Table 1.2	Basis of Design Flows	1-7
Table 1.3	Grit Removal Facility Design Guidelines	1-7
Table 1.4	Grit Removal Alternative Analysis	1-10
Table 1.5	Grit Handling Alternative Analysis	1-13
Table 1.6	Grit Alternative No. 1 Conceptual Design Criteria	1-21
Table 1.7	Grit Alternative No. 2 Conceptual Design Criteria	1-31
Table 1.8	Conceptual Ventilation Schedule for Process Areas	1-40
Table 1.9	Motor Protection Requirements	1-43
Table 1.10	Existing Load Summary	1-44
Table 1.11	Electrical Design Basis Summary	1-45
Table 1.12	Grit Improvements Cost Summary	1-52

Figures

Figure 1.1	Existing Preliminary and Primary Liquids Treatment Schematic	1-2
Figure 1.2	Existing Grit Facility	1-3
Figure 1.3	BRWWTP Aerated Grit Basin	1-8
Figure 1.4	Mechanically-Induced Vortex Grit Basins	1-9
Figure 1.5	Headcell® Multi-tray Vortex System	1-10
Figure 1.6	Cyclone and Grit Classifier	1-12
Figure 1.7	COANDA® Grit Washer	1-13
Figure 1.8	Grit Alternative No. 1 - Existing Facility Modifications	1-14
Figure 1.9	Grit Alternative No. 1 - Conceptual Site Plan	1-15
Figure 1.10	Grit Alternative No. 1 - Grit Basin Retrofit Plan View	1-17
Figure 1.11	Grit Alternative No. 1 - Grit Pump Station Plan View	1-18
Figure 1.12	Grit Alternative No. 1 - Grit Pump Station and Utility Corridor Section View	1-18
Figure 1.13	Grit Alternative No. 1 - Grit Handling Building Exterior Southeast View	1-19
Figure 1.14	Grit Alternative No. 1 - Grit Handling Building Upper Level Plan View	1-20
Figure 1.15	Grit Alternative No. 1 - Grit Handling Building Section View	1-20
Figure 1.16	Grit Alternative No. 2 - New Grit Facility	1-23
Figure 1.17	Grit Alternative No. 2 - Conceptual Site Plan	1-24
Figure 1.18	Grit Alternative No. 2 - New Grit Facility Exterior West View	1-26
Figure 1.19	Grit Alternative No. 2 - New Grit Facility Plan View	1-27
Figure 1.20	Grit Alternative No. 2 - New Grit Facility Lower Level Plan View	1-28
Figure 1.21	Grit Alternative No. 2 - New Grit Facility Section North View	1-28
Figure 1.22	Grit Alternative No. 2 - Grit Handling Building Exterior Southeast View	1-29
Figure 1.23	Grit Alternative No. 2 - Grit Handling Building Upper Level Plan View	1-30
Figure 1.24	Grit Alternative No. 2 - Grit Handling Building Lower Level Plan View	1-30
Figure 1.25	Grit Alternative No. 2 - Grit Handling Building Section North View	1-31
Figure 1.26	Envision Grit Facility Results	1-52

Abbreviations

°F	degrees Fahrenheit
A	ampere
AADF	average annual daily flow
ACH	air changes per hour
ACI	American Concrete Institute
AISC	American Institute of Steel Construction
ANSI	American National Standards Institute
API	American Petroleum Institute
ash	incinerated biosolids
ASHRAE	American Society of Heating Refrigeration and Air Conditioning Association
AUIS	all units in service
AWS	American Welding Society
BRIS	Blue River Interceptor Sewer
BRWWTP	Blue River Wastewater Treatment Plant
Carollo	Carollo Engineers, Inc.
CSO	combined sewer overflow
dV/dT	rate of change in velocity with respect to time
FAS	fire alarm system
FE	portable fire extinguisher
FIRM	Flood Insurance Rate Map
FRP	fiberglass reinforced plastic
FW	fresh water
gpm	gallons per minute
H	hydrant protection
hp	horsepower
HVAC	heating, ventilation, and air-conditioning
I&C	instrumentation and control
IBC	International Building Code
IECC	International Energy Conservation Code
IEEE	Institute for Electrical and Electronics Engineering
IES	Illuminating Engineering Society
IFGC	International Fuel Gas Code
IMC	International Mechanical Code
ISA	International Society of Automation
kA	kiloampere
KC Water	Kansas City Water
KCPL	Kansas City Power and Light

kV	kilovolt
LED	light emitting diode
MCC	motor control center
MDNR Guidelines	Missouri Natural Resources Wastewater Guidelines and Standards Document, February 2019
mgd	million gallons per day
MOP 8	Water Environment Federations' Design of Municipal Wastewater Treatment Plants
N/A	not applicable
NACE	National Association of Corrosion Engineers
NEC	National Electrical Code
NEID	Northeast Industrial District
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Agency
NR	no requirement
NSF	National Sanitation Foundation
O&M	operation and maintenance
OIT	Operator Interface Terminal
OL	overload
OSHA	Occupational Safety and Health Administration
P&ID	process and instrumentation diagram
PHF	peak hour flow
PLC	programmable logic controller
Project	Grit System Improvements Project
PVC	polyvinyl chloride
RTD	resistance temperature detector
SCADA	supervisory control and data acquisition
sf	square foot (feet)
THP	thermal hydrolysis process
TM	Technical Memorandum
UPC	Uniform Plumbing Code
UPS	uninterruptible power supply
V	volt(s)
VAC	volts alternating current
VFD	variable frequency drive
wc	water colum
WDG	winding
WWTP	wastewater treatment plant

TM 1 GRIT SYSTEM IMPROVEMENTS PROJECT CONCEPTUAL DESIGN

1.1 Introduction

The existing Blue River Wastewater Treatment Plant (BRWWTP) is a 105 million gallons per day (mgd) municipal wastewater treatment facility consisting of primary and secondary treatment facilities located on separate sites. The primary plant site includes preliminary and primary liquid treatment operations and solids processing facilities. The secondary plant site provides secondary treatment before ultimately discharging treated effluent to the Missouri River.

1.1.1 Objectives

Kansas City Water (KC Water) seeks to improve and expand the existing grit removal and handling systems at the primary plant. The existing grit facilities consist of a combination of aerated and vortex-style grit removal basins, grit pump stations, grit classifiers, and grit loadout facilities. This Grit System Improvements Project (Project) is necessary to address aging infrastructure and capacity needs, meet current regulatory requirements, and to improve safety, performance, reliability, and hydraulic conditions throughout the facility.

The primary focus of this Technical Memorandum (TM) 1 is to summarize the existing grit facilities, present design criteria and regulatory requirements, summarize results of the new grit removal and handling system alternatives analysis, present conceptual cost estimates, and provide recommendations and next steps.

1.1.2 Organization

The TM is organized into the following sections:

- Section 1.2 presents a multi-discipline overview of the existing grit facility.
- Section 1.3 provides the Project's basis of design and regulatory requirements for treatment process elements.
- Section 1.4 summarizes the alternative technology evaluation, the recommended grit removal and handling technologies, conceptual design criteria, and implementation and site considerations.
- Section 1.5 summarizes the engineering discipline design guidelines, codes, and recommended design criteria.
- Section 1.6 presents the Envision™ assessment summary.
- Section 1.7 presents the conceptual cost estimate.
- Section 1.8 summarizes the Project recommendations and next steps.

1.2 Existing Facility Overview

The BRWWTP grit facilities treat combined screened wastewater from the Blue River Interceptor Sewer (BRIS) and the Northeast Industrial District (NEID) interceptor lines prior to primary clarification. Existing grit removal is accomplished with a combination of aerated and vortex grit basins. The facility was originally constructed in the 1960's with eight aerated grit removal basins equipped with screw conveyors and various means of grit removal. After years of declining performance, the facility ultimately required manual removal of grit using vacuum trucks. In 2005, two of the existing aerated grit basins were repurposed with four, 18-foot diameter, 360-degree, flat floor vortex basins each equipped with a single grit pump for removal of settled grit. The 2005 project also replaced existing aeration piping and diffusers in two of the aerated grit basins and constructed the Grit Handling Facility. The Facility includes two grit classifiers each equipped with grit concentrators, a grit conveyor system consisting of a conveyor belt and shafted screw conveyor, and dual grit bins located on the ground floor. See Figures 1.1 and 1.2 for a schematic of the existing preliminary and primary liquids treatment and an aerial plan view of major facility areas, respectively.

A condition assessment of the existing facilities by a multidiscipline team was conducted on November 8, 2023. The condition assessment utilized three methods to determine the current condition of the facilities: 1) anecdotal information from KC Water staff, 2) a review of record drawings and reports, and 3) field investigations by Carollo Engineers, Inc. (Carollo) and subconsultant team members. This section summarizes the major findings of the assessment.

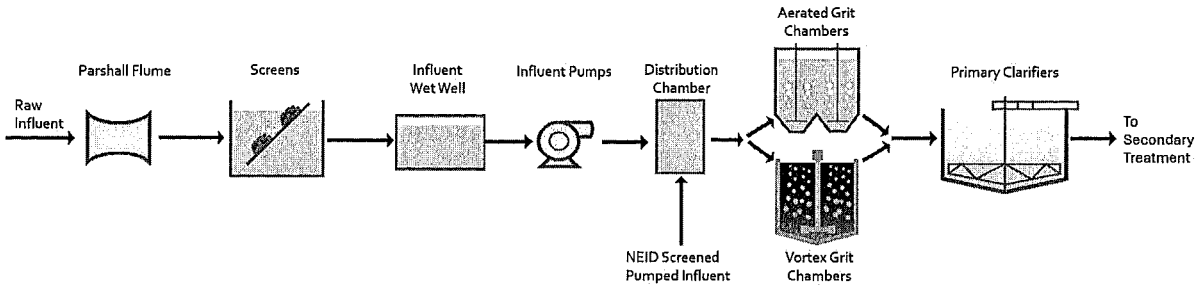


Figure 1.1 Existing Preliminary and Primary Liquids Treatment Schematic

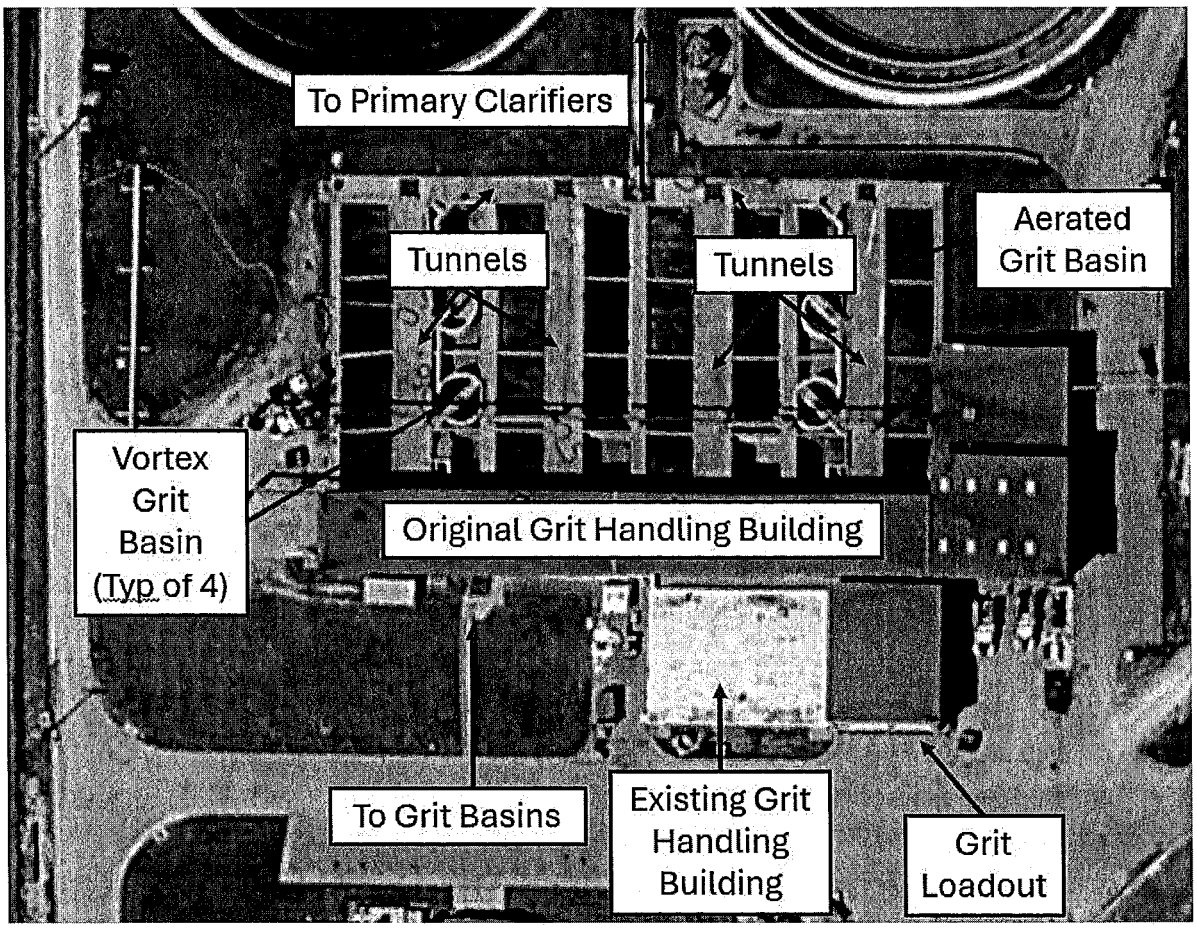


Figure 1.2 Existing Grit Facility

1.2.1 Grit Removal and Grit Handling Facilities

This section provides a multidiscipline summary of the existing Grit Removal Facility (grit basins and pump stations, tunnels, and common areas) and the Grit Handling Facility (grit washing, conveyance and loadout facility and common areas).

1.2.1.1 Treatment Process Summary

The purpose of the 2005 grit improvements project was to solely use the vortex basins for grit removal. The two aerated grit basins with new aeration piping and diffusers were planned as redundant, standby units for the vortex basins. Reported capacities of the existing grit removal facilities following the 2005 improvements and documented in the Grit Removal Operation and Maintenance (O&M) manual are summarized below.

Table 1.1 Existing Grit Removal Design Criteria

Condition	Flow[1]
Minimum Flow, mgd	7.2
Average Flow, mgd	76.8
Maximum Flow, mgd	120

Notes:
(1) Grit Removal Operation and Maintenance Manual, BRWWTP, June 2005.

The following summarizes the process mechanical deficiencies and challenges with the existing grit removal facilities:

- Basins are undersized for existing flows requiring the use of both aerated and vortex basins with no redundancy at current flows.
- Influent and effluent boxes and channels are undersized creating submerged conditions and inadequate freeboard under current design flow criteria.
- Basins do not adequately remove the volume of grit necessary to protect downstream equipment and facilities. Inadequate grit removal can seriously impact the facility's downstream equipment and operations, specifically the new Thermal Hydrolysis Process (THP).
- Grit removal from the aerated grit basins require vacuum trucks to manually remove grit which is labor intensive and results in inefficient grit removal and grit carry over.
- Grit pump stations and associated piping at each vortex basin are prone to regular clogging.
- Grit pumps and grit basin blowers are inadequately sized and located in undersized, repurposed areas providing difficult conditions for safe, regular maintenance and equipment removal.

The following summarizes the process mechanical deficiencies and challenges with the existing Grit Handling Facility:

- Grit concentrators and classifiers are overloaded and produce wet, odorous grit.
- Discharged grit from the classifier is conveyed to the grit bins via an undersized and inadequate conveyor belt and screw conveyor system.
- Poor grit conveyance resulting in wet grit throughout the process area and constant O&M attention.

Currently, the BRWWTP operates the grit removal facility with all aerated and vortex basins in service and continues to struggle with adequate grit removal and grit handling operations.

1.2.1.2 Architectural and Structural Summary

Grit Basins, Tunnels, and Original Grit Building

The grit removal basins, tunnels, and original grit building are part of the original 1964 plant construction project and are constructed of cast in place concrete walls and slabs supported by piles. Tunnels for piping and staff access are located along the length of basins and along the north end the basins as depicted in Figure 1.2. The visible concrete walls and slabs show signs of aging with hairline cracking typical throughout, occasional larger cracking and spalling, and efflorescence spots within the interior tunnels. In general, existing concrete is in poor to average condition with areas throughout the facility requiring repair and possible removal and replacement.

The original Grit Building is a two-story structure on a pile foundation with cast-in-place concrete and brick veneer wall system and a double-tee precast concrete roof. The roof is a ballasted built-up roof with skylights for serviceable equipment, with drainage through scuppers and downspouts. The building is equipped with multiple hollow metal doors and coiling rollup doors. Clerestory windows are located between the double-tee structure. The upper floor has an entrance from grade level and from a loading dock platform. This floor is located above the grating and pipe gallery levels, and collectively houses electrical and process equipment, a maintenance area, a restroom, lockers and offices.

The stairs and grating throughout the area are typically galvanized steel showing signs of corrosion with several areas indicating significant corrosion and requiring repair or replacement. Stair access to the tunnels is located below the original Grit Building and grit channels, with no direct, exterior exit egress doors from the tunnel level. Many of the stairways from the tunnel level to the grating level were inaccessible at the time of the assessment. Travel distance from the furthest location within the tunnels to any stairway exceeds the code required for maximum egress travel distance. In summary, the grit tunnels and original grit building requires significant improvements to meet current building and energy codes.

The condition assessment rated many of the items with a score of 4 or 5, indicating Very Poor/Needs Immediate Repair or Very Poor/Needs Replacement, respectively. Below is a list of the major deficiencies in the tunnels and original Grit Handling Building:

1. Inadequate life safety/egress from the electrical rooms, offices, and storage areas.
2. Inadequate guardrail and handrail heights.
3. Corroded or missing door hardware including doorknobs, panic hardware, door closers, etc.
4. Tripping hazards on floors and multiple holes in walls.
5. Damage to brick walls from water penetration issues.
6. Roof leaks at sky light openings.
7. Damaged or missing roofing material and flashing, requiring full replacement.

Existing Grit Handling Building

The existing Grit Handling Building is located immediately south of the original Grit Building. The existing facility includes process areas for grit washing, conveyance and loadout, a workshop, electrical room, and storage with grade-level exits and access from the original Grit Building via a ramp from the grating level.

The existing Grit Handling Building is a single-story structure on a pile foundation with cast-in-place concrete and brick veneer wall system and a double-tee precast concrete roof. Deteriorated and damaged concrete was observed at the door framing and dock platform. Many tiles are either damaged or show signs of aging. Several architectural components do not meet current code requirements for egress, guardrail and handrail heights, and wall, ceiling, and roof materials.

The condition assessment rated many of the items with a score of 4 or 5, indicating Very Poor/Needs Immediate Repair or Very Poor/Needs Replacement, respectively. Below is a list of the major deficiencies in the existing Grit Handling Building:

1. Inadequate life safety/egress from the electrical rooms, offices, and storage areas.
2. Inadequate guardrail and handrail heights.
3. Corroded or missing door hardware including doorknobs, panic hardware, door closers, etc.

4. Tripping hazards on floors and multiple holes in walls.
5. Damage to brick walls from water penetration issues.
6. Damaged or missing roofing material and flashing, requiring full replacement.

1.2.1.3 Building Mechanical Summary

Heating, ventilation, and air-conditioning (HVAC) and building drainage are inadequate for the tunnels, grit pump stations, original and existing Grit Handling Buildings, common areas, and electrical room. Several areas within the tunnels have significant ponding water which eliminates access to several areas, worsens already inadequate egress, and creates an unsafe environment for staff. The original and existing Grit Handling Buildings house the facility's electrical gear, office space, storage, maintenance areas, and process equipment, all within a common space. The original Grit Handling Building has a multi-use area which includes the grit basin splitter structures where screened influent from the pump station is diverted to the appropriate grit basins. The splitter structures are open to the atmosphere within the building.

The tunnels and the buildings' common areas have inadequate ventilation, cooling, and physical separation as required by the National Fire Protection Agency (NFPA) 820 - Standard for Fire Protection in Wastewater Treatment and Collection Facilities. New HVAC equipment, area separation, and improved drainage are necessary for a safe, operational facility.

1.2.1.4 Electrical, Instrumentation, and Control Summary

The grit electrical gear is mostly original equipment with difficult-to-find replacement parts , often requiring custom fabrication and rebuilds. The electrical gear requires complete replacement and relocation to a dedicated Electrical Building to meet current building, electrical, and fire codes.

Existing instrumentation and controls are minimal and antiquated resulting in manual operation, inadequate operations, and minimal opportunity for optimization.

1.3 Basis of Design

The following is a summary of the projected influent flow criteria and summary of regulatory requirements used as a basis for the grit improvements analysis and design.

1.3.1 Flows

Flow projections are based on initial planning values and may increase based on final flow and loading analyses conducted as part of the BRWWTP Facility Plan and Improvements project (currently in progress). Table 1.2 summarizes the average annual daily flow (AADF), peak hour flow (PHF), and minimum flow for the new grit facilities, existing primary treatment, and future wet weather treatment facilities.

Table 1.2 Basis of Design Flows

Flow Condition(1)	BRWWTP		
	Grit Facilities	Wet Weather (CSO) Treatment	Primary Treatment
Minimum, mgd	35	0	35
AADF, mgd	91	0	91
PHF, mgd	210	70	140
Revised PHF, mgd(2)	270	130	140

Notes:
Abbreviations: CSO - combined sewer overflow.
(1) Basis of flows for initial planning in Year 1.
(2) Ongoing discussions to increase the PHF wet weather flow to 270 mgd.

1.3.2 Process Regulatory Guidelines

The Missouri Department of Natural Resources Wastewater Guidelines and Standards Document, February 2019, (MDNR Guidelines) was used as a guideline in development of the proposed grit removal design criteria. In the event where technologies were not addressed in the MDNR Guidelines, the Water Environment Federations' Design of Municipal Wastewater Treatment Plants Manual of Practice 8 (MOP 8), Sixth Edition guidelines were used.

Table 1.3 Grit Removal Facility Design Guidelines

Criteria	Guideline(1)
Basis of Design Flow	Fixed capacity to treat PHF
Number of Units	Minimum of two units with provisions for isolation
Detention	Based on the detention required for size of particle to be removed

Notes:
(1) MDNR Guidelines.

1.4 Proposed Grit Improvements

The primary purpose of grit removal at a wastewater treatment plant is to protect downstream facilities and reduce maintenance. Benefits of grit removal include reducing accumulation of grit in downstream channels, basins, and digesters and reducing wear in mechanical equipment such as pumps, valves, and sludge collection mechanisms.

This section summarizes the alternative technology evaluation, the recommended grit removal and handling technologies and preliminary design criteria, and implementation and site considerations.

1.4.1 Grit Removal Alternatives Overview

Two grit separation technologies typically used in wastewater treatment are aerated grit basins and vortex grit basins. Vortex grit removal technologies include mechanically induced vortex grit removal as well as free vortex grit removal. The following grit removal technologies were evaluated for this analysis:

- Aerated grit basins.
- Mechanically-induced vortex grit basins.
- Free vortex grit removal system (i.e., HeadCell® multi-tray vortex system).

1.4.1.1 Aerated Grit Basins

Aerated grit basins use a specific velocity of roll or agitation to keep organics in suspension while settling the grit out of the wastewater. Compressed air is typically discharged into a rectangular grit chamber along the bottom of one side of the tank creating a rising air column that causes the flow to rotate. The air rate can be adjusted to create a low enough velocity near the floor to allow the grit to settle to the bottom of the basin and into collection hoppers. If the velocity is properly adjusted, in a well-designed basin, the aerated grit process can capture fine, slow settling grit.

Although aerated grit basins are an effective grit removal technology when designed properly with correct geometry and aeration equipment, they are operationally more complicated and have higher capital and O&M costs. Aerated grit chambers have a larger overall footprint than vortex systems and require multiple grit slurry pumps, aeration blowers, aeration piping, and coarse bubble diffusers, which increases the overall capital and O&M costs. The air introduced into an aerated grit basin is typically collected and treated in a foul air treatment system. Figure 1.3 is a photo of an aerated grit basin at BRWWTP.

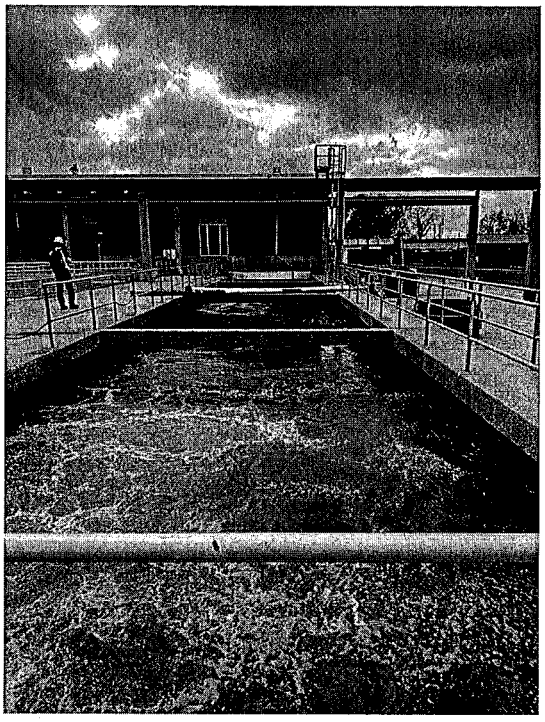


Figure 1.3 BRWWTP Aerated Grit Basin

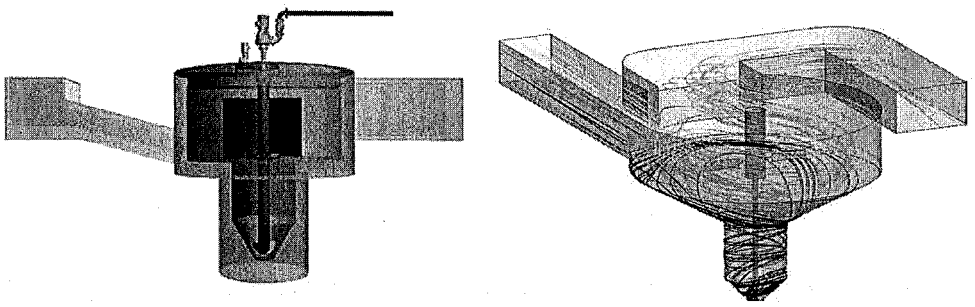
1.4.1.2 Vortex Grit Basins

The vortex grit removal process provides a simpler, less mechanically intensive method of grit removal in a smaller footprint than aerated grit removal.

Mechanically-Induced Vortex Grit Removal

Mechanically-induced vortex grit basins work on the principles of gravity and centrifugal action to capture grit in the center hopper of a circular tank. Figure 1.4 presents schematics of the two primary types of mechanically-induced vortex grit basins - a sloped bottom grit basin and a flat bottom grit basin. The influent enters at a tangent to the outside of the basin producing a spiraling doughnut-shaped flow pattern. The flow pattern in the circular basin pushes the heavier grit particles to the outside where travel times are longer, providing more time for the grit to settle below the "lip" of the outlet opening thus "trapping" it. Impellers at the center of the basins cause a lifting action that suspends and lifts the lighter organic material that is then passed out of the basin through the effluent channel.

Vortex grit basins have been used by many wastewater treatment plants (WWTPs) in the United States to remove grit from the influent flow stream. They have a smaller footprint and significantly lower capital cost than aerated grit systems; however, it is Carollo's experience that the forced vortex grit basin technology has not been as effective in removing slow settling grit particles.



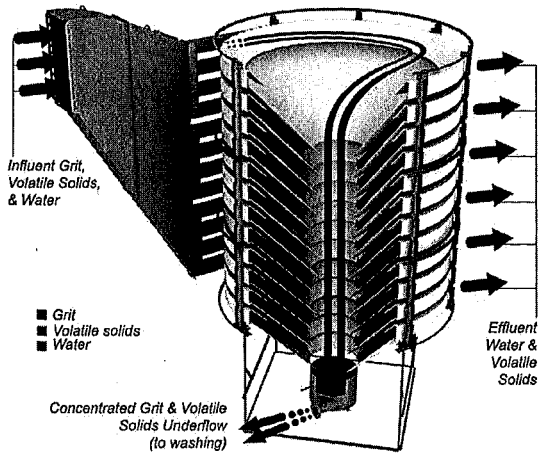
Source: Smith and Loveless and John Meunier, Inc.

Figure 1.4 Mechanically-Induced Vortex Grit Basins

Multi-tray Vortex Grit Removal

The Hydro International HeadCell® is a modular, multiple-tray settleable solids concentrator that can be designed to remove fine grit with low settling velocity. Figure 1.5 presents a schematic of a typical HeadCell® system. A flow distribution header evenly distributes the influent flow over multiple conical trays. The tangential feed establishes a vortex flow pattern where solids settle into a boundary layer on each tray and are swept down to the center underflow collection chamber. The settled solids are continuously pumped to a grit separation, classification, and dewatering system.

The HeadCell® system has a smaller footprint than aerated grit systems and requires less mechanical equipment for operation, resulting in a lower capital cost. HeadCell® systems are also anticipated to provide higher removal of fine (i.e., slow-settling) grit than aerated grit basins and mechanically-induced vortex grit basins.



Source: Hydro International, Inc.

Figure 1.5 Headcell® Multi-tray Vortex System

1.4.1.3 Alternative Analysis

A qualitative analysis of the grit removal alternatives was performed. Table 1.4 summarizes the key advantages and disadvantages of each alternative.

Table 1.4 Grit Removal Alternative Analysis

Alternative	Advantages	Disadvantages
Aerated Grit	▪ Sized for virtually any flow ▪ Potential improved flocculation of light solids resulting in good primary treatment operation ▪ Improved control of removal	▪ Energy intensive ▪ Increased O&M ▪ Large footprint ▪ More foul air to collect and treat ▪ Higher O&M cost
Mechanically-Induced Vortex Grit Removal	▪ Well-established technology ▪ Continuous or batch grit pumping operation ▪ Easier to inspect ▪ 270- and 360-degree configurations	▪ Less efficient at capturing fine grit ▪ Larger footprint (than Multi-tray) ▪ Requires motorized paddle ▪ Requires de-rating for adequate performance
Multi-tray Grit Removal, Headcell®	▪ High turndown ratios ▪ No moving parts or blowers ▪ Small footprint ▪ Removes finer particles than other technologies	▪ Newer technology, as compared to others ▪ Influent screening requirements (< 1/2 inch) ▪ More difficult to inspect ▪ Higher headloss ▪ Sole source required

Based on the Project goals, alternative analysis results, and the existing grit removal facility condition assessment, vortex grit basins and Headcells® are recommended for further consideration in the design alternatives discussed herein.

1.4.2 Grit Handling Alternatives

This section summarizes the grit handling technology alternatives evaluation.

1.4.2.1 Grit Withdrawal and Transfer

Once settled, the settled grit must be removed from the bottom of the grit basins and transferred to grit dewatering equipment. This is typically accomplished using heavy-duty pumps with hardened wear components that can handle abrasive materials common in settled grit.

Fully recessed cup-type impeller pumps located at the bottom of the grit basins are recommended for this application. These pumps have a successful, long track record in grit pumping applications and are very durable and reliable. The pump impellers are located out of the main flow path and the pump can pass solids almost as large in diameter as the inlet of the pump. These pumps require a flooded suction for proper operation.

1.4.2.2 Grit Washing and Dewatering

Grit washing separates grit from organic solids and grit dewatering removes the free water from the material in preparation for disposal. A lower organic content in grit reduces odors and vector attraction while dewatering reduces the weight, volume, and cost of materials hauled. Two technologies were evaluated for project implementation:

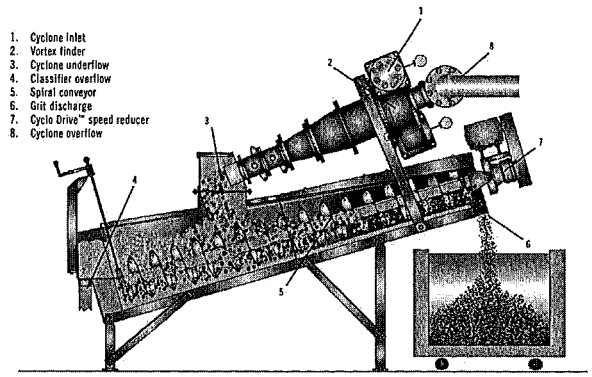
- Cyclone and grit classifier.
- Huber COANDA® grit washer.

Cyclone and Grit Classifier

Cyclone/classifier systems have a long history of successful operation at municipal WWTPs. Figure 1.6 illustrates the cyclone/classifier grit dewatering system.

In this system, grit slurry withdrawn from the grit basin hopper is pumped to the cyclone, which is mounted on top of the classifier. When the pressurized grit flow enters the cyclone, the energy furnished by the pump is converted into a rotational motion, similar to a cyclone, which causes the grit to be pushed to the outer walls by centrifugal force. The cyclone uses this centrifugal force to concentrate the grit to as little as five percent of the total incoming flow, while returning overflow water and some organic material back to the plant influent. The concentrated cyclone underflow discharges into the classifier mounted below. Grit settles to the bottom of the classifier and is removed with a short helical auger. The remaining water and suspended light organics discharge over a weir at the back of the classifier.

Cyclone/classifier units have a lower capital cost than other technologies; however, they have potential to produce a lower quality grit that contains more organics and is more odorous.



Source: Trillium Flow Technologies, Inc.

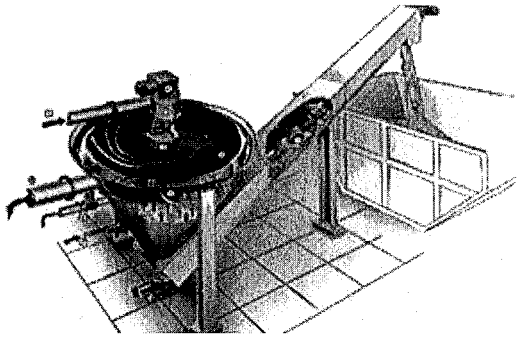
Figure 1.6 Cyclone and Grit Classifier

Coanda® Grit Washer

The COANDA® grit washer is a proprietary grit washing/dewatering system (manufactured by Huber) that typically produces a cleaner and drier grit than other systems. Figure 1.7 illustrates the COANDA® grit washing/dewatering system. Several other manufactures have recently announced new grit washers with higher levels of grit washing and dewatering. Proper evaluation of new equipment with a focus on the number of US installations, long-term experience, and a successful operational history is critical when selecting equipment advertising comparable grit quality vs. the Huber Coanda unit.

In this system, grit slurry (pumped or from cyclones) is fed through a vortex chamber where a rotational motion is generated. The slurry then flows down through a trumpet-shaped segment into the washing/separation unit. The flow is diverted along the curved inner surface of the trumpet-shaped segment by the COANDA® effect, whereby a liquid flow adheres to the contour of a curved surface. The flow is diverted smoothly, without generation of eddies, from a fast-rotating vertical direction to a gradually slower rotating horizontal direction, spreading evenly across the washing tank.

The combined forces of gravity and inertia cause grit and heavier organics particles to settle out of the flow. The separated grit is then washed in the bottom portion of the grit chamber. Wash water is fed into a bottom chamber to create a fluidized grit bed. The vertical flow of water carries the removed low-density organics upwards towards the overflow weir while the heavier grit remains within the fluidized bed. A stirrer also increases the friction and grit particles rubbing against each other, further separating attached organic matter from the grit. Washed grit is periodically removed through the bottom of the unit. The grit drops into the inclined screw and is conveyed above the water level in the grit washer and drained by gravity. The washed and dewatered grit drops from the conveyor into a dumpster.



Source: Huber Technology, Inc.

Figure 1.7 COANDA® Grit Washer

1.4.2.3 Alternative Analysis

A qualitative analysis of the grit handling alternatives was performed. Table 1.5 summarizes the key advantages and disadvantages of each alternative.

Table 1.5 Grit Handling Alternative Analysis

Alternative	Advantages	Disadvantages
Cyclone/Grit Classifier	▪ Extensive successful experience ▪ Wide range of hydraulic capacity applications ▪ Adequate process performance ▪ Moderate capital cost	▪ Limited washing of grit ▪ Grit product contains higher levels of organics and odors
COANDA® Grit Washer	▪ Produces significantly cleaner, drier, less odorous product ▪ Reduces hauling volume and frequency	▪ Higher capital cost ▪ Sole source required

Based on the Project goals, alternative analysis results, and the existing grit handling facility condition assessment, Huber's COANDA® grit washer with direct discharge into grit hauling trucks located in a new, dedicated Grit Handling Building is recommended for the design alternatives evaluated herein.

1.4.3 Grit Alternative No. 1

Two design alternatives were evaluated for construction of new grit removal and handling at the BRWWTP primary site: Grit Alternative No. 1 - Existing Facility Modifications and Grit Alternative No. 2 - New Facility Construction.

Grit Alternative No. 1 consists of retrofitting the existing grit basins with new vortex grit removal systems and grit pump stations. A new Grit Handling Building would house grit washers, grit loadout, and mechanical and electrical rooms. Grit will be conveyed from the grit pump stations to the Grit Handling Building through a Utility Corridor located above the grit basin deck.

1.4.3.1 Site Civil Considerations

Figure 1.8 presents the conceptual site layout of Grit Alternative No. 1 on an aerial view. Figure 1.9 presents the conceptual site plan of Grit Alternative No. 1 including the location of the proposed new Grit Handling Building and access roads for staff and grit load out access.

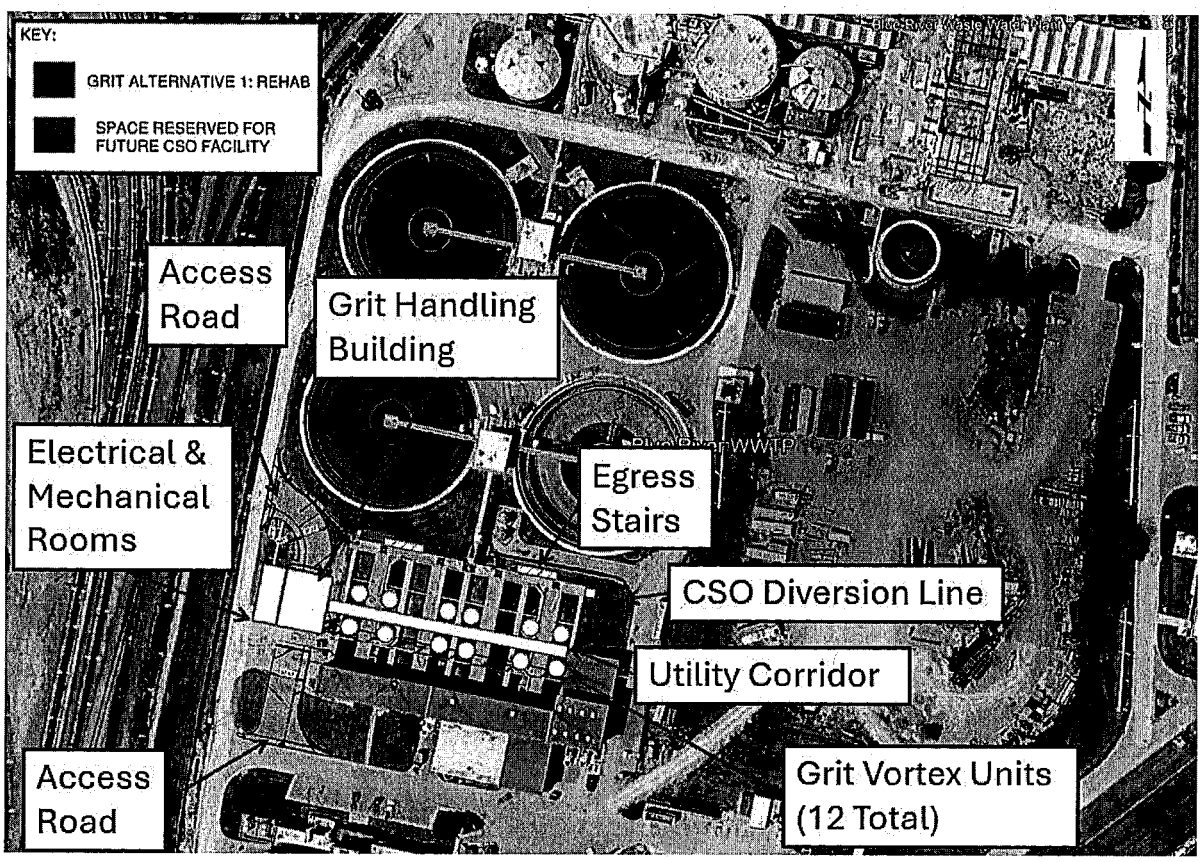
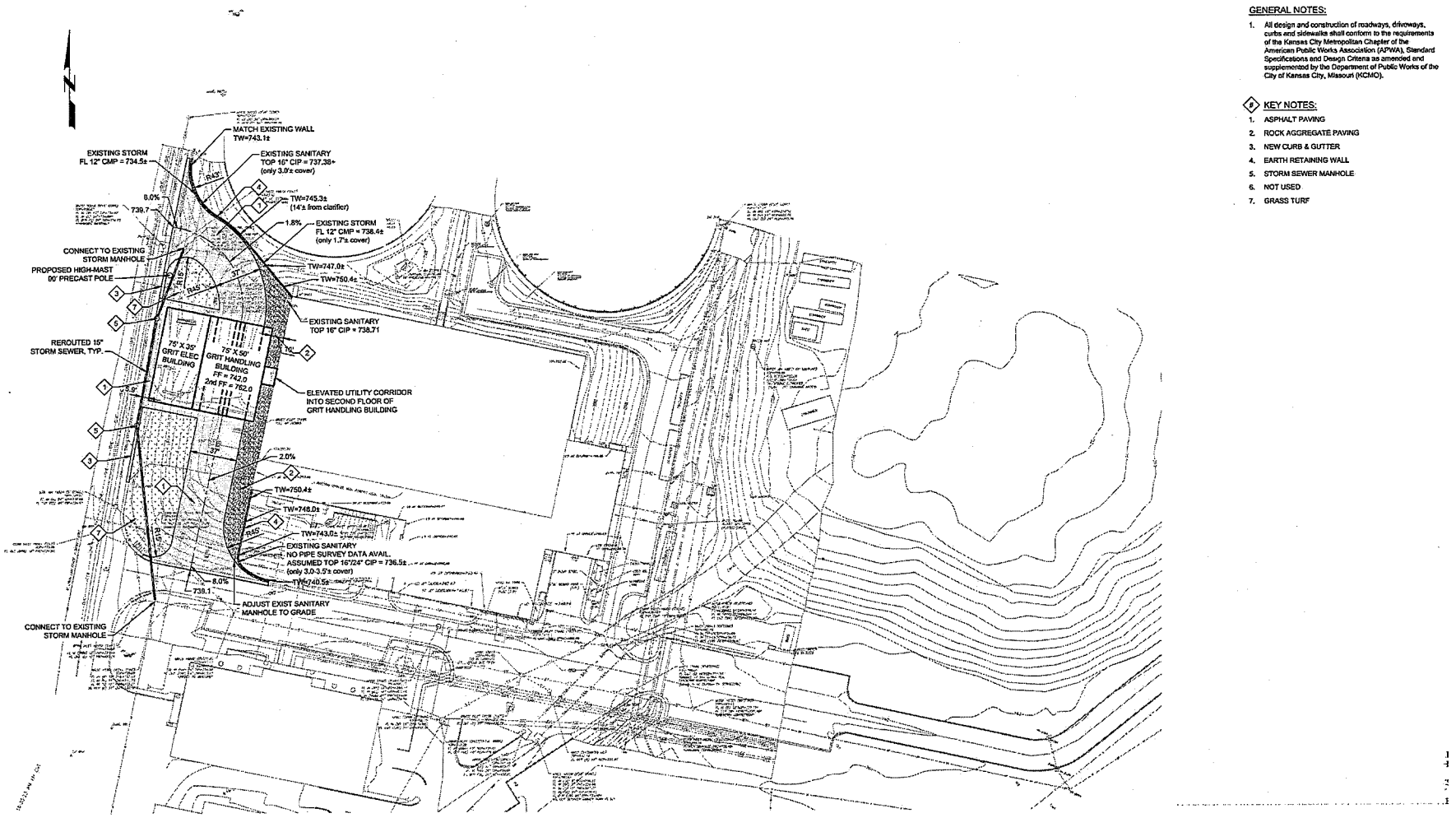


Figure 1.8 Grit Alternative No. 1 - Existing Facility Modifications



GENERAL NOTES:

1. All design and construction of roadways, driveways, curbs and sidewalks shall conform to the requirements of the Kansas City Metropolitan Chapter of the American Public Works Association (APWA), Standard Specifications and Design Criteria as amended and supplemented by the Department of Public Works of the City of Kansas City, Missouri (KCMO).

KEY NOTES:

1. ASPHALT PAVING
2. ROCK AGGREGATE PAVING
3. NEW CURB & GUTTER
4. EARTH RETAINING WALL
5. STORM SEWER MANHOLE
6. NOT USED
7. GRASS TURF

Figure 1.9 Grit Alternative No. 1 - Conceptual Site Plan

Site Preparation

The area immediately west of the existing Grit Building would require demolition of existing site elements including curbs, gravel pavement and asphalt driveways. Significant grading changes are also required to lower the grade elevation adjacent to the existing building by approximately nine feet. Shoring will likely be required to protect the existing Grit Building, grit basins, and utilities.

Site Layout and Access

The proposed location of the new Grit Handling Building is approximately ten feet from the west side of the existing grit basins. The finished floor elevation of the new building is approximately 742.0 promoting positive drainage from the building towards the adjacent roadways and existing storm sewer system. Retaining walls nine-feet in height are proposed between the new access drives and existing facilities.

Based on input from KC Water staff, grit loadout trucks will access the new Grit Building along the south access road and exit to the west access road. The 40-foot wide asphalt entrance and exit drive slopes approximately 2.0 percent up to the new Grit Handling Building and approximately 1.8 percent down to the access road, respectively. Concrete driveways are proposed at both drives where they intersect the existing access roads.

An aggregate surface is proposed for the 10-foot wide area between the new Grit Handling Building and existing grit basins for ease of maintenance and natural grass is recommended for the remainder of the disturbed areas.

Site Utilities

The location proposed for the new Grit Building conflicts with an existing 15-inch storm sewer along the west access road requiring relocation of approximately 300 feet of 15-inch reinforced concrete pipe storm sewer and two new manhole structures. Additionally, the new THP duct bank is located within the area of the proposed Grit Building. Proposed site grading may decrease the amount of cover over existing storm and sanitary sewer pipes and manholes. Adjustments to these utilities may be required to provide the required cover. If sufficient cover is not attainable, bedding improvements like controlled low-strength material (CLSM) or concrete encasement may also be considered. Additionally, relocation of site lighting poles is necessary to avoid conflict with the new exit drive from the Grit Handling Building.

1.4.3.2 Grit Removal Basins

Each aerated grit basin is repurposed with two, 18-foot diameter, 350-degree, vortex-style grit basins, to match the existing four basins, for a total of 12 vortex basins as shown in Figure 1.10. The de-rated process capacity of the grit basins is 17.5 mgd per basin. The facility's influent and effluent channels located on the south and north, respectively, are modified to account for the additional channels entering and exiting the new vortex basins. The effluent channel is also equipped with a new pipeline to divert degritted effluent to the future, proposed wet weather combined sewer overflow (CSO) facility.

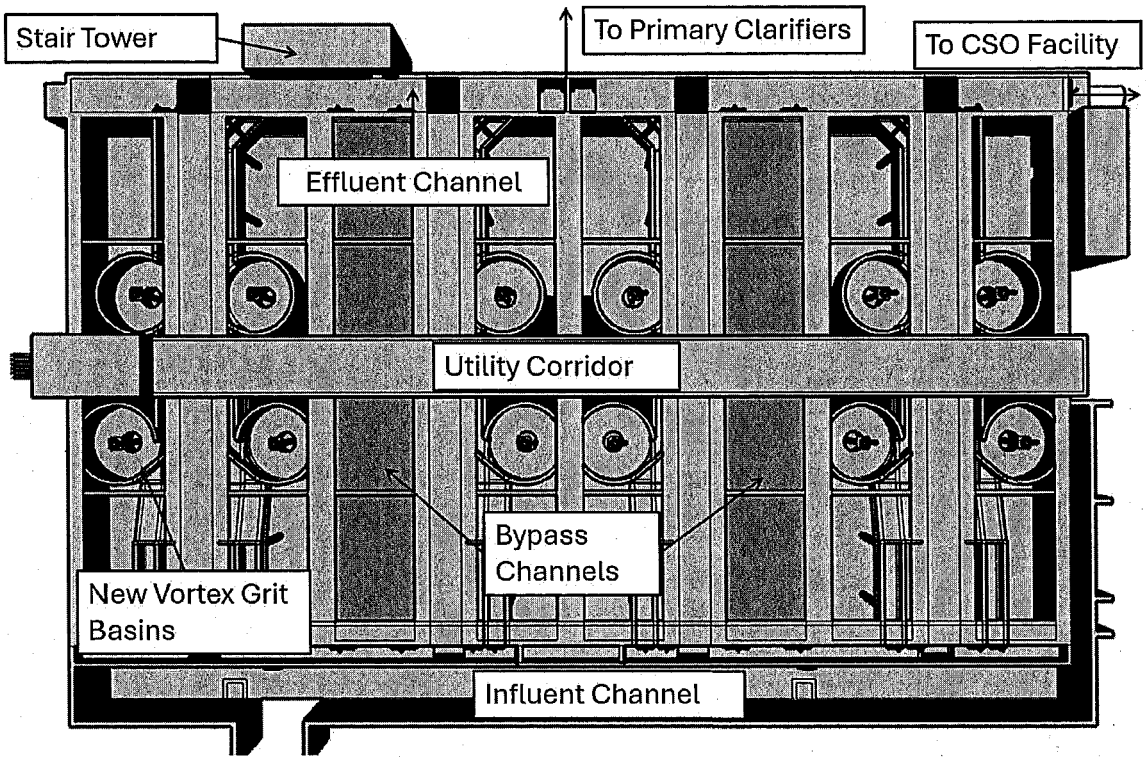


Figure 1.10 Grit Alternative No. 1 - Grit Basin Retrofit Plan View

1.4.3.3 Grit Pump Station and Utility Corridor

Each vortex basin is equipped with a single, fully recessed cup impeller-style grit pump which conveys settled grit from the grit pump station, through the Utility Corridor located above the deck of the grit basins, and directly to the new Grit Handling Building. Grit pumps serving the two vortex basins within the same, original grit basin are located within a common grit pump station and utilize a combined grit discharge pipe. The Utility Corridor is sized to accommodate the grit discharge piping from each grit pump station, plant utilities, and staff access from the new Grit Handling Building to the grit basin deck. See Figure Nos. 1.11 and 1.12 for the conceptual grit pump station and Utility Corridor plan and section views.

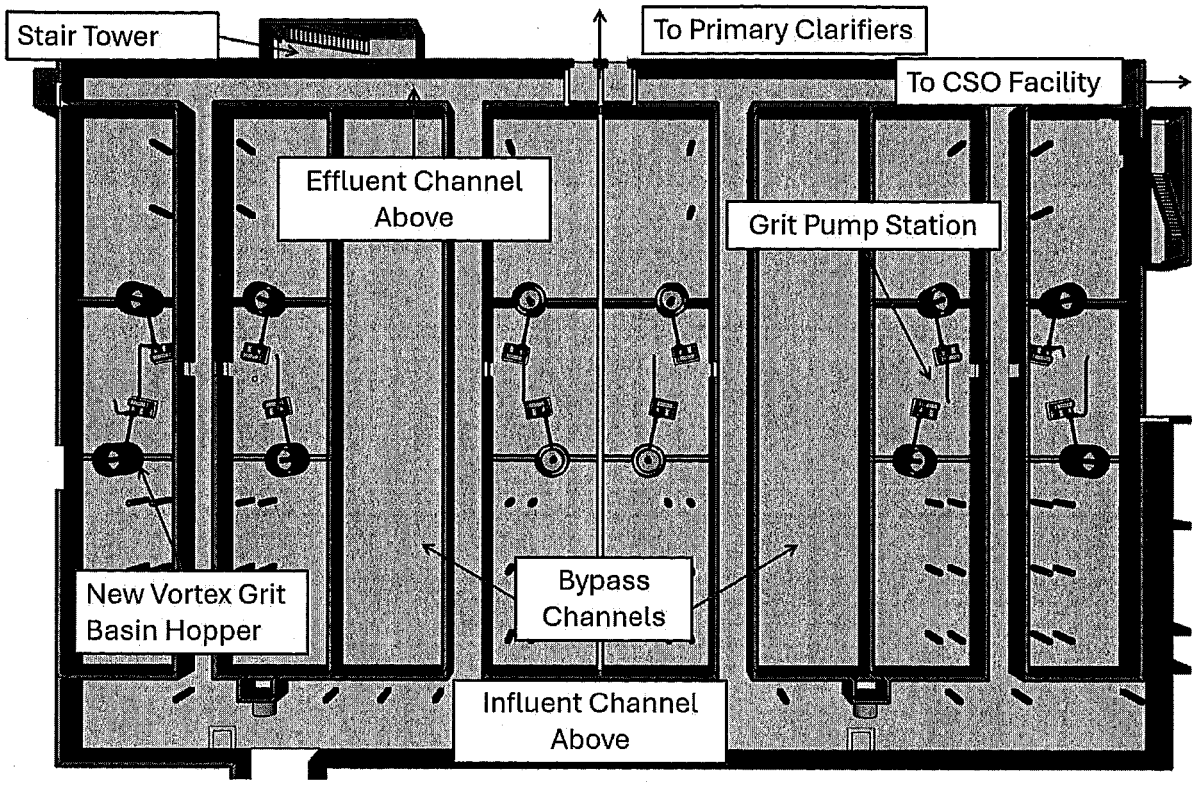


Figure 1.11 Grit Alternative No. 1 - Grit Pump Station Plan View

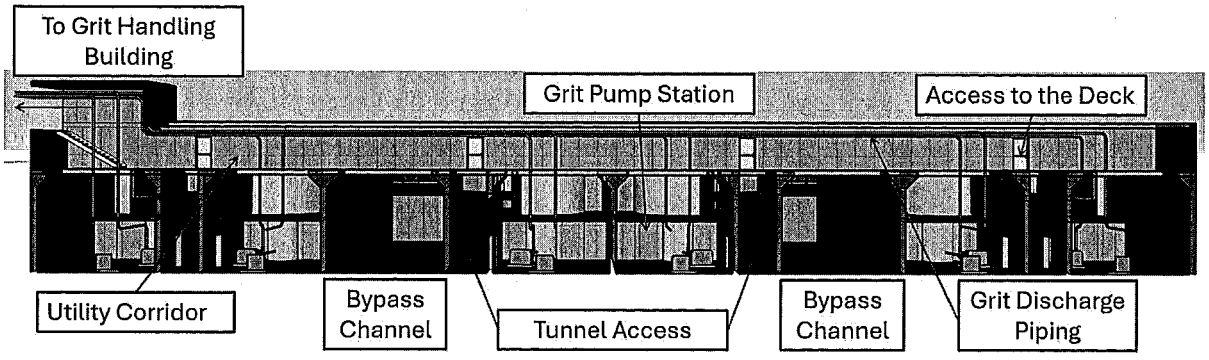


Figure 1.12 Grit Alternative No. 1 - Grit Pump Station and Utility Corridor Section View

1.4.3.4 Grit Handling Building

A new Grit Handling Building is proposed immediately west of the modified grit basins to house new grit washing and loadout facilities. The new facility is a two-story building with elevated grating for access to the second-floor grit washers, a second floor mechanical room, and grade-level grit load out, electrical, and control rooms. The new building is accessed from grade via multiple access doors and through the proposed Utility Corridor.

Grit discharge lines containing grit from two vortex basins are piped directly to one of six grit washers. Washed grit is discharged directly to trucks for ultimate disposal at the landfill. Figure Nos. 1.13, 1.14, and 1.15 provide exterior, plan, and section views, respectively, of the proposed Grit Handling Building.

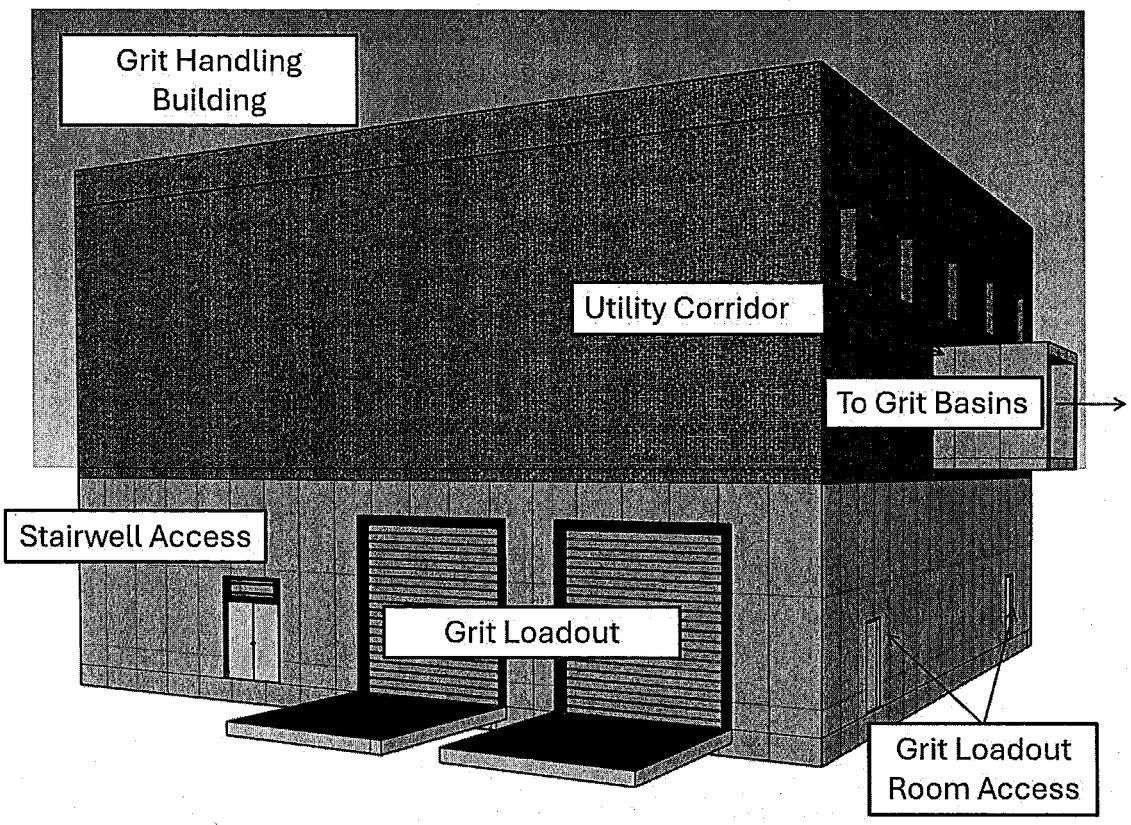


Figure 1.13 Grit Alternative No. 1 - Grit Handling Building Exterior Southeast View

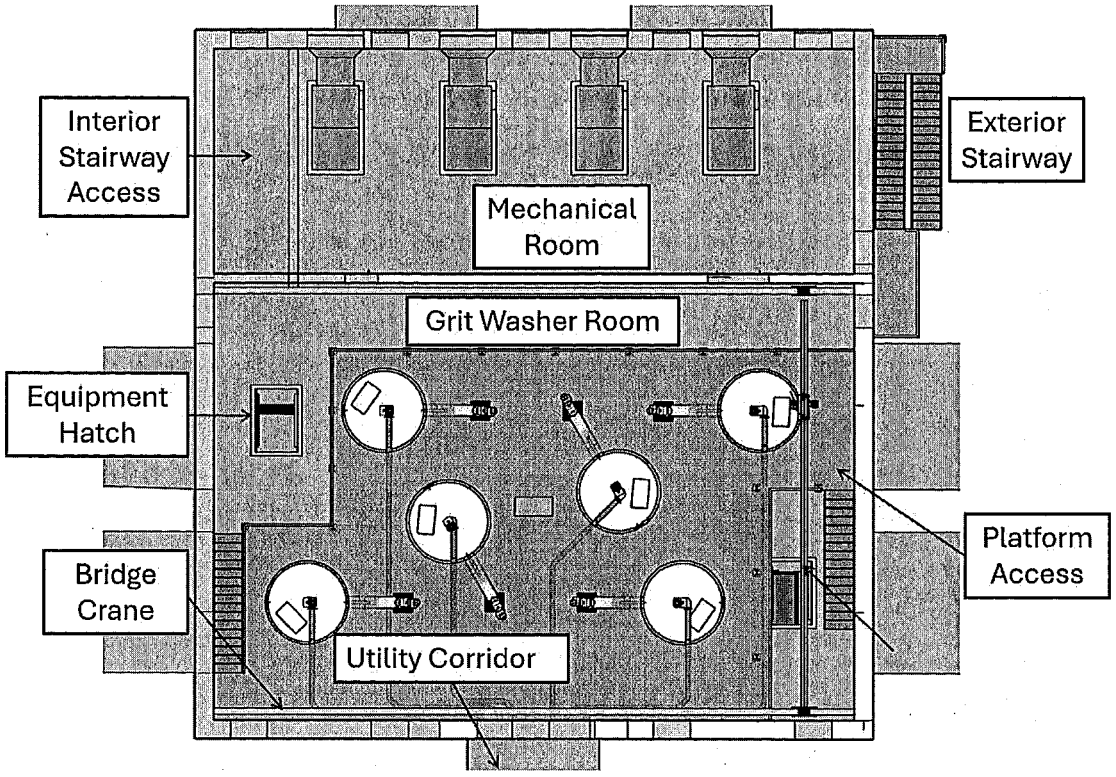


Figure 1.14 Grit Alternative No. 1 - Grit Handling Building Upper Level Plan View

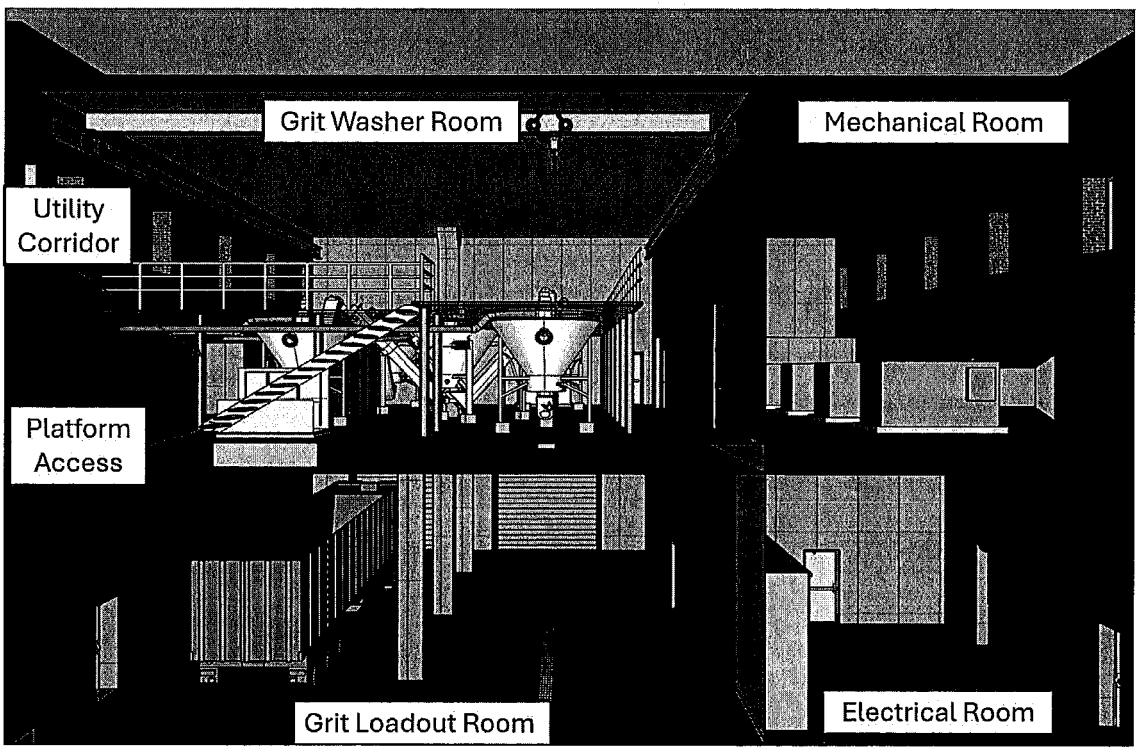


Figure 1.15 Grit Alternative No. 1 - Grit Handling Building Section View

1.4.3.5 Grit Alternative No. 1 Equipment Design Criteria

Table 1.6 summarizes the conceptual equipment design criteria for Grit Alternative No. 1 - Existing Facility Modifications. See Appendix A for conceptual level process flow diagrams and additional 3D renderings of Grit Alternative No. 1.

Table 1.6 Grit Alternative No. 1 Conceptual Design Criteria

Parameter	Design Criteria
Grit Removal	
Type	Mechanically induced vortex
Number	12
Diameter	18 feet
Capacity (De-rated Treatment)	17.5 mgd each, for a total of 210 mgd with all units in service
Grit Pumps	
Type	Fully recessed cup impeller
Number	12
Capacity	250 gpm
Grit Washer Classifier	
Type	COANDA®, RoSF4 3
Number	6
Hydraulic Capacity (Design/Maximum Pumped Flow Rate)	400 gpm / 500 gpm

Notes:
Abbreviations: gpm - gallons per minute.

1.4.3.6 Hydraulic Analysis

A hydraulic model was developed to establish the hydraulic profile through the modified grit facility representing the Project's major improvements. The hydraulic model was used to develop a conceptual hydraulic profile to determine whether sufficient hydraulic gradient exists to convey AADF and PHF while maintaining adequate velocities, channel depths, and freeboard within the system.

Existing grit basin and primary clarifier record drawings, conceptual grit basin modifications, proposed Project AADF and PHF criteria, and estimated CSO facility design criteria were used to develop the model from the influent grit boxes through the primary clarifiers effluent box.

Hydraulix® Model

Hydraulic modeling of the grit system was performed using Hydraulix® software by Carollo. Hydraulix® is an in-house, spreadsheet-based, steady-state hydraulic model used to calculate the hydraulic and energy grade lines through the treatment plant.

Hydraulic Modeling Design Flow Criteria and Assumptions

A hydraulic analysis was performed using the downstream hydraulic control point of the existing primary clarifiers effluent launder and the estimated CSO facility influent water surface elevation since the new grit basins will concurrently feed both parallel facilities.

The following hydraulic design criteria and assumptions were utilized in the hydraulic evaluation:

- Design flows from Table 1. 2 and an assumed PHF of 210 mgd.
- A Manning's "n" friction coefficient of 0.015 for aged pipes and channels in the hydraulic profile headloss calculations.
- Bypass channels around the grit removal convey PHF.
- All four primary clarifiers are in service at all times.
- All weirs are free discharging under all design flow conditions.
- No modifications to existing primary clarifier splitter structure.
- 12 grit basins in service for peak flows.

Hydraulic modeling results indicate the modified grit removal facility is unable to convey the proposed PHF of 210 mgd and results in submerged channels with flows overtopping the structure under peak conditions. The influent splitter boxes, common influent channel, vortex basin influent and effluent channels, and the common effluent channel are undersized and require significant demolition and reconstruction efforts with complex construction sequencing to accommodate the increased flows.

1.4.3.7 Conceptual Design Summary

Grit Alternative No. 1 proposes repurposing the existing grit removal basins with 12 grit vortex units and new grit pump stations and constructing a new utility corridor and Grit Handling Building. Based on the hydraulic modeling results, the extensive facility modifications are insufficient to meet the Project's design flows of 210 or 270 mgd. Increasing the existing facility's capacity is cost prohibitive and unlikely to meet KC Water's needs. Grit Alternative No. 1 is no longer considered a viable alternative and is not further evaluated.

1.4.4 Grit Alternative No. 2

Grit Alternative No. 2 includes new grit removal and grit handling facilities. Grit removal is based on Hydro's Headcell® equipment with a grit pump station located directly below the basins. The new Grit Handling Building houses grit washers, grit loadout, and mechanical and electrical rooms. Grit is conveyed from the grit pump stations to the Grit Handling Building through a utility corridor located between the grit pump station and grit washer room. Degritted effluent is conveyed from the new grit facility to the existing primary clarifiers through new piping and the existing effluent channel in the existing grit facility or to the future wet weather facility.

1.4.4.1 Site Civil Considerations

Figure 1.16 presents the conceptual site layout of Grit Alternative No. 2 on an aerial view. Figure 1.17 presents the conceptual site plan of Grit Alternative No. 2 including the location of the proposed new grit removal facility and Grit Handling Building and access roads for staff and grit hauling.

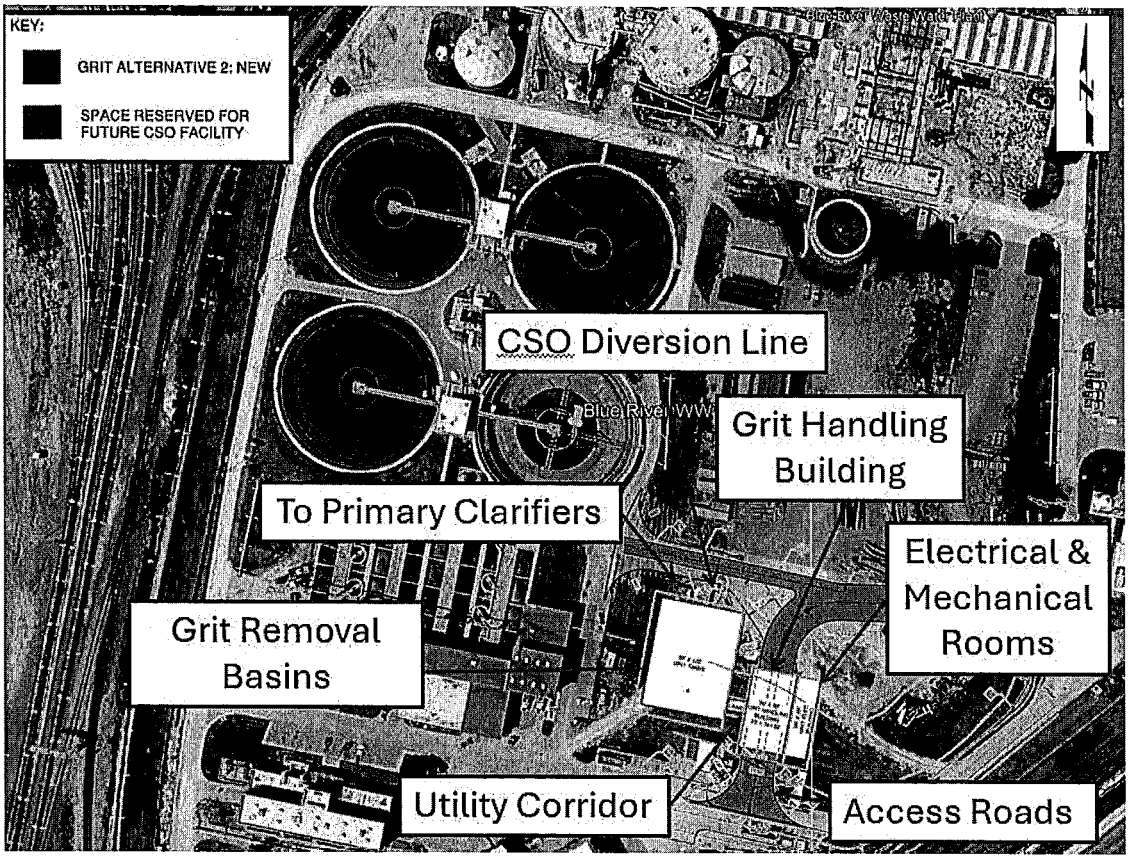


Figure 1.16 Grit Alternative No. 2 - New Grit Facility

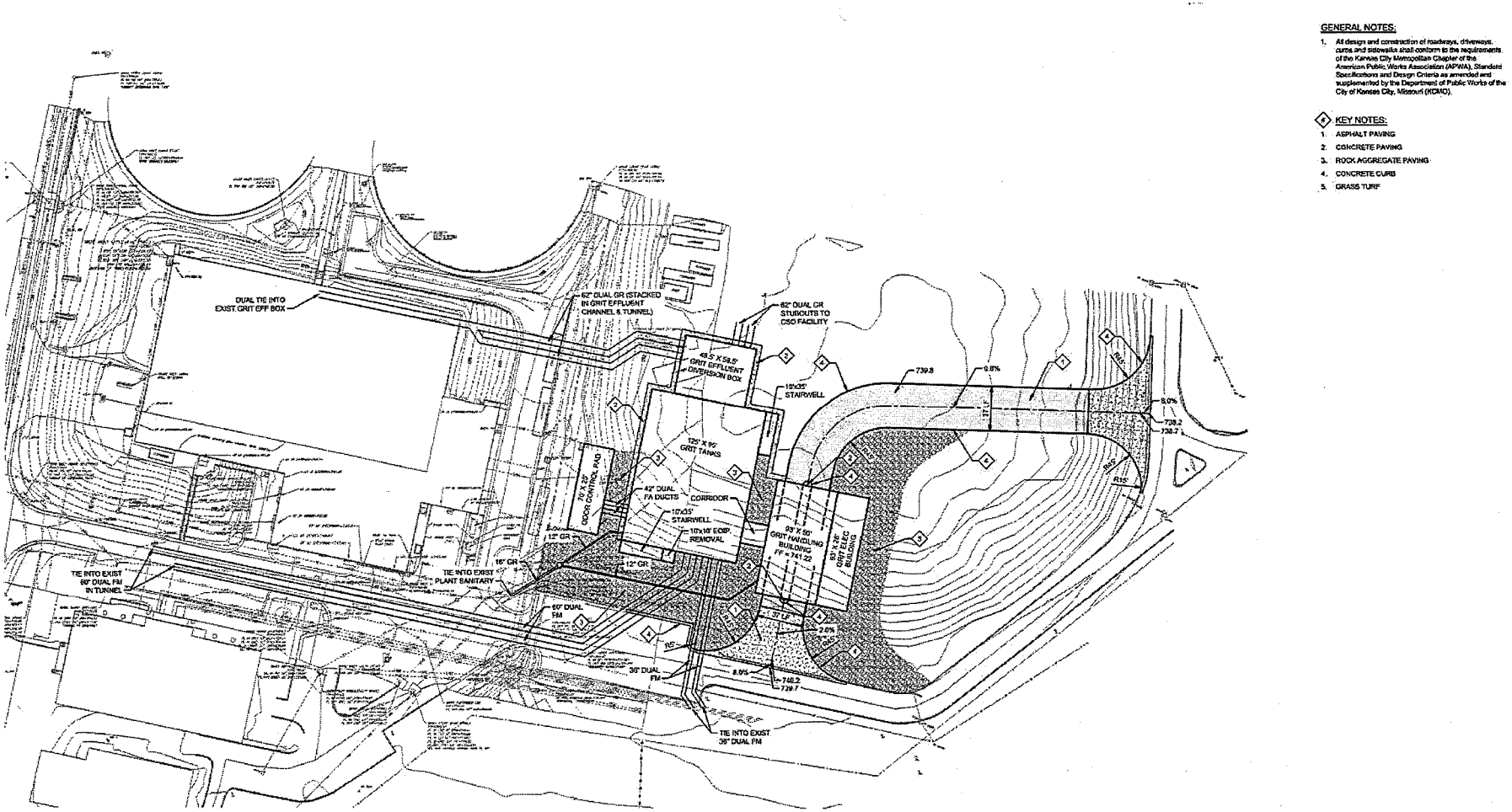


Figure 1.17 Grit Alternative No. 2 - Conceptual Site Plan

Site Preparation

The proposed new grit facility is partially located on the South Ash Pond which is approximately 3.8 acres in size and consisting of approximately 113,000 cubic yards of incinerated biosolids (ash) material. Closure of the South Ash Pond requires ash material excavation and hauling to a landfill for ultimate disposal. Based on previous studies, approximately 60,000 cubic yards of clean backfill is estimated for the area prior to construction of grit improvements. Minor additional grading improvements are required to promote positive drainage around the new facility.

The new grit improvements also require demolition of existing site elements including temporary storage containers, curbs, asphalt pavement and gravel surfacing. Record drawings for this area do not indicate other significant utilities or features requiring removal or relocation.

Site Layout and Access

The new grit removal and handling facilities are proposed east of the existing grit facility. Space for future odor control abatement is planned for the area between the access road and the west side of the new grit basins. A utility corridor connects the new grit removal facility to the Grit Handling Building. The Grit Handling Building's finished floor elevation is approximately 741.2, prompting positive drainage from the building to the southeast and adjacent roadways. Stormwater runoff is collected by the existing storm sewer system located along the existing access roads.

Grit loadout trucks can enter the Grit Handling Building from the south or east access roads from either direction without restriction. The 40-foot wide asphalt drive is proposed with an approximate slope of 2.0 percent and 0.8 percent up to the new Grit Handling Building from the south and east access roads, respectively. Concrete driveways are recommended at the intersection with existing access roads.

Natural grass vegetation is recommended for the disturbed areas surrounding the new grit facility.

Site Utilities

The South Ash Pond closure will include removing or abandoning inlet and outlet structures and piping. Based on locations shown in the existing record drawings, an existing storm sewer and power pole for overhead electrical lines located adjacent to the proposed future odor control equipment may need relocation in the final layout. Gravity pipelines will convey effluent from the new grit effluent diversion box to the existing grit effluent channel and tunnel, followed by conveyance to the primary clarifiers using existing pipelines.

New, dual 62-inch gravity pipelines are located on the north side of the new grit effluent diversion box to convey effluent to the CSO facility as part of a future project.

Lastly, the new Grit Facility and Grit Handling Buildings require new plant drain service connections to the existing plant drain system.

1.4.4.2 Grit Removal Basins

Grit Alternative No. 2 includes a new grit removal facility consisting of eight, 12-tray, 12-foot deep Headcell® units. Screened influent flow is intercepted in the yard and conveyed to the new grit basins via dual influent pipes. The influent box distributes flow to four influent channels where each channel's flow is

split between two Headcell® units. An effluent box conveys up to 140 mgd of degritted flow to the existing primary clarifiers with the remaining flow of 130 mgd diverted to the new CSO system via a series of weirs and launders (each sized for 35 mgd) and transfer gates. The effluent box is also designed to divert degritted flow to the CSO system for primary treatment in the event the existing primary clarifiers are out of service.

Dual purpose effluent/bypass channels are included to permit the bypass of grit removal treatment in the event upstream screening is bypassed. Hydro requires bypass of the Headcell® units if upstream screening is bypassed.

Modifications to the Project's influent PHF, wet weather criteria were under consideration during the conceptual design of the new grit facility. To accommodate the potential need for higher wet weather flows, the new grit removal facility and effluent box are conceptually sized to accommodate a total PHF of 270 mgd. Table 1.7 summarizes the estimated level of grit removal at various flows within the Headcells®. Accurate flow splitting between the primary clarifiers and CSO system above 210 mgd requires the use of adjustable gates or a flow control valve to maintain a maximum flow of 160 mgd to the primary clarifiers and the remaining flow 130 mgd conveyed to the future CSO system.

Figure Nos. 1.18 and 1.19 provide exterior and plan views of the proposed grit basins.

Evaluation of the required screening improvements and the new grit removal facility's impact to existing influent pumping should be considered. The evaluation should consider either replacement of existing screens with at least 1/2-inch spacing or the addition of finer screens downstream of the existing bar screen facility. Additionally, evaluation of the influent pumps is necessary to determine the impact of the new grit basins' higher water surface elevation and the location of new finer screens.

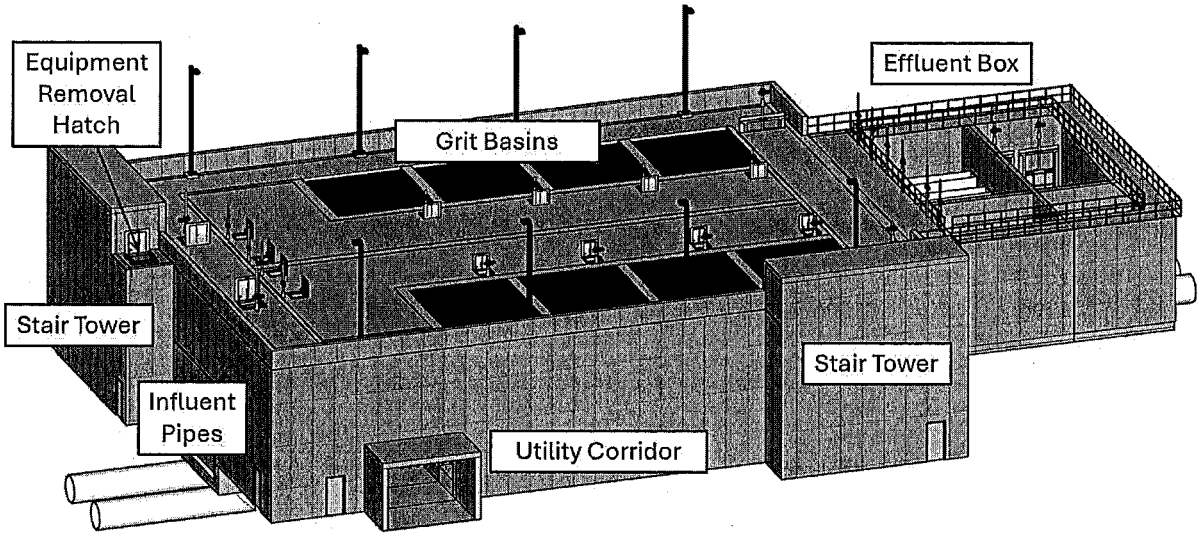


Figure 1.18 Grit Alternative No. 2 - New Grit Facility Exterior West View

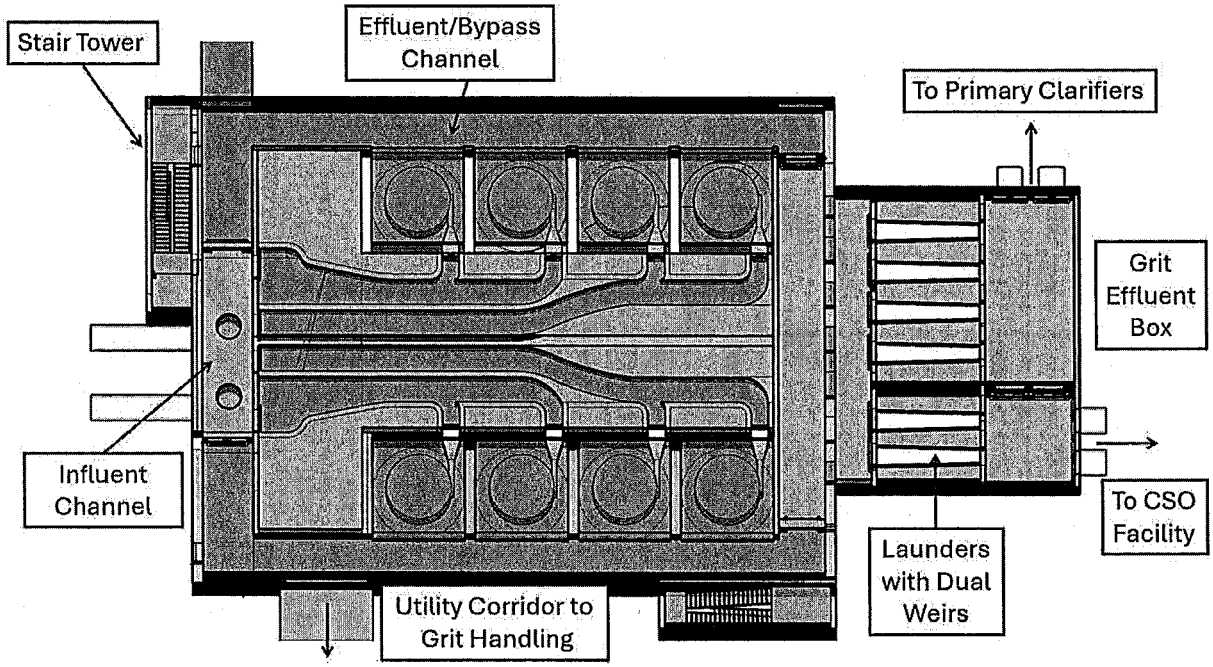


Figure 1.19 Grit Alternative No. 2 - New Grit Facility Plan View

1.4.4.3 Grit Pump Station and Utility Corridor

The grit pump station is located below the grit removal basins with access from grade or from the Grit Handling Building via the utility corridor. Each grit basin is equipped with a single, fully recessed cup impeller-style grit pump which conveys settled grit from the grit pump station, through the Utility Corridor, then directly to the new Grit Handling Building. Additional grit pumps maintained as shelf spares provide grit pump redundancy in the event a pump requires maintenance. The Utility Corridor is sized to accommodate grit discharge piping from each grit pump, plant utilities, and staff access from the new Grit Handling Building to the grit pump station. See Figure Nos. 1.20 and 1.21 for the conceptual grit pump station and Utility Corridor plan and section views.

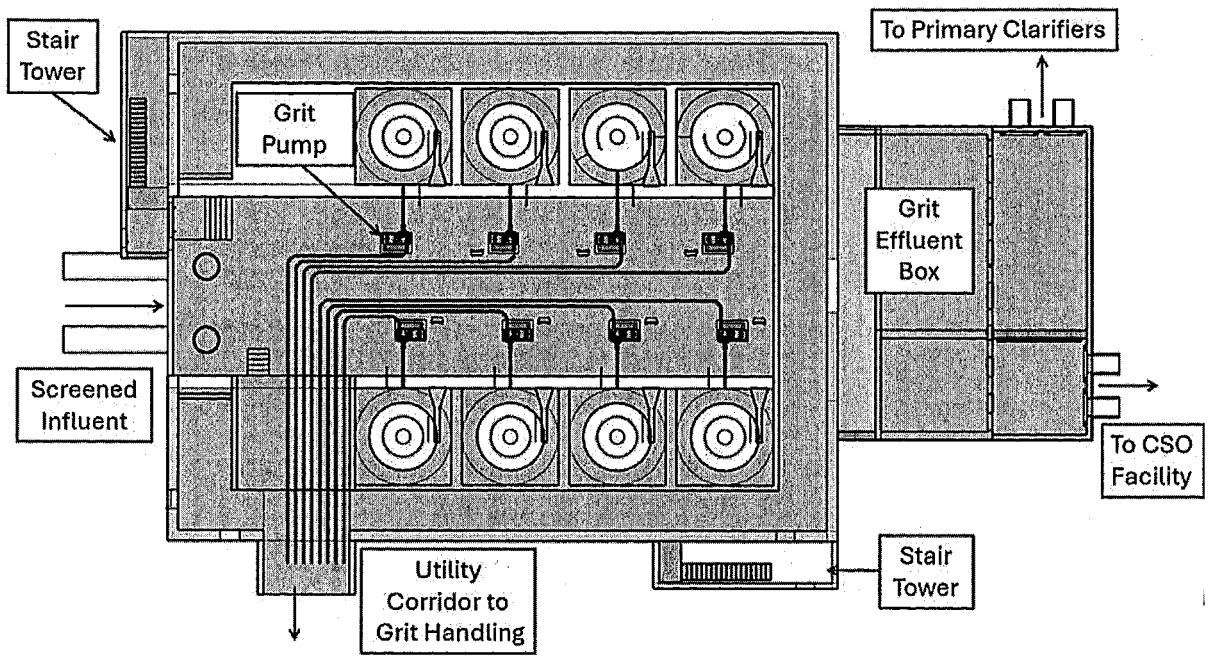


Figure 1.20 Grit Alternative No. 2 - New Grit Facility Lower Level Plan View

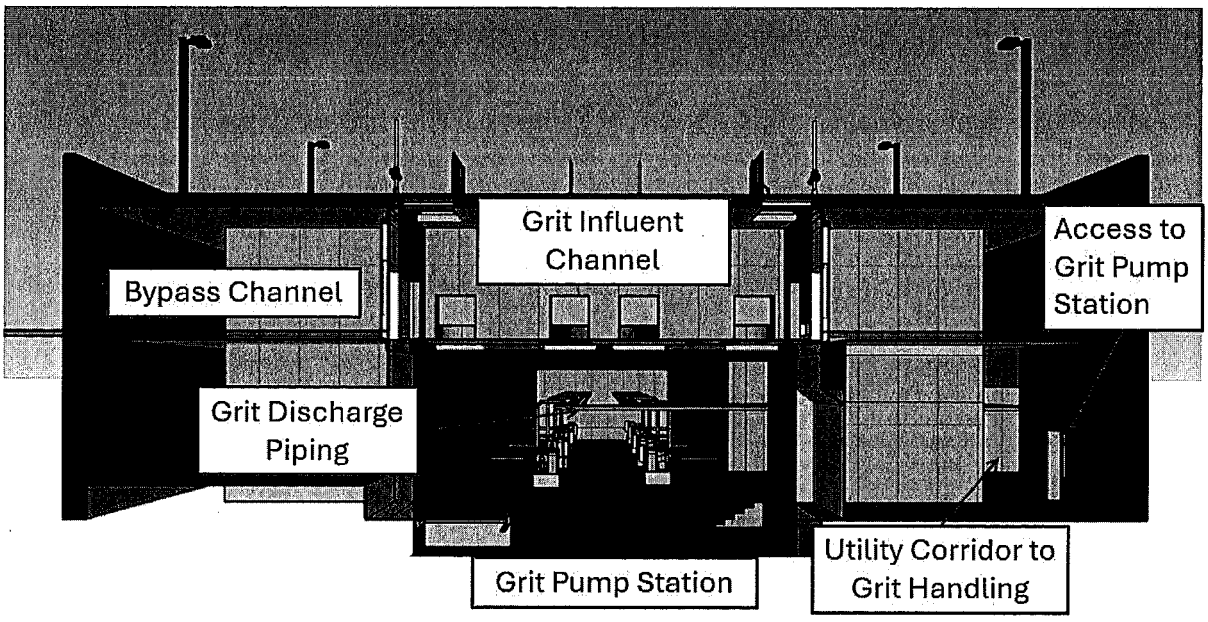


Figure 1.21 Grit Alternative No. 2 - New Grit Facility Section North View

1.4.4.4 Grit Handling Building

A new Grit Handling Building is proposed immediately east of the new grit basins to house new grit washing and loadout facilities. The new facility is proposed as a two-story building with elevated grating for access to the second-floor grit washers, a second-floor mechanical room, and grade-level grit load out, electrical, and control rooms. The new building is accessed from grade via multiple access doors and through the proposed Utility Corridor.

Grit discharge lines conveying grit from the grit basins are piped directly to one of eight grit washers. Washed grit is discharged directly to trucks for ultimate disposal at the landfill. Grit discharge hoppers are located for bi-directional truck traffic and to promote even filling of the trucks. Figure Nos. 1.22 through 1.25 provide exterior, upper and lower plan, and section views of the proposed building.

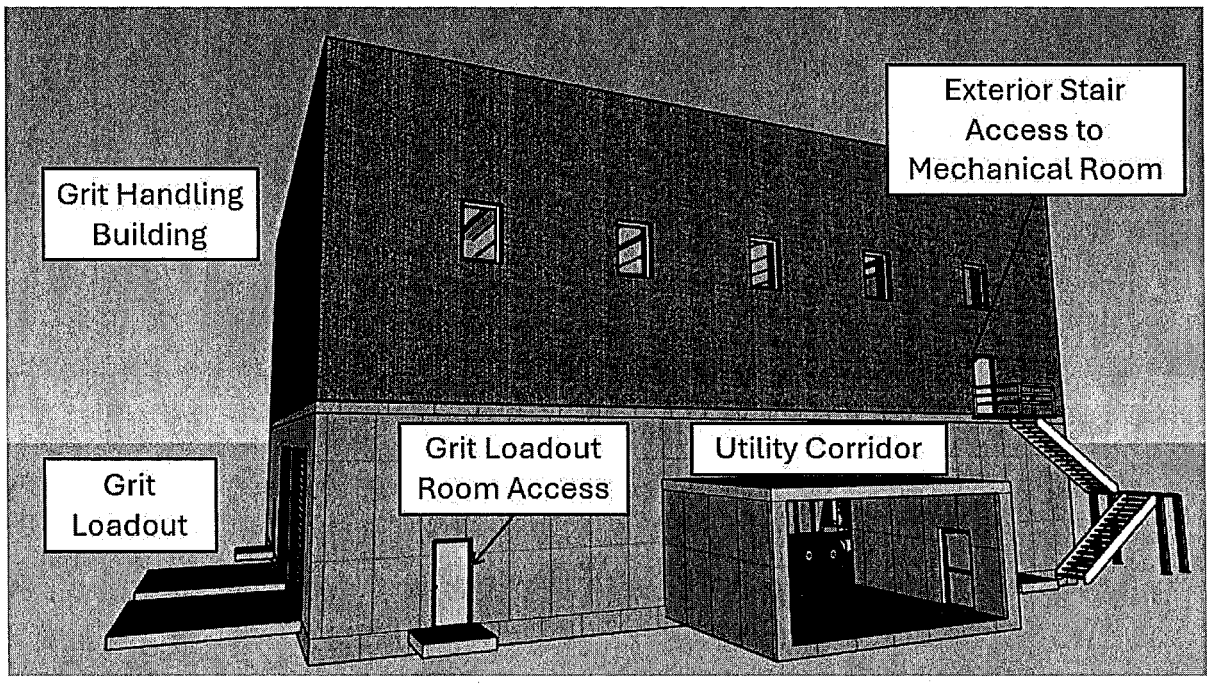


Figure 1.22 Grit Alternative No. 2 - Grit Handling Building Exterior Southeast View

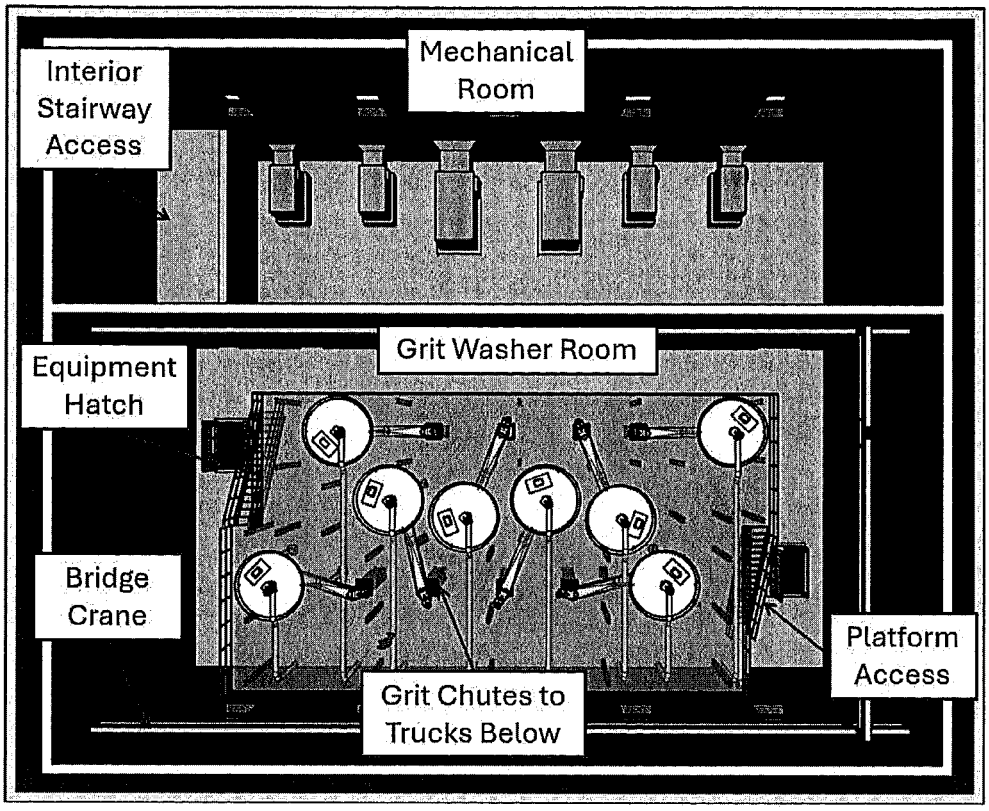


Figure 1.23 Grit Alternative No. 2 - Grit Handling Building Upper Level Plan View

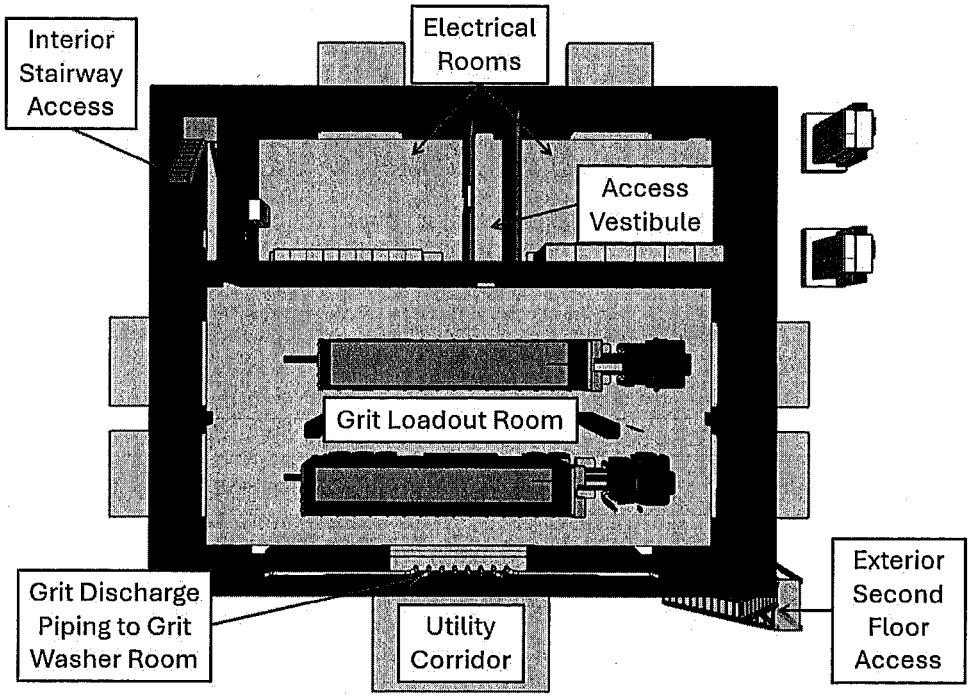


Figure 1.24 Grit Alternative No. 2 - Grit Handling Building Lower Level Plan View

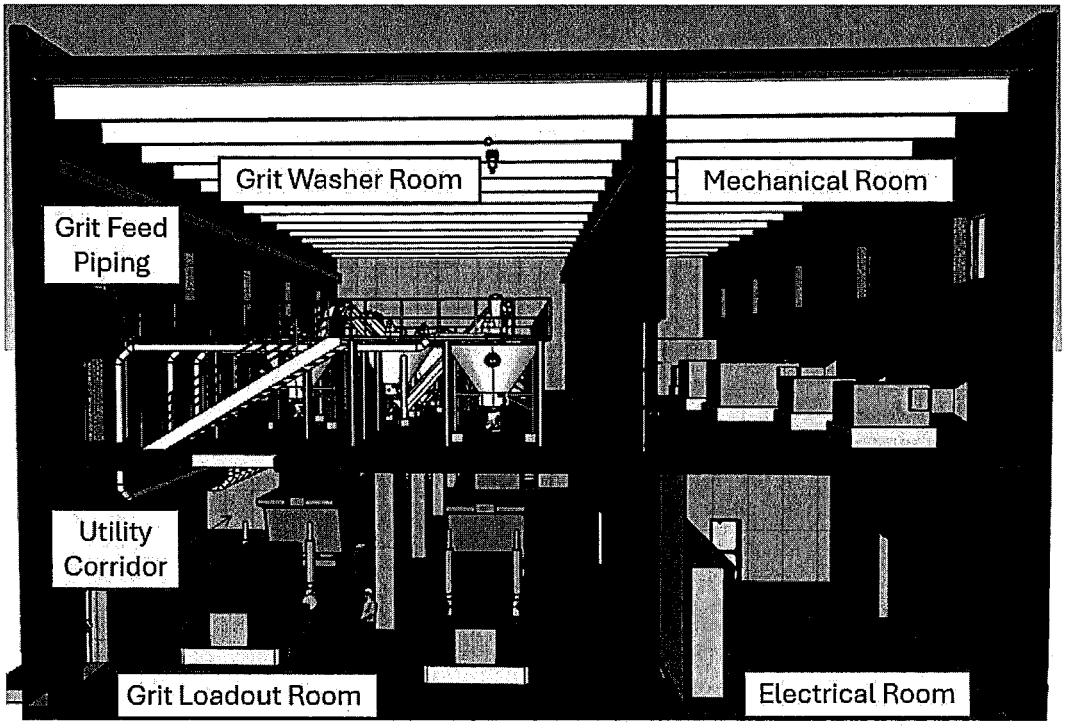


Figure 1.25 Grit Alternative No. 2 - Grit Handling Building Section North View

1.4.4.5 Odor Control

An area immediately west of the new basins is reserved for locating future odor control equipment to minimize the amount of future foul air duct from the new facility. Provisions included in the conceptual design to adequately contain and exhaust odors generated at the facility include covered and enclosed channels and basins, adequate space for future foul air duct and exhaust fans, and properly sized ventilation system for staff safety and to prolong the life of the facility. Ventilation is discussed below in Building Mechanical Design section.

1.4.4.6 Equipment Design Criteria

Table 1.7 summarizes the conceptual equipment design criteria for Grit Alternative No. 2 - New Grit Facility. See Appendix B for conceptual level process flow diagrams and additional 3D renderings of Grit Alternative No. 2.

Table 1.7 Grit Alternative No. 2 Conceptual Design Criteria

Parameter	Design Criteria
Grit Removal	
Type	Multi tray vortex, Headcell®
Number	8
Tray Diameter	12 feet
Number of Trays	12

Parameter	Design Criteria
Treatment Capacity	
Minimum Flow, 35 mgd, (2 units in service)	17 mgd each
Annual Average Daily Flow, 91 mgd (AUIS)	11.4 mgd each, with 95% removal of grit > 75 microns
Peak Day, 210 mgd (AUIS)	26.25 mgd each, with 95% removal of grit > 125 microns
Peak Hour Flow, 270 mgd (AUIS)	35 mgd each, with 95% removal of grit > 150 microns
Maximum Hydraulic Capacity (each unit)	46 mgd
Grit Pumps	
Type	Fully Recessed cup-type impeller
Number	8, plus 2 shelf spares
Capacity	500 gpm
Grit Washer Classifier	
Type	Huber COANDA® grit washer
Number	8
Hydraulic Capacity (Design/Peak)	400 gpm / 500 gpm

Notes:
Abbreviations: AUIS - all units in service.

1.4.4.7 Hydraulic Analysis

A hydraulic model was developed to establish the hydraulic profile through the new grit facility representing the Project's major improvements. The hydraulic model was used to develop a conceptual hydraulic profile to determine whether sufficient hydraulic gradient exists to convey AADF and PHF while maintaining adequate velocities, channel depths, and freeboard within the system. The hydraulic model identified areas of hydraulic constraints and was used in an iterative process to conceptually design the new facility while minimizing hydraulic constraints.

Hydraulix® Model

Hydraulic modeling of the grit system was performed using Hydraulix® software by Carollo. Hydraulix® is an in-house, spreadsheet-based, steady-state hydraulic model used to calculate the hydraulic and energy grade lines through the treatment plant.

Hydraulic Modeling Design Flow Criteria and Assumptions

A hydraulic analysis was performed using the downstream hydraulic control point of the existing primary clarifiers effluent launder and the estimated CSO facility influent water surface elevation since the new grit basins will concurrently feed both parallel facilities.

Existing grit basin and primary clarifier record drawings were used to create the existing plant hydraulic configuration used in the hydraulic model.

The following hydraulic design criteria and assumptions were utilized in the hydraulic evaluation:

- Design flows from Table 1. 2 and an assumed PHF of 270 mgd.
- A Manning's "n" friction coefficient of 0.015 for aged pipes and channels in the hydraulic profile headloss calculations.
- Bypass channels around the grit removal convey PHF.

- All four primary clarifiers are in service at all times.
- All weirs are free discharging under all design flow conditions.
- No modifications to existing primary clarifier splitter structure.
- 6 of 8 Headcell® basins in service, each equipped with a 46 mgd nozzle.

Hydraulic Modeling Results

The following is a summary of the hydraulic recommendations for the new grit facility:

- Dual 60-inch forcemains to convey screened influent from the existing screenings facility. Final tie-in location will depend on screening analysis recommendations.
- Dual 36-inch forcemains to convey screened influent from NEID. Final tie-in location will depend on screening analysis recommendations.
- Dual 62-inch gravity lines to the existing primary clarifiers and the future wet weather facility.
- Estimated high water surface elevations at 270 mgd:
  - » Grit effluent diversion box: 752.6 feet.
  - » Grit common effluent channel: 758.7 feet.
  - » Grit common influent channel: 761 feet.

See Appendix C for Grit Alternative No. 2 conceptual design hydraulic model calculations.

1.5 Discipline Design

This section summarizes the major codes, criteria, and conceptual design elements for the civil, geotechnical, architectural, structural, building mechanical, electrical, and instrumentation and control disciplines.

1.5.1 Civil Design Codes and Standards

The following is a summary of the civil design codes and standards applicable to the Grit Improvements Project:

- Project area is located on the Flood Insurance Rate Map (FIRM) Panel Number 29095C0276H, effective December 7, 2023. The site is in an area of reduced flood risk due to levee protection.
- Design and construction of roadways, driveways, curb and sidewalks conform to the requirements of the Kansas City Metropolitan Chapter of the American Public Works Association, Standard Specifications and Design Criteria as amended and supplemented by the Department of Public Works of the City of Kansas City, Missouri.
- AWWA C900 - Polyvinyl Chloride (PVC) pressure pipe and Fabricated Fitting, 4 in. through 60 In.
- AWWA C906 - Polyethylene (PE) Pressure Pipe and Fittings, 4 In. Through 65 In.
- AWWA C950 - Fiberglass Pressure Pipe.
- ASTM D3034 - Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.

1.5.2 Geotechnical Design

This section provides recommendations based on the results of a desktop study performed for the proposed grit improvements. The evaluation includes a description of generalized, anticipated subsurface conditions based on previous reports, review of public historical geotechnical data and well logs near the project location, estimated depths to bedrock near the project location, and recommendations for further geotechnical exploration.

1.5.2.1 Desktop Study Summary and Recommendations

Based on the results of the desktop study (see Appendix D for the geotechnical report), driven H-piles are recommended for the foundation of the new grit facilities. Alternative foundation types to consider during preliminary design include driven pipe piles, auger cast-in-place piles, or helical piers. It is anticipated that variable fill depths of very soft to medium stiff cohesive soils and granular soil with variable consistencies are located in the Project area. Below the fill, the upper native soft to medium stiff cohesive soils and underlying medium dense to dense granular soils are variable in consistency.

A recommended boring plan with nine boring locations (following closure of the South Ash Pond) is included in Appendix D. Because the Project area is in the Alluvium of the Missouri and Blue Rivers, the bedrock can be deeper in the river channel and may not be uniform across the site. Multiple borings in the Project area will provide a better understanding of the soil and rock materials and their elevations and assist in design efforts.

1.5.3 Architectural Design

This section presents a summary of the applicable architectural codes and recommended general design criteria.

1.5.3.1 Applicable Codes

The following is a list of the applicable codes for the Project:

- 2018 International Building Code (IBC), with KC Water Amendments.
- NFPA 70, with KC Water Amendments.
- 2017 National Electrical Code (NEC), with KC Water Amendments.
- 2021 International Energy Conservation Code (IECC), with KC Water Amendments.
- 2018 International Fire Code (IFC), with KC Water Amendments.
- 2018 International Fuel Gas Code (IFGC), with KC Water Amendments.
- 2018 International Mechanical Code (IMC), with KC Water Amendments.
- 2018 Uniform Plumbing Code (UPC), with KC Water Amendments.

The Project's building code classification summary includes the following:

- Building Code:
  - » Occupancy Group F-1 (Moderate Hazard Factory Industrial).
  - » Type of Construction: Type II-B.

- Building Heights and Areas:
  - » Allowable Height in Feet: Unlimited.
  - » Allowable Number of Stories: Unlimited.
  - » Allowable Floor Area: 15,500 square feet (sf) per floor.
- Required Separation:
  - » Building Separation: None Required.
  - » Room Separation: Electrical Room - 2 hours.
- Occupant Load:
  - » 300 sf per occupant in Mechanical Rooms.
  - » 100 sf per occupant in F-1 Areas.
- Minimum required number of exits: 2.
- Maximum Exit Access Travel Distance: 75-feet.

1.5.3.2 Materials of Construction

Below is a summary of recommended materials for the new grit facilities.

- Walls and Floors:
  - » Cavity wall comprised of cast-in-place concrete walls with insulation and brick veneer.
  - » Cast-in-place reinforced concrete slab supported by pile foundations.
  - » Cast-in-place reinforced concrete elevated second floor slab and basins.
  - » Aluminum floor hatches for equipment removal within the elevated slab.
  - » An equipment platform level comprised of steel structure with aluminum grating above the second floor.
  - » Wall and slab insulation.
- Roofs:
  - » Precast concrete double-tees with a topping slab, rigid insulation, tapered insulation for roof drainage, and a thermoplastic polyolefin roofing system.
  - » Roof insulation.
- Doors, Hardware, Windows, and Skylights:
  - » Metals are stainless steel, aluminum, or ferrous with high performance coating.
  - » Aluminum framed fixed skylights and windows.
  - » Fiberglass reinforced plastic (FRP) doors and door frames with stainless steel (as available) hardware.
  - » Insulated, motorized, stainless steel overhead doors.

1.5.3.3 Major Element Design Summary

Below is a summary of recommended architectural conceptual design criteria for major Project elements.

- Grit Pump Station and Utility Corridor:
  - » Piping and other utilities in occupied spaces mounted above 6-feet 8-inches minimum.
  - » Grit Pump Station egress includes man doors and dual interior stair towers for access to the grit basin deck and the exterior.

  - » Open riser stairs with guardrails and handrails.
  - » Equipment access hatch for pump removal adjacent to the south stair tower.
- Grit Handling Building:
  - » Overhead coiling door access for the dual semi-trucks loading bays.
  - » Personnel door and overhead coiling door access to the dual Electrical Rooms.
  - » Multiple personnel door access to the Grit Loadout Room.
  - » Separate access vestibule equipped with direct access to the exterior, both electrical rooms and the Grit Loadout Room for improved environment separation.
  - » Interior stair tower for egress from the second floor to the first floor and to the exterior and contained within a 1-hour rated wall and ceiling enclosure.
  - » Galvanized exterior stair tower for egress from the Mechanical Room directly to the exterior.
  - » Second floor access hatches and a bridge crane above the equipment platform for equipment removal.
  - » Aluminum grated equipment platform for access to the top of grit handling equipment:
    - Equipment platform stair access with guardrails and handrails.
    - Removeable floor panels for equipment access.
    - Elevation allows staff access, pipe routing, and electrical and control panels below.
  - » Windows on the second floor equally spaced with aluminum louvers in the exterior wall.
  - » Illuminated exit signs with egress light capability within the suspended ceiling lights.
  - » Wall mounted portable fire extinguishers with signage where required.
- Roof:
  - » Roof ladder (with extending safety post and Occupational Safety and Health Administration (OSHA)-required fall arrest system) and hatch for roof access from the Mechanical Room.
  - » Skylights within the roof for natural light but not for equipment removal.
  - » 42-inch minimum height parapet walls with aluminum coping cap.
- Doors, Hardware, Windows, and Skylights:
  - » Doors equipped with panic hardware as required per code.
  - » Fixed windows and skylights for natural light only.
  - » Equally spaced 4-foot by 6-foot windows located 4-feet above the equipment platform on the east and west exterior walls.
  - » Equally spaced 3-foot by 5-foot skylights in two rows above the Grit Handling Room and one row above the Mechanical room.

1.5.4 Structural Design

The structural design guidelines are primarily related to the design of major structural systems and elements comprised of concrete, masonry, steel, and aluminum. This section summarizes the applicable codes and General Design Criteria of major Project elements.

1.5.4.1 Applicable Codes, Standards, and Guidelines

The following codes, specifications and standards shall apply to the related structural design.

- General Design Criteria:
  - » American Society of Civil Engineers (ASCE) 7-16, Minimum Design Loads for Buildings and Other Structures.
  - » 2018 IBC, with KC Water Amendments.
  - » OSHA and all applicable state and local codes:
- Concrete:
  - » American Concrete Institute (ACI) 301-16, Specifications for Structural Concrete.
  - » ACI 318-14, Building Code Requirements and Commentary for Reinforced Concrete.
  - » ACI 350-06, Code Requirements for Environmental Engineering Concrete Structures.
  - » ACI 350.5-12, Specifications for Environmental Concrete Structures.
  - » ACI 350.3-06, Seismic Design of Liquid-Containing Concrete Structures.
- Masonry:
  - » TMS 402/602-16, Building Code Requirements and Specification for Masonry Structures.
- Steel:
  - » American Institute of Steel Construction (AISC) 360-16, Specifications for Structural Steel Buildings.
  - » AISC 341-16, Seismic Provisions for Structural Steel Buildings.
  - » American Welding Society (AWS) D1.1-15, Structural Welding Code - Steel.
- Aluminum:
  - » Aluminum Association Design Manual 2015.
  - » AWS D1.2-14, Structural Welding Code - Aluminum.

The following references and professional organizations publish industry standards and design guidelines commonly used in design. Unless stated otherwise, the latest edition of all codes shall apply:

- ASTM International.
- American National Standards Institute (ANSI).
- ACI.
- ACI 543R-12, Guide to Design, Manufacture, and Installation of Concrete Piles.
- Concrete Reinforcing Steel Institute (CRSI) Handbook.
- AISC, 15th Edition.
- AWS.
- ANSI/AWS D1.1, Structural Welding Code.
- National Association of Corrosion Engineers (NACE).
- AWWA.
- ANSI/AWWA D100, Welded Steel Tanks for Water Storage, and NACE Standard PRO 178-89, Item No. 53041.

1.5.4.2 General Design Criteria

The following sections summarize the design criteria for the structural conceptual design grit improvements. The designed structures support and resist actions due to all applicable loads and load combinations that are estimated in accordance with the applicable building codes, design standards, and the prevailing engineering practice for the type of facility designed. The design of the structure and components use proportions as required to limit material stresses and deformations within the limits established by the applicable building code or relevant design standard.

1.5.4.3 Major Element Design Summary

See Section 1.5.3.2 for building material recommendations. We anticipate supporting the structures on deep foundations. The draft geotechnical report recommends driven H-piles, driven steel piles, auger cast concrete piles, or helical piles.

1.5.5 Building Mechanical Design

The following section summarizes the approach to HVAC, plumbing, and fire protection design for the Project facilities.

1.5.5.1 Heating, Ventilation, and Conditioning

This section presents the HVAC codes, design references, and major element design summary for the Project.

Applicable Code Summary

The following codes are applicable to the Project improvements:

- 2018 IBC, with KC Water Amendments.
- 2018 IMC, with KC Water Amendments.
- NFPA 820, latest edition.
- 2021 IECC, with KC Water Amendments.
- 2018 International Fire Code (IFC), with KC Water Amendments.

Mechanical Design Standards

Applicable sections from the following commercial standards and publications are used as design references:

- Air Movement and Control Association (AMCA).
- Air Conditioning, Heating, and Refrigeration Institute (AHRI).
- Sheet Metal and Air Conditioning Contractors National Association (SMACNA).
- ASTM International.
- American Society of Heating Refrigeration and Air Conditioning Association (ASHRAE).
- ANSI.
- National Electrical Manufacturers Association (NEMA).

Major Element Design Summary

Below is a summary of recommended building mechanical conceptual design criteria for major Project elements:

- Grit Pump Station, Utility Corridor, and Grit Handling Building ventilation at minimum rate of 6 air changes per hour (ACH) excluding the Mechanical and Electrical Rooms.
- Electrical Rooms heated and conditioned while maintaining a positive pressure of at least 0.1-inch water column (wc).
- Interior spaces adjacent to Electrical Rooms maintain a negative pressure of at least 0.1-inch wc.
- Cooling and heating units located in the Mechanical Room.
- No ducts overhead electrical equipment, cabinets, or panels.
- Wall-mounted exhaust fans.
- No rooftop HVAC equipment is permitted.
- FRP, stainless steel, or coated stainless steel duct material for HVAC.
- Based on climate data in Kansas City, Missouri, and as documented in ASHRAE Fundamentals Handbook latest edition:
  - » Summer (0.5 percent): 96 degrees Fahrenheit (°F) dry bulb, coincident 77°F wet bulb. Site elevation: 750 feet above sea level (ASL).
  - » Winter (99.6 percent): heating design dry bulb, 2 degrees.
  - » Air-cooled condensing units shall use the summer design dry bulb temperature of 105°F.
- Electrical Rooms cooled to approximately 75-80°F. ASHRAE 90.1 Energy Code requirements are applicable.
- Control Rooms and occupied spaces (if any) provided with mechanical cooling to 75°F and heating to 68°F. Compliance with ASHRAE 90.1 Energy Code is required.
- Select HVAC equipment constructed to withstand corrosion caused by Hydrogen Sulfide (H_2S).
- Energy recovery systems between the supply and exhaust systems will have zero cross contamination between the air streams.
- Outside air intake and exhaust air ventilation flow rate for all rooms and occupied spaces designed to meet NFPA 820.
- Include Go/No Go Panels at main entrance locations per NFPA 820.
- Table 1.8 summarizes the ventilation schedule for the various process areas.

Table 1.8 Conceptual Ventilation Schedule for Process Areas

Building	Area	Ventilation Type	NFPA				
			Table	Row	Ventilation Rate	Hazardous Location Class	Fire Protection
Grit Handling Building	Grit Washer and Grit Loadout Rooms	Supply Makeup Air, Exhaust Fans	6.2.2	2	NR	Unclassified	H, FE, FAS
Grit Pump Station and Utility Corridor	Interior Occupied Spaces	Supply Makeup Air, Exhaust Fans	6.2.2	2	NR	Unclassified	H, FE, FAS

Notes:
Abbreviations: FAS - fire alarm system; FE - portable fire extinguisher; H - hydrant protection; NR - no requirement.

1.5.5.2 Plumbing

The mechanical plumbing and fire protection design guidelines for the Project are summarized in this section.

Applicable Code Summary

The following codes are applicable to the Project improvements:

- 2018 IBC, with KC Water amendments.
- 2021 IECC, with KC Water amendments.
- 2018 UPC, with KC Water amendments.
- 2018 IFGC, with KC Water amendments.

Major Element Design Criteria Summary

- Equipment in contact with potable fresh water (FW) complies with 2018 UPC material requirements. Submittal of material certification in accordance with National Sanitation Foundation (NSF) 61, NSF 372, and lead-free certification by an independent ANSI third party is required.
- Floor drains equipped with trap priming line to maintain trap seal per UPC.
- Trap primers provided in wall boxes with access door located strategically to provide trap priming lines to the floor drains.
- Pipe and fitting materials selected based on the type of material or fluid conveyed and selected for longevity, durability and economy.
  - » Potable Water, Non-Potable Water, and Hot Water Supply: chlorinated polyvinyl chloride (CPVC) or 304 Stainless Steel.
  - » Drain Waste and Vent: polyvinyl chloride (PVC) and Ductile Iron.
  - » Natural Gas: Schedule 40 Black Steel.
  - » Compressed Air: 304 Stainless Steel.

1.5.6 Electrical Design

This section summarizes the electrical conceptual design for the Project, including applicable codes and references, general design criteria, and major element design criteria.

1.5.6.1 Code Summary

The following codes and their latest editions are used in the design:

- 2017 NEC - NFPA 70, with KC Water amendments.
- NFPA 70E - Standard for Electrical Safety in the Workplace.
- 2018 IBC, with KC Water amendments.
- NFPA-101 for emergency lighting.

1.5.6.2 Electrical Design Standards

The following references are used in the design:

- Institute for Electrical and Electronics Engineering (IEEE):
  - » IEEE 519, Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems.
- Illuminating Engineering Society (IES):
  - » IES, Lighting Handbook for Lighting Levels.

1.5.6.3 General Design Criteria

The following general design criteria are utilized in the electrical design of the Project.

Safety

Electrical equipment ratings need to exceed the calculated available short circuit currents to ensure the safety of plant personnel and equipment. Where transformers step down to 480 Volts (V), the maximum short circuit withstand rating of electrical equipment is 65 kiloampere (kA) or less wherever possible. A short circuit device coordination and arc-flash study is required for all equipment provided in the Project using the utility as a fixed reference. Arc flash labels are required on electrical equipment. If an existing and relevant computer-based protective device study exists, add the new equipment to the existing study. KC Water requires submittal of all computer model files in SKM format upon Project completion. Provide arc-flash mitigating equipment in accordance with NEC 240.87 requirements, as applicable.

Equipment grounding conductors are separate ground conductors routed with the non-grounded conductors and cannot rely solely on the raceway as the equipment ground conductor. Distribution systems are wye connected, solidly grounded. Resistance grounding is permitted to limit ground fault currents on medium voltage systems only.

Power Quality

Design of the BRWWTP electrical system revisions shall meet Evergy requirements and voltage and current distortion levels as specified in IEEE 519. Harmonic calculations are required during the design and field-verified through measurements when the system is commissioned. Voltage drops from source to load must be under recommended NEC limits. Variable frequency drives (VFDs) with line reactors are required as necessary to reduce harmonics.

Energy Efficiency

Transformers meet or exceed applicable Department of Energy efficiency standards. NEMA Premium Efficiency type motors are required for all applicable motors.

Future Expansion

The design shall incorporate floor space, reserve transformer capacity, spare raceways, spare positions in switchgear line-ups and power centers for known future loads. Motor control centers (MCCs) and panelboards include 20 percent usable spare space and load capacity provisions for unknown future loads.

Space Requirements

Dedicated, air conditioned, electrical rooms are provided for switchboards, MCCs, VFDs, panelboards, general purpose transformers, and similar type electrical gear. Electrical room doors are equipped with panic hardware and open in the direction of egress from the electrical room. Multiple exits at opposite ends of electrical rooms are provided as required by code and personnel safety. Equipment access space meets NEC requirements as a minimum. Equipment, anchoring, and mountings meets seismic requirements for the location.

Area Classifications

Area classification for individual areas within the Project area for modified and new construction will be identified. All exterior and hazardous or non-hazardous process areas are considered wet/corrosive and require NEMA 4X, NEMA 7, or NEMA 3R, 316 stainless steel enclosures suitable for the anticipated environment. Electrical rooms, control rooms, administrative areas and office areas are considered NEMA 12 - General Purpose.

The interior of wastewater channels, junction boxes, grit basin interiors, wet wells, and other wetted process areas are Class 1, Div 1 rated areas per NFPA 820. Areas adjacent to Class 1 Div 1 areas are subject to Class 1 Div 2 classifications per NFPA 820's envelop definition. Assume Class 1 Div 2 classification around all foul air ductwork to account for potential leakage sources.

Lighting

New lighting for the Project area is based on the following criteria.

- Energy - saving light emitting diode (LED) type luminaires, suitable for the installation environment with consistent LED color temperature 4000 Kelvin throughout the facilities.
- Lighting levels meet IBC, IECC 2021, and IES requirements. Where IES does not apply, equivalent IES lighting levels for similar types of spaces are required.
- Lighting allows staff to safely perform routine operation and maintenance activities without the use of portable, supplemental or task lighting.
- Design lighting level calculations (photometric study) using established computer program(s) for photometric studies and visual lighting software.

- Emergency luminaires meeting IBC and NFPA-101 emergency egress lighting requirements, including exterior emergency luminaires at building egress points as required and equipped 90-minute battery packs.
- Receptacles are located in process areas for utilization anywhere in the process area with the use of a 25-foot extension cord. Weatherproof and/or ground-fault circuit interrupter receptacles are required in wet areas and where required by the NEC.
- Control exterior lighting by photocell with hand-off-auto capability.
- Control interior lighting with motion control with the ability to manually over-ride the controls.

Distribution Equipment

Low voltage switchboard with integral Type 2 surge protection device (SPD) is recommended for main distribution equipment. Smaller systems (800 amperes or less) use MCCs for distribution where appropriate. Main-Tie-Main arrangements are provided with key interlocking to prevent parallel operation of switchboards and MCCs. Electrically operated power circuit breakers are used for automatic transfer schemes, except where transfer switches are used. MCCs use NEMA-rated devices.

Starters are NEMA Size 1 minimum. MCC enclosures are 20 inches deep, front access only. Panelboards use bolt-in circuit breakers. All busses are aluminum. Equipment does not rely on series ratings to meet short circuit fault requirements. Critical panelboards are fed from both the A and B sides and include a manual transfer switch between the sources. Local disconnects for equipment are provided in accordance with NEC requirements. Fused disconnects are used where calculated fault current values exceed the ratings of non-fused equipment.

Medium voltage equipment utilizes metal-clad, draw-out, and vacuum switchgear for power distribution. Metal enclosed starters utilize fused draw-out vacuum contactors and may be close coupled to the switchgear where feasible. Metal enclosed breakers or fused switches will not be used for distribution.

Motor Protection

Table 1.9 summarizes the motor protection requirements for various sized motors.

Table 1.9 Motor Protection Requirements

Motor (hp)	WDG RTD/ Thermistor	Bearing RTDs	WDG Temperature Switch	Micro-Processor Based OL	Solid State OL	Bi- Metallic Heater OL
>300 hp	Yes	Option	-	Yes	-	-
5-250 hp or Submersible Pumps > 5 hp	-	-	Yes	-	Yes	-
1-40 hp	-	-	Yes	-	Yes	-
<10 hp	-	-	-	-	-	Yes

Notes:
Abbreviations: hp - horsepower; OL - overload; RTD - resistance temperature detector; WDG- winding.

Fire Alarm, Telephones and Public Address System

The Grit Handling Facility utilizes the existing plant systems for fire alarm, telephones and public address (intercom) systems. Existing systems will be expanded as required to integrate the new facilities into the existing site.

Variable Frequency Drives

Where variable frequency drives are used, motors are inverter duty and equipped with shaft grounding rings. Insulated bearings are utilized where recommended by the driven equipment, motor and/or VFD manufacturers, but does not substitute for shaft grounding rings. dV/dT devices are installed where required by the VFD and/or motor manufacturers. VFD rated cables are utilized for VFD outputs. VFDs are not used on rewound or non-inverter duty motors. Evergy requires all soft starts on motors over 10 hp; therefore, all motors not on VFD and over 10 hp are required to have Reduced Voltage Soft Starters.

1.5.6.4 Major Element Design Criteria Summary

The following section summarizes the major electrical design elements.

Redundancy Considerations

The BRWWTP is fed from two separate Evergy substations. Blue Valley circuit 5381 is south and Hawthorne circuit 9622 is north. The 13.2 kilovolt (kV) power pen does not have space or spares available on the switchgear. It's recommended to feed the new Grit Handling Facility Substation from this electrical power pen via two existing dual 4160V feeds downstream of the 13.2kV power pen. The existing grit facility has two substations interconnected via tie breaker. The new grit facility will follow this same philosophy of redundancy. Since the existing grit facility building remains, its electrical system will remain in place.

The new facility's service feeders are routed via new parallel duct banks to the new facility location. The proposed Grit Handling Facility 4160V substation is similar in design to all other substations on the facility with a medium voltage switch on each primary feed and a tie breaker between north and south 480V switchboards. In case of an outage, each feed is capable of sustaining 100 percent load.

Per the conceptual load study, the size of the existing electrical system is sufficient to accommodate all new loads proposed in the new grit facility along with the existing Grit Handling Building remaining in service, see existing load summary below in Table 1.10.

Table 1.10 Existing Load Summary

KCPL 1200A, 13.2kV Circuit	Load Summary				
	KCPL Bill Max Demand (kW)	SKM Analysis Max Demand (kW)	Difference (%)	KCPL Circuit Max Load (kW) @ 0.8 PF	Additional Load Capacity (kW) per SKM Max Demand
CKT 5381	1,538.04	3730.6	0.59	12,672.00	8,941.40
CKT 9622	1,827.84	3747.5	0.51	12,672.00	8,924.50

Notes:
Abbreviations: A - ampere; KCPL - Kansas City Power and Light.

Basis of Design

Table 1.11 summarizes recommendations for electrical design, including voltages, and requirements for raceways, wiring, and lighting materials. For more information on existing conditions see Appendix E for the load study report.

Table 1.11 Electrical Design Basis Summary

System	Description
System Voltages	Motors over 300 hp are 4160V, unless 460V is required due to special circumstances. Lighting is 120 VAC. MCCs are 480V, 3 phase, 3 wire (solidly grounded wye). Panelboards are 480V, 3 phase, 3 wire (solidly grounded wye) or 120/208V, 3 phase, 4 wire, as applicable. 120/240V, 1 phase, 3 wire transformers and panelboards are necessary only if necessary to meet special equipment needs.
	In accordance with NEC recommendations.
Conductor Ampacity	In accordance with NEC requirements.
Power Factor	Correction as required to maintain an overall 95 percent power factor or better if required to avoid utility power factor penalty charges. Closely coordinate correction with harmonic generating loads to avoid resonant conditions.
Equipment Fault Duty Ratings (minimum)	480V switchgear and MCC - 65kA. Higher ratings to be used if higher fault currents are encountered.
Cables	Low voltage - stranded copper conductors, XHHW-2, except for VFD outputs, use low capacitance VFD-rated cables. Use 75 degree ampacity ratings, maximum. Low voltage Instrumentation - twisted pair, individual/overall mylar shielded, PVC-jacketed, black/white 600V (similar to Belden 8719).
	Medium voltage power - stranded copper, tape shield, EPR insulation, single conductor, type MV-105 (using 90 degree ampacities).
	Fiber optic, communications, etc., - specialty cables as required.
Raceways	Exposed conduit - PVC coated rigid.
	Exposed conduits in wet area - PVC coated rigid.
	Indoor conduit - Rigid galvanized steel.
	Concrete embedded conduit - PVC Schedule 40 with FRP or PVC coated rigid steel where the conduits emerge from encasement. Use PVC coated rigid galvanized steel where emerging into hazardous areas.
	Cable tray - aluminum ladder type.
	Conduits in reinforced duct bank - PVC Schedule 40.
Lighting System	All Areas - LED Type.

Notes:
Abbreviations: VAC - volts alternating current.

Power Monitoring Requirements

Key electrical parameters are sent to plant supervisory control and data acquisition (SCADA). Historical sequence of events and power quality records are accessed at the Multilin relay when needed.

Electrical Coordination, Short Circuit and Arc-Flash Studies

The electrical contractor shall prepare power system reports for the Project, including short circuit calculations, a protective device coordination study, a harmonic analysis, and an arc flash study in accordance with KC Water standards. The studies shall include all portions of the electrical distribution system for normal and standby power sources. The studies shall include all equipment operating at 208V and above. The analyses shall include an evaluation of harmonic distortion and the furnishing and installation of filters and any other equipment as may be required to meet the requirements of IEEE 519 Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems. Prepare all studies and reports utilizing SKM software.

Fire Detection and Alarm

Existing plant systems are used as the basis for design of fire alarm, telephones and public address (intercom) systems. Expand existing systems, if required, to integrate the new facilities into the existing site.

1.5.7 Instrumentation and Control Design

This section defines the general design requirements for the instrumentation and control (I&C) equipment for the Project. The I&C system provides for protection of personnel and equipment, reliability, redundancy, automation and remote indication and control.

1.5.7.1 Applicable Codes and Standards

The I&C Design conforms to the following codes and standards.

- International Society of Automation (ISA):
  - » Automation, Systems, and Instrumentation Dictionary, Fourth Edition.
  - » ISA 18.2 - Alarm Management.
  - » ISA 88 - Process Modeling.
  - » ISA 95 - Enterprise/Control Integration (B2MML).
  - » ISA 99 - Industrial Automation and Control Systems Cybersecurity (also known as ISA/IEC 62443.
  - » ISA100 - Wireless Systems for Automation.
  - » ISA101 - Human Machine Interfaces for Process Automation Systems.
- NFPA 70.
- Federal Communications Commission (FCC) Part 15 - Class A (digital computing devices).
- NEMA Enclosures for Electrical Equipment (1000V Maximum) (NEMA 250).
- National Institute of Standards and Technology (NIST) Cyber Security Framework 800-53, 800-82, 800-30.
- Underwriters Laboratory, UL 508 - Industrial Control Equipment.

1.5.7.2 General Design Criteria

The BRWWTP's SCADA system was recently upgraded and a new set of standards was developed as part of that project. The I&C conceptual design for this project is based on the KC Water, Wastewater SCADA

System Standards, Technical Memorandum 4, Rev 0, August 2023. Instrument and equipment tagging is based on KC Water asset management tagging guidelines and will develop as the design progresses.

1.5.7.3 Major Element Design Summary

The following section summarizes the major I&C design elements.

SCADA Connectivity

A new SCADA panel is recommended for installation in the Grit Handling Building's Electrical Room. This panel will be integrated into the plant SCADA system by connecting it to the plant fiber loop at the fiber patch panel within the South Sludge House SCADA panel, located north of the new grit facility, and to the fiber patch panel within the Blue River Pump Station SCADA panel, located south of the new grit facility. The intent is to avoid connecting into the existing grit facility SCADA panel, in the event this building is demolished in the future.

The new Grit Handing Building SCADA panel will have an Allen-Bradley ControlLogix PLC, Allen-Bradley Stratix Layer 2 Ethernet switch, fiber patch panel, uninterruptible power supply (UPS) and an Allen-Bradley Panelview Operator Interface Terminal (OIT). The Ethernet switch connects to the grit washer vendor supplied control panels. Incorporation of other panel requirements are based on the KC Water SCADA Standards.

The grit washer vendor supplied control panels will have an Allen-Bradley CompactLogix PLC, industrial Ethernet switch, UPS and an Allen-Bradley Panelview OIT. The vendor is responsible for the control of the grit washer. The SCADA integrator is responsible for integrating the communication interface into the plant SCADA system.

A preliminary SCADA Architecture diagram is shown on Drawing Y01 in Appendix F.

Control Philosophy

Grit Channels:

- The proposed grit system consists of eight channels, eight grit tanks, two bypass channels, and an effluent diversion box. Each slide gate is equipped with a motor operated actuator. The gate to the CSO treatment are modulating with all other gates having discrete open/close operation. The process and instrumentation diagram (P&ID) for the grit channels is shown on Drawing Y02 in Appendix F.
- The plant operators will manually select the operational channels based on influent flow or storm events and to direct effluent flow, either to the primary clarifiers, CSO treatment, or both.
- LOCAL - Local monitoring and control is available at the integral gate actuator. The actuator has selector switches to select local/remote operation and to open/close the gate manually. Lights are provided to monitor open/close status of the valve.
- REMOTE MANUAL - Remote monitoring and control is available at the SCADA OIT. The OIT displays "Valve Open/Close" and "Local/Remote" status. For modulating gates, "Percent Open" is displayed. If the operator selects MANUAL mode at the OIT, the operator can manually open/close the gates individually and select the gate position percentage at the OIT.
- REMOTE AUTO - If the operator selects AUTO mode at the OIT, the influent gates are opened/closed based on the grit tank/bypass channel/effluent flow path selected at the OIT. The gates will

automatically open for the corresponding flow path. Alternatively, if a grit tank/bypass channel/effluent flow path is taken out of service, the corresponding gates will close.

- ALARMS - If a gate fails to open (or close) for the selected flow path, the system will be alarmed.
- INTERLOCKS - The following interlocks are integrated into the system:
  - » Selection of the grit tank being placed into service is interlocked with the corresponding grit pump.
  - » If there is not an adequate number of grit channels open for the flow as reported at the Blue River Pump Station, the system will be alarmed.
  - » The Primary Clarifiers and/or CSO Treatment need to be online/available to accept the flow based on the path selected or the system will be alarmed.
  - » Both grit tanks/pumps are required to be out of service to close the influent channel common inlet gate.
  - » If a gate fails to open, the downstream equipment will not be allowed to start.

Grit Pumps:

- The proposed grit system has eight grit pumps, one dedicated to each grit basin. The grit pumps are constant speed and controlled by motor starters located in the MCC in the electrical room. The P&ID for the grit pumps is shown on Drawing Y03 in Appendix F.
- INSTRUMENTATION - The following instrumentation is recommended:
  - » Motor thermostats - thermostats will alarm on high motor temperature.
  - » Pressure switches - switch will alarm on low suction pressure or high discharge pressure.
  - » Pressure gages - local gage will display pressure at the pump suction and discharge.
- Solenoid valve/flow switch - a solenoid valve will open/close to allow flow from the plant water system; the flow switch will monitor if plant water flow is low. One solenoid valve/flow switch will be used for fluidizing water for the grit tank; one solenoid valve/flow switch will be used for pump seal water.
- LOCAL - Local monitoring and control is available at a pump local control station or at the motor starter. The local control station has indicating lights that monitor pump running and off conditions. The local control station has a selector switch to select local/remote operation and pushbuttons to start/stop the pump. An E-stop pushbutton is mounted on the local control station for stopping the pump in an emergency.
- REMOTE MANUAL - Remote monitoring and control is available at the SCADA OIT. The OIT displays "Pump Running", "In Remote" and "In Local" status. If the operator selects MANUAL mode at the OIT, the operator can manually start/stop the pump at the OIT.
- REMOTE AUTO - If the operator selects AUTO mode at the OIT, the grit pump will automatically start/stop based on the grit tank selected. The grip pump runs either continuously or on a timer.
- ALARMS - Low suction pressure, high discharge pressure, high motor temperature switches, fluidizing/seal water flow switches are hard-wired interlocked to trip the pump. A "Common Fail" signal will be transmitted to the OIT if one of these conditions exists. "Motor Overload" and "E-stop" signals will be individually sent to the OIT.
- INTERLOCKS - The system has the following interlocks:

- » If the pump is called to run, the motor starter opens the solenoid valves for the plant water to the grit tank and pump seal water system.
- » The grit pump is interlocked with the downstream grit washer. If the grit pump is called to run, the corresponding grit washer is called to start. Alternatively, if the grit pump is called to stop, the grit washer is called to stop.
- » If there is a grit washer fault, the grit pump is called to stop and the system is alarmed.
- » Operation of the grit pumps and washers are interlocked with the upstream gates.
- » System to verify that a truck is in place prior to starting operation.

Grit Washers:

- The proposed grit system has eight grit washers, one dedicated to each grit basin and grit pump. The grit washers are controlled via a vendor control panel located next to the washers. This panel houses a PLC that monitors and controls the motors and instrumentation within the equipment package. The P&ID for the grit washers is shown on Drawing Y04 in Appendix F.
- INSTRUMENTATION - The following instrumentation is provided by the grit washer vendor:
  - » Motor thermostats - thermostats will alarm on high motor temperature.
  - » Washer level transmitter - pressure probe in the washer tank will monitor grit bed level.
  - » Over torque switch - screw conveyor will shut down on a high torque condition.
  - » Truck weight transmitter - sensor will monitor that a truck is in place; an alarm will occur if the truck weight is high.
  - » Solenoid valve/flow switch - a solenoid valve will open/close to allow flow from the plant water system; a flow switch will monitor if plant water flow is low.
- LOCAL - Local monitoring and control is available at the vendor control panel OIT. The operator can manually control the motors and valves from the OIT. An E-stop pushbutton will be mounted locally at the washer and at the loadout truck to stop operation in an emergency.
- REMOTE MANUAL - Remote monitoring and control is available at the SCADA OIT. The OIT displays washer and screw conveyor "Running" and "Off" status. If the operator selects MANUAL mode at the OIT, the operator can manually start/stop the washer. A system "Run" or "Stop" signal will be sent to the vendor control panel.
- REMOTE AUTO - If the operator selects "System in AUTO" mode at the SCADA OIT, the washer operation is controlled based on the status of the upstream grit pump.
- ALARMS - High motor temperature, tank level high, over torque, plant water low flow, and E-stop signals will shut down the washer and an alarm will be sent to the OIT.
- INTERLOCKS - The following interlocks are integrated into the system:
  - » The grit washer is interlocked with the upstream grit pump. If the grit pump is started, the corresponding grit washer is called to start. Alternatively, if the grit pump is called to stop/fails, the grit washer is called to stop.
  - » If the washer stops/fails, the upstream grit pump is called to stop.
  - » If a truck is not in place as determined by the weight transmitter the washer is not allowed to start.
  - » The ability to change setpoints in the vendor provided control system is available from the SCADA OIT.

General Monitoring:

- SCADA PANEL MONITORING - The SCADA panel is monitored for Loss of Control Power, On UPS Power and UPS Low Battery/Fail.
- NFPA 820 REQUIREMENTS - The grit pump area requires a fire alarm system according to NFPA 820, Table 6.2.2.(a), Row 2. The fire alarm control panel will send Trouble, Fail, and Supervisory signals to the plant SCADA system.
- HVAC AND PLUMBING - Monitoring and alarms are provided for miscellaneous building equipment, such as sump pump running/level high, air compressor running/fail, HVAC fail. These signals will be determined as the design progresses.
- ELECTRICAL - Power monitors are provided in the new switchgear and MCC to monitor the incoming power, voltage, current and frequency at a minimum for each power feed. The power monitors will communicate with the SCADA system over Ethernet IP.

1.6 Envision™ Assessment

Envision is an infrastructure framework developed by ISI, the Institute for Sustainable Infrastructure, first released in 2012. The framework is used to guide project planning and development and rate project success in five different categories: Quality of Life, Leadership, Resource Allocation, Natural World, and Climate and Resilience. The intent behind Envision is to support "higher performance through better choices in infrastructure development".

In 2014, Kansas City passed Resolution 140859 supporting incorporation of the sustainable principles outlined in Envision on all City projects. While the original Envision Framework is useful, the organization and amount of detail presented can sometimes cause the focus to shift from promoting sustainability to earning points. In response, KC Water developed the Sustainability Playbook which organizes Envision credits and concepts in an easy-to-use format based on project type, size, scope, and sustainable opportunities. The Sustainability Playbook includes a Conversation Guide to be used through project planning, design and construction and a tiered credit assessment to give the project an internal sustainability rating.

1.6.1 Sustainable Project Management

Sustainability has been an integral part of the Grit System Upgrades project since it began. The project team met in early 2024 to hold a Design CAMP. The Carollo Design CAMP approach optimizes stakeholder participation, encourages decision making, solidifies process criteria, and critically evaluates the design. Through a facilitated approach, the combined experience of key personnel from KC Water, Carollo, and other specialists was leveraged over a two-day, concentrated effort to accelerate project development. Goals for efficiency, future needs, and increased community benefit were established on the first day of the CAMP, allowing everyone to agree on the core sustainable aspects of the project and explore additional sustainable options where feasible.

In the 2024 Grit System Improvements Report, evaluations were conducted on the process, vortex equipment, and grit handling alternatives. Factors such as capital cost, level of O&M, equipment life, footprint, energy and water usage, efficiency, hauling volume and frequency, amount and size of grit removed, and odor were all considered as part of the selection process. A detailed evaluation like this

demonstrates commitment to finding truly sustainable options that best meet all the stakeholders' needs, now and in the future, versus simply doing what has been done before.

In March 2024 a sustainability meeting was held to review the various sustainable decisions that had been made and discuss additional options for future investigation. Since the Design CAMP strongly supports the Envision principles of collaboration and stakeholder engagement and the project alternatives had already been evaluated based on multiple factors, the team's Envision Sustainability Professional primarily used the KC Water Conversation Guide to document efforts that had already been made. However, there were several additional ideas discussed including options for stormwater management onsite, non-potable water use, and recycled content specifications.

1.6.2 Tiered Sustainable Assessment

Per the Sustainability Playbook "a Tier 1 evaluation focuses on predetermined Envision credits based on project type and sets the baseline for sustainability". A KC Water project can still experience the benefits of an Envision sustainability evaluation without the extensive time and cost commitments. Tier 1 is meant to inspire Project Managers to do more than business-as-usual with their projects, with a primary focus on the planning, pre-design, and design phases."

For a facility project Tier 1 Sustainability Assessment there are 19 pre-selected Envision credits that have a total of 79 assessment questions. During the assessment, the questions are reviewed and a verbal response, citing examples and references, is developed for each credit. Twenty-two of the questions were marked not applicable (N/A) for the Grit System Upgrades project, meaning they were outside the scope and scale of the project. Forty-seven questions were marked "Yes", indicating that the sustainable action or consideration described had been incorporated into the project. Five questions (for four credits) were answered with a "No" indicating that the team did not pursue the measures described in the question. Additional explanations for those credits are provided below. Five were incomplete, indicating they are awaiting a decision from the design team or could not be determined until later in the design process. The Tier 1 Sustainability Assessment can be found in Appendix G.

1.6.2.1 RA1.2 - Use Recycled Materials

The intent of this credit is to set minimum recycled percentages for project materials. The City allows specifications to require 50 percent recycled asphalt; however, these specifications have not yet been written. Other components that may use potentially recycled materials have also not yet been identified.

1.6.2.2 RA1.5 - Balance Earthwork on Site

The intent of this credit is focused on minimizing the movement of soils and other excavated materials off site. Based on the current design, the grade will be slightly raised to encourage positive drainage, however the amount of cut/fill has not yet been determined.

1.6.2.3 RA3.1 - Preserve Water Resources

The intent of this credit is to reduce the negative net impact on fresh-water availability, quality, and quantity at a watershed scale, which the project does positively impact by supporting efficient operation at the BRWWTP and efforts to reduce or eliminate CSOs. However, some of the assessment questions are outside the scope of this project.

1.6.2.4 CR1.2 - Reduce Greenhouse Gas Emissions

The intent of this credit is to reduce greenhouse gas emissions during project operation. At the time of the assessment, there was no significant difference in energy consumption for the grit alternatives, so the project is not able to demonstrate a reduction in energy use or emissions at this time. Since the project utilizes energy to power the equipment this credit cannot be marked as N/A. Further exploration of this element is recommended following a more detailed load study.

Figure 1.25 summarizes the assessment results.

Facilities Results

			Credit Assessment Status	Assessment Questions			
				Yes	No	N/A	Incomplete
Quality of Life	Wellbeing	QL1.2 Enhance Public Health & Safety	Assessed	6	0	0	0
		QL1.4 Minimize Noise & Vibration	Partially Assessed	2	0	3	0
Leadership	Collaboration	LD1.2 Foster Collaboration & Teamwork	Assessed	4	0	0	0
		LD1.3 Provide for Stakeholder Involvement	Partially Assessed	5	0	1	0
	Planning	LD2.2 Plan for Sustainable Communities	Assessed	5	0	0	0
	Economy	LD3.3 Conduct a Life-Cycle Economic Evaluation	Assessed	5	0	0	0
Resource Allocation	Materials	RA1.2 Use Recycled Materials	Assessed	0	1	0	0
		RA1.5 Balance Earthwork On Site	Assessed	0	1	0	0
	Energy	RA2.1 Reduce Operational Energy Consumption	Partially Assessed	1	0	0	1
	Water	RA3.1 Preserve Water Resources	Assessed	4	2	0	0
		RA3.2 Reduce Operational Water Consumption	Not Assessed	0	0	0	4
Natural World	Siting	NW1.1 Preserve Sites of High Ecological Value	Partially Assessed	1	0	5	0
		NW1.4 Preserve Undeveloped Land	Not Assessed	0	0	2	0
	Conservation	NW2.2 Manage Stormwater	Assessed	4	0	0	0
		NW2.4 Protect Surface & Groundwater Quality	Partially Assessed	3	0	3	0
	Ecology	NW3.3 Maintain Floodplain Functions	Partially Assessed	2	0	3	0
Climate and Resilience	Emissions	CR1.2 Reduce Greenhouse Gas Emissions	Partially Assessed	0	1	1	0
		CR1.3 Reduce Air Pollutant Emissions	Not Assessed	0	0	4	0
	Resilience	CR2.6 Improve Infrastructure Integration	Assessed	5	0	0	0

Credit Assessment Status	Assessment Questions			
	Yes	No	N/A	Incomplete
3 Not Assessed	47	5	22	5

Figure 1.26 Envision Grit Facility Results

1.7 Cost Estimate Summary

An opinion of probable construction cost for grit improvements as outlined above for Grit Alternative No. 2 was developed. The total estimated construction cost for the Project is approximately $90.1 Million based on the design criteria summarized in Appendix H. This cost includes estimated direct construction costs and indirect construction cost factors including estimating contingency, contractor general conditions, and contractor overhead and profit for grit improvements. Costs for screening and influent pump improvements are not included in the cost. All cost estimates are planning-level estimates with an expected accuracy rate of -30 percent to +50 percent based on AACE Class 4 estimate. Annual O&M costs were developed based on power, consumables, and replacement costs. Net present value estimates assumed a 20-year life cycle and a net discount rate of 3 percent.

Table 1.12 Grit Improvements Cost Summary

Alternative	Total Capital Cost	Total Annual O&M Cost	20-Year O&M Net Present Value	Total Net Present Value
Grit Alternative No. 2	$90,100,000	$690,000	$10,300,000	$100,400,000

1.8 Recommendations

Grit Alternative No. 2 is conceptually designed with flexibility for future expansion in the event influent wet weather flows increase as part of the current facility plan flow and load analysis. This will allow KC Water sufficient capacity to provide grit removal for screened mainstream and wet weather liquid streams. Larger, regional preliminary treatment facilities are more cost effective than dispersed treatment facilities for capital and O&M costs. Discussions for possible repurposing of existing grit facilities are ongoing and will be captured in the ongoing facility planning efforts.

The intense level of maintenance required to keep the existing grit removal system operational, coupled with its relatively poor performance is driving the need to upgrade the grit removal system as soon as possible. Immediate grit removal performance will be a benefit to the new biosolids THP system which is planned for substantial completion in 2025. For these reasons, KC Water is undertaking the grit removal system upgrades while sizing for future flow requirements.

The future flow requirements considered include:

1. The City's Consent Decree requires construction of additional wet-weather primary treatment facilities by 2035.
2. KC Water is evaluating consolidation of treatment facilities which would include some flow from the Birmingham WWTP being conveyed to the BRWWTP primary treatment facility.

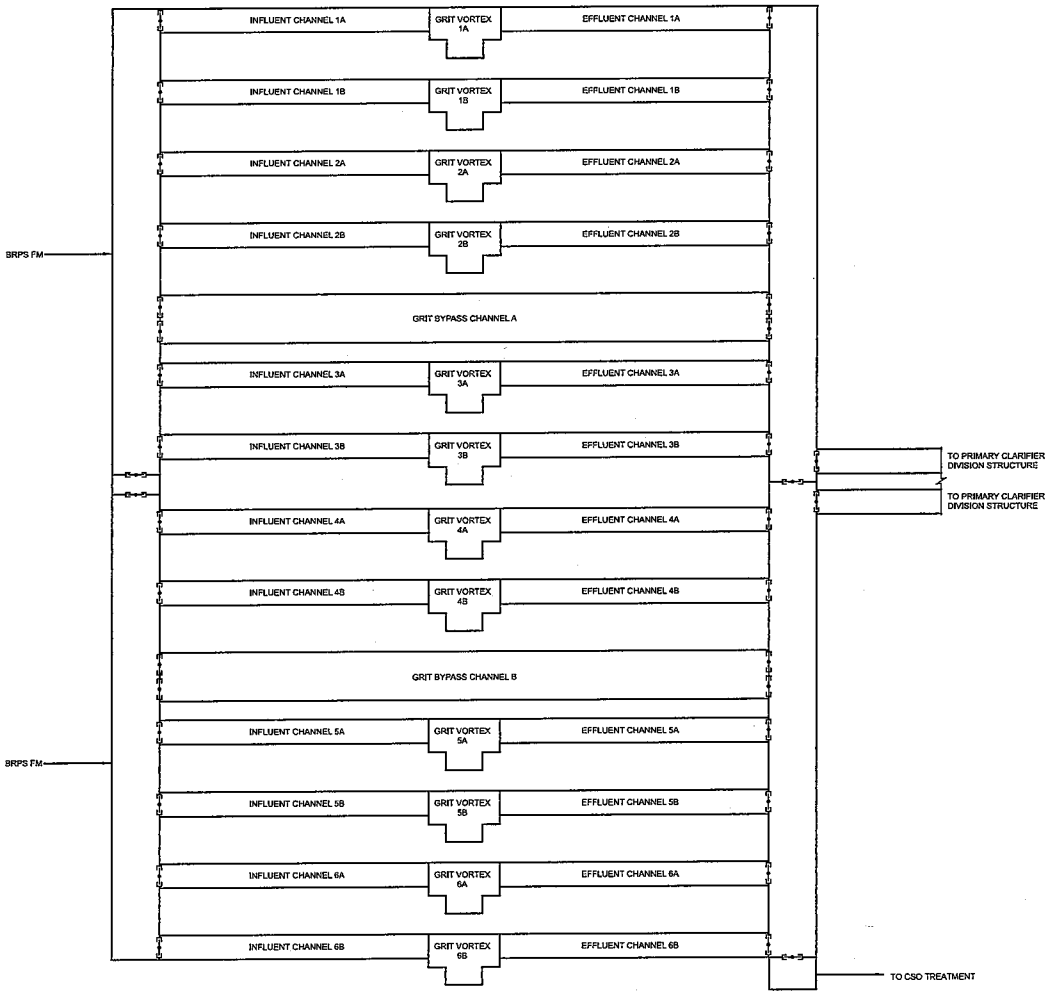
1.8.1 Next Steps

The following steps are recommended for the Grit System Improvements project:

1. Complete an evaluation for upstream screening improvements which may include existing screen replacement with finer screens or the addition of finer screens in a new screening facility downstream of the existing influent pumps and upstream of grit removal to accommodate Headcell's® screening requirements.
2. Complete an evaluation of the influent pumps to determine if improvements are necessary based on the higher operating water surface of the proposed grit system and the ultimate location of the new fine screens.
3. Complete a grit characterization study to aide in the preliminary design of the new grit removal basins and grit handling and washing equipment.
4. Coordinate with CSO project for hydraulic requirements.

APPENDIX A

GRIT ALTERNATIVE NO. 1 - DIAGRAMS AND FIGURES



GENERAL NOTES:

1. NOT ALL VALVES, PIPING, AND APPURTENANCES SHOWN.

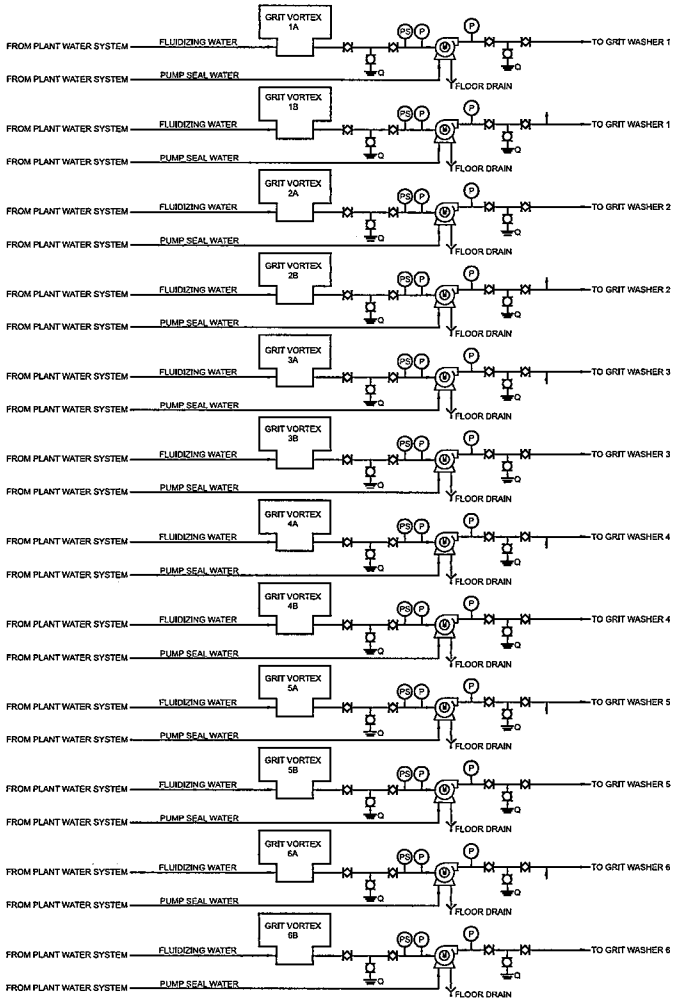
KC WATER BRWWTP
GRIT SYSTEM UPGRADE PROJECT

GRIT ALTERNATIVE NO. 1

PROCESS FLOW DIAGRAM
GRIT REMOVAL

carollo

User: svcPW Plot Date: 19-JAN-2024 7:08:16 AM File: E:\ICS\forPDFWorking\9747\0277707_5\202359_FIG 1.dgn



GENERAL NOTES:

1. NOT ALL VALVES, PIPING, AND APPURTENANCES SHOWN.

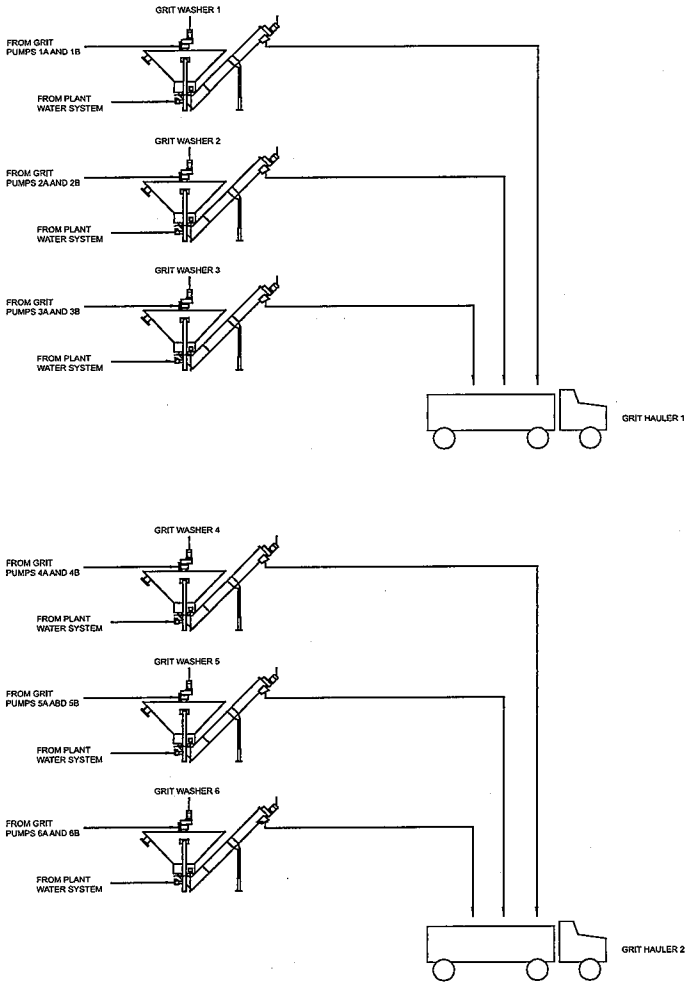
KC WATER BRWWTP
GRIT SYSTEM UPGRADE PROJECT

GRIT ALTERNATIVE NO. 1

PROCESS FLOW DIAGRAM
GRIT PUMPING

carollo

User: svcPW Plot Date: 19-JAN-2024 7:08:36 AM File: E:\ICS\forPDFWorking\9747\277707_6\202359_FIG 2.dgn



GENERAL NOTES:

1. NOT ALL VALVES, PIPING, AND APPURTENANCES SHOWN.

KC WATER BRWWTP
GRIT SYSTEM UPGRADE PROJECT

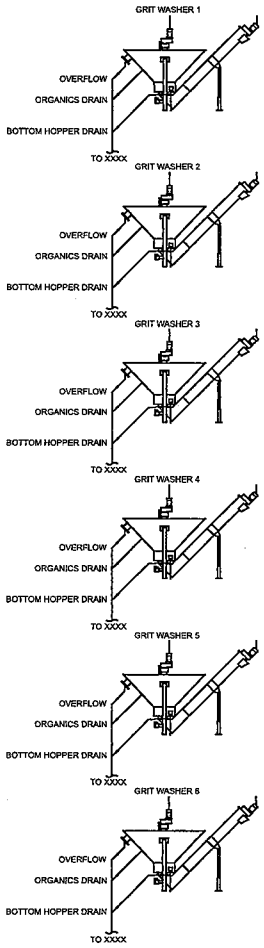
GRIT ALTERNATIVE NO. 1

PROCESS FLOW DIAGRAM
GRIT HANDLING - WASHERS

carollo

User: svcPW Plot Date: 19-JAN-2024 7:09:13 AM File: E:\ICS\forPDFWorking\9747\277707_14\202359_FIG 3.dgn

User: svcPW Plot Date: 19-JAN-2024 7:08:40 AM File: E:\ICS\forPDFWorking\9747\0277707_8\2023359_FIG 4.dgn



GENERAL NOTES:

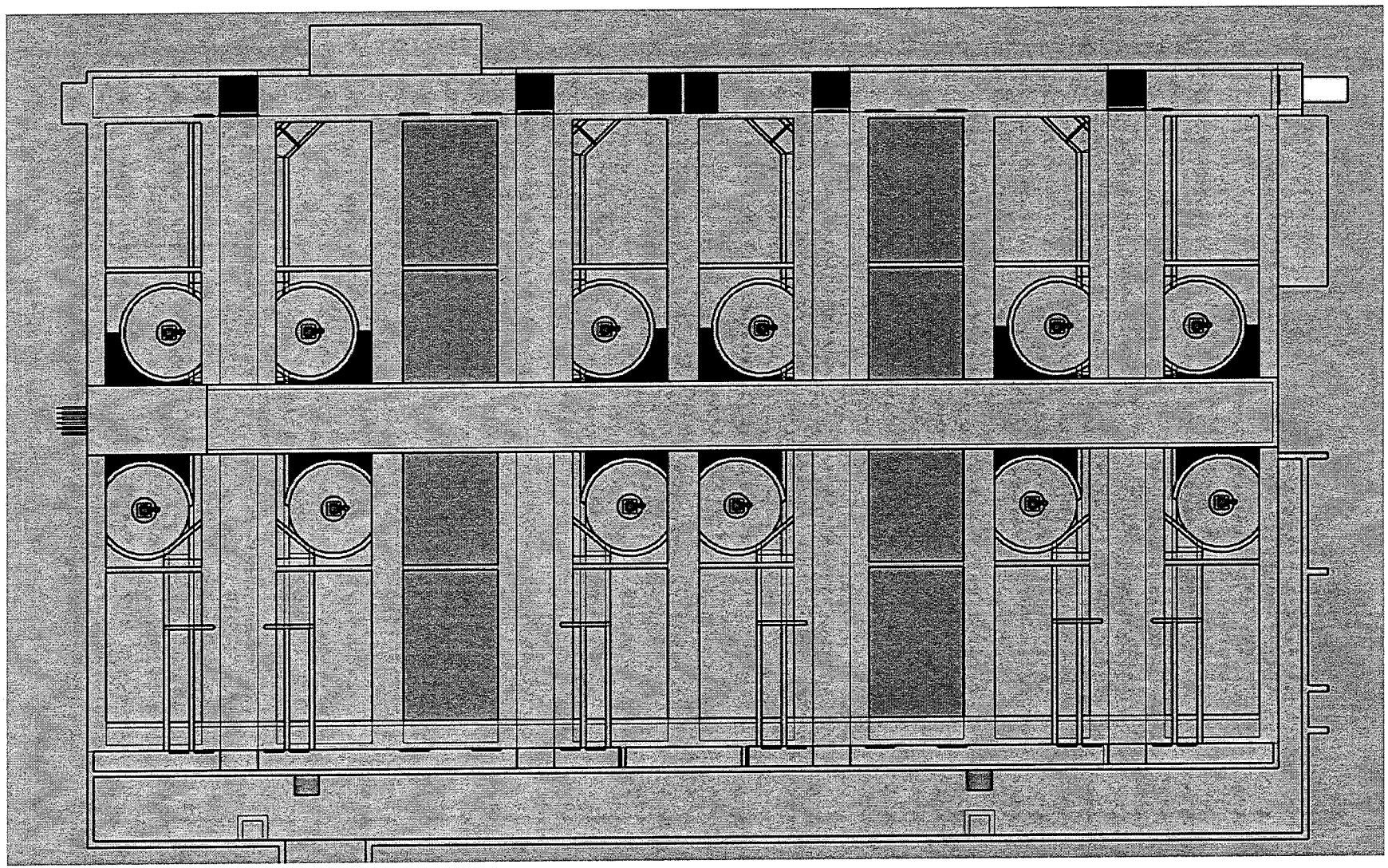
1. NOT ALL VALVES, PIPING, AND APPURTENANCES SHOWN.

KC WATER BRWWTP
GRIT SYSTEM UPGRADE PROJECT

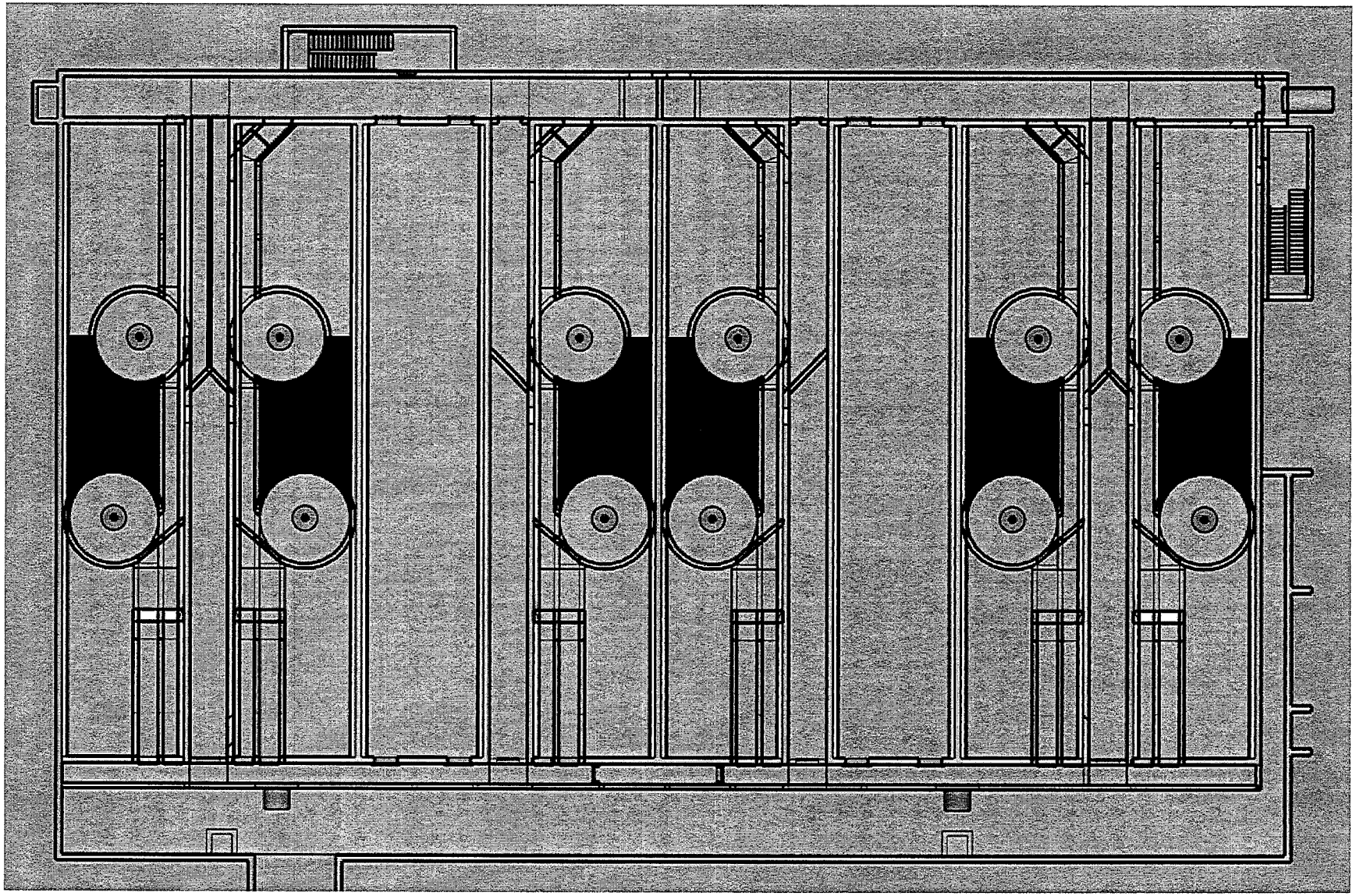
GRIT ALTERNATIVE NO. 1

PROCESS FLOW DIAGRAM
GRIT HANDLING - DRAINAGE

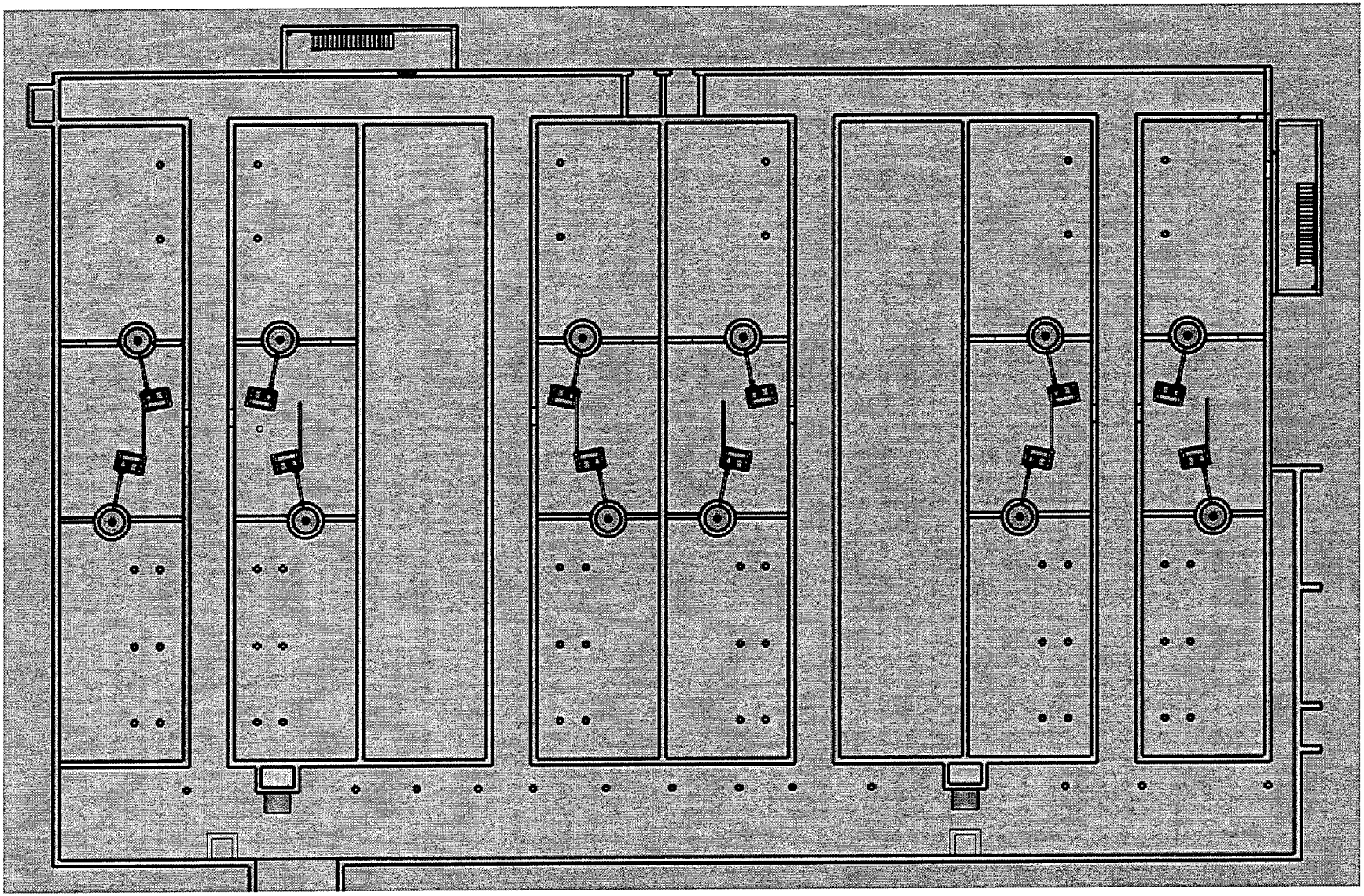
carollo



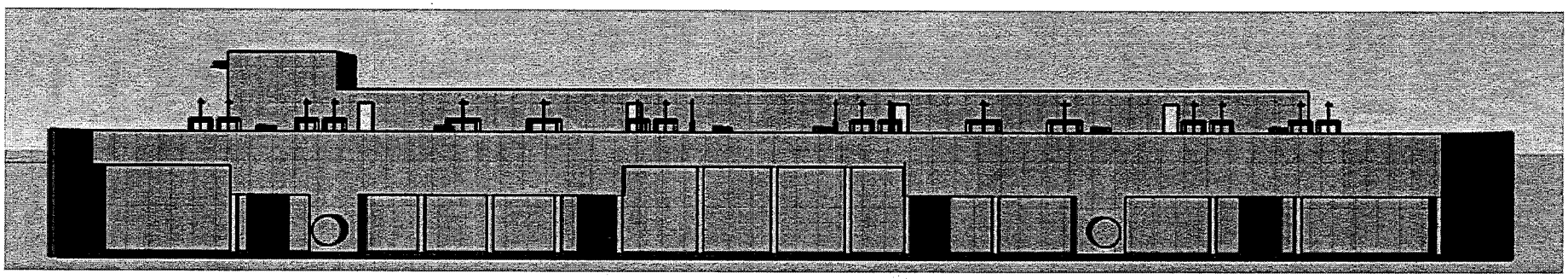
GRIT ALT NO. 1 - BASIN PLAN VIEW DECK LEVEL



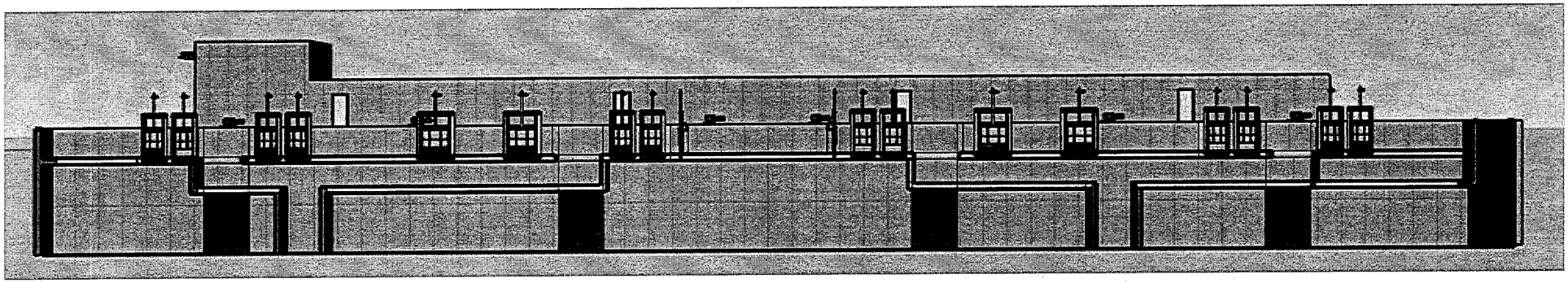
GRIT ALT NO. 1 - BASIN PLAN VIEW INTERMEDIATE LEVEL



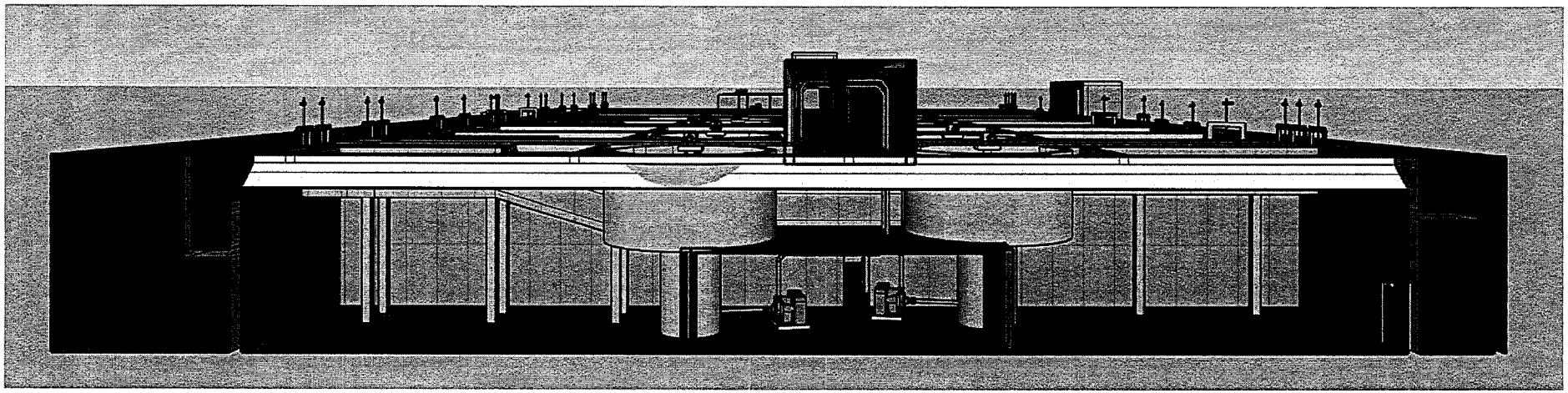
GRIT ALT NO. 1 - BASIN PLAN VIEW LOWER LEVEL



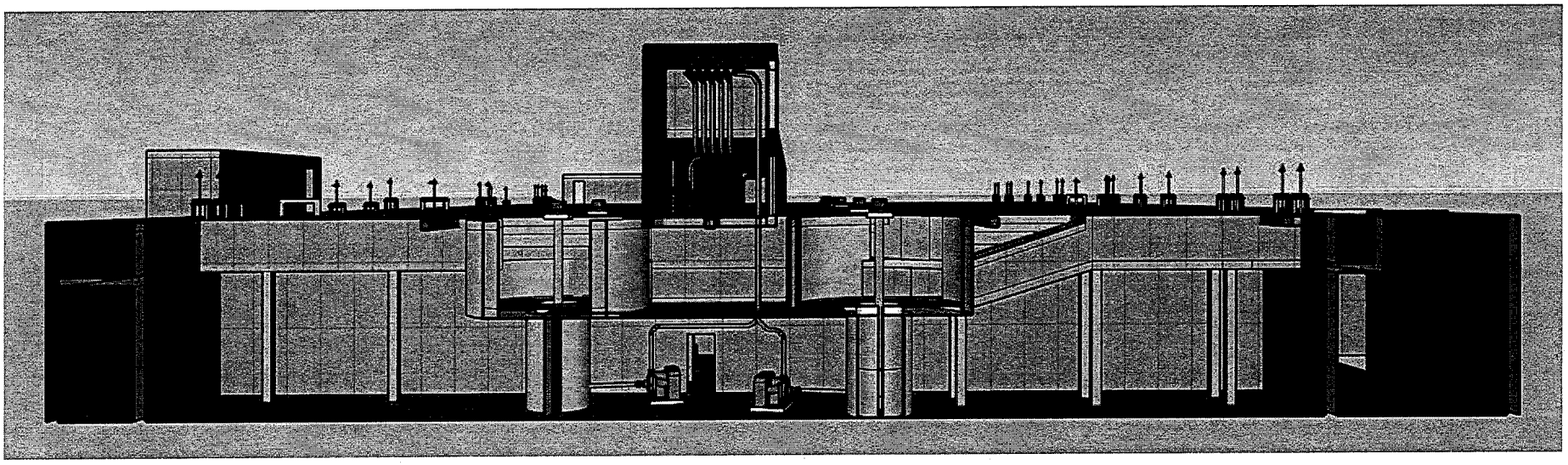
GRIT ALT NO. 1 - INFLUENT SECTION VIEW



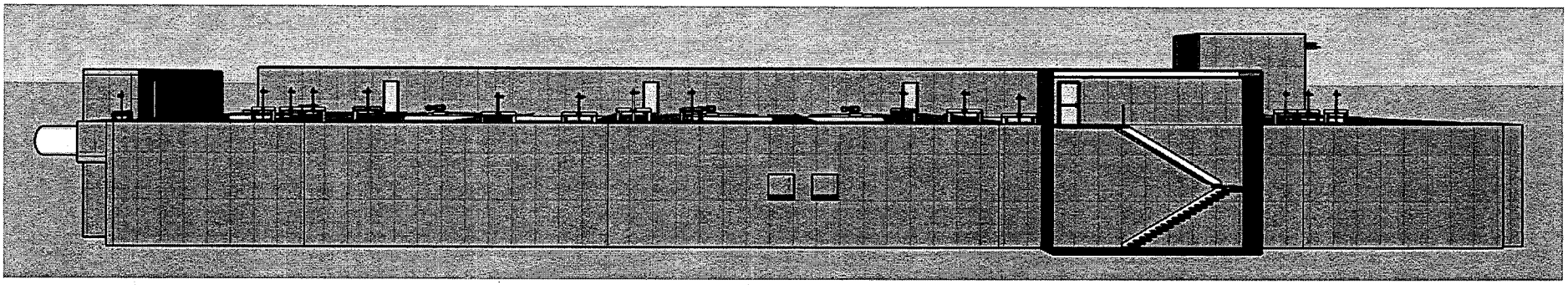
GRIT ALT NO. 1 - INFLUENT CHANNEL SECTION VIEW



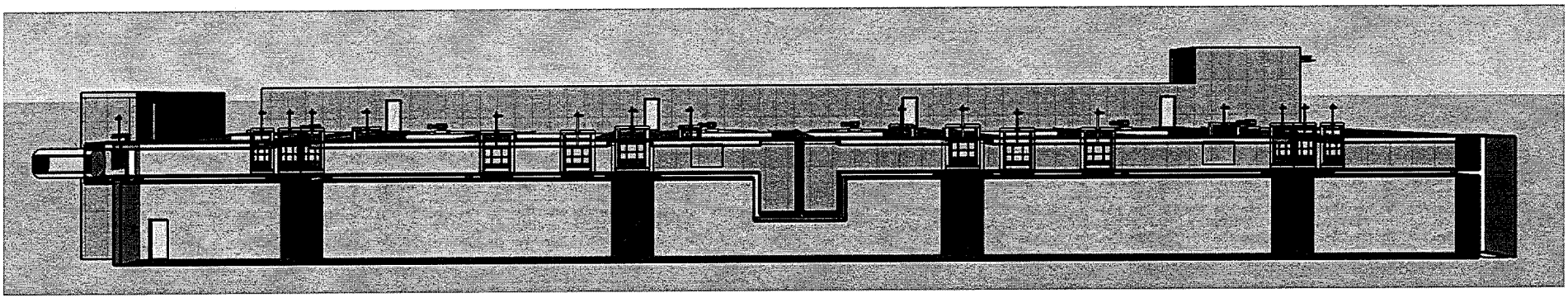
GRIT ALT. NO. 1 - SECTION VIEW LOOKING WEST



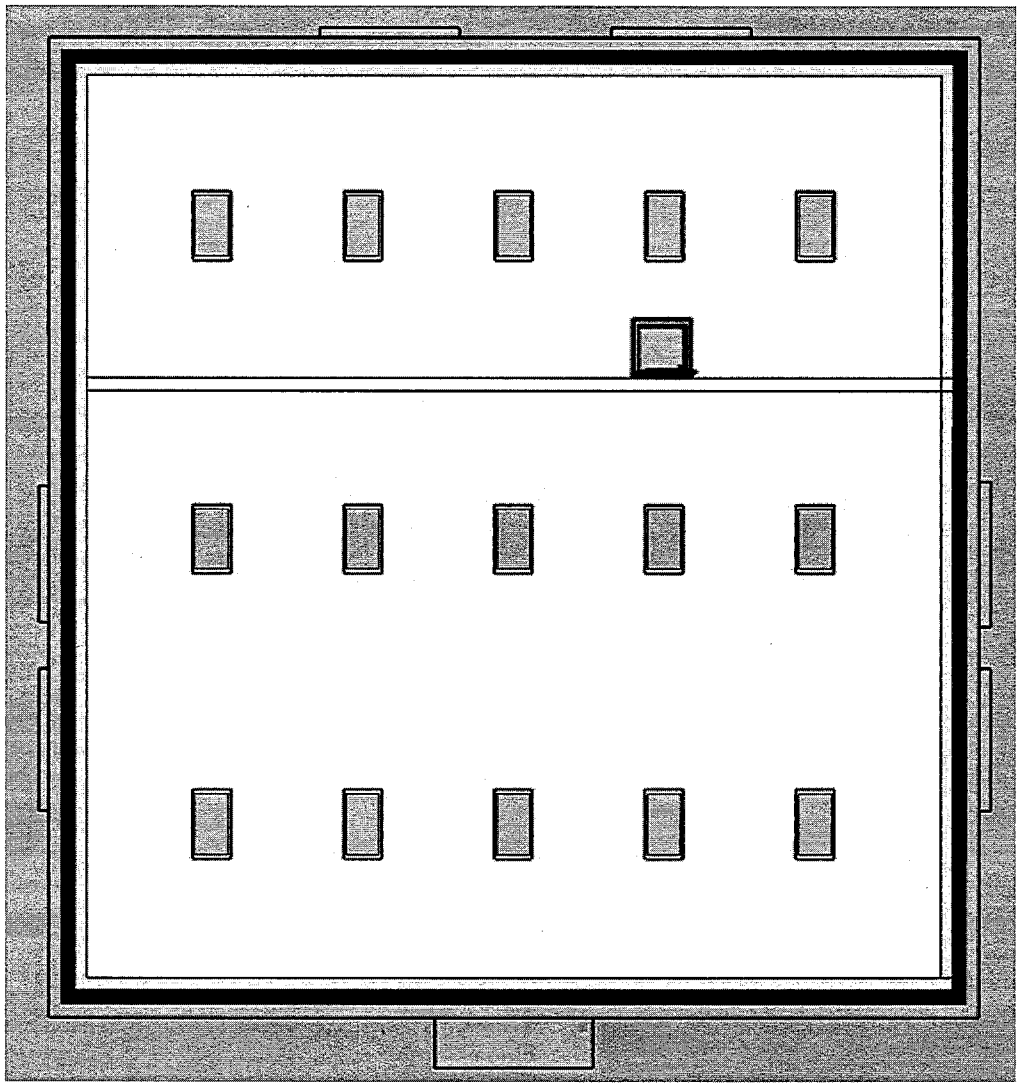
GRIT ALT. NO. 2 - SECTION - LOOKING EAST



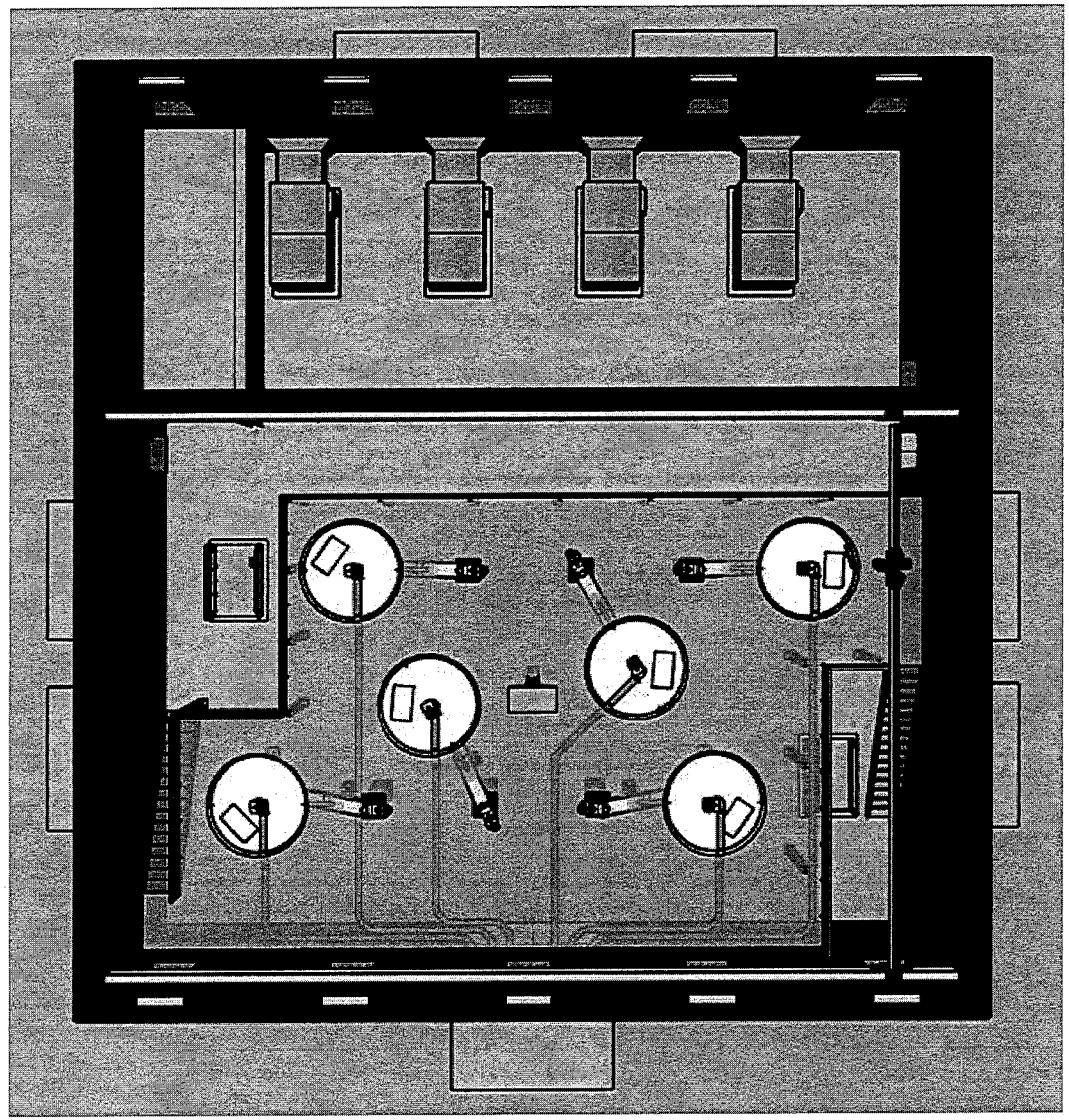
GRIT ALT. NO. 1 - EFF CHANNEL EXTERIOR VIEW



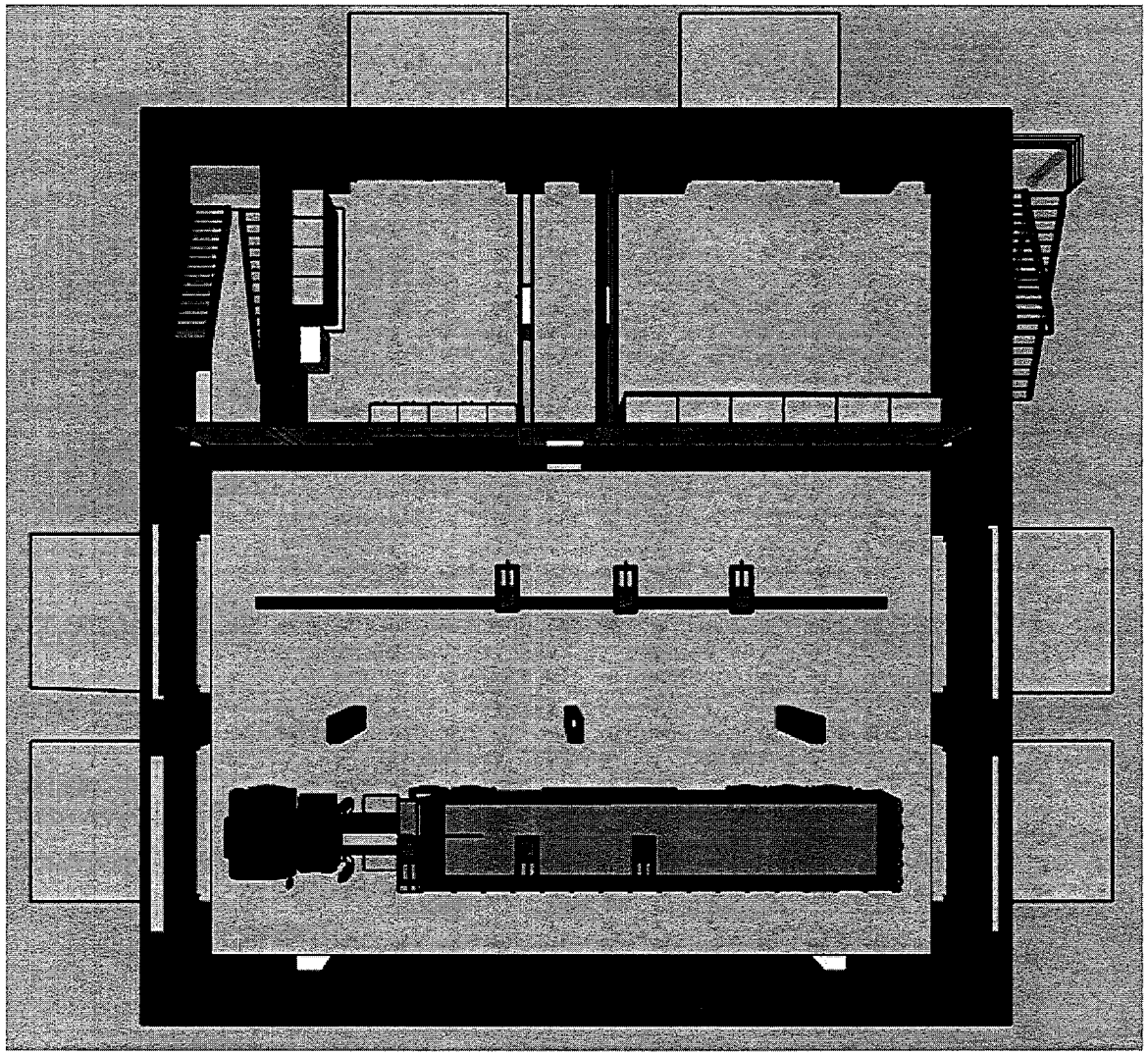
GRIT ALT. NO. 1 - EFF CHANNEL SECTION VIEW



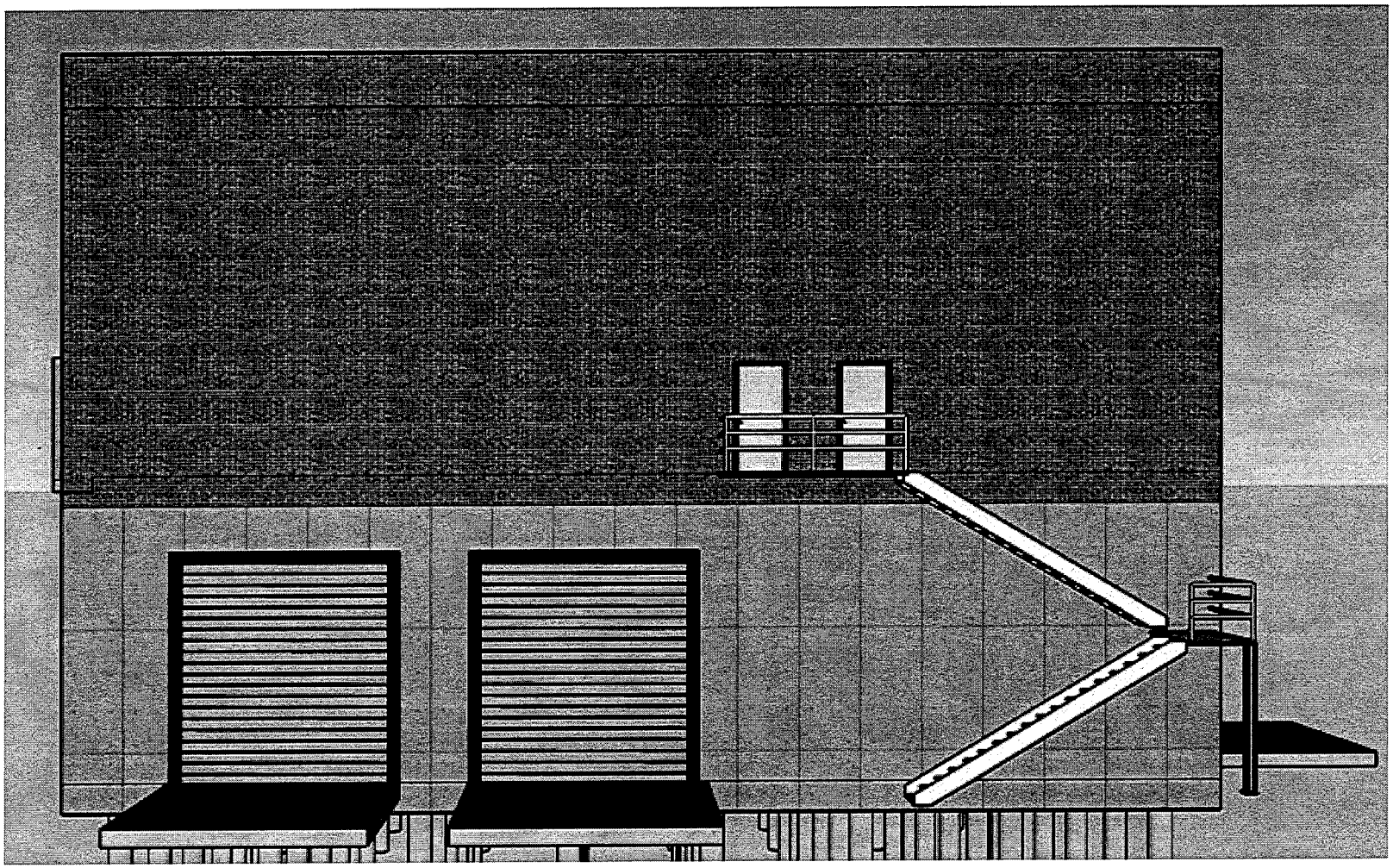
GRIT ALT. NO. 1 - GHB ROOF PLAN



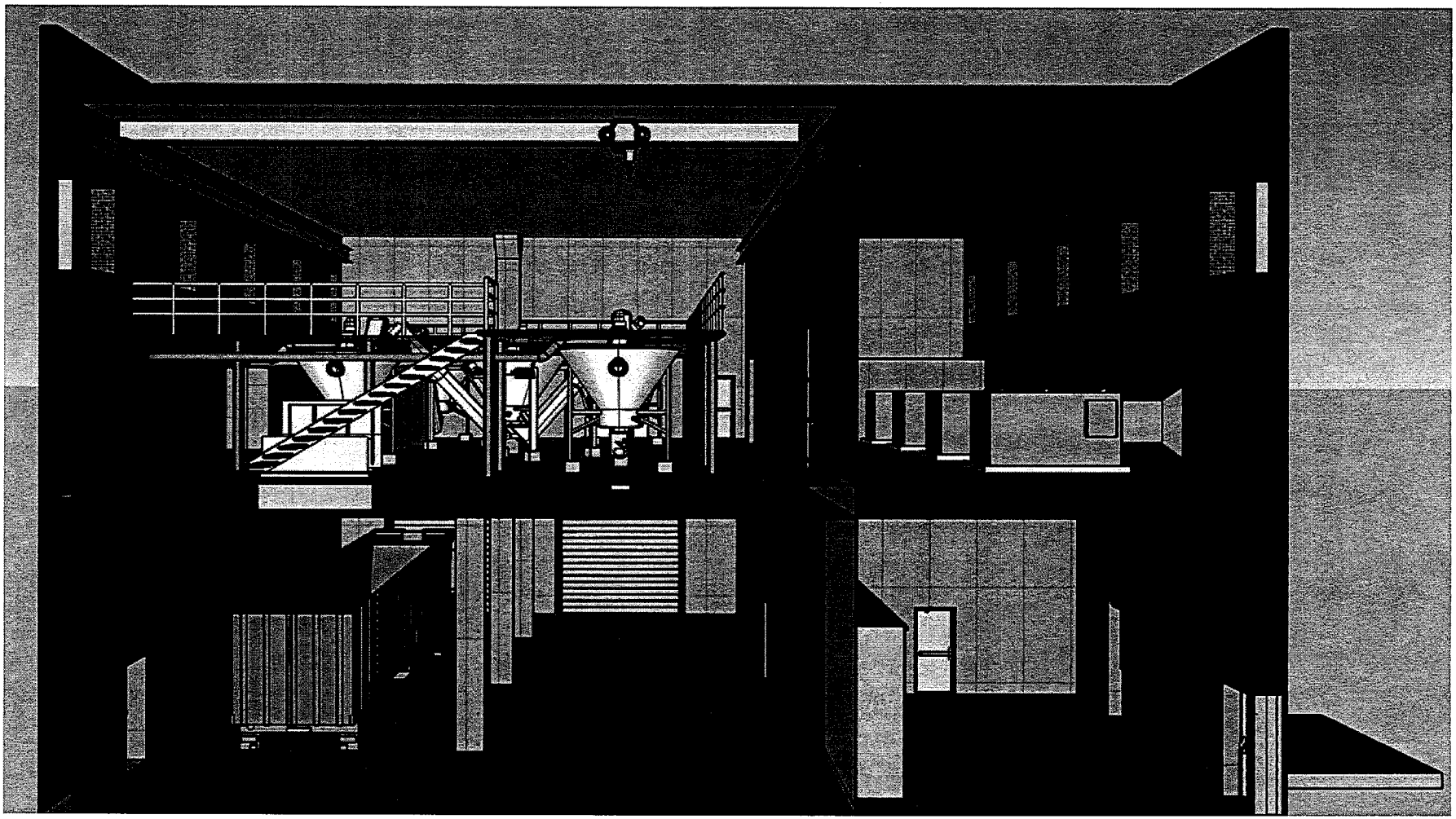
GRIT ALT. NO. 1 - GHB PLAN VIEW



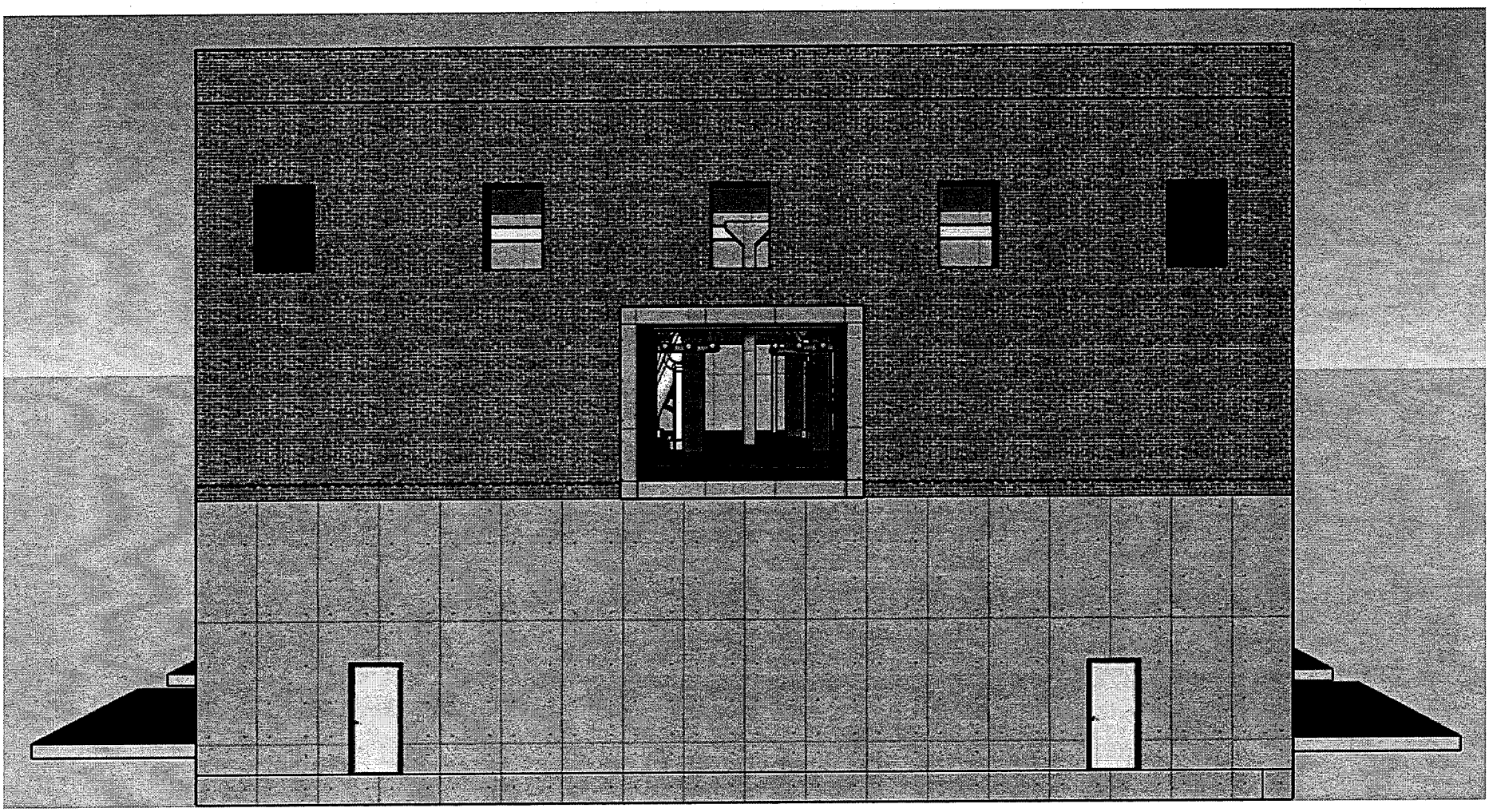
GRIT ALT. NO. 1 - GHB LOWER LEVEL PLAN VIEW



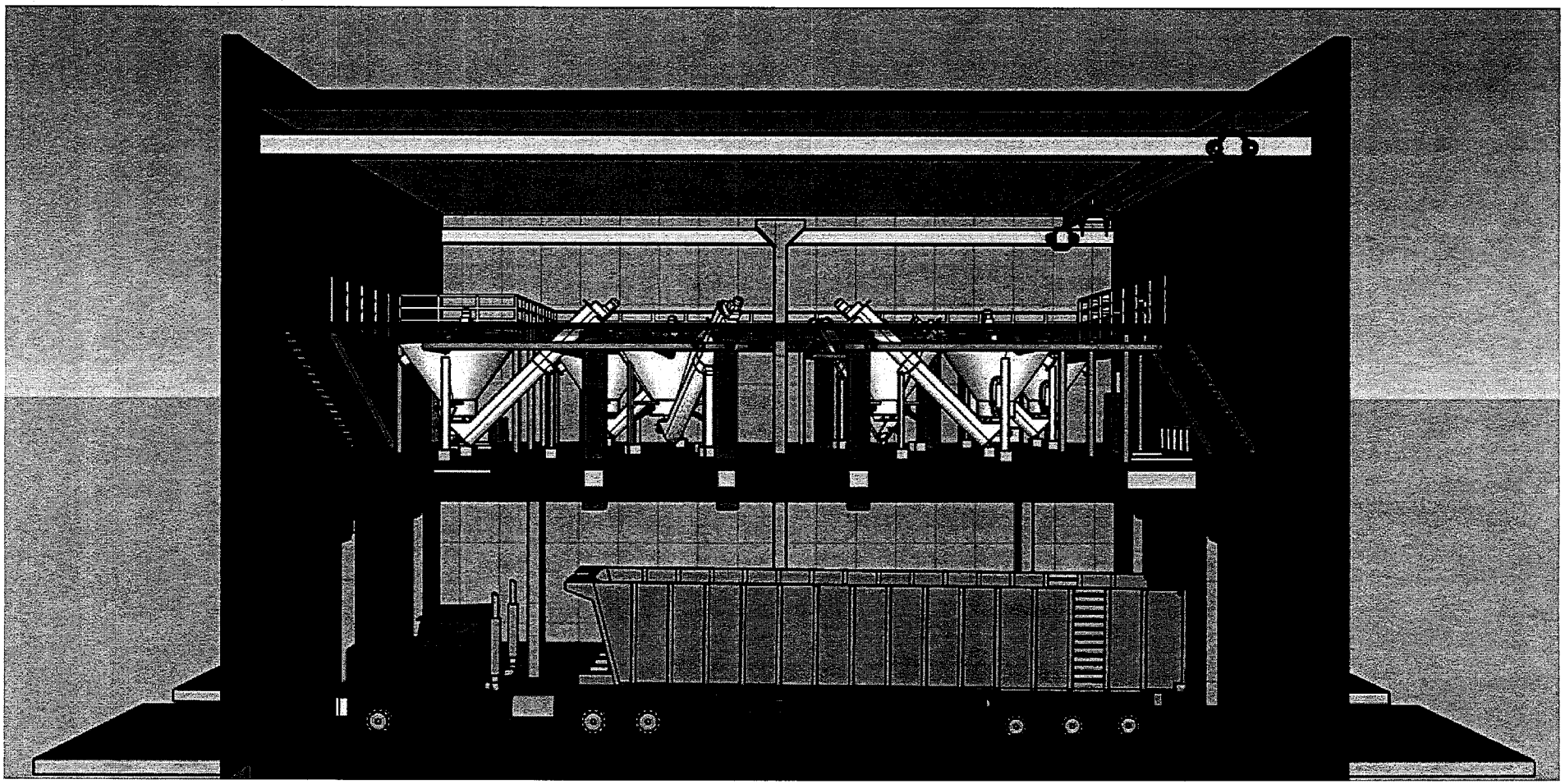
GRIT ALT. NO. 1 - GHB NORTH ELEVATION VIEW



GRIT ALT. NO. 1 - GHB SECTION LOOKING SOUTH



GRIT ALT. NO. 1 - GHB EAST EXTERIOR WALL VIEW



GRIT ALT. NO. 1 - GHB SECTION VIEW LOOKING WEST

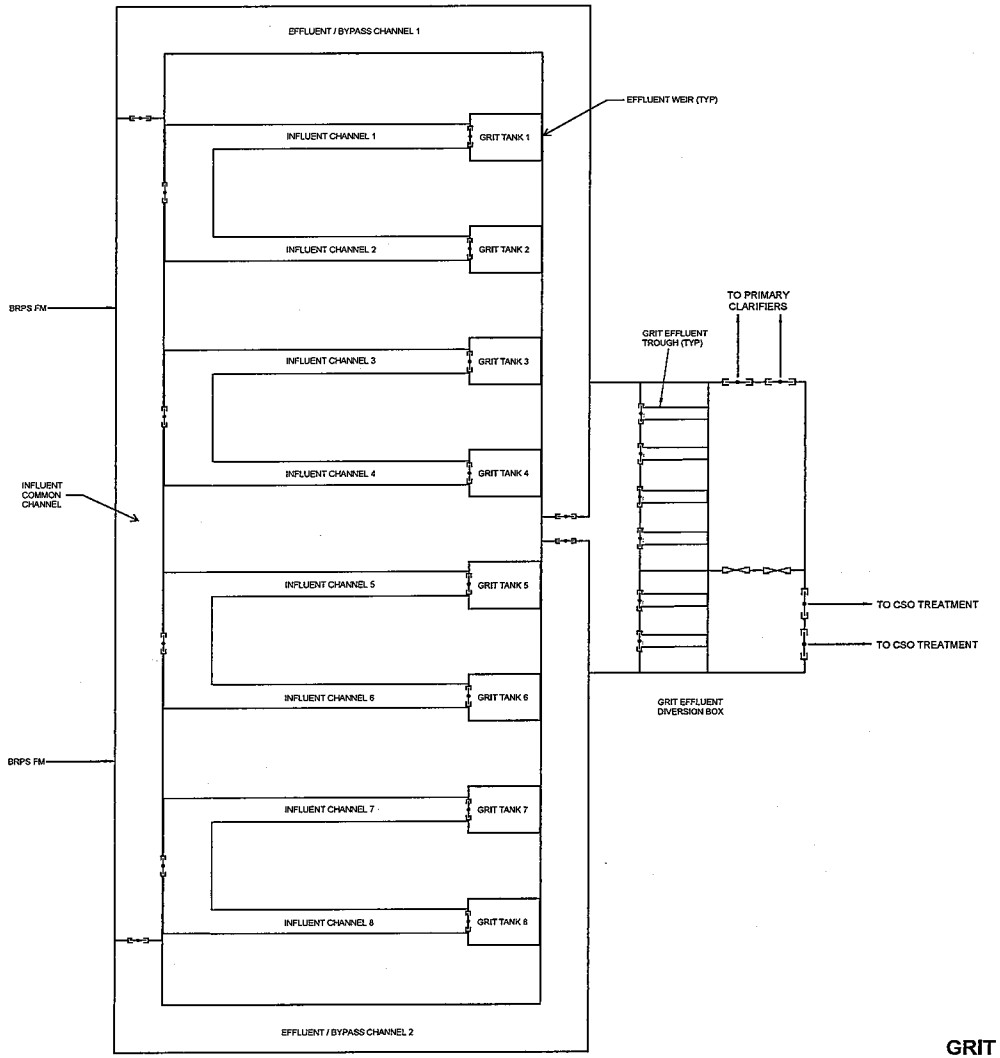
APPENDIX B

GRIT ALTERNATIVE NO. 2 - DIAGRAMS AND FIGURES

User: svcPW Plot Date: 19-JAN-2024 7:08:16 AM File: E:\ICS\for\PDFWorking\97471277707_5\202359_FIG 1.dgn

GENERAL NOTES:

1. NOT ALL VALVES, PIPING, AND APPURTENANCES SHOWN.

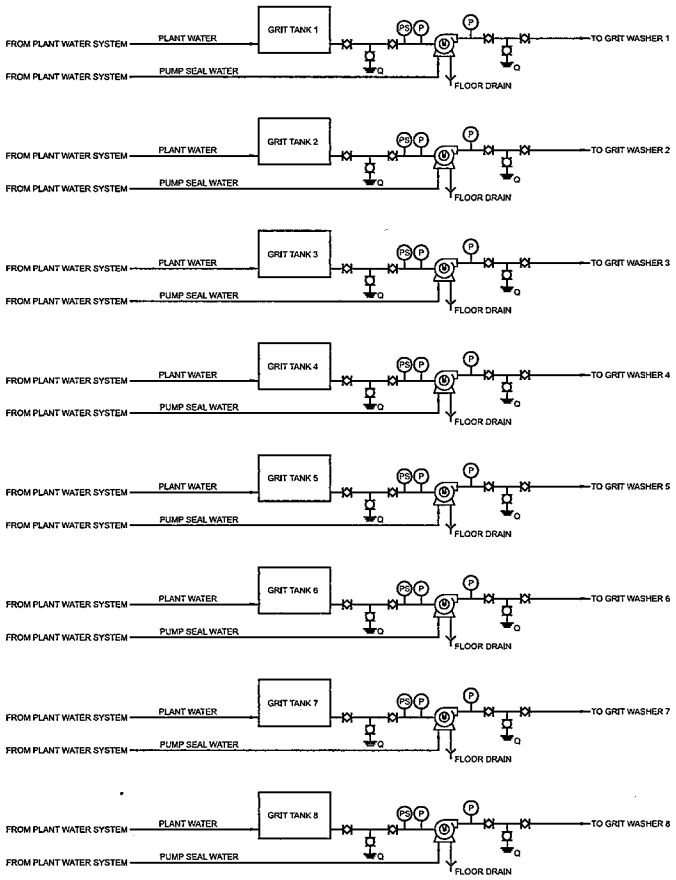


KC WATER BRWWTP
GRIT SYSTEM UPGRADE PROJECT

GRIT ALTERNATIVE NO. 2

PROCESS FLOW DIAGRAM
GRIT REMOVAL

carollo



GENERAL NOTES:

1. NOT ALL VALVES, PIPING, AND APPURTENANCES SHOWN.

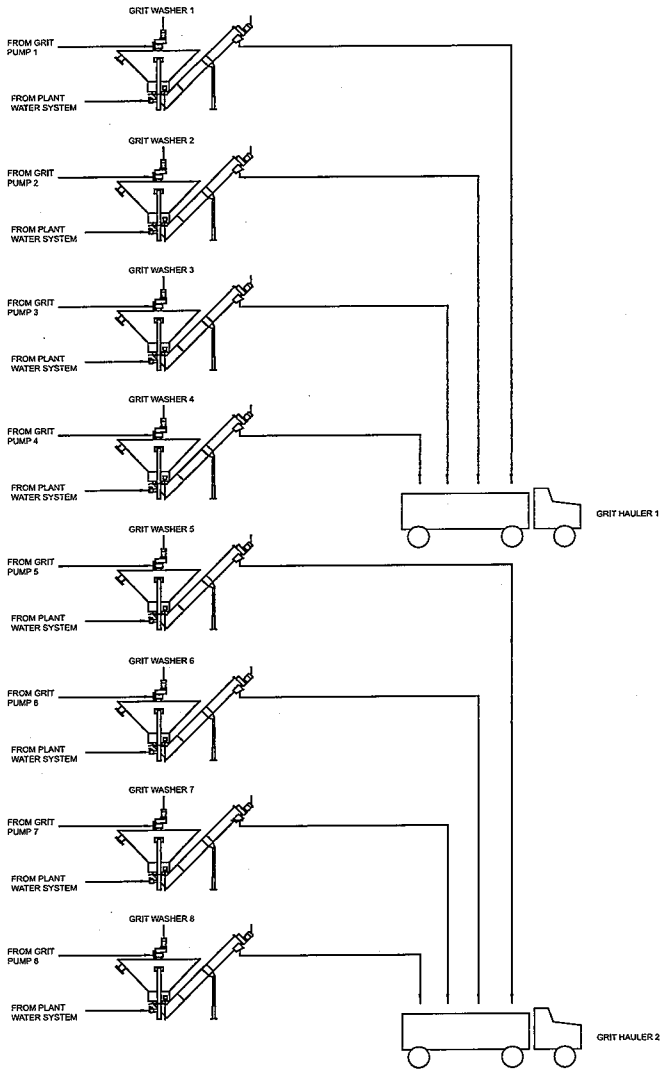
KC WATER BRWWTP
GRIT SYSTEM UPGRADE PROJECT

GRIT ALTERNATIVE NO. 2

PROCESS FLOW DIAGRAM
GRIT REMOVAL

carollo

User: svcPW Plot Date: 19-JAN-2024 7:08:45 AM File: E:\ICS\for PDF Working\9747\277707_10\202359_FIG 5.dgn



GENERAL NOTES:

1. NOT ALL VALVES, PIPING, AND APPERTENANCES SHOWN.

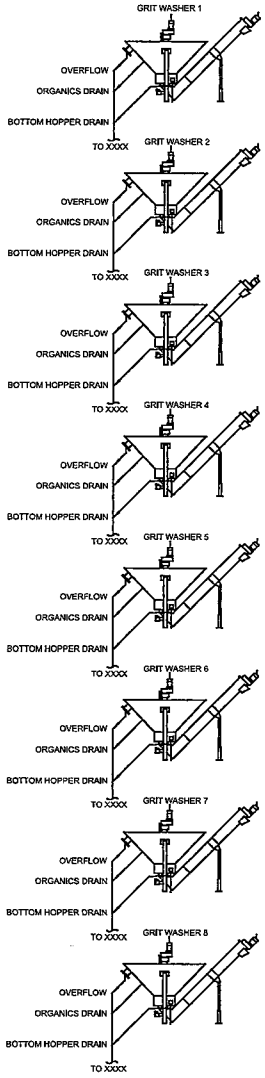
KC WATER BRWWTP
GRIT SYSTEM UPGRADE PROJECT

GRIT ALTERNATIVE NO. 2

PROCESS FLOW DIAGRAM
GRIT HANDLING - WASHER

carollo

User: svcPW Plot Date: 19-JAN-2024 7:08:53 AM File: E:\ICS\forPDFWorking\19747\277707_11\202359_FIG 6.dgn



GENERAL NOTES:

1. NOT ALL VALVES, PIPING, AND APPURTENANCES SHOWN.

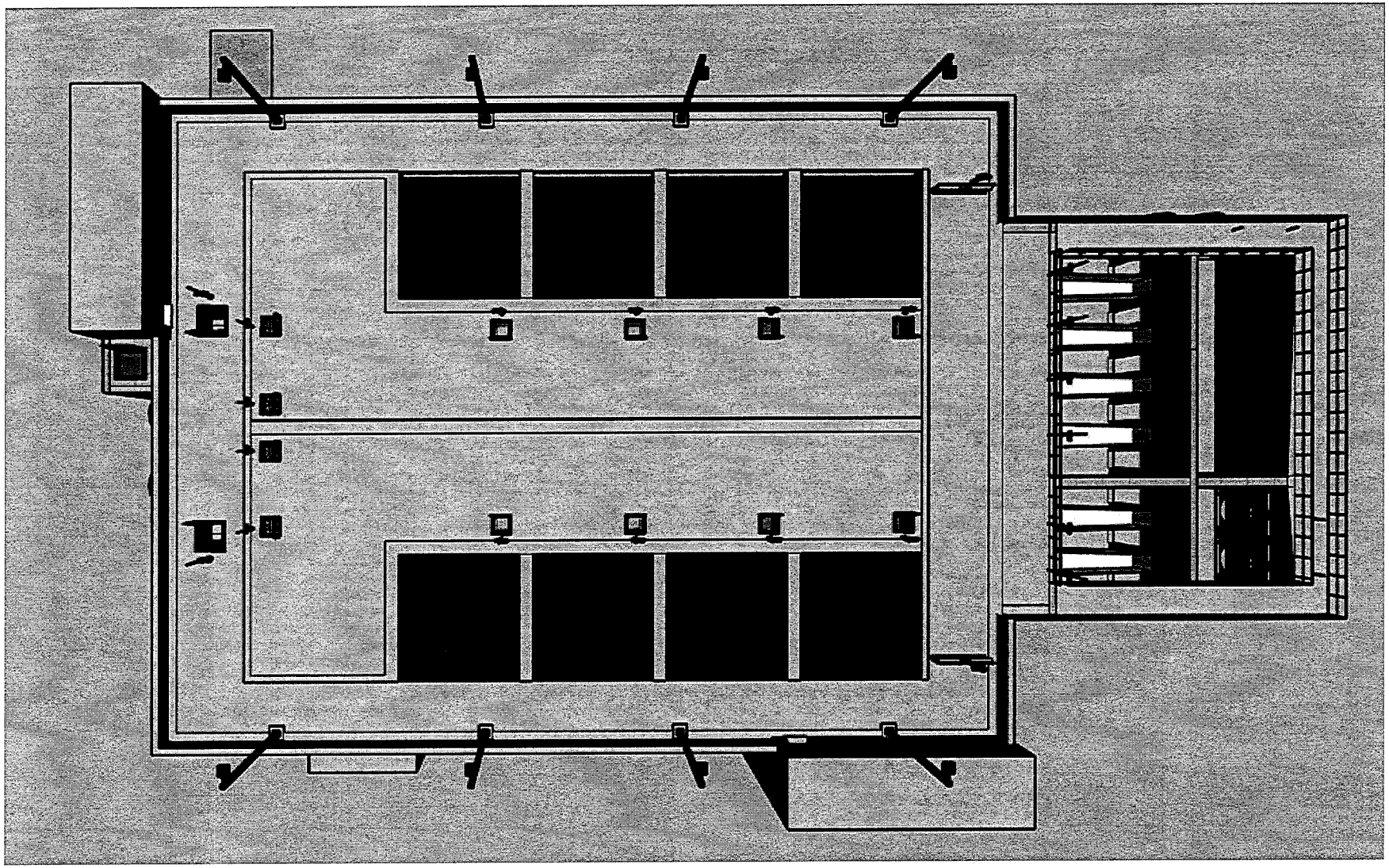
KC WATER BRWWTP
GRIT SYSTEM UPGRADE PROJECT

GRIT ALTERNATIVE NO. 2

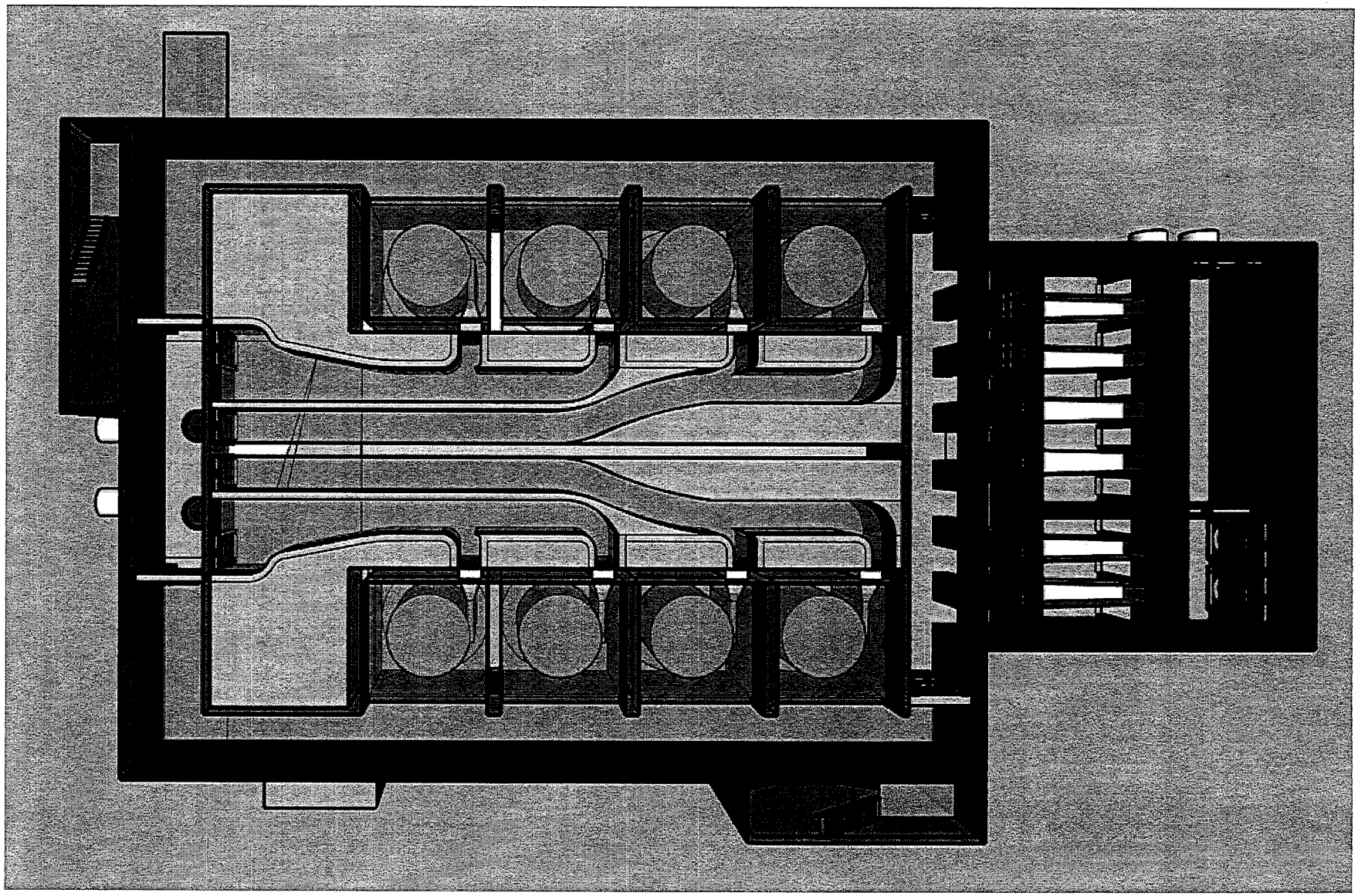
PROCESS FLOW DIAGRAM
GRIT HANDLING - DRAINAGE

carollo

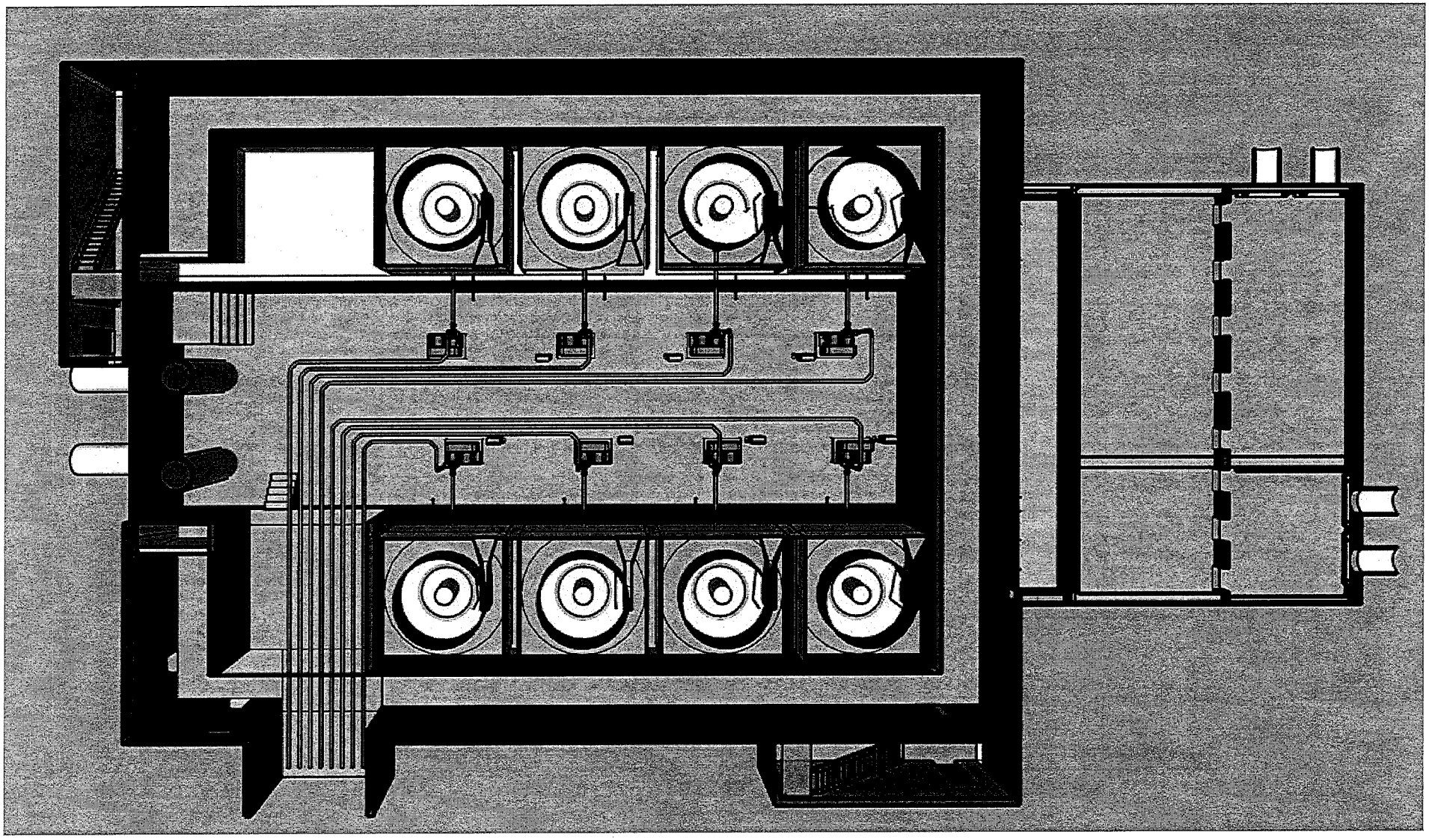
User: svcPW Plot Date: 19-JAN-2024 7:08:54 AM File: E:\ICS\forPDFWorking\97470277707_130202359_FIG 7.dgn



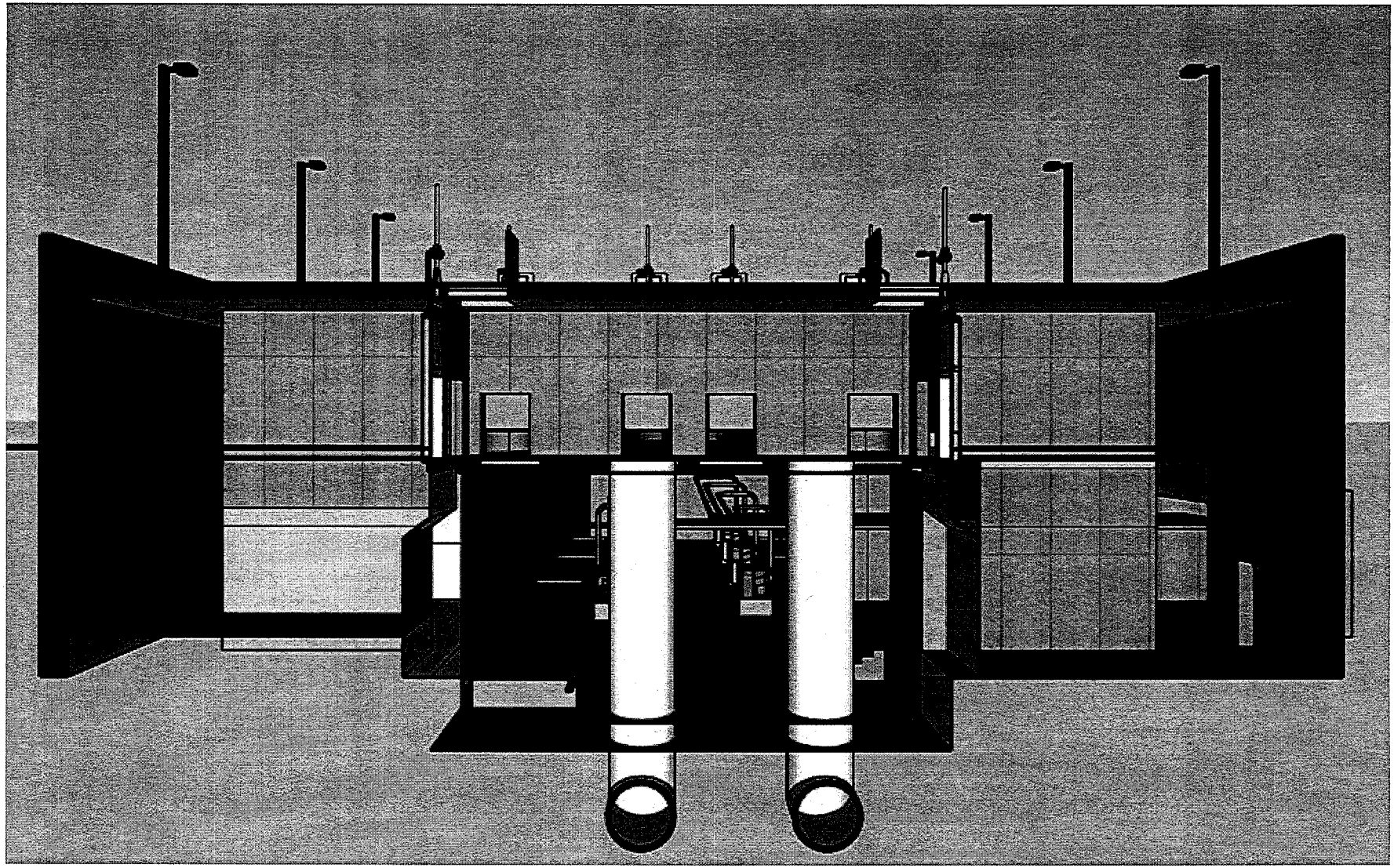
GRIT ALT. NO. 2 - GRIT BASINS TOP PLAN VIEW



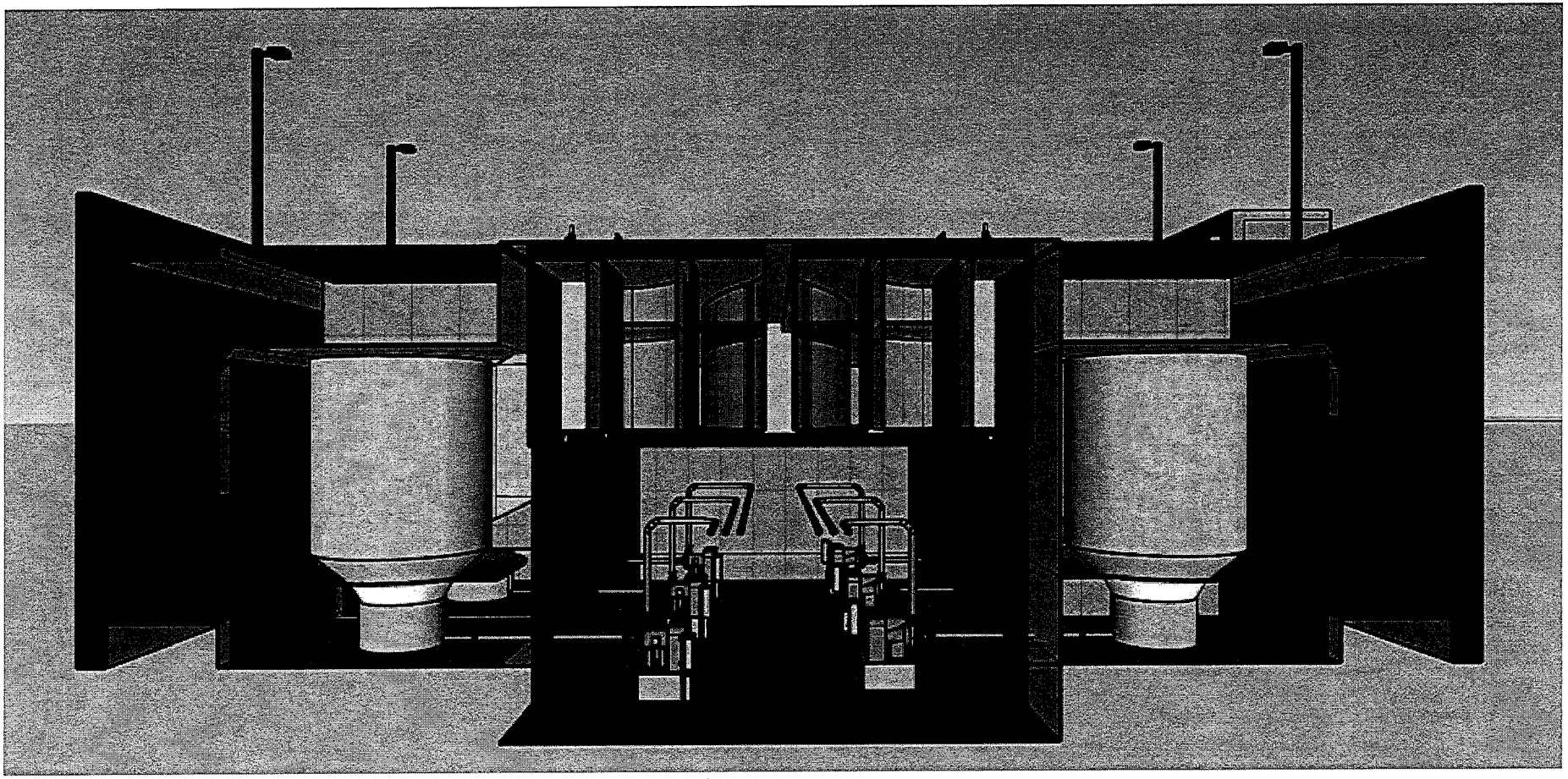
GRIT ALT. NO. 2 - GRIT BASINS INTERMEDIATE PLAN VIEW



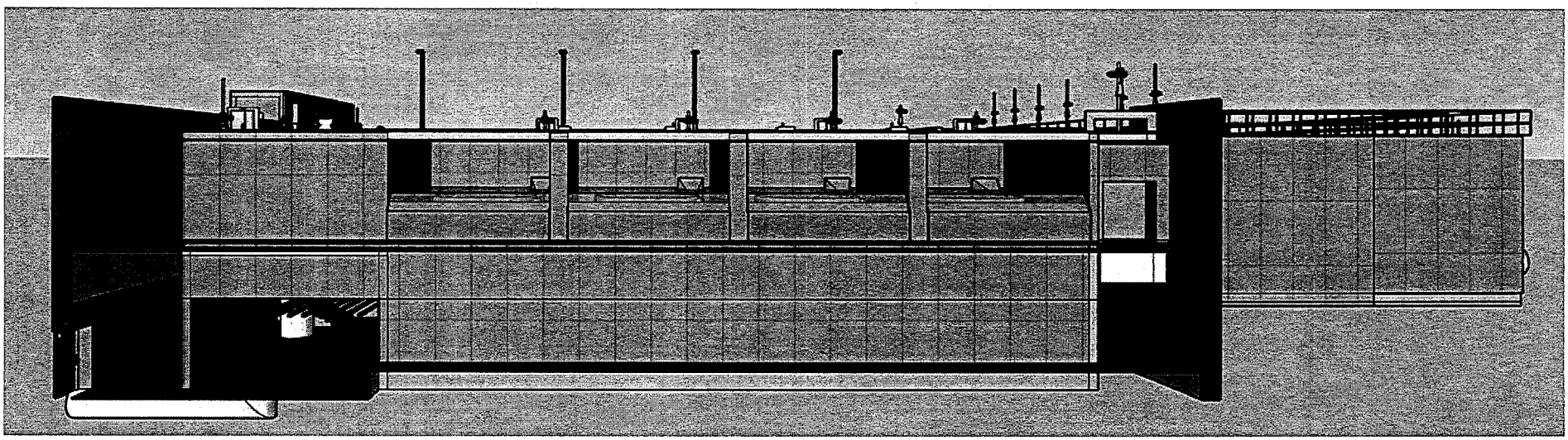
GRIT ALT. NO. 2 - GRIT BASINS LOWER PLAN VIEW



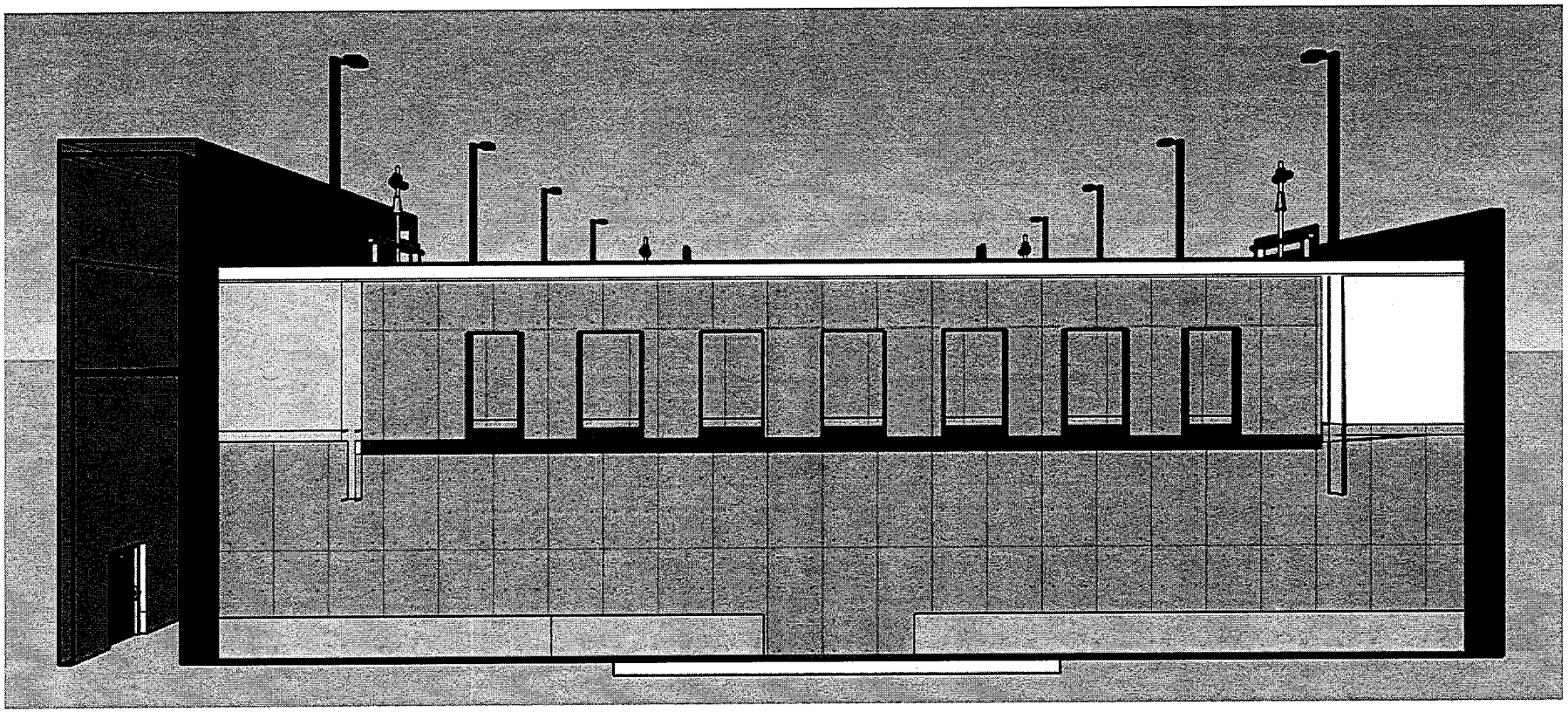
GRIT ALT. NO. 2 - GRIT BASINS INFLUENT CHANNEL ELEVATION



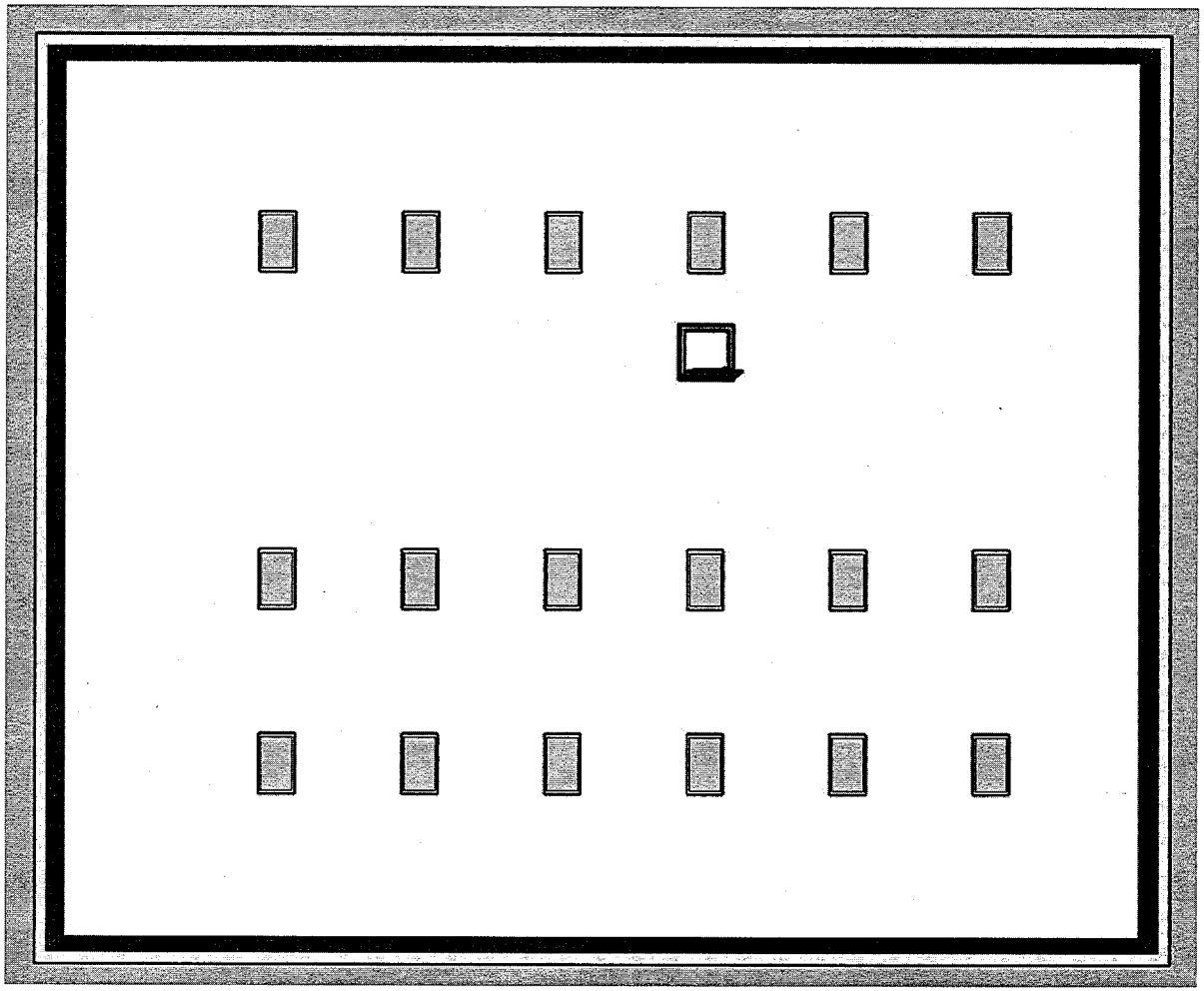
GRIT ALT. NO. 2 - GRIT BASINS ELEVATION VIEW



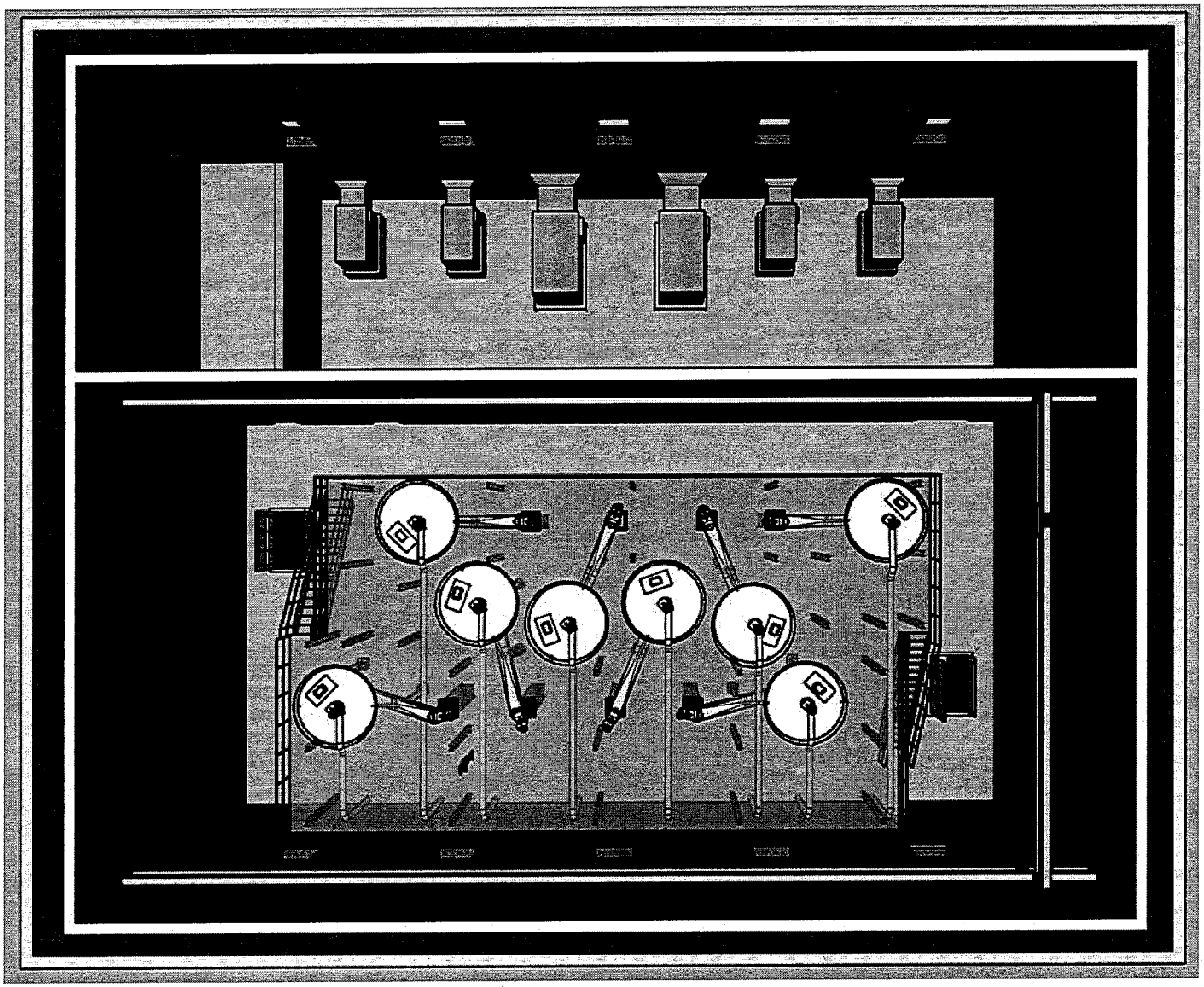
GRIT ALT. NO. 2 - GRIT BASINS ELEVATION LOOKING WEST



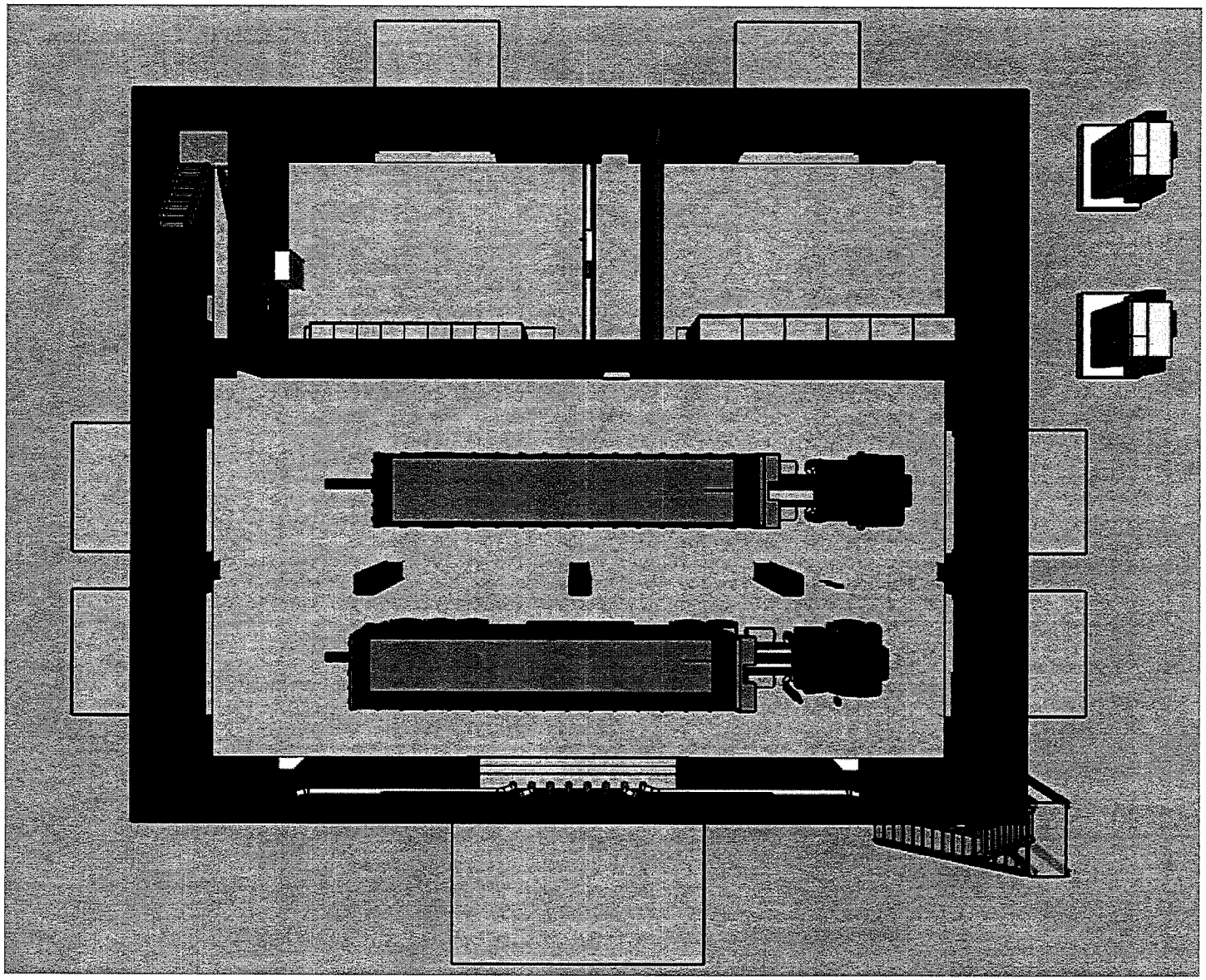
GRIT ALT. NO. 2 - GRIT BASINS EFFLUENT CHANNEL SECTION VIEW



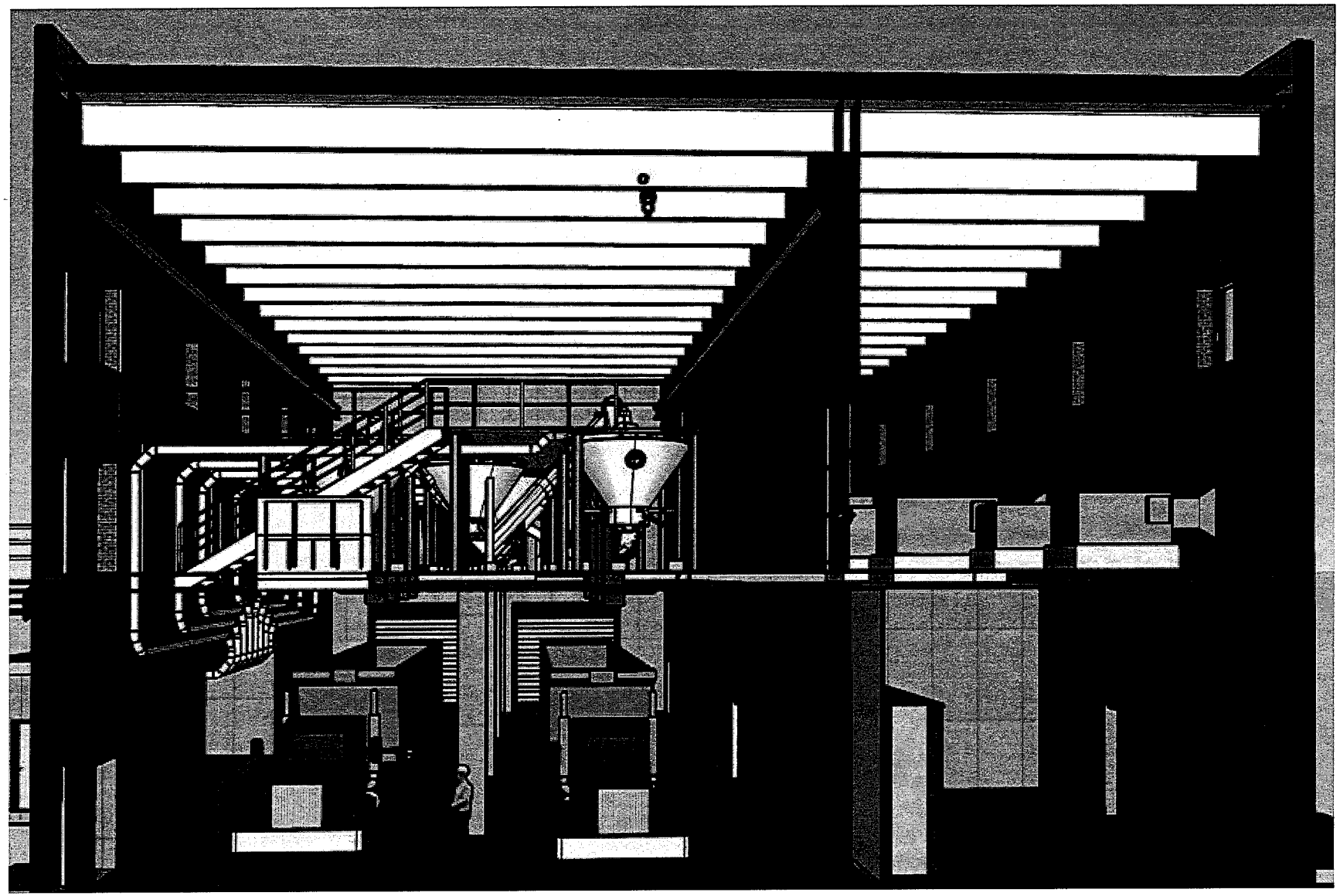
GRIT ALT. NO. 2 - GHB ROOF PLAN VIEW



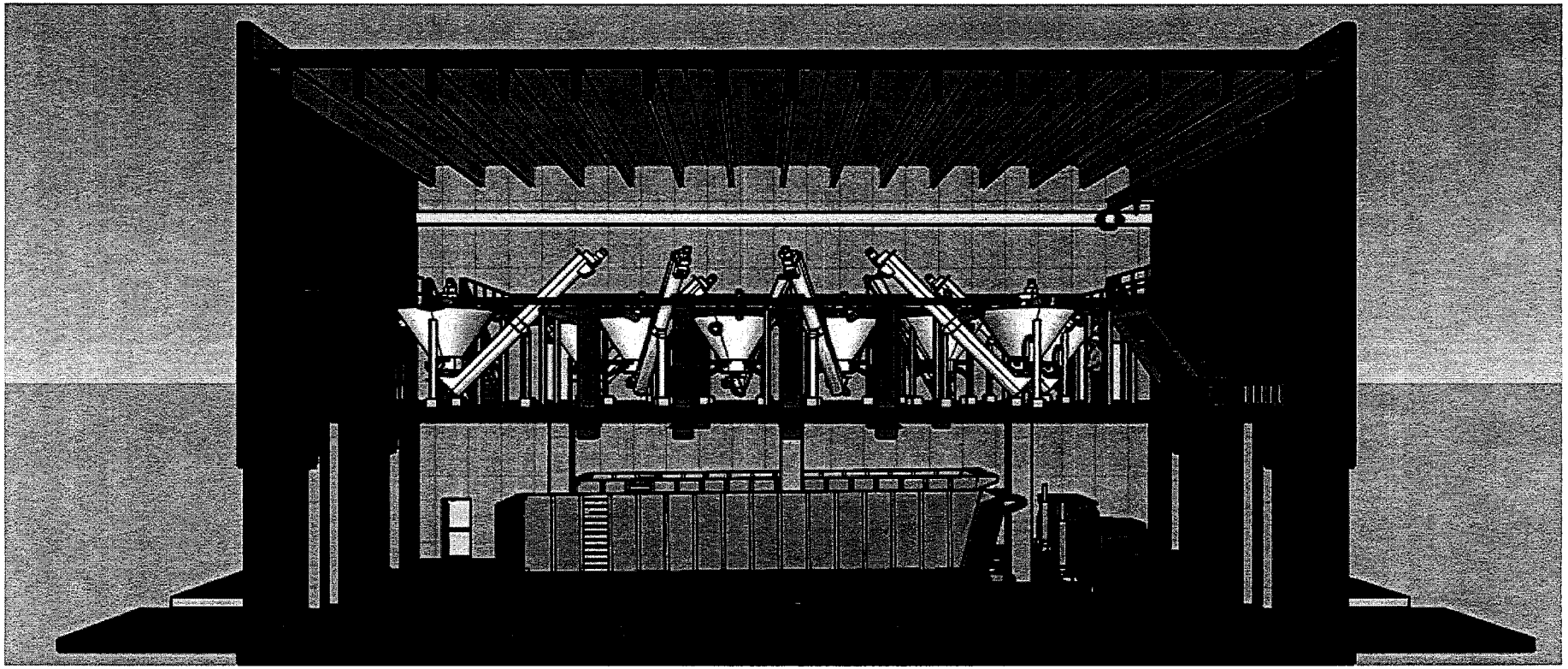
GRIT ALT. NO. 2 - GHB UPPER PLAN VIEW



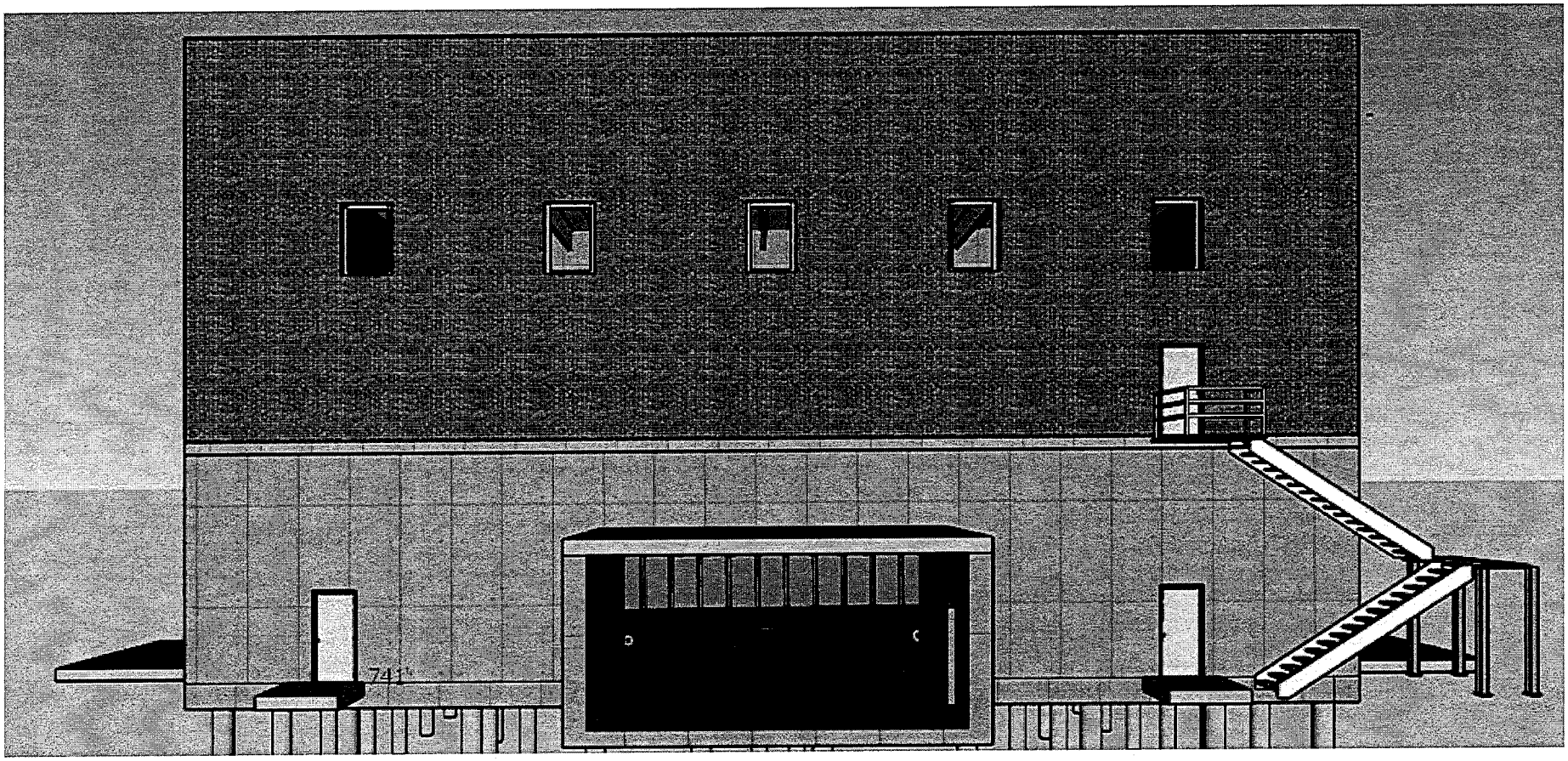
GRIT ALT. NO. 2 - GHB LOWER PLAN VIEW



GRIT ALT. NO. 2 - GHB SECTION VIEW LOOKING EAST



GRIT ALT. NO. 2 - GHB SECTION VIEW LOOKING EAST



GRIT ALT. NO. 2 - GHB EXTERIOR EAST WALL ELEVATION

APPENDIX C

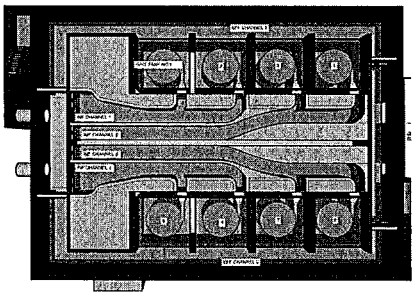
GRIT ALTERNATIVE NO. 2 - CONCEPTUAL DESIGN HYDRAULIC CALCULATIONS

PROJECT : KCMO: BLUE RIVER WWTP FACILITY PLAN AND IMPROVEMENTS DESIGN
ALTERNATIVE 2: GRIT TANK (HEADCELL) FACILITY

JOB # : 202359 REVISION: CONCEPTUAL DESIGN - 10%

BY : Powell Hinson
DATE : 3/6/2024

CURRENT SCENARIO DESIGN CRITERIA



EX PRIMARIES: CRITICAL ELEVATIONS

Primary Clarifier Weir (Apex) El =	744.46			*From record dwgs
Primary Clarifier Weir El =	744.67			APEX WEIR = 744.46, 2.5" DEEP V-NOTCH
Primary Clarifier WSE El =	744.88			*Assumes free discharging Primary Clarifier Weir for this Analysis

EX STRUCTURES: FLOWS

Total Flow To Primaries =	140.00	mgd	PHF	*140 mgd is current design target through the primaries
Flow Per Primary Clarifier =	35.00	mgd	PHF	*140 mgd is current design target through the primaries
Flow Split for Division Box, Tunnel, EX Grit Eff, 1/2=	70.00	mgd	PHF	*140 mgd is current design target through the primaries
Total Flow Through EX Grit Eff Channel =	140.00	mgd	PHF	

NEW GRIT TANK STRUCTURE: FLOWS

Total Grit Influent Flow for Analysis =	270.00	mgd	PHF	*140 mgd (grit) + 70 mgd (CSO)
Flow 2 Total Grit Influent Flow =	270.00	mgd	PHF	*140 mgd (grit) + 130 mgd (CSO)
Flow 2 to CSO =	130.00	mgd	PHF	
Half Flow to CSO =	65.00	mgd	PHF	
Flow to Primaries =	140.00	mgd	PHF	
Flow to CSO =	130.00	mgd	PHF	
Flow Per Grit Eff Pipeline to Primaries =	70.00	mgd	PHF	* 140 mgd / 2 pipelines (54")
Flow Per Grit Eff Channel (ALL UNITS) =	135.00	mgd	PHF	
Flow Per Grit Eff Channel (-2 UNITS) =	160.00	mgd	PHF	PEAK FLOW EVENT W/ 2 UNITS OUT
Flow Per Grit Tank =	33.75	mgd	PHF	
Flow Per Grit Influent Channel (ALL UNITS) =	67.50	mgd	PHF	
Flow For Grit Tank #8 =	33.75	mgd	PHF	
Flow For Grit Tank #7 =	33.75	mgd	PHF	
Flow For Grit Tank #6 =	33.75	mgd	PHF	
Flow For Grit Tank #5 =	33.75	mgd	PHF	
Flow For Grit Tank (-2 UNITS) =	45.00	mgd	PHF	PEAK FLOW EVENT W/ 2 UNITS OUT
Flow Per Grit Influent Channel (-2 UNITS) =	90.00	mgd	PHF	

NEW GRIT TANK STRUCTURE: ELEVATIONS AND DIMENSIONS

Approx Grade El =	740.00			
Grit Tank FF El =	738.00			*Starting assumption
Distance B/W Grit Pump FF & Grit Tank FF =	3	ft		
Grit Pump Room FF El =	735.00			
Distance B/W Grit Tank FF & Weir El	20.88	ft	21.03	
Grit Eff Weir El =	758.63	OG		
Grit Eff Weir El =	758.88	UPDATED		
Distance B/W Eff Channel FF & Grit Eff Weir =	9.43	ft		
Grit Eff Channel FF El =	752.00		747.45	
Grit Eff Dist Box Channel FF El =	742.00			
Distance B/W Grit Tank FF & Top Structure =	28.35	ft	28.35	
Top of Main Structure El =	764.00		766.35	
Top of Grit Eff Structure El =	761.00			
Distance B/W Grit Eff Weir & Inf Channel FF =	5.2	ft		
Inf Channel El =	753.68			
Parapit Height =	3.5	ft		
Top of Parapit El =	767.50			
Grit Eff Dist Box Pipe Outlet Channel FF El =	742.00			
Grit Eff Channel Width=	7.50			

ESTIMATED HEADLOSS THROUGH HEADCELL UNITS

HL =	0.25	ft	@ 10.2 MGD	PER MNFCR PROPOSAL - 10/03/2023
HL peak =	1.00	ft	@ 23.4 MGD	PER MNFCR PROPOSAL & TERI CONFIRMED
HL calculated (@33.75 MGD) =	0.56	ft		
HL calculated (@45.00 MGD) =	1.00	ft		
Q peak	45.00	mgd	Per unit	Assumes nozzle sized for 35 mgd
Q1	33.75	mgd	Per unit	
Q2	45.00	mgd	Per unit	

Process Flows

	Annual Avg Day Flow AADF	Max Month Flow MMF	Peak Flow 1 PF	Peak Flow 2 PF	Current Values in Model
Preliminary Treatment					
Plant Influent =	102.0	140.0	210.0		210.00
Headworks Influent =	102.0	140.0	210.0		210.00
Grit Influent =	102.0	140.0	210.0		210.00
Primary Treatment					
Diversion Box =	102.0	140.0	140.0		140.00
Primary Clarifier Influent =	102.0	140.0	140.0		140.00
Primary Clarifier Effluent =	102.0	140.0	140.0		140.00

Number of Units in Service

		0 OUT OF SERVICE @ PHF
Primary Clarifiers	4	of 4
Grit Influent Channels / Banks	4	of 4
Grit Tank / Headcell Units	8	of 8
Grit Effluent Channels / Banks	4	of 4

Roughness Coefficient Assumptions

Absolute Roughness, ε	Existing concrete	0.00400	ft
	New Steel / HDPE	0.00010	ft

Node Summary

**Triggers at 6-inches freeboard*

Headworks Node ID	Description	Flow (mgd)	WSE	TOS	Freeboard (ft)	Freeboard Alarm*	TOS Reference
	Primary Clarifiers						
	Center Column Feed	35	745.27	746.33	1.06		
	Division Box						
	Overflow to Effluent Side	140	746.12	747.00	0.88		
	Overflow of Entire Structure	140	746.12	752.50	6.38		
	Existing Grit Channels						
	Effluent Box and Channels	70	749.66	752.50	2.84		
	New Grit Tanks						
	Effluent Diversion Box - CSO	130	752.61	761.00	8.39		
	Flow over Downward Opening Gate to CSO	65	755.94	761.00	5.06		
	Combined Effluent Diversion Box - Split b/w Ex. PCs and CSO	270	756.17	761.00	4.83		
	Flow over Launders to Combined Effluent Diversion Box	270	757.10	761.00	3.90		
	Splitter Channel to Combined Effluent Diversion Box	270	757.71	761.00	3.29		
	Grit Tank Common Effluent Channel - East	135	758.73	764.00	5.27		
	Flow over Grit Tank Eff Weir - Tank 8	33.75	759.86	764.00	4.14		
	Grit Tank 8	33.75	760.42	764.00	3.58		
	Grit Influent Channel - Channel 2 - Tank 8	33.75	760.44	764.00	3.56		
	Grit Influent Channel - Channel 2	67.50	760.69	764.00	3.31		
	Grit Common Influent Channel	270	760.97	764.00	3.03		

				Equation Ref.	HGL	EGL
DOWNSTREAM CONTROL						
EGL =	**744.46**				744.46	744.46
Flow =	**35.00 mgd =**	**54.15 cfs**	**FLOW USED REPRESENTS 1/2 FLOW AROUND CLAR**			
PRIMARY CLARIFIER NO. 4 EFFLUENT WEIR						
[V-NOTCH WEIR]						
Flow	35.0 mgd =	54.1 cfs				
WSE Downstream of Weir	743.75 ft		**ASSUMED FREE DISCHARGE BY 6"**			
Weir Crest Elevation	744.67 ft		**A1 APEX WEIR = 744.46, 2.5" DEEP V-NOTCH**			
Downstream head, Hd	-0.92 ft					
Weir Length	534.00 ft		**A2 BASED ON INSIDE DIA OF 170'**			
Distance Between Notches	6.00 in		**A2**			
Number of Notches	1068					
WEIR IS FREE-DISCHARGING						
Free Discharging Weir Computation				{8}		
Head on Weir, H	0.21 ft					
Upstream WSE	744.88 ft					
Submerged Weir Computation				{9}		
K	NA					
M	NA					
Increment	NA ft					
Upstream Head, Hu1	NA ft					
F(H1)	NA					
F'(H1)	NA					
Upstream Head, Hu2	NA ft					
Upstream WSE	NA ft					
Head over Weir	*0.21 ft*					
			Condition Upstream of Weir		744.88	744.88
PRIMARY CLARIFIER NO. 4 FEEDWELL **[SUBMERGED ORIFICE (CIRCULAR)]**			**TREATING AS SUBMERGED ORIFICE**	{3}		
Flow	35.0 mgd =	54.1 cfs				
Number of Ports	1		**8 SCUM PORTS BUT ASSUME FLOW EXITS FEEDWELL ONLY**			
Flow Per Port	35.0 mgd =	54.1 cfs				
Port Area	1500 sq ft		**A3 FEEDWELL AREA - CENTER COLUMN AREA**			
Discharge Coefficient, C	0.61		**FEEDWELL DIA = 44', CC DIA = 5'**			
Velocity through port, v	0.04 fps =	0.660 m/min				
Orifice Energy Loss, h_L	0.00 ft					
			Condition Upstream of Orifice		744.88	744.88
PRIMARY CLARIFIER NO. 4 EDI **[SUBMERGED ORIFICE (CIRCULAR)]**			**TREATING AS SUBMERGED ORIFICE**	{3}		
Flow	35.0 mgd =	54.1 cfs				
Number of Ports	10		**A4 PER SECTION 2.06.B.3 AND DWGS**			
Flow Per Port	3.5 mgd =	5.4 cfs				
Port Diameter	30 inches =	2.5 ft	**A4 EDI = 3.5' TALL, ASSUMING 2.5' TALL OPENING**			
Discharge Coefficient, C	0.61					
Velocity through port, v	1.10 fps					
Orifice Energy Loss, h_L	0.05 ft					
			Condition Upstream of Orifice		744.93	744.93
PRIMARY CLARIFIER NO. 4 CENTER COLUMN PORTS **[SUBMERGED ORIFICE (CIRCULAR)]**			**TOP OF WALL OF PC IS ELEV 746.33**	{3}		

				Equation Ref.	HGL	EGL
Flow	35.0 mgd =	54.1 cfs				
Number of Ports	4					
Flow Per Port	8.8 mgd =	13.5 cfs				
Port Length	38 inches =	3.2 ft	A5	DIMENSIONS FROM HAND CALCS PG 2		
Port Height	18 inches =	1.5 ft	A5			
Port Area	4.75 sq. ft.					
Discharge Coefficient, C	0.61					
Velocity through port, v	2.85 fps					
				CENTER COLUMN DIA IS 5'		
Orifice Energy Loss, h_L	0.34 ft					

No.	Description	Flow (mgd)	Flow (cfs)	K	Dia Up (in)	Dia Down (in)	Vel Up (fps)	Vel Down (fps)	Vel Head (ft)	Minor Loss (ft)
0	Mounding Loss	35.00	54.15	1.00	60	----	2.76	----	0.12	0.00
									Sum =	0.00

Total Energy Loss = 0.34 ft

Condition Upstream of Orifice 745.27 745.27

PRIMARY CLARIFIER NO. 4 CENTER COLUMN FEED
[PIPE FRICTION LOSSES (DARCY-WEISBACH / COLEBROOK)] {4}

Flow	35.0 mgd =	54.1 cfs		
Pipe Diameter, D	60 inch		A3	CENTER COLUMN DIA
Pipe Length, L	20 ft		A6	ESTIMATED BASED ON CLARIFIER ELEVATIONS
Absolute Roughness, ε	0.00085 ft			CONFIRM MATERIAL OF CENTER COLUMN
Pipe velocity, v	2.76 fps			
Kinematic Viscosity	1.000E-05 ft^2/sec			
Reynold's Number, R	1378791			
Friction factor, f	0.0141	Equivalent Hazen-Williams "C" = 138.0286		
Friction Energy Loss, h_L	0.01 ft			

MINOR PIPE LOSS HEADING

Flow, Q 35.0 mgd = 54.1 cfs

No.	Description	Flow (mgd)	Flow (cfs)	K	Dia Up (in)	Dia Down (in)	Vel Up (fps)	Vel Down (fps)	Vel Head (ft)	Minor Loss (ft)	
1	90 ° Elbow - Regular Fl.	35.00	54.15	0.30	60	----	2.76	----	0.12	0.04	A7
1	Mitre Bend - 22.5 ° Deflection	35.00	54.15	0.15	60	----	2.76	----	0.12	0.02	A38
1	Increaser	35.00	54.15	0.25	54	60	3.40	2.76	0.06	0.02	A7
									Sum =	0.07	

Total Energy Loss = 0.08 ft

Upstream Condition 745.35 745.35

PRIMARY CLARIFIER NO. 4 FEED TUNNEL FROM DIVERSION BOX
[PIPE FRICTION LOSSES (DARCY-WEISBACH / COLEBROOK)] {4}

Flow	35.0 mgd =	54.1 cfs		
Pipe Diameter, D	54 inch		A8	EQUIVALENT PIPE DIA TO 4'x4' TUNNEL
Pipe Length, L	149 ft		A9	60'+89'
Absolute Roughness, ε	0.00400 ft			
Pipe velocity, v	3.40 fps			
Kinematic Viscosity	1.000E-05 ft^2/sec			
Reynold's Number, R	1531990			
Friction factor, f	0.0193	Equivalent Hazen-Williams "C" = 115.5188		
Friction Energy Loss, h_L	0.12 ft			

	Equation Ref.	HGL	EGL

MINOR PIPE LOSS HEADING

Flow, Q 35.0 mgd = 54.1 cfs

No.	Description	Flow (mgd)	Flow (cfs)	K	Dia Up (in)	Dia Down (in)	Vel Up (fps)	Vel Down (fps)	Vel Head (ft)	Minor Loss (ft)	
1	90 ° Elbow - Regular Fl.	35.00	54.15	0.30	54	---	3.40	---	0.18	0.05	A10
1	Entrance Loss - Flush	35.00	54.15	0.50	---	54	---	3.40	0.18	0.09	A11
									Sum =	0.14	

Total Energy Loss = 0.26 ft

Upstream Condition 745.60 745.60

DIVERSION BOX EXIT THROUGH 48"X48" SLUICE GATE {2}
[SUBMERDED GATE - RECTANGULAR OPENING]

Flow, Q 35.0 mgd = 54.1 cfs

Gate Width	4 ft	A12
Full Height of Opening	4 ft	A12
Gate Percent Open	100%	
Discharge Coefficient, C	0.61	
Velocity through gate, v	3.38 fps	

Energy Loss thru Gate, h_L 0.48 ft

Condition Upstream of Orifice 746.08 746.08

DIVERSION BOX PC 2&4 COMPARTMENT
FLOW SPLIT

Downstream Flow 35.0 mgd = 54.1 cfs

New Flow 70.0 mgd = 108.3 cfs **1/2 TOTAL FLOW IN DIVISION BOX**

[CHANNEL FRICTION LOSSES] {5}

Flow, Q	70.00 mgd = 108.3 cfs	
Channel Width	6.00 ft	A13
Total Channel Length	20.00	A14
Downstream Invert El	724.75	A15
Channel Slope	0.00%	
Manning Coeff, n	0.013	

Station	Invert Up	Invert Down	Depth (ft)	Vel. (fps)	Hydr. Radius (ft)	Sf	Avg. Sf	Friction Loss (ft)	HGL	EGL
0.0	724.75	724.75	21.32	0.846	2.63	0.000	---	---	746.07	746.08
4.0	724.75	724.75	21.32	0.846	2.63	0.000	0.000	0.00	746.07	746.08
8.0	724.75	724.75	21.32	0.846	2.63	0.000	0.000	0.00	746.07	746.08
12.0	724.75	724.75	21.32	0.846	2.63	0.000	0.000	0.00	746.07	746.08
16.0	724.75	724.75	21.32	0.846	2.63	0.000	0.000	0.00	746.07	746.08
20.0	724.75	724.75	21.32	0.846	2.63	0.000	0.000	0.00	746.07	746.08

TOTAL ENERGY LOSS *0.00 ft*

Condition at Upstream End of Channel 746.07 746.08

[CRITICAL DEPTH AT CHANNEL DROP (Exit From a Rectangular Channel Into a Drop Box)]

Flow, Q 70.0 mgd = 108.3 cfs

Downstream HGL > Invert + Crit. Depth: FLOODED EXIT - CRITICAL DEPTH DOES NOT OCCUR

			Equation Ref.	HGL	EGL
Downstream WSE	746.07 ft				
Downstream EGL	746.08 ft				
Channel Width, W	20.0 ft		A14		
Critical. Depth, y_c	0.97 ft				
Channel Invert @ Exit	740.00 ft		A16		
Flooded Condition					
Depth Upstream of Drop	6.10 ft				
Velocity Upstream of Drop	0.89 fps				
Channel Exp./Bend "K"	2.00	(Note: Modify K value as appropriate)			
Energy Loss	0.02 ft				
EGL Upstream of Drop	746.11 ft				
HGL Upstream of Drop	746.10 ft				
Freefall Condition					
Depth Upstream of Drop	N/A				
Velocity Upstream of Drop	N/A				
EGL Upstream of Drop	N/A				
HGL Upstream of Drop	N/A				
Condition Upstream of Drop				746.10	746.11

MINOR CHANNEL LOSS HEADING

Flow, Q: 70.0 mgd = 108.3 cfs

No.	Description	Flow (mgd)	Flow (cfs)	K	Width Up (ft)	Width Down (ft)	Depth (ft)	Vel Up (fps)	Vel Down (fps)	Vel Head (ft)	Minor Loss (ft)
1	90 Degree Bend - Long Rad	70.00	108.29	0.30	20 A14	---	6.10	0.89	---	0.01	0.00
										Sum =	0.00368

Total Energy Loss = 0.00 ft

Upstream Condition				746.11	746.11

DIVERSION BOX UPPER COMPARTMENT FULL FLOW
FLOW SPLIT

Downstream Flow: 70.0 mgd = 108.3 cfs

New Flow: 140.0 mgd = 216.6 cfs

DIVERSION BOX UPPER COMPARTMENT
[CHANNEL FRICTION LOSSES] {5}

Flow, Q	140.00 mgd = 216.6 cfs		
Channel Width	10.00 ft		A17
Total Channel Length	20.00		A14
Downstream Invert El	740.00		A16
Channel Slope	0.00%		
Manning Coeff, n	0.013		

Station	Invert Up	Invert Down	Depth (ft)	Vel. (fps)	Hydr. Radius (ft)	Sf	Avg. Sf	Friction Loss (ft)	HGL	EGL
0.0	740.00	740.00	5.90	3.670	2.71	0.000	---	---	745.90	746.11
4.0	740.00	740.00	5.90	3.669	2.71	0.000	0.000	0.00	745.90	746.11
8.0	740.00	740.00	5.90	3.668	2.71	0.000	0.000	0.00	745.90	746.11
12.0	740.00	740.00	5.91	3.667	2.71	0.000	0.000	0.00	745.91	746.11
16.0	740.00	740.00	5.91	3.667	2.71	0.000	0.000	0.00	745.91	746.12
20.0	740.00	740.00	5.91	3.666	2.71	0.000	0.000	0.00	745.91	746.12

TOTAL ENERGY LOSS *0.01 ft*

Condition at Upstream End of Channel	745.91	746.12

					Equation Ref.	HGL	EGL
OUTFALL FROM ABOVE TUNNEL 2 THROUGH 54" GATE INTO DIVERSION BOX UPPER COMPARTMENT							
FLOW SPLIT							
Downstream Flow	140.0 mgd =	216.6 cfs					
New Flow	70.0 mgd =	108.3 cfs		**1/2 TOTAL FLOW IN DIVISION BOX EVEN SPLIT THROUGH GATES**			
[SUBMERDED GATE - RECTANGULAR OPENING]					{14}		
Flow, Q	70.0 mgd =	108.3 cfs					
Gate Width	4.5 ft			**A18**			
Full Height of Opening	4.5 ft			**A18**			
Gate Percent Open	100%						
Discharge Coefficient, C	0.61						
Velocity through gate, v	5.35 fps						
Energy Loss thru Gate, h_L	1.19 ft						
Condition Upstream of Gate						747.31	747.31
GRIT EFF THROUGH TUNNEL NO. 2 TO DIVERSION BOX							
[PIPE FRICTION LOSSES (DARCY-WEISBACH / COLEBROOK)]					{4}		
Flow	70.0 mgd =	108.3 cfs					
Pipe Diameter, D	60 inch			**EQUIVALENT PIPE DIA TO 4.5'x4.5' TUNNEL**			
Pipe Length, L	215 ft			**A19**			
Absolute Roughness, ε	0.00400 ft						
Pipe velocity, v	5.52 fps						
Kinematic Viscosity	1.000E-05 ft^2/sec						
Reynold's Number, R	2757582						
Friction factor, f	0.0187	Equivalent Hazen-Williams "C" =	111.8155				
Friction Energy Loss, h_L	0.38 ft						

MINOR PIPE LOSS HEADING

Flow, Q: 70.0 mgd = 108.3 cfs

No.	Description	Flow (mgd)	Flow (cfs)	K	Dia Up (in)	Dia Down (in)	Vel Up (fps)	Vel Down (fps)	Vel Head (ft)	Minor Loss (ft)
0	90 ° Elbow - Regular Fl.	70.00	108.29	0.30	60	----	5.52	----	0.47	0.00
1	Outlet Loss - Still Water	70.00	108.29	1.00	60	----	5.52	----	0.47	0.47
1	Entrance Loss - Flush	70.00	108.29	0.50	----	60	----	5.52	0.47	0.24
									Sum =	0.71

Total Energy Loss = 1.09 ft

Upstream Condition					748.40	748.40
GRIT EFF BOX (TOP OF CONCRETE IN BOX IS EL 752.50')							
[SUBMERDED GATE - RECTANGULAR OPENING]					{14}		
Flow, Q	70.0 mgd =	108.3 cfs		**ASSUMES ONLY 70 MGD THROUGH 54" GATE TO DIV BOX**			
Gate Width	4.5 ft			**A20**			
Full Height of Opening	4.5 ft			**A20**			
Gate Percent Open	100%						
Discharge Coefficient, C	0.61						
Velocity through gate, v	5.35 fps						
Energy Loss thru Gate, h_L	1.19 ft						
Condition Upstream of Gate						749.59	749.59
GRIT EFF BOX (TOP OF CONCRETE IN BOX IS EL 752.50')							
[CHANNEL FRICTION LOSSES]					{5}		
Flow, Q	70.0 mgd =	108.3 cfs					

		Equation Ref.	HGL	EGL
Channel Width	8.00 ft	B1		
Total Channel Length	6.50	A21		
Downstream Invert El	740.00	B2		
Channel Slope	0.00%			
Manning Coeff, n	0.013			

Station	Invert Up	Invert Down	Depth (ft)	Vel. (fps)	Hydr. Radius (ft)	Sf	Avg. Sf	Friction Loss (ft)	HGL	EGL
0.0	740.00	740.00	9.56	1.416	2.82	0.000	----	----	749.56	749.59
1.3	740.00	740.00	9.56	1.416	2.82	0.000	0.000	0.00	749.56	749.59
2.6	740.00	740.00	9.56	1.416	2.82	0.000	0.000	0.00	749.56	749.59
3.9	740.00	740.00	9.56	1.416	2.82	0.000	0.000	0.00	749.56	749.59
5.2	740.00	740.00	9.56	1.416	2.82	0.000	0.000	0.00	749.56	749.59
6.5	740.00	740.00	9.56	1.416	2.82	0.000	0.000	0.00	749.56	749.59

TOTAL ENERGY LOSS *0.00 ft*

Condition at Upstream End of Channel 749.56 749.59

GRIT EFF BOX (TOP OF CONCRETE IN BOX IS EL 752.50')
MINOR CHANNEL LOSS HEADING

Flow, Q 70.0 mgd = 108.3 cfs

No.	Description	Flow (mgd)	Flow (cfs)	K	Width Up (ft)	Width Down (ft)	Depth (ft)	Vel Up (fps)	Vel Down (fps)	Vel Head (ft)	Minor Loss (ft)
0	90 Degree Bend - 0° Radius	70.00	108.29	1.30	6.5	----	9.56	1.74	----	0.05	0.00
1	Sudden Expansion	70.00	108.29	1.00	4.50	8.00	9.56	2.52	1.42	0.07	0.07
										Sum =	0.07

Total Energy Loss = 0.07 ft

Upstream Condition 749.66 749.66

TIE-IN POINT BETWEEN EXISTING STRUCTURE AND NEW YARD PIPING

	Equation Ref.	HGL	EGL
DOWNSTREAM CONTROL			
EGL = 752.60 — MAX WSE DOWNSTREAM OF LAUNDERS - CSO		752.60	752.60
Flow = 130.00 mgd = 201.11 cfs			

CSO DIVERSION BOX
MINOR CHANNEL LOSS HEADING

Flow, Q: 130.0 mgd = 201.1 cfs

No.	Description	Flow (mgd)	Flow (cfs)	K	Width Up (ft)	Width Down (ft)	Depth (ft)	Vel Up (fps)	Vel Down (fps)	Vel Head (ft)	Minor Loss (ft)
0	Sudden Expansion	130.00	201.11	1.00	4.00	17.50	10.60	4.74	1.08	0.33	0.00
1	90 Degree Bend - Long Rad	130.00	201.11	0.30	18	---	10.60	1.05	---	0.02	0.01
										Sum =	0.01

Total Energy Loss = 0.01 ft

Upstream Condition		752.61	752.61

CSO DIVERSION BOX {5}
[CHANNEL FRICTION LOSSES]

Flow, Q: 130.00 mgd = 201.1 cfs
Channel Width: 18.00 ft
Total Channel Length: 17.50
Downstream Invert El: 742.00
Channel Slope: 0.00%
Manning Coeff, n: 0.013

Station	Invert Up	Invert Down	Depth (ft)	Vel. (fps)	Hydr. Radius (ft)	Sf	Avg. Sf	Friction Loss (ft)	HGL	EGL
0.0	742.00	742.00	10.59	1.055	4.86	0.000	---	---	752.59	752.61
3.5	742.00	742.00	10.59	1.055	4.86	0.000	0.000	0.00	752.59	752.61
7.0	742.00	742.00	10.59	1.055	4.86	0.000	0.000	0.00	752.59	752.61
10.5	742.00	742.00	10.59	1.055	4.86	0.000	0.000	0.00	752.59	752.61
14.0	742.00	742.00	10.59	1.055	4.86	0.000	0.000	0.00	752.59	752.61
17.5	742.00	742.00	10.59	1.055	4.86	0.000	0.000	0.00	752.59	752.61

TOTAL ENERGY LOSS *0.00 ft*

Condition at Upstream End of Channel		752.59	752.61

CSO DOWNWARD OPENING GATE
FLOW SPLIT

Downstream Flow: 130.0 mgd = 201.1 cfs

New Flow: 65.0 mgd = 100.6 cfs

[STRAIGHT EDGED SHARP CRESTED WEIR]

Flow: 65.00 mgd = 100.6 cfs

WSE Downstream of Weir: 752.59 ft
Weir Crest Elevation: 753.00 ft
Downstream head, Hd: -0.41 ft
Length of Weir, L: 6.00 ft

WEIR IS FREE-DISCHARGING

Free Discharging Weir Computation {6}
Head on Weir, H: 2.94 ft
Upstream WSE: 755.94 ft

			Equation Ref.	HGL	EGL
Submerged Weir Computation			{7}		
K	NA				
M	NA				
Increment	NA	ft			
Upstream Head, Hu1	NA	ft			
F(H1)	NA				
F'(H1)	NA				
Upstream Head, Hu2	NA	ft			
Upstream WSE	NA	ft			
Head over Weir	*2.94 ft*				
			Condition Upstream of Weir	755.94	755.94

COMBINED GRIT EFFLUENT BOX
FLOW SPLIT

Downstream Flow	65.0 mgd =	100.6 cfs	
New Flow	270.0 mgd =	417.7 cfs	

[CHANNEL FRICTION LOSSES] {5}

Flow, Q	270.00 mgd =	417.7 cfs
Channel Width	17.50 ft	
Total Channel Length	37.00	
Downstream Invert El	742.00	
Channel Slope	0.00%	
Manning Coeff, n	0.013	

Station	Invert Up	Invert Down	Depth (ft)	Vel. (fps)	Hydr. Radius (ft)	Sf	Avg. Sf	Friction Loss (ft)	HGL	EGL
0.0	742.00	742.00	13.89	1.718	5.37	0.000	----	----	755.89	755.94
7.4	742.00	742.00	13.89	1.718	5.37	0.000	0.000	0.00	755.89	755.94
14.8	742.00	742.00	13.89	1.718	5.37	0.000	0.000	0.00	755.89	755.94
22.2	742.00	742.00	13.89	1.718	5.37	0.000	0.000	0.00	755.89	755.94
29.6	742.00	742.00	13.89	1.718	5.37	0.000	0.000	0.00	755.89	755.94
37.0	742.00	742.00	13.89	1.718	5.37	0.000	0.000	0.00	755.89	755.94

TOTAL ENERGY LOSS *0.00 ft*

Condition at Upstream End of Channel		755.89	755.94

COMBINED GRIT EFFLUENT BOX
MINOR CHANNEL LOSS HEADING

Flow, Q 270.0 mgd = 417.7 cfs

No.	Description	Flow (mgd)	Flow (cfs)	K	Width Up (ft)	Width Down (ft)	Depth (ft)	Vel Up (fps)	Vel Down (fps)	Vel Head (ft)	Minor Loss (ft)
1	Entrance - Bell Mouthed	140.00	216.58	0.10	7	17.5	13.89	2.23	0.89	0.06	0.01
1	Sudden Expansion	135.00	208.85	1.00	7.00	37.50	13.89	2.15	0.40	0.07	0.07
1	Tee - Thru Side	140.00	216.58	1.60	7.00	17.50	13.89	2.23	0.89	0.06	0.10
										Sum =	0.18

Total Energy Loss = 0.18 ft

Upstream Condition		756.12	756.12

FLOW SPLIT

Downstream Flow	270.0 mgd =	417.7 cfs	
New Flow	135.0 mgd =	208.8 cfs	

	Equation Ref.	HGL	EGL

DROP INTO BAY TO PRIMARY CLARIFIERS
MINOR CHANNEL LOSS HEADING

Flow, Q: 135.0 mgd = 208.8 cfs

No.	Description	Flow (mgd)	Flow (cfs)	K	Width Up (ft)	Width Down (ft)	Depth (ft)	Vel Up (fps)	Vel Down (fps)	Vel Head (ft)	Minor Loss (ft)
1	Sudden Contraction	135.00	208.85	0.50	20.00	7.00	14.12	0.74	2.11	0.06	0.03
1	Turn Around Baffle	135.00	208.85	3.20	20	----	14.12	0.74	----	0.01	0.03
										Sum =	0.06

Total Energy Loss = 0.06 ft

Upstream Condition		756.17	756.17

DROP INTO BAY NO. 1 TO PRIMARY CLARIFIERS
FLOW SPLIT

Downstream Flow: 270.0 mgd = 417.7 cfs

Number of Launders: 4
Flow per Launder: 67.5 mgd = 104.4 cfs

New Flow: 67.5 mgd = 104.4 cfs

LAUNDER DIMENSION

Width: 4 ft
Invert Elevation: 752.00 ft

LAUNDER FF MATCHES GRIT EFF CHANNEL FF

LAUNDER NO. 1 EFFLUENT WEIR
FLOW SPLIT

Downstream Flow: 67.5 mgd = 104.4 cfs

Number of Weirs per Launder: 2
Flow per Weir: 33.8 mgd = 52.2 cfs

New Flow: 33.8 mgd = 52.2 cfs

FLOW PER WEIR (2 PER LAUNDER)

[STRAIGHT EDGED SHARP CRESTED WEIR]

Flow: 33.75 mgd = 52.2 cfs

WSE Downstream of Weir: 756.17 ft
Weir Crest Elevation: 756.25 ft
Downstream head, Hd: -0.08 ft
Length of Weir, L: 20.00 ft

SET WEIR HEIGHT FOR 0.50-FT FREE DISCHARGE

WEIR IS FREE-DISCHARGING

Free Discharging Weir Computation {6}
Head on Weir, H: 0.85 ft
Upstream WSE: 757.10 ft

Submerged Weir Computation {7}
K: NA
M: NA
Increment: NA ft
Upstream Head, Hu1: NA ft
F(H1): NA
F'(H1): NA
Upstream Head, Hu2: NA ft
Upstream WSE: NA ft

Head over Weir 0.85 ft

	Equation Ref.	HGL	EGL
Condition Upstream of Weir		757.10	757.10

LAUNDER NO. 1
FLOW SPLIT

Downstream Flow 33.8 mgd = 52.2 cfs

New Flow 67.5 mgd = 104.4 cfs

[CHANNEL FRICTION LOSSES] {5}

Flow, Q 67.50 mgd = 104.4 cfs
Channel Width 4.00 ft
Total Channel Length 20.00
Downstream Invert El 752.00
Channel Slope 0.00%
Manning Coeff, n 0.013

Station	Invert Up	Invert Down	Depth (ft)	Vel. (fps)	Hydr. Radius (ft)	Sf	Avg. Sf	Friction Loss (ft)	HGL	EGL
0.0	752.00	752.00	4.60	5.675	1.39	0.002	---	---	756.60	757.10
4.0	752.00	752.00	4.61	5.665	1.39	0.002	0.002	0.01	756.61	757.11
8.0	752.00	752.00	4.62	5.655	1.40	0.002	0.002	0.01	756.62	757.11
12.0	752.00	752.00	4.62	5.646	1.40	0.002	0.002	0.01	756.62	757.12
16.0	752.00	752.00	4.63	5.636	1.40	0.002	0.002	0.01	756.63	757.13
20.0	752.00	752.00	4.64	5.626	1.40	0.002	0.002	0.01	756.64	757.13

TOTAL ENERGY LOSS *0.03 ft*

Condition at Upstream End of Channel		756.64	757.13

FLOW INTO LAUNDER NO. 1
MINOR CHANNEL LOSS HEADING

Flow, Q 67.5 mgd = 104.4 cfs

No.	Description	Flow (mgd)	Flow (cfs)	K	Width Up (ft)	Width Down (ft)	Depth (ft)	Vel Up (fps)	Vel Down (fps)	Vel Head (ft)	Minor Loss (ft)
1	Tee Thru Side Outlet	67.50	104.42	1.80	8	---	4.60	2.84	---	0.13	0.23
1	90 Degree Bend - 0° Radius	67.50	104.42	1.30	8	---	4.60	2.84	---	0.13	0.16
1	Sudden Expansion	67.50	104.42	1.00	10.00	20.00	4.60	2.27	1.13	0.06	0.06
1	Sudden Contraction	67.50	104.42	0.50	20.00	10.00	4.60	1.13	2.27	0.06	0.03
1	Gate Losses	67.50	104.42	0.20	4	---	4.60	5.67	---	0.50	0.10
										Sum =	0.58

Total Energy Loss = 0.58 ft

Upstream Condition		757.71	757.71

GRIT EFFLUENT CHANNEL - EAST
FLOW SPLIT

Downstream Flow 67.5 mgd = 104.4 cfs

New Flow 135.0 mgd = 208.8 cfs

GRIT EFFLUENT CHANNEL - EAST
[CHANNEL FRICTION LOSSES] {5}

Flow, Q 135.00 mgd = 208.8 cfs
Channel Width 9.00 ft
Total Channel Length 25.00
Downstream Invert El 752.00
Channel Slope 0.00%
Manning Coeff, n 0.013

									Equation Ref.	HGL	EGL
Station	Invert Up	Invert Down	Depth (ft)	Vel. (fps)	Hydr. Radius (ft)	Sf	Avg. Sf	Friction Loss (ft)			
0.0	752.00	752.00	5.42	4.278	2.46	0.000	----	----		757.42	757.71
5.0	752.00	752.00	5.43	4.276	2.46	0.000	0.000	0.00		757.43	757.71
10.0	752.00	752.00	5.43	4.274	2.46	0.000	0.000	0.00		757.43	757.71
15.0	752.00	752.00	5.43	4.272	2.46	0.000	0.000	0.00		757.43	757.72
20.0	752.00	752.00	5.43	4.270	2.46	0.000	0.000	0.00		757.43	757.72
25.0	752.00	752.00	5.44	4.268	2.46	0.000	0.000	0.00		757.44	757.72

TOTAL ENERGY LOSS *0.01 ft*

Condition at Upstream End of Channel 757.44 757.72

GRIT EFFLUENT ISOLATION GATE - NOT SUBMERGED - FRAME EMBEDDED IN CHANNEL
MINOR CHANNEL LOSS HEADING

Flow, Q 135.0 mgd = 208.8 cfs

No.	Description	Flow (mgd)	Flow (cfs)	K	Width Up (ft)	Width Down (ft)	Depth (ft)	Vel Up (fps)	Vel Down (fps)	Vel Head (ft)	Minor Loss (ft)	
1	Gate Losses	135.00	208.85	0.20	6.5	6.5	5.44	5.91	-	0.54	0.11	
										Sum =	0.10847	{14}

Total Energy Loss = 0.11 ft

Condition Upstream of Gate 757.83 757.83

GRIT EFFLUENT CHANNEL - EAST
[CHANNEL FRICTION LOSSES] {5}

Flow, Q 135.00 mgd = 208.8 cfs
Channel Width 7.50 ft
Total Channel Length 10.00
Downstream Invert El 752.00
Channel Slope 0.00%
Manning Coeff, n 0.013

Station	Invert Up	Invert Down	Depth (ft)	Vel. (fps)	Hydr. Radius (ft)	Sf	Avg. Sf	Friction Loss (ft)	HGL	EGL
0.0	752.00	752.00	5.42	5.140	2.22	0.001	----	----	757.42	757.83
2.0	752.00	752.00	5.42	5.138	2.22	0.001	0.001	0.00	757.42	757.83
4.0	752.00	752.00	5.42	5.137	2.22	0.001	0.001	0.00	757.42	757.83
6.0	752.00	752.00	5.42	5.135	2.22	0.001	0.001	0.00	757.42	757.83
8.0	752.00	752.00	5.42	5.134	2.22	0.001	0.001	0.00	757.42	757.83
10.0	752.00	752.00	5.43	5.132	2.22	0.001	0.001	0.00	757.43	757.83

TOTAL ENERGY LOSS *0.01 ft*

Condition at Upstream End of Channel 757.43 757.83

GRIT EFFLUENT CHANNEL - EAST
MINOR CHANNEL LOSS HEADING

Flow, Q 135.0 mgd = 208.8 cfs

No.	Description	Flow (mgd)	Flow (cfs)	K	Width Up (ft)	Width Down (ft)	Depth (ft)	Vel Up (fps)	Vel Down (fps)	Vel Head (ft)	Minor Loss (ft)

											Equation Ref.	HGL	EGL
1	90 Degree Bend - 0° Radius	135.00	208.85	1.30	7.50	---	5.43	5.13	---	0.41			
										Sum = 0.53167			
	Total Energy Loss =	0.53 ft											
	Upstream Condition											758.37	758.37

GRIT EFFLUENT CHANNEL - EAST - TANK 8
[CHANNEL FRICTION LOSSES] {5}

Flow, Q	135.00 mgd =	208.8 cfs
Channel Width	7.50 ft	
Total Channel Length	20.00	
Downstream Invert El	752.00	
Channel Slope	0.00%	
Manning Coeff, n	0.013	

Station	Invert Up	Invert Down	Depth (ft)	Vel. (fps)	Hydr. Radius (ft)	Sf	Avg. Sf	Friction Loss (ft)	HGL	EGL
0.0	752.00	752.00	6.04	4.613	2.31	0.001	---	---	758.04	758.37
4.0	752.00	752.00	6.04	4.611	2.31	0.001	0.001	0.00	758.04	758.37
8.0	752.00	752.00	6.04	4.610	2.31	0.001	0.001	0.00	758.04	758.37
12.0	752.00	752.00	6.04	4.608	2.31	0.001	0.001	0.00	758.04	758.37
16.0	752.00	752.00	6.05	4.606	2.31	0.001	0.001	0.00	758.05	758.37
20.0	752.00	752.00	6.05	4.604	2.31	0.001	0.001	0.00	758.05	758.38

TOTAL ENERGY LOSS *0.01 ft*

Condition at Upstream End of Channel 758.05 758.38

GRIT EFFLUENT CHANNEL - EAST - TANK 8
MINOR CHANNEL LOSS HEADING

Flow, Q 135.0 mgd = 208.8 cfs

No.	Description	Flow (mgd)	Flow (cfs)	K	Width Up (ft)	Width Down (ft)	Depth (ft)	Vel Up (fps)	Vel Down (fps)	Vel Head (ft)	Minor Loss (ft)
1	Tee - Thru Straight Run	135.00	208.85	0.60	7.50	---	6.05	4.60	---	0.33	0.20
										Sum =	0.19751
	Total Energy Loss =	0.20 ft									
	Upstream Condition										758.57	758.57

GRIT EFFLUENT CHANNEL - EAST - TANK 7
FLOW SPLIT

Downstream Flow	135.0 mgd =	208.8 cfs
New Flow	101.3 mgd =	156.6 cfs

GRIT EFFLUENT CHANNEL - EAST
[CHANNEL FRICTION LOSSES] {5}

Flow, Q	101.25 mgd =	156.6 cfs
Channel Width	7.50 ft	
Total Channel Length	20.00	
Downstream Invert El	752.00	
Channel Slope	0.00%	
Manning Coeff, n	0.013	

Station	Invert Up	Invert Down	Depth (ft)	Vel. (fps)	Hydr. Radius (ft)	Sf	Avg. Sf	Friction Loss (ft)	HGL	EGL

Station	Invert Up	Invert Down	Depth (ft)	Vel. (fps)	Hydr. Radius (ft)	Sf	Avg. Sf	Friction Loss (ft)	HGL	EGL	Equation Ref.	HGL	EGL
0.0	752.00	752.00	6.41	3.258	2.37	0.000	----	----	758.41	758.57			
4.0	752.00	752.00	6.41	3.258	2.37	0.000	0.000	0.00	758.41	758.58			
8.0	752.00	752.00	6.41	3.257	2.37	0.000	0.000	0.00	758.41	758.58			
12.0	752.00	752.00	6.41	3.257	2.37	0.000	0.000	0.00	758.41	758.58			
16.0	752.00	752.00	6.41	3.256	2.37	0.000	0.000	0.00	758.41	758.58			
20.0	752.00	752.00	6.42	3.255	2.37	0.000	0.000	0.00	758.42	758.58			

TOTAL ENERGY LOSS *0.01 ft*

Condition at Upstream End of Channel 758.42 758.58

GRIT EFFLUENT CHANNEL - EAST - TANK 7
MINOR CHANNEL LOSS HEADING

Flow, Q 101.3 mgd = 156.6 cfs

No.	Description	Flow (mgd)	Flow (cfs)	K	Width Up (ft)	Width Down (ft)	Depth (ft)	Vel Up (fps)	Vel Down (fps)	Vel Head (ft)	Minor Loss (ft)
1	Tee - Thru Straight Run	101.25	156.63	0.60	7.50	----	6.42	3.26	----	0.16	0.10
										Sum =	0.09874

Total Energy Loss = 0.10 ft

Upstream Condition 758.68 758.68

GRIT EFFLUENT CHANNEL - EAST - TANK 6
FLOW SPLIT

Downstream Flow 101.3 mgd = 156.6 cfs

New Flow 67.5 mgd = 104.4 cfs

GRIT EFFLUENT CHANNEL - EAST
[CHANNEL FRICTION LOSSES] {5}

Flow, Q 67.50 mgd = 104.4 cfs
Channel Width 7.50 ft
Total Channel Length 20.00
Downstream Invert El 752.00
Channel Slope 0.00%
Manning Coeff, n 0.013

Station	Invert Up	Invert Down	Depth (ft)	Vel. (fps)	Hydr. Radius (ft)	Sf	Avg. Sf	Friction Loss (ft)	HGL	EGL
0.0	752.00	752.00	6.61	2.106	2.39	0.000	----	----	758.61	758.68
4.0	752.00	752.00	6.61	2.106	2.39	0.000	0.000	0.00	758.61	758.68
8.0	752.00	752.00	6.61	2.106	2.39	0.000	0.000	0.00	758.61	758.68
12.0	752.00	752.00	6.61	2.106	2.39	0.000	0.000	0.00	758.61	758.68
16.0	752.00	752.00	6.61	2.106	2.39	0.000	0.000	0.00	758.61	758.68
20.0	752.00	752.00	6.61	2.106	2.39	0.000	0.000	0.00	758.61	758.68

TOTAL ENERGY LOSS *0.00 ft*

Condition at Upstream End of Channel 758.61 758.68

GRIT EFFLUENT CHANNEL - EAST - TANK 6
MINOR CHANNEL LOSS HEADING

Flow, Q 67.5 mgd = 104.4 cfs

No.	Description	Flow (mgd)	Flow (cfs)	K	Width Up (ft)	Width Down (ft)	Depth (ft)	Vel Up (fps)	Vel Down (fps)	Vel Head (ft)	Minor Loss (ft)

											Equation Ref.	HGL	EGL
1	Tee - Thru Straight Run	67.50	104.42	0.60	7.50	---	6.61	2.11	---	0.07			
										Sum = 0.04131			
	Total Energy Loss =	0.04 ft											
	Upstream Condition											758.72	758.72

GRIT EFFLUENT CHANNEL - EAST - TANK 5
FLOW SPLIT

Downstream Flow	67.5 mgd =	104.4 cfs	
New Flow	33.8 mgd =	52.2 cfs	

GRIT EFFLUENT CHANNEL - EAST
[CHANNEL FRICTION LOSSES] {5}

Flow, Q	33.75 mgd =	52.2 cfs	
Channel Width	7.50 ft		
Total Channel Length	20.00		
Downstream Invert El	752.00		
Channel Slope	0.00%		
Manning Coeff, n	0.013		

Station	Invert Up	Invert Down	Depth (ft)	Vel. (fps)	Hydr. Radius (ft)	Sf	Avg. Sf	Friction Loss (ft)	HGL	EGL
0.0	752.00	752.00	6.71	1.038	2.40	0.000	---	---	758.71	758.72
4.0	752.00	752.00	6.71	1.038	2.40	0.000	0.000	0.00	758.71	758.72
8.0	752.00	752.00	6.71	1.038	2.40	0.000	0.000	0.00	758.71	758.72
12.0	752.00	752.00	6.71	1.038	2.41	0.000	0.000	0.00	758.71	758.72
16.0	752.00	752.00	6.71	1.038	2.41	0.000	0.000	0.00	758.71	758.72
20.0	752.00	752.00	6.71	1.038	2.41	0.000	0.000	0.00	758.71	758.72

TOTAL ENERGY LOSS *0.00 ft*

	Condition at Upstream End of Channel											758.71	758.72

GRIT EFFLUENT CHANNEL - EAST - TANK 5
MINOR CHANNEL LOSS HEADING

Flow, Q	33.8 mgd =	52.2 cfs	

No.	Description	Flow (mgd)	Flow (cfs)	K	Width Up (ft)	Width Down (ft)	Depth (ft)	Vel Up (fps)	Vel Down (fps)	Vel Head (ft)	Minor Loss (ft)
1	Tee - Thru Straight Run	33.75	52.21	0.60	7.50	---	6.71	1.04	---	0.02	0.01
										Sum =	0.01004
	Total Energy Loss =	0.01 ft									
	Upstream Condition										758.73	758.73

GRIT TANKS

GRIT TANK 8 - WEIR CRITICAL PATH
[STRAIGHT EDGED SHARP CRESTED WEIR]

Flow	33.8 mgd =	52.2 cfs	
WSE Downstream of Weir	758.73 ft		
Weir Crest Elevation	758.88 ft		
Downstream head, Hd	-0.14 ft		
Length of Weir, L	16.00 ft		

WEIR IS FREE-DISCHARGING

		Equation Ref.	HGL	EGL
Free Discharging Weir Computation		{6}		
Head on Weir, H	0.99 ft			
Upstream WSE	759.86 ft			
Submerged Weir Computation		{7}		
K	NA			
M	NA			
Increment	NA ft			
Upstream Head, Hu1	NA ft			
F(H1)	NA			
F'(H1)	NA			
Upstream Head, Hu2	NA ft			
Upstream WSE	NA ft			
Head over Weir	*0.99 ft*			
Condition Upstream of Weir			759.86	759.86

ESTIMATED HEADLOSS THROUGH HEADCELL UNIT

Flow 33.8 mgd = 52.2 cfs

Total Energy Loss = 0.56 ft **CALCULATED VALUE BASED ON NOZZLE SIZE**

Upstream Condition		760.42	760.42

GRIT INFLUENT CHANNEL - CHANNEL 3 - TANK 8
GRIT INFLUENT ISOLATION GATE - NOT SUBMERGED - FRAME EMBEDDED IN CHANNEL
MINOR CHANNEL LOSS HEADING

Flow, Q 33.8 mgd = 52.2 cfs

No.	Description	Flow (mgd)	Flow (cfs)	K	Width Up (ft)	Width Down (ft)	Depth (ft)	Vel Up (fps)	Vel Down (fps)	Vel Head (ft)	Minor Loss (ft)	
1	Gate Losses	33.75	52.21	0.20	3	-	6.75	2.58	-	0.10	0.02	
1	Tee - Thru Straight Run	33.75	52.21	0.60	3	-	6.75	2.58	-	0.10	0.06	
1	90 Degree Bend - Long Rad	33.75	52.21	0.30	3	----	6.75	2.58	----	0.10	0.03	
										Sum =	0.11358	{14}

Total Energy Loss = 0.11 ft

Condition Upstream of Gate		760.54	760.54

GRIT INFLUENT CHANNEL - CHANNEL 3 - TANK 8
[CHANNEL FRICTION LOSSES] {5}

Flow, Q 33.75 mgd = 52.2 cfs
Channel Width 3.00 ft
Total Channel Length 25.00
Downstream Invert El 753.68
Channel Slope 0.00%
Manning Coeff, n 0.013

Station	Invert Up	Invert Down	Depth (ft)	Vel. (fps)	Hydr. Radius (ft)	Sf	Avg. Sf	Friction Loss (ft)	HGL	EGL
0.0	753.68	753.68	6.76	2.575	1.23	0.000	----	----	760.43	760.54
5.0	753.68	753.68	6.76	2.574	1.23	0.000	0.000	0.00	760.44	760.54
10.0	753.68	753.68	6.76	2.573	1.23	0.000	0.000	0.00	760.44	760.54
15.0	753.68	753.68	6.77	2.572	1.23	0.000	0.000	0.00	760.44	760.54
20.0	753.68	753.68	6.77	2.572	1.23	0.000	0.000	0.00	760.44	760.55
25.0	753.68	753.68	6.77	2.571	1.23	0.000	0.000	0.00	760.44	760.55

TOTAL ENERGY LOSS *0.01 ft*

Condition at Upstream End of Channel		760.44	760.55

GRIT INFLUENT CHANNEL - CHANNEL 3

	Equation Ref.	HGL	EGL

FLOW SPLIT

Downstream Flow 33.8 mgd = 52.2 cfs

New Flow 67.5 mgd = 104.4 cfs

[CHANNEL FRICTION LOSSES] {5}

Flow, Q 67.50 mgd = 104.4 cfs
Channel Width 4.50 ft
Total Channel Length 80.00
Downstream Invert El 753.68
Channel Slope 0.00%
Manning Coeff, n 0.013

Station	Invert Up	Invert Down	Depth (ft)	Vel. (fps)	Hydr. Radius (ft)	Sf	Avg. Sf	Friction Loss (ft)	HGL	EGL
0.0	753.68	753.68	6.69	3.471	1.68	0.000	---	---	760.36	760.55
16.0	753.68	753.68	6.69	3.467	1.68	0.000	0.000	0.01	760.37	760.55
32.0	753.68	753.68	6.70	3.463	1.68	0.000	0.000	0.01	760.38	760.56
48.0	753.68	753.68	6.71	3.459	1.68	0.000	0.000	0.01	760.38	760.57
64.0	753.68	753.68	6.72	3.455	1.69	0.000	0.000	0.01	760.39	760.58
80.0	753.68	753.68	6.72	3.451	1.69	0.000	0.000	0.01	760.40	760.58

TOTAL ENERGY LOSS *0.04 ft*

Condition at Upstream End of Channel 760.40 760.58

GRIT INFLUENT CHANNEL - CHANNEL 3
GRIT COMMON INFLUENT CHANNEL GATE - NOT SUBMERGED - FRAME EMBEDDED IN CHANNEL
MINOR CHANNEL LOSS HEADING

Flow, Q 67.5 mgd = 104.4 cfs

No.	Description	Flow (mgd)	Flow (cfs)	K	Width Up (ft)	Width Down (ft)	Depth (ft)	Vel Up (fps)	Vel Down (fps)	Vel Head (ft)	Minor Loss (ft)
2	22.5 ° Bend	67.50	104.42	0.15	4.5	---	6.69	3.47	---	0.19	0.06
1	Gate Losses	67.50	104.42	0.20	4	-	6.69	3.91	-	0.24	0.05
										Sum =	0.10

Total Energy Loss = 0.10 ft

Upstream Condition 760.69 760.69

GRIT COMMON INFLUENT CHANNEL
FLOW SPLIT

Downstream Flow 67.5 mgd = 104.4 cfs

New Flow 270.0 mgd = 417.7 cfs

[CHANNEL FRICTION LOSSES] {5}

Flow, Q 270.00 mgd = 417.7 cfs
Channel Width 10.00 ft
Total Channel Length 36.00
Downstream Invert El 753.68
Channel Slope 0.00%
Manning Coeff, n 0.013

	Invert	Invert	Depth	Vel.	Hydr. Radius	Avg.	Friction Loss

Station	Up	Down	(ft)	(fps)	(ft)	Sf	Sf	(ft)	HGL	EGL	Equation Ref.	HGL	EGL
0.0	753.68	753.68	6.34	6.591	2.79	0.001	----	----	760.01	760.69			
7.2	753.68	753.68	6.35	6.583	2.80	0.001	0.001	0.01	760.02	760.69			
14.4	753.68	753.68	6.35	6.575	2.80	0.001	0.001	0.01	760.03	760.70			
21.6	753.68	753.68	6.36	6.567	2.80	0.001	0.001	0.01	760.04	760.71			
28.8	753.68	753.68	6.37	6.559	2.80	0.001	0.001	0.01	760.04	760.71			
36.0	753.68	753.68	6.38	6.551	2.80	0.001	0.001	0.01	760.05	760.72			
TOTAL ENERGY LOSS		*0.03 ft*											
											Condition at Upstream End of Channel	760.05	760.72

GRIT COMMON INFLUENT CHANNEL
MINOR CHANNEL LOSS HEADING

Flow, Q 135.0 mgd = 208.8 cfs

No.	Description	Flow (mgd)	Flow (cfs)	K	Width Up (ft)	Width Down (ft)	Depth (ft)	Vel Up (fps)	Vel Down (fps)	Vel Head (ft)	Minor Loss (ft)
1	Entrance - Bell Mouthed	135.00	208.85	0.05	10	4.5	6.34	3.30	7.32	0.66	0.03
1	90 Degree Bend - 0° Radius	135.00	208.85	1.30	10	----	6.34	3.30	----	0.17	0.22
										Sum =	0.25

Total Energy Loss = 0.25 ft

Upstream Condition	760.97	760.97	

APPENDIX D

DRAFT GEOTECHNICAL DESKTOP STUDY REPORT

DRAFT DESKTOP STUDY REPORT

BLUE RIVER WWTP – FACILITY PLAN AND IMPROVEMENTS
KANSAS CITY, MISSOURI
TSI PROJECT NUMBER 20232064.00

CAROLLO ENGINEERS
903 E 104th Street, Suite 230
Kansas City, Missouri 64131



1340 North Price Road
St. Louis, Missouri 63132

April 11, 2024

TSi
geotechnical, inc.

April 11, 2024

Ms. Maya Turner
CAROLLO ENGINEERS
903 E 104th Street, Suite 230
Kansas City, Missouri 64131

Re: Desktop Study Report Facility Plan and Improvements
Blue River WWTP
Kansas City, Missouri
TSi Job Number: 20232064.00

Dear Ms. Turner:

TSi Geotechnical, Inc. (TSi) has completed the authorized Desktop Study for the referenced project and is pleased to submit this report of our findings to Carollo Engineers. This report should be considered a guide, as a site investigation has not been completed. The overall purpose of this Desktop Study was to research and review available information including local geology review and water well logs near the site in order to evaluate anticipated critical geotechnical design considerations.

We appreciate the opportunity to assist you with this project. If you have any questions, or if we may be of further service to you, please call us.

Respectfully submitted,
TSI GEOTECHNICAL, INC.

DRAFT

Fred H. Held, III
Geotechnical Project Manager

DRAFT

Andrew Declue, PE
Director of Operations

DRAFT

Denise B. Hervey, PE
Principal

TABLE OF CONTENTS

1.0 SCOPE OF SERVICES 1

2.0 SITE AND PROJECT DESCRIPTION 1

3.0 REGIONAL GEOLOGY 1

4.0 WELL LOG REVIEW 2

5.0 AVAILABLE GEOTECHNICAL DATA FROM PAST PROJECTS 2
5.1 Seismic Site Classification 3

6.0 MODNR INFORMATION REVIEW 3

7.0 PROPOSED FOUNDATION TYPES 4
7.1 Alternate 1 4
7.2 Alternate 2 5

8.0 RECOMMENDED GEOTECHNICAL EXPLORATION 6

9.0 REPORT LIMITATIONS 6

Appendix A
- Vicinity Map, Figure 1
- Generalized Project Location Plan, Figure 2

Appendix B
- Well Log, Figure 3
- Public Well Log Records
- USGS Alluvium and Bedrock Presence, Figure 4
- USGS Geological Hazards, Figure 5
- Proposed Boring Location Plan for Alternate 2, Figure 6

DRAFT DESKTOP STUDY REPORT
BLUE RIVER WWTP – FACILITY PLAN AND IMPROVEMENTS
KANSAS CITY, MISSOURI

1.0 SCOPE OF SERVICES

This report summarizes the results of a desktop study performed for the proposed improvements to the Blue River Wastewater Treatment Plant (WWTP) in Kansas City, Missouri. The study was performed in general accordance with Task Order 1, dated December 6, 2023 between Carollo and TSi. TSi's has been provided available information including existing geotechnical reports, a review of local geology and water well logs in the area. Based on TSi's understanding of the project, the following items have been identified for inclusion in this desktop study report:

- Generalized subsurface conditions anticipated near the project location based on previous TSi projects;
- Review of public historical geotechnical data and well logs near the project location;
- Estimated depths to bedrock near the project location; and,
- Recommendations for further geotechnical explorations.

2.0 SITE AND PROJECT DESCRIPTION

The project site is the Blue River Primary WWTP in Kansas City, Missouri. TSi understands the project will consist of two alternate sites, both with new buildings and Alternate 2 with new grit tanks. The existing structures on the site are possibly clarifiers and small buildings. Due to the site at Alternate 1 being developed, the level of the site should be relatively uniform. Although, without any provided topographic maps, the site elevation could vary significantly. The site at Alternate 2 will be engineered fill after the removal of the ash pond. The general location of the project site is located about 0.2 miles northwest of the Blue River about 20 feet above the river and is shown in Appendix A as Figure 1.

3.0 REGIONAL GEOLOGY

Based on the United States Geological Survey (USGS) and Missouri Department of Natural Resources (GeoSTRAT) database, the site for this project lie into Holocene series geologic formation belongs to Quaternary-Holocene Series geologic age. The project site is also within the flood plains of the Missouri River and the Blue River. Subsurface conditions in the Missouri River flood plain typically consist of alluvial soils extending to bedrock at a depth of 70 to 150 feet. The depth to bedrock is typically deeper near the center of the floodplain. The alluvial soils typically consist of soft, silty clays in the upper 5 to 15 feet, with fine grained sands continuing below the shallow clays to bedrock.

In areas where river channels were more recently abandoned, the surface soils tend to be very soft fat clays to depths of 20 to 30 feet. Coarser grained sands and some gravels are typically present at greater depths, with several feet of gravel sometimes present just above the top of shale bedrock. In the Blue River flood plain, the subsurface profile is similar to the Missouri River flood plain. However, the fine-grained soils at the ground surface typically continue to greater depths (20 to

50 feet) and are softer. These bedrock layers and Alluvium are shown on Figure 3 in Appendix B of this report.

The alluvial soils are likely underlain by the Pleasanton Shale formation. This formation is part of the Missourian Series, Pennsylvanian System, Pleasanton Group. The geologic units with this Group are generally shales and sandstones.

4.0 WELL LOG REVIEW

TSi reviewed the Missouri Department of Natural Resources well log inventory of monitoring wells and water well logs to determine approximate elevation to bedrock in the vicinity of the proposed alignments and soil overburden materials. There are about 6 registered wells or well groups surrounding the project area up to about 1.2 miles. A plan indicating these approximate well locations is provided in Figure 3 in Appendix B of this report. These registered wells were installed at depths ranging from 20 to 743 feet.

The two wells drilled north and southwest of the site were installed to depths of approximately 700 feet and 743 feet. These well logs indicate bedrock at depths of 48 and 70 feet, respectively, resulting in bedrock elevations of approximately 762 feet and 665 feet. Well logs 2, 3, 4, and 5 are monitoring wells drilled to depths of about 40.5 to 79 feet and indicate clays to depths of about 55 feet, with underlying sands. Well log 5 encountered rock at a depth of about 60 feet at an elevation of about 694 that was weathered shale.

5.0 AVAILABLE GEOTECHNICAL DATA FROM PAST PROJECTS

TSi has reviewed historic data and borings from our past projects near the study area. Those projects and the soil types encountered are summarized in the following paragraphs. The approximate location of these reference projects is shown in Figure 2 of Appendix A attached to this report. These three sites are located in the same Alluvium zone of the Missouri River as the project.

Project site A is located directly above and 1 mile north of the site and involved TSi drilling a total of three (3) borings. Although for the purpose of this study, the boring that is located a mile away from the focus site will be ignored. The depths of the two boring next to the site are approximately 70 and 78 feet. The borings encountered existing fill over native material consisting of mostly sand and pockets of soft lean clay, fat clays, and a small presence of gravel. Below the native soils, the upper bedrock was encountered consisting of shale, starting at depths ranging from approximately 69 and 77 feet below the existing ground surface at elevations near 740 feet.

Project site B is also located directly above the site and involved TSi drilling a total of seven (7) borings to depths of approximately 63.5 to 88.7 feet. The surficial materials consisted of cohesive soils consisting of clays, underlain primarily by sands with varying layers of lean and fat clays, gravel, and silt, with generally stiff consistencies. Below the native soils, weathered shale bedrock

was encountered at depths ranging from approximately 63.5 to 78 feet below the existing ground surface at elevations near 665 feet.

Project C is located on and around the site and involved TSi drilling a total of eight (8) borings to depths of 40 feet. The borings encountered existing fill over native material consisting of mostly lean clays and silts with varying amounts of sands and gravels. The subsurface materials below the fill can be generalized as native clays and silts underlain by sands. However, alternate layers of sands and clays were encountered.

5.1 SEISMIC SITE CLASSIFICATION

Based on the general soil characteristics as determined by the previous projects and the depth to bedrock, the project area may be designated a Site Class D, in accordance with the International Building Code (IBC) without considering potential liquefaction. The standard penetration test (N) values suggest that the soil has adequate density to resist liquefaction in consideration of the distance to known seismic sources. Thus, the soils in the project area will not likely be considered susceptible to liquefaction, or to substantial settlement or loss in strength when subject to the design earthquake loading. However, a detailed evaluation of liquefaction was not performed.

6.0 MODNR INFORMATION REVIEW

Published data from the Missouri Department of Natural Resources (MoDNR) and their GeoSTRAT database indicate geologic features within the project study area that should be addressed during the design phase. Figures 4 and 5 in Appendix B of this report include this geologic information from GeoSTRAT and indicate the approximate study area boundary. MoDNR provides data and estimates including depth to bedrock, known mine locations, estimated groundwater depths and elevations, geologic structures (such as fault lines and synclines/anticlines), top of bedrock elevation, geotechnical hazards (such as liquefaction potential), registered monitoring and water wells, oil and gas wells, and known sinkholes.

The following paragraph summarizes the information that is from MoDNR published data. Estimate bedrock depth and elevation information was discussed in Section 5 of this report. There are no reported mines within the study area boundary, the closest known mine is approximately 0.7 miles southeast of the project site. Groundwater depth is estimated to be between 0 and 10 feet throughout the study area with groundwater elevations estimated to be approximately 750 to 775 feet. Groundwater can be higher during prolonged precipitation and flooding events. A geologic structure is noted to travel near the study area, this is understood to be a anticline in the bedrock known as the Centerview-Kansas City Anticline. A geologic hazard area covers most of the study corridor and indicates a liquefaction potential of the soils along the Missouri and Kansas Rivers extending up through the Alluvium. Reported monitoring wells were discussed in Section 4 of this report. There are no known oil and gas wells within the study area. The closest known oil or gas well is approximately 0.3 miles north from the project site. No mapped sinkholes have been observed within the project corridor. The closest known sinkhole is approximately 7.5 miles

southeast of the project site. Karst formations are of low concern for this site due to the shale formations underlying the alluvium soils.

7.0 PROPOSED FOUNDATION TYPES

The following recommendations for foundation support and assessment for the proposed structures are based on the anticipation that proposed ground surface elevations not differing significantly from the existing ground elevations. TSi does anticipate significant amounts of cut and fill at both sites. Table 1 below presents the proposed structures and corresponding pertinent information.

TABLE 1
SUMMARY OF DATA FOR STRUCTURES

Structure		Proposed Plan Dimensions (ft)	Estimated Proposed Finished Floor Elevation (ft)	General Location
Alternate 1	Grit Elec. Building	75 x 35	Approx. 751.0	West side adjacent to existing grit tanks
	Grit Handling Building	75 x 50	735.0	
Alternate 2	Grit Tanks	95 x 122	725.0	Over 100 ft East of existing grit tanks
	Tunnel	12 wide	Not Provided	
	Grit Handling Building	90 x 50	741.22	
	Grit Elec. Building	90 x 26	750.0	

7.1 ALTERNATE 1

TSi understands that Alternate 1 is located on a sloped area on the west side of existing grit tanks that will be cut 4 to 18 feet to level the area for the grit handling building at a finished floor level of 735. The two retaining walls and existing grit building will retain the adjacent area.

Helical anchors

We understand that the existing Grit Tanks are supported by helical piles. We recommend supporting Alternate 1 with the same system. We do not recommend helical piles bear into soft clays or loose sands and the bottom helix of the helical piles should be a minimum of 3 helix diameters above any loose or soft soils. Since the helical piles typically have slender shafts and considering the relatively deep depths of proper bearing materials at the site, we recommend a detailed buckling analysis be performed for the piles planned to be installed for each structure. Helical anchors with pipe shafts that can be grouted can provide additional lateral

Retaining Wall

MSE walls are typically subcontracted as design-build structures. Established design methods for MSE walls address local, external and internal stability issues, but do not specifically address the global stability of the wall system. The MSE walls should be embedded at least 2.5 feet below surface grades to account for frost depth.

Internal, external and local stability analyses for each wall design should be performed by the design contractor and should consider both drained and undrained strength parameters to evaluate the long-term (drained) and end of construction (undrained) conditions. The designer should include the material's strength parameters assumed for the analysis and design, in their design and construction documents.

7.2 ALTERNATE 2

TSi understands that Alternate 2 is proposed to be located on the ash pond area. It will house new grit tanks, handling and electric buildings, and a tunnel, along with a new road access path. We understand that Alternate 2 is the preferred option.

The ash pond will be closed prior to the construction of Alternate 2. Before the construction of Alternate 2 can begin, the pond will be removed of all biosolids ash material and then replaced with engineered fill. The closure of the ash pond is estimated to start in 2024 and end in 2026.

Driven H-piles

For Alternate 2, it is proposed that the structures be supported by Driven H-piles. A reduction in factored capacity results from steel H-piles being placed closer than 3 pier diameters apart (center-to-center spacing). The reduction in individual capacity depends on many factors including the configuration of the group, number of piles in the group, pile size, depth of installation, and pile spacing.

Pile driving resistance should be closely monitored. We recommend a minimum PDA testing of one pile per bent. If refusal is encountered early, TSi recommends PDA testing of that pile during re-strike to measure the achieved capacity.

Alternate Foundations

In addition to driven H-piles, driven pipe piles may also be used. Other foundation considerations includer Auger cast-in-place pile (ACP) or Helical pier could also be appropriate for this site.

Proposed Boring Location Plan

TSi recommends that new borings be drilled in the ash pond, after its closure, to evaluate the site to its specific requirements. Figure 6, located in Appendix B, is our recommended boring location plan from the provided plans.

8.0 RECOMMENDED GEOTECHNICAL EXPLORATION

Without performing a field exploration on the project site, TSi cannot state with any certainty that the soil and bedrock conditions at certain locations will be similar, better, or worse than what has been estimated using historic project data and published information from MoDNR. The design team should consider and accept these uncertainties while reviewing the general anticipated subsurface conditions in this desktop study report.

Due to the unknown specific foundations of the existing structures, a field exploration is recommended by TSi to perform borings in soil and rock, and perform laboratory testing to provide recommendations for the proposed new buildings and grit tanks.

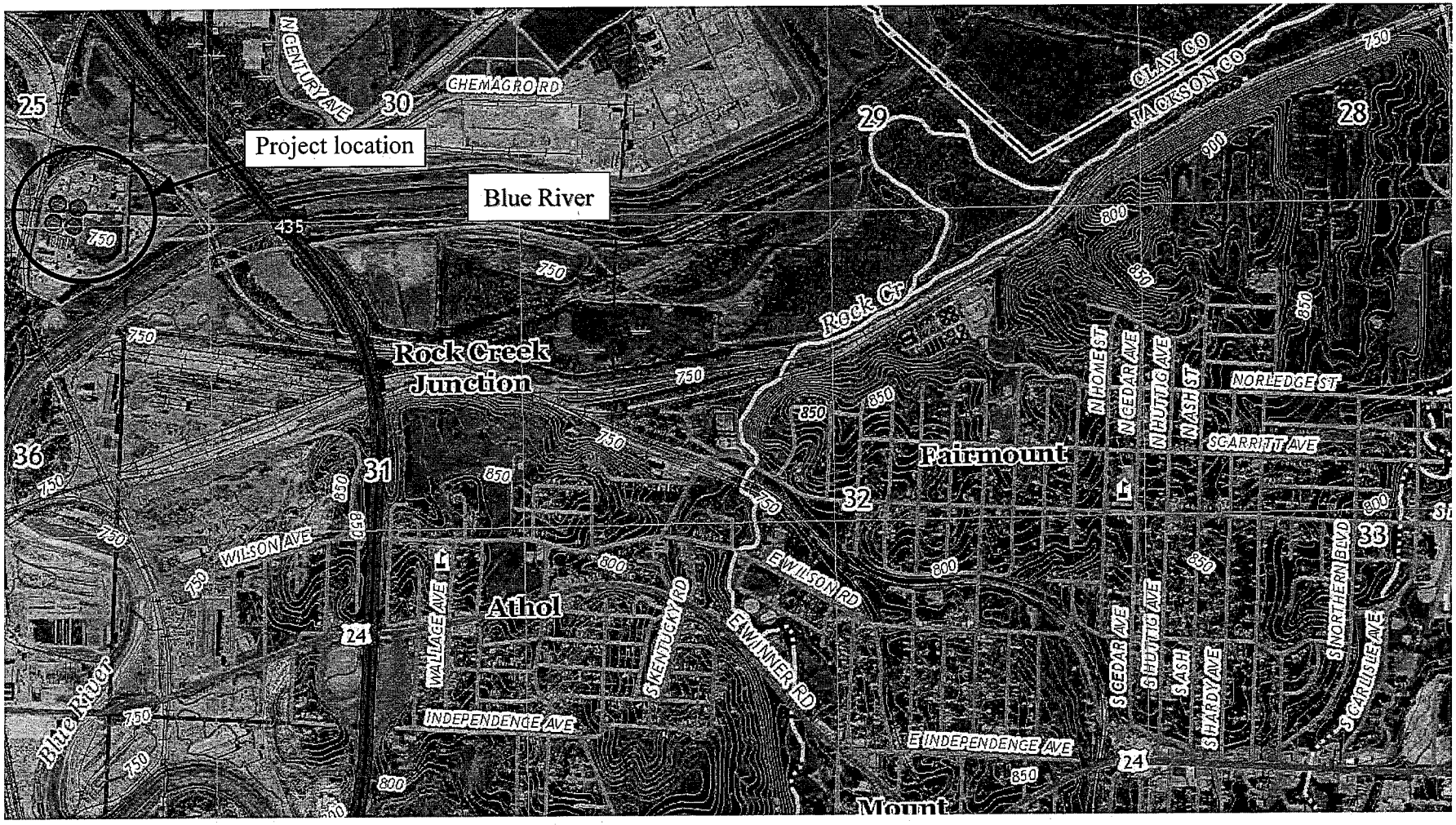
We anticipate variable fill depths of very soft to medium sift cohesive soils and granular soil with variable consistencies. Below the fill the upper native soft to medium stiff cohesive soils and underlying medium dense to dense granular soils are variable in consistency. Borings should be performed at the proposed site location where the new structures are planned. Borings drilled in other locations may not apply to the proposed new buildings and grit tanks. Due to the location being in the Alluvium of the Missouri and Blue Rivers, the bedrock can be carved out deeper in the river channel and may not be uniform across the site. Multiple borings drilled in the project site would be prudent to better evaluate the soil and rock materials and their elevations for design.

9.0 REPORT LIMITATIONS

This report has been prepared for the exclusive use of **Carollo Engineers** for the specific application to the subject project. The considerations contained in this report have been made in accordance with generally accepted soil and foundation engineering practices; no other warranties are implied or expressed.

The analyses submitted in this report are based upon data obtained from well logs, MoDNR published data and TSi historic geotechnical information near the general project site. The nature and extent of variations from these findings may not become evident until a geotechnical exploration is performed within the study corridor and at specific river crossing locations. If variations then appear evident or the alignments change, it may be necessary to re-evaluate the contents of this report.

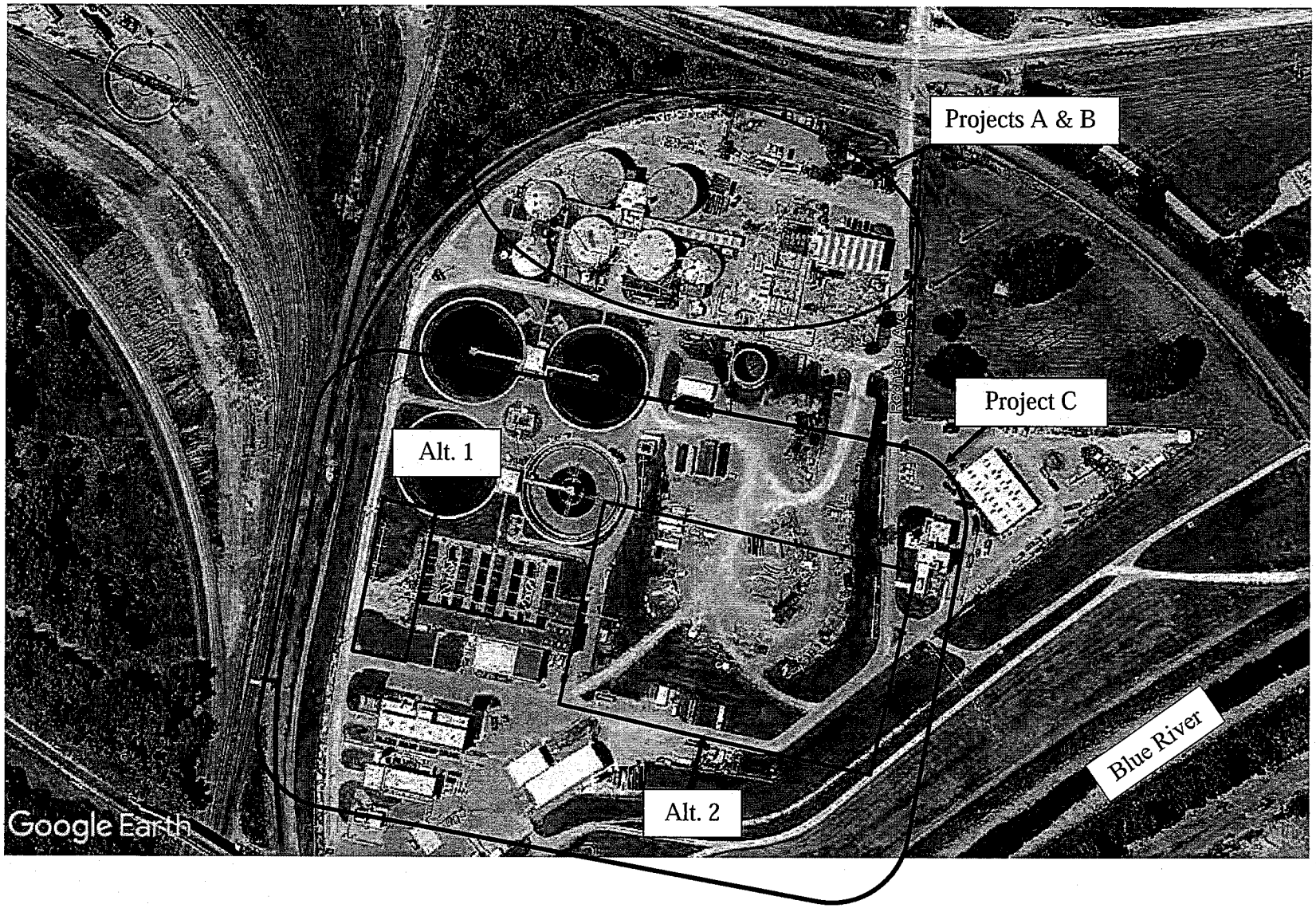
APPENDIX A



Note: This plan was prepared from an image obtained from USGS TopoView on December 28, 2023.

N
W E
S

Figure 1, Vicinity Map		Project No. 20232064.00
Blue River WWTP – New Grit Tanks – Study Kansas City, Missouri		TSI geotechnical, inc.
Not to Scale	Approved by: FH	



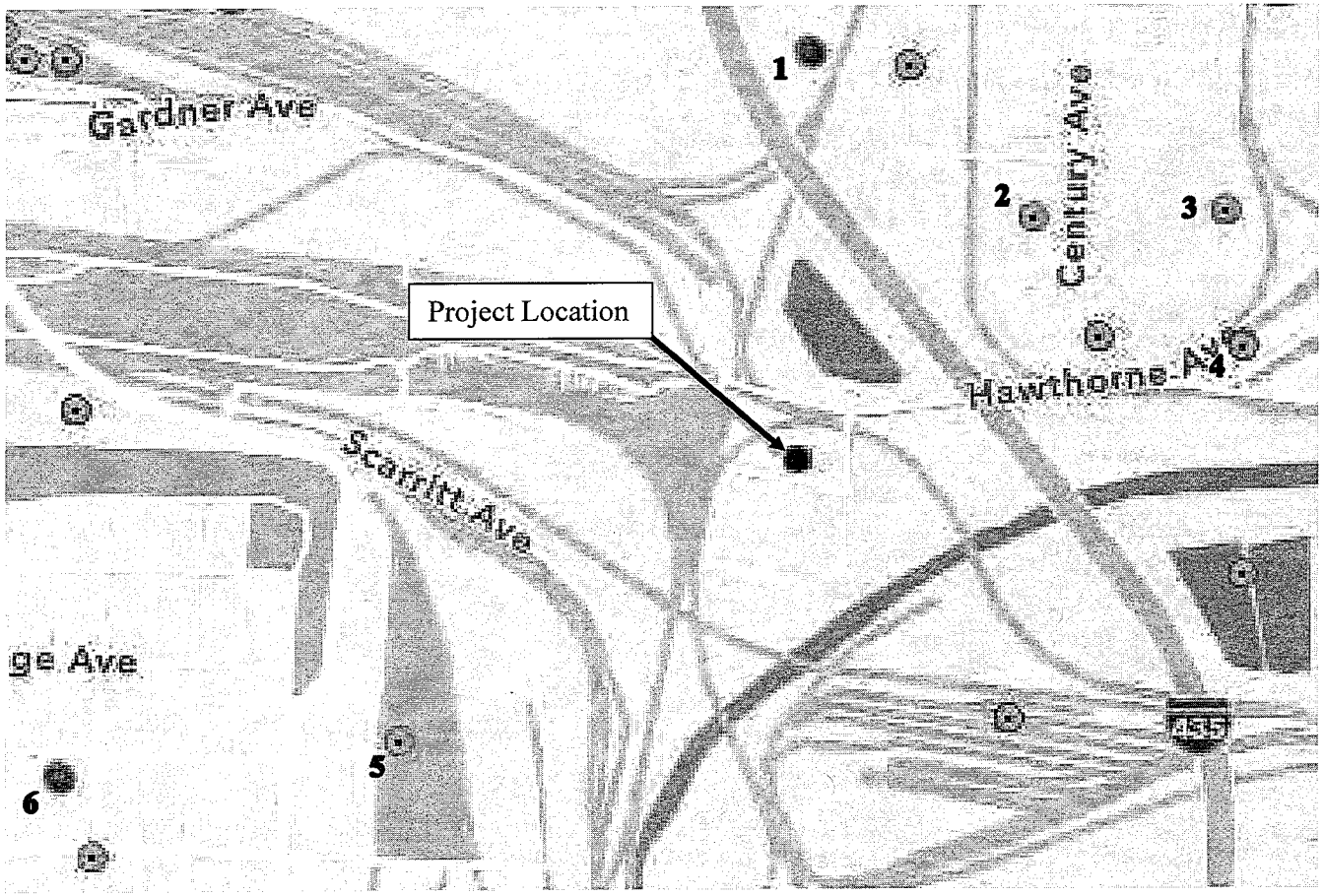
Note: This plan was prepared from an image obtained from Google arth on December 28, 2023.

N
W E
S

Figure 2, Generalized Project Location Plan	Project No. 20232064.00
Blue River WWTP – New Grit Tanks – Study Kansas City, Missouri	
Not to Scale	Approved by: FH

TSI

APPENDIX B



Legend

- Well Log
- Well Core
- Monitoring Well

1- DL02042
2- 11272133
3- 11272264
4- 11272262 & 11272147
5- 00527416
6- DL03673

This plan was prepared from an image retrieved from USGS on December 27, 2023.

N
W E
S

Figure 3.0, Wells		Project No. 20232064
Blue River WWTP – New Grit Tanks – Study Kansas City, Missouri		TSI geotechnical, inc.
Not to Scale	Approved by:	

MISSOURI BUREAU OF GEOLOGY & MINES, ROLLA, MO.

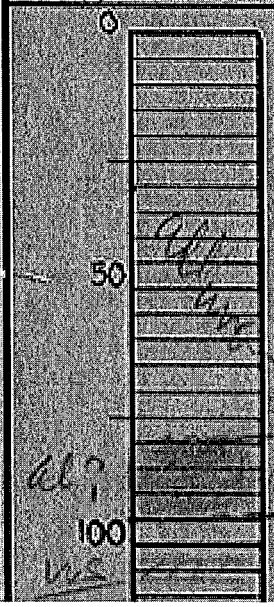
MO SURVEY NO.	OWNER	
2042		
COUNTY	FARM Meriwether & Knoche	WELL NO.
		1
T	R	DRILLER
50N	33W	
		DATE
	ELEVATION	PRODUCTION
25	735 ± (F.C.G.)	77
	SAMPLES STUDIED	

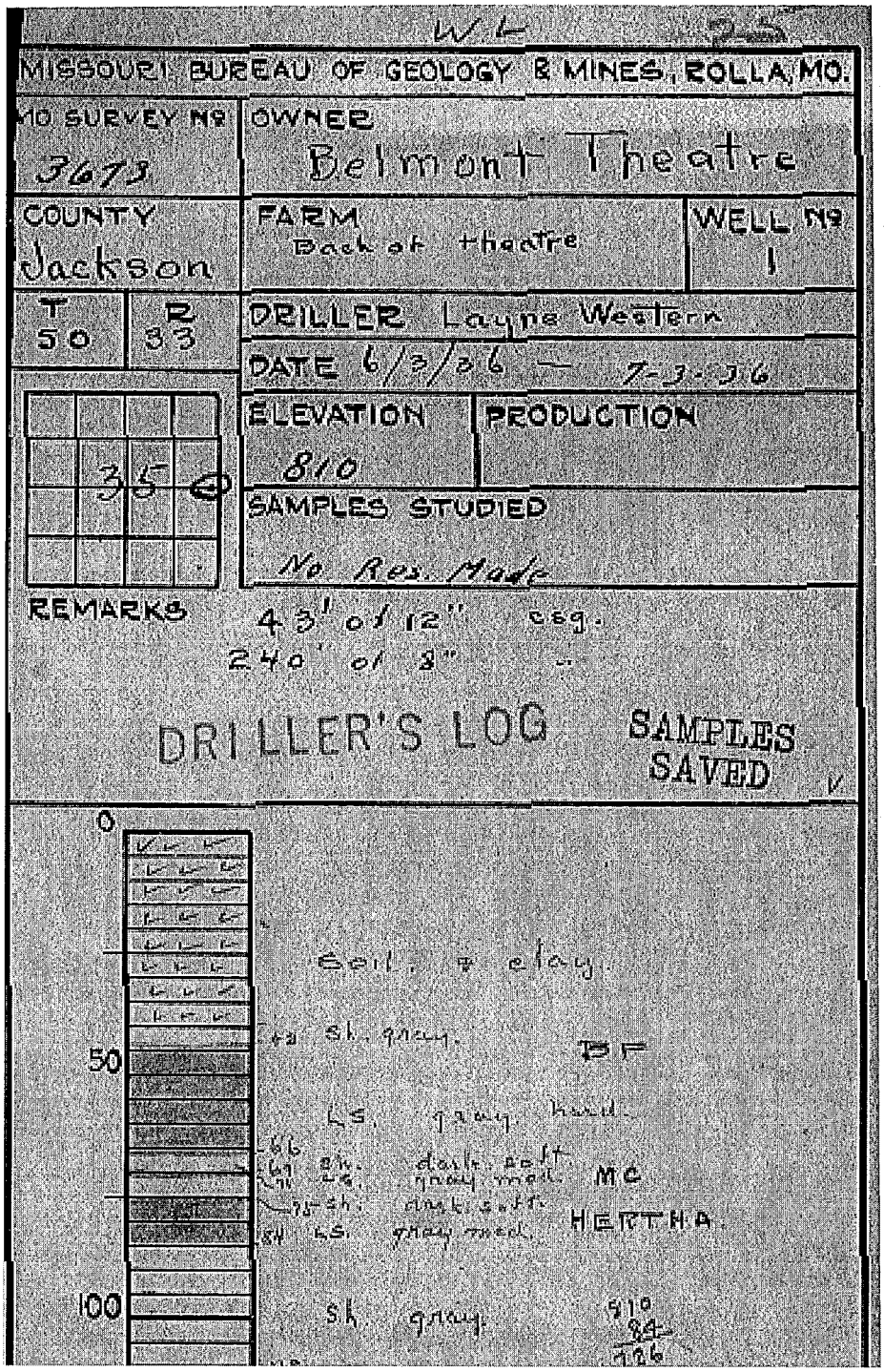
REMARKS

DRILLER'S LOG

SAMPLES SAVED ✓

T7N R14





W L

MISSOURI BUREAU OF GEOLOGY & MINES, ROLLA, MO.

MO SURVEY NO
3673

OWNER
Belmont Theatre

COUNTY
Jackson

FARM
Back of theatre

WELL NO
1

T
50

R
33

DRILLER Layne Western

DATE 6/3/26 — 7-1-26

35

ELEVATION
810

PRODUCTION

SAMPLES STUDIED
No Res. Made

REMARKS 43' of 12" csg.
240' of 8" "

DRILLER'S LOG

SAMPLES SAVED

0

Soil & clay.

sh. gray. BF

50

LS. gray hard.

sh. dark soft
gray med. MC

sh. dark soft.
LS. gray med. HERTHA

100

sh gray 910
84
826

MISSOURI DEPARTMENT OF NATURAL RESOURCES
MISSOURI GEOLOGICAL SURVEY
Monitoring Well and Nested Monitoring Well Certification Report

FOR OFFICE USE ONLY		
REFERENCE NUMBER 00527416	REVENUE NUMBER 030917	
CERTIFICATION NUMBER A211106	CHECK NO. 217813	
DATE RECEIVED 03/09/2017	APPROVED BY DNR USERID	APPROVAL DATE 03/13/2017

TYPE	STATUS	COMPLETED	DRILL AREA	TOTAL DEPTH	VARIANCE #
Monitoring	Active	02/08/2017		79.0	

SITE INFORMATION

SITE NAME	ADDRESS (STREET, CITY, STATE, ZIP)
FORMER HARDESTY FEDERAL COMPLEX	607 HARDESTY AVENUE KANSAS CITY, MO
DECIMAL DEGREE COORDINATES: 39.11422, -94.5065	DEGREES MINUTES SECONDS: 39°6'51.2" 94°30'23.4"

OWNER INFORMATION

OWNER NAME	ADDRESS (STREET, CITY, STATE, ZIP)
GENERAL SERVICES ADMINISTRATION C/O JOSHUA TRADER	2300 MAIN STREET 7TH FLOOR KANSAS CITY, MO 64108

CATEGORY OF WELL

- ☐ Direct Push
- ☐ Observation
- ☒ Standard
- ☐ Standard Nested Well
- ☐ Extraction
- ☐ Inclinometer
- ☐ Open Hole
- ☐ Gas Migration
- ☐ Piezometer
- ☐ Soil Vapor Probe
- ☐ Injection
- ☐ Lysimeter
- ☐ Other (specify) _____

MONITORING FOR

- ☐ Explosives
- ☐ Petroleum
- ☒ VOCS(non-petroleum)
- ☐ Metals
- ☐ Radionuclides
- ☐ Geotechnical Data
- ☐ Pesticides/Herbicides
- ☐ SVOCS
- ☐ Water Level/Flow

WELL NAME	DNR/EPA PROJECT OR SITE ID NUMBER

SURFACE COMPLETION INFORMATION

SC LENGTH	SC DIAMETER	SC BOREHOLE DEPTH	SC BOREHOLE DIAMETER	SC MATERIAL	SC GROUT TYPE	
1.0	7.000	1.0	24.000	Steel	Concrete	☐ Above Ground ☒ Flush Mount ☐ None(Variance Required) ☐ Locking Cap ☐ Vented Cap ☐ Weep Hole

CASING AND LINER INFORMATION

CASING MATERIAL	TOP	BOTTOM	CASING OD	HOLE DIA	CASING WEIGHT	DRIVE SHOE?	LINER?	LINER USE	PERF FROM	PERF TO

CASING GROUT INFORMATION

GROUT METHOD	TYPE	AMOUNT	HOURS SUSPENDED

RISER INFORMATION

RISER MATERIAL	TOP	BOTTOM	CASING OD	HOLE OD	WEIGHT (#)
Plastic	0.0	64.0	2.000	6.000	40

PUMP INFORMATION

WELL YIELD	STATIC WATER LEVEL	GROUNDWATER DEPTH	PUMP INSTALLED?
	10.2		N

SCREEN INFORMATION

SCREEN TYPE	SCREEN MATERIAL	TOP	BOTTOM	SLOT SIZE
	Plastic	64.0	79.0	

FORMATION INFORMATION

TOP	BOTTOM	FORMATION DESCRIPTION
0.0	15.0	BRN STY CLY
15.0	20.0	WT BRN STY CLY
20.0	55.0	WET GRY STY CLY
55.0	60.0	WT SND GRVL
60.0	79.0	GRY WTHRD SH

RISER GROUT AND SCREEN FILTER INFORMATION

FILTER TYPE	TOP DEPTH	BOTTOM DEPTH
Cement Type I	0.0	57.0
Bentonite Chips	57.0	60.0
Other	60.0	79.0

DRILLER INFORMATION

DRILLER BUSINESS	PERMIT #	NAME
CASCADE DRILLING	006365	NICHOLAS MORENO
PRIMARY CONTRACTOR BUSINESS: TERRACON CONSULTANTS INC	PERMIT # 005001	NAME: SHANE STROPE
DRILLER APPRENTICE	PERMIT	NAME

MISSOURI DEPARTMENT OF NATURAL RESOURCES
MISSOURI GEOLOGICAL SURVEY
Monitoring Well and Nested Monitoring Well Certification Report

FOR OFFICE USE ONLY		
REFERENCE NUMBER 11272133	REVENUE NUMBER	
CERTIFICATION NUMBER A909786	CHECK NO. 1969	
DATE RECEIVED 11/01/2023	APPROVED BY DNR USERID NRFAUSE	APPROVAL DATE 11/02/2023

TYPE	STATUS	COMPLETED	DRILL AREA	TOTAL DEPTH	VARIANCE #
Monitoring	Active	09/17/2023	Area 5	40.5	

SITE INFORMATION

SITE NAME	ADDRESS (STREET, CITY, STATE, ZIP)
	8700 Hawthorn Kansas City, MO 64120
DECIMAL DEGREE COORDINATES	DEGREES MINUTES SECONDS
39.124430000000004, -94.490649	39°7'27.95" -94°29'26.34"

OWNER INFORMATION

OWNER NAME	ADDRESS (STREET, CITY, STATE, ZIP)
KC POWER AND LIGHT CO	PO BOX 418679 KANSAS CITY, MO 64141

CATEGORY OF WELL

- [ ] Direct Push
- [x] Observation
- [ ] Standard
- [ ] Standard Nested Well
- [ ] Extraction
- [ ] Inclinometer
- [ ] Open Hole
- [ ] Gas Migration
- [ ] Piezometer
- [ ] Soil Vapor Probe
- [ ] Injection
- [ ] Lysimeter
- [ ] Other (specify) _____

MONITORING FOR

- [ ] Explosives
- [ ] Petroleum
- [ ] VOCS(non-petroleum)
- [ ] Metals
- [ ] Radionuclides
- [ ] Geotechnical Data
- [ ] Pesticides/Herbicides
- [ ] SVOCS
- [ ] Water Level/Flow

WELL NAME	DNR/EPA PROJECT OR SITE ID NUMBER
MW 216	

SURFACE COMPLETION INFORMATION

SC LENGTH	SC DIAMETER	SC BOREHOLE DEPTH	SC BOREHOLE DIAMETER	SC MATERIAL	SC GROUT TYPE
5.0	8.250	2.0	4.000	Steel	Concrete

- [x] Above Ground
- [ ] Flush Mount
- [ ] None(Variance Required)
- [x] Locking Cap
- [ ] Vented Cap
- [x] Weep Hole

CASING AND LINER INFORMATION

CASING MATERIAL	TOP	BOTTOM	CASING OD	HOLE DIA	CASING WEIGHT	DRIVE SHOE?	LINER?	LINER USE	PERF FROM	PERF TO

CASING GROUT INFORMATION

GROUT METHOD	TYPE	AMOUNT	HOURS SUSPENDED

RISER INFORMATION

RISER MATERIAL	TOP	BOTTOM	CASING OD	HOLE OD	WEIGHT (#)
Plastic	0.0	32.5	2.000	8.250	40

PUMP INFORMATION

WELL YIELD	STATIC WATER LEVEL	GROUNDWATER DEPTH	PUMP INSTALLED?
			N

SCREEN INFORMATION

SCREEN TYPE	SCREEN MATERIAL	TOP	BOTTOM	SLOT SIZE
	Plastic	29.5	40.5	

FORMATION INFORMATION

TOP	BOTTOM	FORMATION DESCRIPTION
0.0	40.5	BRN SND

RISER GROUT AND SCREEN FILTER INFORMATION

FILTER TYPE	TOP DEPTH	BOTTOM DEPTH
Bentonite Chips	3.0	27.5
Sand	27.5	40.5

DRILLER INFORMATION

DRILLER BUSINESS MAXS ENTERPRISES	PERMIT # 002836	NAME DAVID HUNZIKER
PRIMARY CONTRACTOR BUSINESS MAXS ENTERPRISES	PERMIT # 002836	NAME DAVID HUNZIKER
DRILLER APPRENTICE BUSINESS	PERMIT #	NAME

MISSOURI DEPARTMENT OF NATURAL RESOURCES
MISSOURI GEOLOGICAL SURVEY
Monitoring Well and Nested Monitoring Well Certification Report

FOR OFFICE USE ONLY		
REFERENCE NUMBER 11272147	REVENUE NUMBER 101923	
CERTIFICATION NUMBER A909783	CHECK NO. 1949	
DATE RECEIVED 10/19/2023	APPROVED BY DNR USERID NRFAUSE	APPROVAL DATE 11/02/2023

TYPE	STATUS	COMPLETED	DRILL AREA	TOTAL DEPTH	VARIANCE #
Monitoring	Active	07/25/2023	Area 5	44.5	

SITE INFORMATION

SITE NAME	ADDRESS (STREET, CITY, STATE, ZIP)
	8700 Hawthorn Kansas City, MO 64141
DECIMAL DEGREE COORDINATES	DEGREES MINUTES SECONDS
39.121880000000004, -94.485359	39°7'18.78" -94°29'7.29"

OWNER INFORMATION

OWNER NAME	ADDRESS (STREET, CITY, STATE, ZIP)
KC POWER AND LIGHT CO	PO BOX 418679 KANSAS CITY, MO 64141

CATEGORY OF WELL

☐ Direct Push ☒ Observation ☐ Standard ☐ Standard Nested Well
☐ Extraction ☐ Inclinometer ☐ Open Hole
☐ Gas Migration ☐ Piezometer ☐ Soil Vapor Probe
☐ Injection ☐ Lysimeter ☐ Other (specify) _____

MONITORING FOR

☐ Explosives ☐ Petroleum ☐ VOCS(non-petroleum)
☐ Metals ☐ Radionuclides ☐ Geotechnical Data
☐ Pesticides/Herbicides ☐ SVOCS ☐ Water Level/Flow

WELL NAME	DNR/EPA PROJECT OR SITE ID NUMBER
MW 201	

SURFACE COMPLETION INFORMATION

SC LENGTH	SC DIAMETER	SC BOREHOLE DEPTH	SC BOREHOLE DIAMETER	SC MATERIAL	SC GROUT TYPE		
5.0	8.250	2.0	4.000	Steel	Concrete	☒ Above Ground ☐ Flush Mount ☐ None(Variance Required)	☐ Locking Cap ☐ Vented Cap ☒ Weep Hole

CASING AND LINER INFORMATION

CASING MATERIAL	TOP	BOTTOM	CASING OD	HOLE DIA	CASING WEIGHT	DRIVE SHOE?	LINER?	LINER USE	PERF FROM	PERF TO

CASING GROUT INFORMATION

GROUT METHOD	TYPE	AMOUNT	HOURS SUSPENDED

RISER INFORMATION

RISER MATERIAL	TOP	BOTTOM	CASING OD	HOLE OD	WEIGHT (#)
Plastic	0.0	36.5	2.000	8.250	40

PUMP INFORMATION

WELL YIELD	STATIC WATER LEVEL	GROUNDWATER DEPTH	PUMP INSTALLED?
			N

SCREEN INFORMATION

SCREEN TYPE	SCREEN MATERIAL	TOP	BOTTOM	SLOT SIZE
	Plastic	10.0	44.5	

FORMATION INFORMATION

TOP	BOTTOM	FORMATION DESCRIPTION
0.0	10.0	BRN SNDY SLT
10.0	44.5	BRN SND

RISER GROUT AND SCREEN FILTER INFORMATION

FILTER TYPE	TOP DEPTH	BOTTOM DEPTH
Bentonite Chips	4.0	30.5
Sand	30.5	44.5

DRILLER INFORMATION

DRILLER BUSINESS MAXS ENTERPRISES	PERMIT # 002836	NAME DAVID HUNZIKER
PRIMARY CONTRACTOR BUSINESS MAXS ENTERPRISES	PERMIT # 002836	NAME DAVID HUNZIKER
DRILLER APPRENTICE BUSINESS	PERMIT #	NAME

MISSOURI DEPARTMENT OF NATURAL RESOURCES
MISSOURI GEOLOGICAL SURVEY
Monitoring Well and Nested Monitoring Well Certification Report

FOR OFFICE USE ONLY		
REFERENCE NUMBER 11272262	REVENUE NUMBER	
CERTIFICATION NUMBER A909792	CHECK NO. 1969	
DATE RECEIVED 11/01/2023	APPROVED BY DNR USERID NRFAUSE	APPROVAL DATE 11/02/2023

TYPE	STATUS	COMPLETED	DRILL AREA	TOTAL DEPTH	VARIANCE #
Monitoring	Active	07/26/2023	Area 5	45.0	

SITE INFORMATION

SITE NAME	ADDRESS (STREET, CITY, STATE, ZIP)
	8700 Hawthorn Kansas City, MO 64120
DECIMAL DEGREE COORDINATES	DEGREES MINUTES SECONDS
39.12194, -94.485365	39°7'19.01" -94°29'7.31"

OWNER INFORMATION

OWNER NAME	ADDRESS (STREET, CITY, STATE, ZIP)
KC POWER AND LIGHT CO	PO BOX 418679 KANSAS CITY, MO 64141

CATEGORY OF WELL

- [ ] Direct Push
- [x] Observation
- [ ] Standard
- [ ] Standard Nested Well
- [ ] Extraction
- [ ] Inclinometer
- [ ] Open Hole
- [ ] Gas Migration
- [ ] Piezometer
- [ ] Soil Vapor Probe
- [ ] Injection
- [ ] Lysimeter
- [ ] Other (specify) _____

MONITORING FOR

- [ ] Explosives
- [ ] Petroleum
- [ ] VOCS(non-petroleum)
- [ ] Metals
- [ ] Radionuclides
- [ ] Geotechnical Data
- [ ] Pesticides/Herbicides
- [ ] SVOCS
- [ ] Water Level/Flow

WELL NAME	DNR/EPA PROJECT OR SITE ID NUMBER
MW 202	

SURFACE COMPLETION INFORMATION

SC LENGTH	SC DIAMETER	SC BOREHOLE DEPTH	SC BOREHOLE DIAMETER	SC MATERIAL	SC GROUT TYPE	
5.0	8.250	2.0	4.000	Steel	Concrete	[x] Above Ground [ ] Flush Mount [ ] None(Variance Required) [x] Locking Cap [ ] Vented Cap [x] Weep Hole

CASING AND LINER INFORMATION

CASING MATERIAL	TOP	BOTTOM	CASING OD	HOLE DIA	CASING WEIGHT	DRIVE SHOE?	LINER?	LINER USE	PERF FROM	PERF TO

CASING GROUT INFORMATION

GROUT METHOD	TYPE	AMOUNT	HOURS SUSPENDED

RISER INFORMATION

RISER MATERIAL	TOP	BOTTOM	CASING OD	HOLE OD	WEIGHT (#)
Plastic	0.0	37.0	2.000	8.250	SCH40

PUMP INFORMATION

WELL YIELD	STATIC WATER LEVEL	GROUNDWATER DEPTH	PUMP INSTALLED?
			N

SCREEN INFORMATION

SCREEN TYPE	SCREEN MATERIAL	TOP	BOTTOM	SLOT SIZE
	Plastic	34.0	45.0	

FORMATION INFORMATION

TOP	BOTTOM	FORMATION DESCRIPTION
0.0	10.0	BRN SNDY SLT
10.0	45.0	BRN SND

RISER GROUT AND SCREEN FILTER INFORMATION

FILTER TYPE	TOP DEPTH	BOTTOM DEPTH
Bentonite Chips	1.0	31.0
Sand	31.0	45.0

DRILLER INFORMATION

DRILLER BUSINESS MAXS ENTERPRISES	PERMIT # 002836	NAME DAVID HUNZIKER
PRIMARY CONTRACTOR BUSINESS MAXS ENTERPRISES	PERMIT # 002836	NAME DAVID HUNZIKER
DRILLER APPRENTICE BUSINESS	PERMIT #	NAME

MISSOURI DEPARTMENT OF NATURAL RESOURCES
MISSOURI GEOLOGICAL SURVEY
Monitoring Well and Nested Monitoring Well Certification Report

FOR OFFICE USE ONLY		
REFERENCE NUMBER 11272264	REVENUE NUMBER	
CERTIFICATION NUMBER A909794	CHECK NO. 1969	
DATE RECEIVED 11/01/2023	APPROVED BY DNR USERID NRFAUSE	APPROVAL DATE 11/02/2023

TYPE	STATUS	COMPLETED	DRILL AREA	TOTAL DEPTH	VARIANCE #
Monitoring	Active	07/26/2023	Area 5	47.5	

SITE INFORMATION

SITE NAME	ADDRESS (STREET, CITY, STATE, ZIP)
	8700 Hawthorn Kansas City, MO 64141
DECIMAL DEGREE COORDINATES	DEGREES MINUTES SECONDS
39.124539999999996, -94.485804	39°7'28.34" -94°29'8.89"

OWNER INFORMATION

OWNER NAME	ADDRESS (STREET, CITY, STATE, ZIP)
KC POWER AND LIGHT CO	PO BOX 418679 KANSAS CITY, MO 64141

CATEGORY OF WELL

- [ ] Direct Push
- [x] Observation
- [ ] Standard
- [ ] Standard Nested Well
- [ ] Extraction
- [ ] Inclinometer
- [ ] Open Hole
- [ ] Gas Migration
- [ ] Piezometer
- [ ] Soil Vapor Probe
- [ ] Injection
- [ ] Lysimeter
- [ ] Other (specify) _____

MONITORING FOR

- [ ] Explosives
- [ ] Petroleum
- [ ] VOCS(non-petroleum)
- [ ] Metals
- [ ] Radionuclides
- [ ] Geotechnical Data
- [ ] Pesticides/Herbicides
- [ ] SVOCS
- [ ] Water Level/Flow

WELL NAME	DNR/EPA PROJECT OR SITE ID NUMBER
MW 213	

SURFACE COMPLETION INFORMATION

SC LENGTH	SC DIAMETER	SC BOREHOLE DEPTH	SC BOREHOLE DIAMETER	SC MATERIAL	SC GROUT TYPE	
5.0	8.250	2.0	4.000	Steel	Concrete	[x] Above Ground [ ] Flush Mount [ ] None(Variance Required) / [x] Locking Cap [ ] Vented Cap [x] Weep Hole

CASING AND LINER INFORMATION

CASING MATERIAL	TOP	BOTTOM	CASING OD	HOLE DIA	CASING WEIGHT	DRIVE SHOE?	LINER?	LINER USE	PERF FROM	PERF TO

CASING GROUT INFORMATION

GROUT METHOD	TYPE	AMOUNT	HOURS SUSPENDED

RISER INFORMATION

RISER MATERIAL	TOP	BOTTOM	CASING OD	HOLE OD	WEIGHT (#)
Plastic	0.0	39.5	5.000	8.250	SCH40

PUMP INFORMATION

WELL YIELD	STATIC WATER LEVEL	GROUNDWATER DEPTH	PUMP INSTALLED?
			N

SCREEN INFORMATION

SCREEN TYPE	SCREEN MATERIAL	TOP	BOTTOM	SLOT SIZE
	Plastic	36.5	47.5	

FORMATION INFORMATION

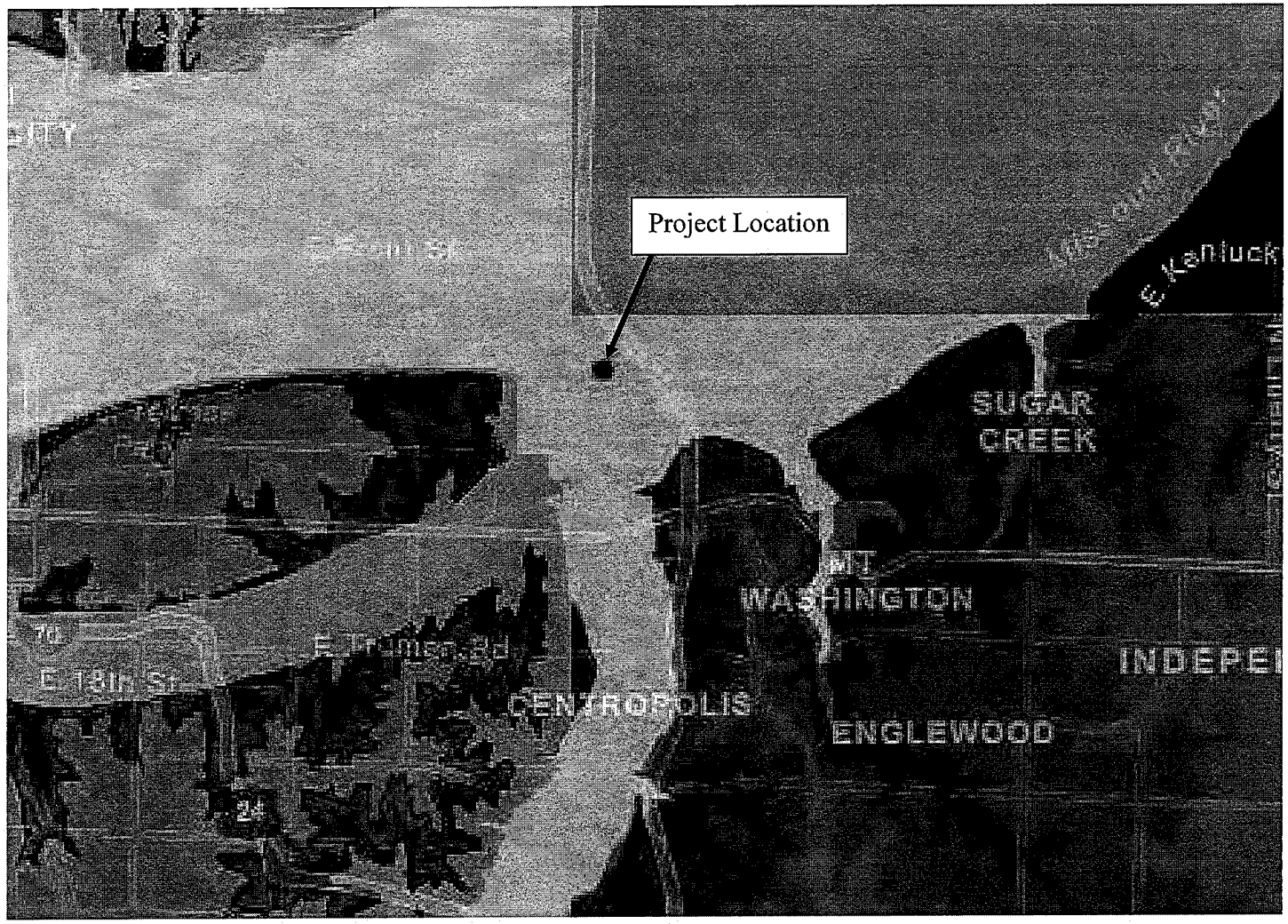
TOP	BOTTOM	FORMATION DESCRIPTION
0.0	15.0	BRN SNDY SLT
15.0	42.5	BRN SND

RISER GROUT AND SCREEN FILTER INFORMATION

FILTER TYPE	TOP DEPTH	BOTTOM DEPTH
Bentonite Chips	5.0	33.5
Sand	33.5	47.5

DRILLER INFORMATION

DRILLER BUSINESS MAXS ENTERPRISES	PERMIT # 002836	NAME DAVID HUNZIKER
PRIMARY CONTRACTOR BUSINESS MAXS ENTERPRISES	PERMIT # 002836	NAME DAVID HUNZIKER
DRILLER APPRENTICE BUSINESS	PERMIT #	NAME

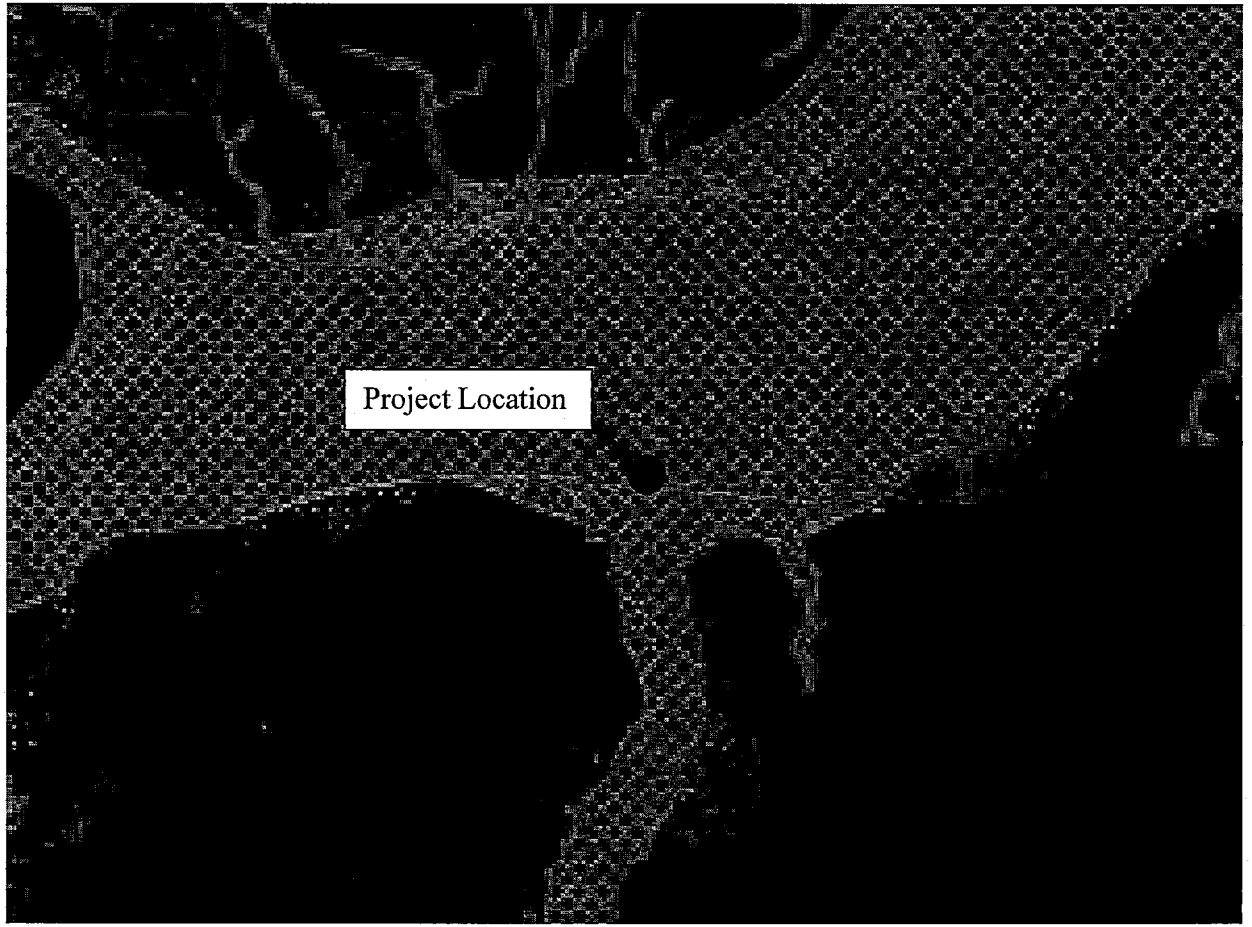


ote This plan was prepared from an image obtained from USGS on December 2 , 2023.

N
W E
S

Figure 4, USGS Alluvium and Bedrock Presence	Project No. 20232064.00
Blue River WWTP – New Grit Tanks – Study Kansas City, Missouri	
Not to Scale | Approved by:	

TSi geotechnical, inc.



Collapse potential Liquefaction potential

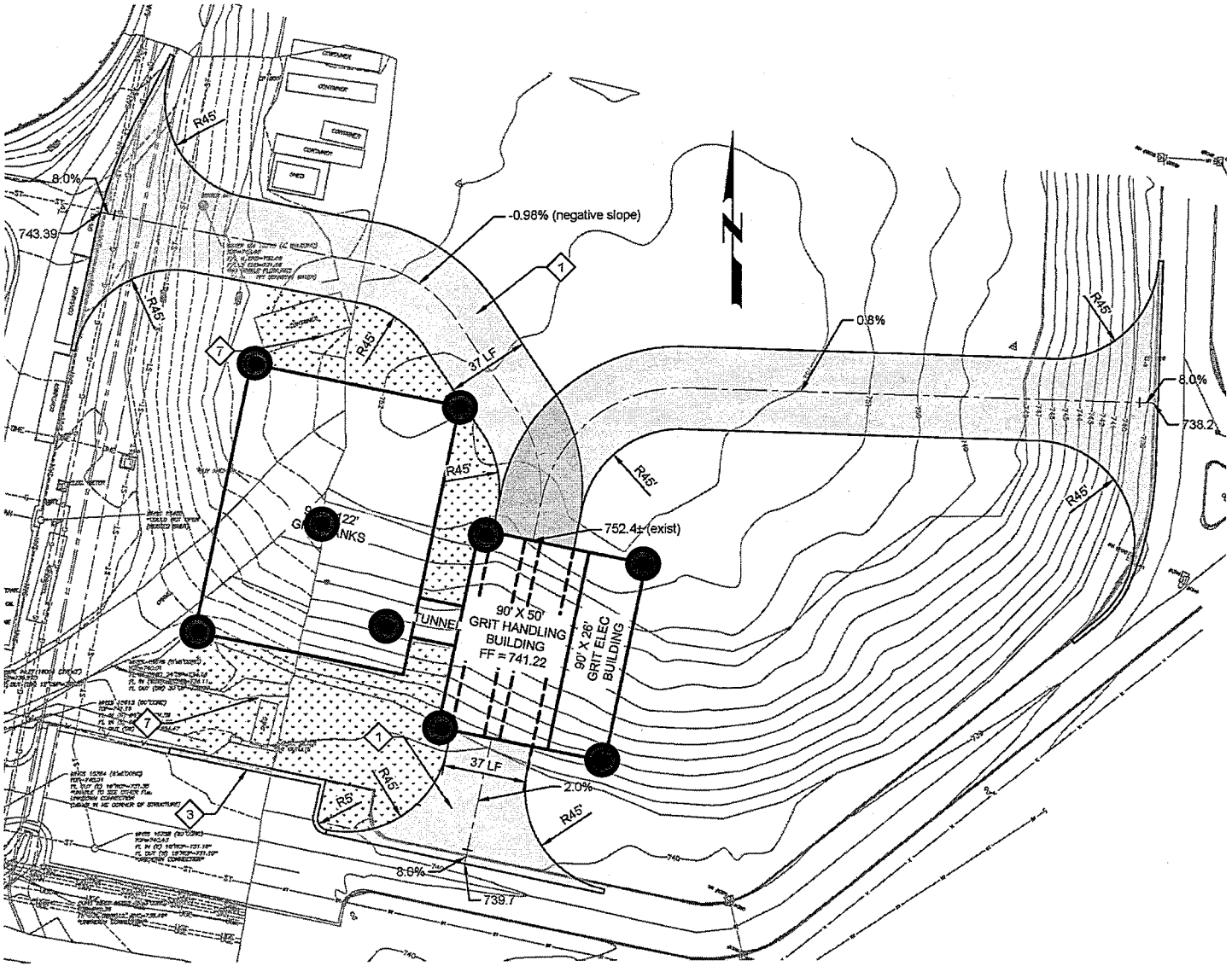
Landslide potential

ote This plan was prepared from an image obtained from USGS on an ar 02, 202 .

N
W E
S

Figure 5, USGS Geological Hazards	Project No. 20232064.00
Blue River WWTP – New Grit Tanks – Study Kansas City, Missouri	
t to Scale	Approved by:

TSi



Legend

● **Approximate Boring Locations**

Note: This plan was prepared from a site plan obtained from Carollo Engineers on January 22, 2024.

Figure 6, Proposed Boring Location Plan – Alt 2		Project No. 20232064.00
Blue River WWTP – New Grit Tanks – Study Kansas City, Missouri		TSI geotechnical, inc.
Not to Scale	Approved by:	

APPENDIX E

PRELIMINARY LOAD STUDY

CONCEPTUAL GRIT BUILDING ESTIMATED TOTAL LOAD

SERVICE SIZE :	1600 AMPS	SE LOCATION :	Elec Room	CONNECTED kVA :	805.53	GND. FLT. :	YES
VOLTAGE :	480 VOLTS	ENCLOSURE TYPE:	NEMA 4X	CONNECTED AMPS :	968.90	SOLID NEUTRAL :	YES
PHASE :	3	MOUNTING :	FREE STANDING	DEMAND kVA :	805.53	GROUND BUS :	YES
WIRE :	4			DEMAND AMPS :	968.90		
A.I.C. :	65 kA, SE RATED						

ITEM #	DESCRIPTION	LOAD			DUTY/STANDBY	REMARKS
		HP	FLA	MTR TYPE		
MAIN	CIRCUIT BREAKER / SERVICE DISCONNECT	175	968.9			
1	BYPASS CHANNEL 1 GATE 1	1	2.1	CS	DUTY	MOV
2	BYPASS CHANNEL 1 GATE 2	1	2.1	CS	DUTY	MOV
3	INFLUENT GATE CHANNEL 1	1	2.1	CS	DUTY	MOV
4	INFLUENT GATE CHANNEL 2	1	2.1	CS	DUTY	MOV
5	INFLUENT GATE CHANNEL 3	1	2.1	CS	DUTY	MOV
6	INFLUENT GATE CHANNEL 4	1	2.1	CS	DUTY	MOV
7	BYPASS CHANNEL 2 GATE 1	1	2.1	CS	DUTY	MOV
8	BYPASS CHANNEL 2 GATE 2	1	2.1	CS	DUTY	MOV
9	COMMON GATE TANK 1	2	3.4	CS	DUTY	MOV
10	COMMON GATE TANK 2	2	3.4	CS	DUTY	MOV
11	COMMON GATE TANK 3	2	3.4	CS	DUTY	MOV
12	COMMON GATE TANK 4	2	3.4	CS	DUTY	MOV
13	COMMON GATE TANK 5	2	3.4	CS	DUTY	MOV
14	COMMON GATE TANK 6	2	3.4	CS	DUTY	MOV
15	COMMON GATE TANK 7	2	3.4	CS	DUTY	MOV
16	COMMON GATE TANK 8	2	3.4	CS	DUTY	MOV
17	GRIT PUMP	15	21	CS	DUTY	
18	GRIT PUMP	15	21	CS	DUTY	
19	GRIT PUMP	15	21	CS	DUTY	
20	GRIT PUMP	15	21	CS	DUTY	
21	GRIT PUMP	15	21	CS	DUTY	
22	GRIT PUMP	15	21	CS	DUTY	
23	GRIT PUMP	15	21	CS	DUTY	
24	GRIT PUMP	15	21	CS	DUTY	
25	COANDA SCREW MOTOR	1.5	3.0	CS	DUTY	Per RoSF4 model, Hydro
26	COANDA SCREW MOTOR	1.5	3.0	CS	DUTY	Per RoSF4 model, Hydro
27	COANDA SCREW MOTOR	1.5	3.0	CS	DUTY	Per RoSF4 model, Hydro
28	COANDA SCREW MOTOR	1.5	3.0	CS	DUTY	Per RoSF4 model, Hydro
29	COANDA SCREW MOTOR	1.5	3.0	CS	DUTY	Per RoSF4 model, Hydro
30	COANDA SCREW MOTOR	1.5	3.0	CS	DUTY	Per RoSF4 model, Hydro
31	COANDA SCREW MOTOR	1.5	3.0	CS	DUTY	Per RoSF4 model, Hydro
32	COANDA SCREW MOTOR	1.5	3.0	CS	DUTY	Per RoSF4 model, Hydro
33	COANDA STIRRER MOTOR	0.75	1.6	CS	DUTY	Per RoSF4 model, Hydro
34	COANDA STIRRER MOTOR	0.75	1.6	CS	DUTY	Per RoSF4 model, Hydro
35	COANDA STIRRER MOTOR	0.75	1.6	CS	DUTY	Per RoSF4 model, Hydro
36	COANDA STIRRER MOTOR	0.75	1.6	CS	DUTY	Per RoSF4 model, Hydro
37	COANDA STIRRER MOTOR	0.75	1.6	CS	DUTY	Per RoSF4 model, Hydro
38	COANDA STIRRER MOTOR	0.75	1.6	CS	DUTY	Per RoSF4 model, Hydro
39	COANDA STIRRER MOTOR	0.75	1.6	CS	DUTY	Per RoSF4 model, Hydro
40	COANDA STIRRER MOTOR	0.75	1.6	CS	DUTY	Per RoSF4 model, Hydro
41	OVERHEAD DOOR	1	2.1	CS	DUTY	ESTIMATED LOAD
42	OVERHEAD DOOR	1	2.1	CS	DUTY	ESTIMATED LOAD
43	OVERHEAD DOOR	1	2.1	CS	DUTY	ESTIMATED LOAD
44	BRIDGE CRANE	5	7.6	CS	DUTY	ESTIMATED LOAD
45	BRIDGE CRANE	5	7.6	CS	DUTY	ESTIMATED LOAD
46	HVAC GRIT PUMP STATION		160.8			133.52KW (Heating)
47	HVAC UTILITY TUNNEL		50			41.52KW (Heating)
48	HVAC GRIT HANDLING BUILDING		210.7			175KW (Heating)
49	HOT WATER HEATERS		77.1			65KW (Plumbing)
50	GENERAL PLANT LOADS		200			ESTIMATED LOAD LIGHTING, POWER, AUXILLARY

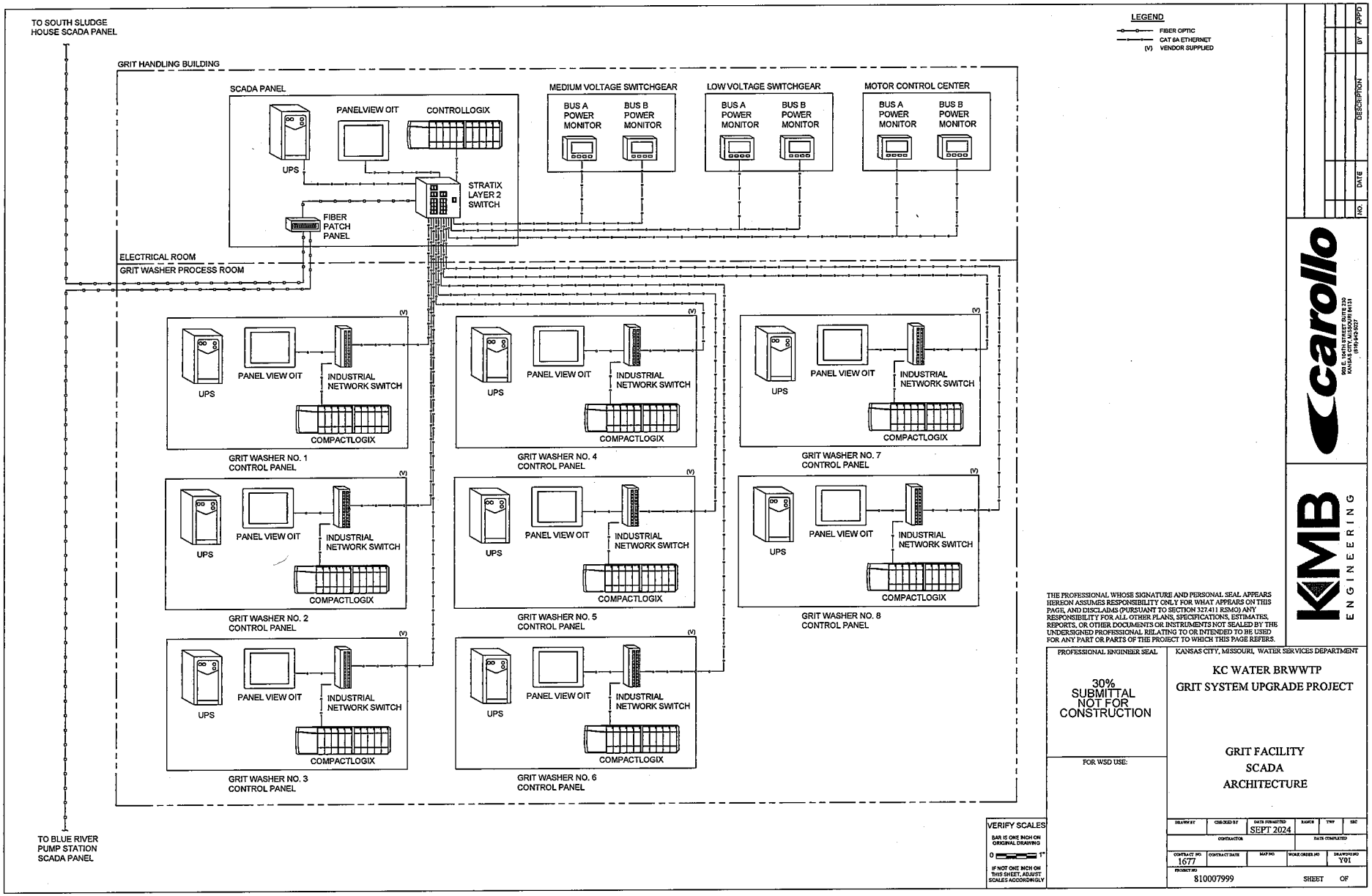
ESTIMATED EXISTING GRIT BUILDING TOTAL LOAD

BUS :	1600 AMPS	LOCATION :	BOILER 118	CONNECTED kVA :	1153.98	GND. FLT. :	YES
VOLTAGE :	480 VOLTS	ENCLOSURE :	NEMA 1	CONNECTED AMPS :	1388.02	SOLID NEUTRAL :	YES
PHASE :	3	MOUNTING :	FREE STANDING	DEMAND kVA :	1153.98	GROUND BUS :	YES
WIRE :	4			DEMAND AMPS :	1388.02		
A.I.C. :	65 kA, SE RATED						

CKT. #	DESCRIPTION	DISCONNECT				PHASE LOADING IN kVA			ACCESSORIES	REMARKS
		TYPE	FRAME SIZE AMPS	POLES	BREAKER / TRIP AMPS	A	B	C		
MAIN	CIRCUIT BREAKER / SERVICE DISCONNECT	-	1600	3	1600	384.66	384.66	384.66		
1	MCC-5	-	1600	3	1000	200	200	200		
2	MCC-6	-	1600	3	1000	150	150	150		EXISTING ESTIMATED LOAD
3	MCC-7	-	225	3	150	66	66	66		EXISTING ESTIMATED LOAD
4	MCC-8	-	225	3	150	66	66	66		EXISTING ESTIMATED LOAD
5	MCC-9/MCC-G1	-	600	3	600	102.66	102.66	102.66		EXISTING ESTIMATED LOAD

APPENDIX F

I&C DRAWINGS



LEGEND

FIBER OPTIC
CAT 6A ETHERNET
(V) VENDOR SUPPLIED

NO.	DATE	DESCRIPTION	BY	APP'D

carollo
902 E. 104TH STREET - SUITE 220
KANSAS CITY, MISSOURI 64131
(816) 942-2027

KMB ENGINEERING

THE PROFESSIONAL WHOSE SIGNATURE AND PERSONAL SEAL APPEARS HEREON ASSUMES RESPONSIBILITY ONLY FOR WHAT APPEARS ON THIS PAGE, AND DISCLAIMS (PURSUANT TO SECTION 327.411 RSMO) ANY RESPONSIBILITY FOR ALL OTHER PLANS, SPECIFICATIONS, ESTIMATES, REPORTS, OR OTHER DOCUMENTS OR INSTRUMENTS NOT SEALED BY THE UNDERSIGNED PROFESSIONAL RELATING TO OR INTENDED TO BE USED FOR ANY PART OR PARTS OF THE PROJECT TO WHICH THIS PAGE REFERS.

PROFESSIONAL ENGINEER SEAL

30% SUBMITTAL NOT FOR CONSTRUCTION

FOR WSD USE:

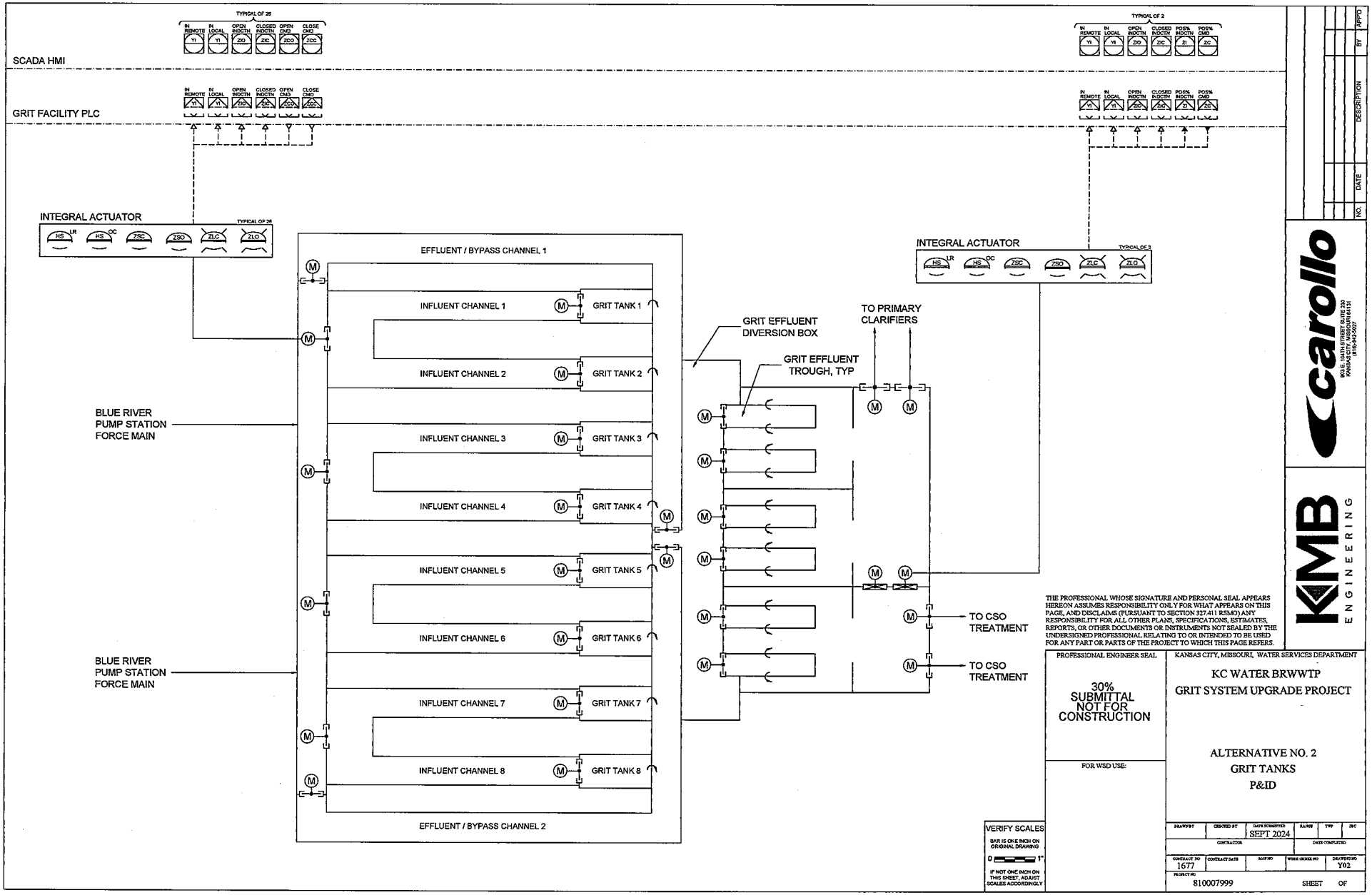
KANSAS CITY, MISSOURI, WATER SERVICES DEPARTMENT

KC WATER BRWWTP
GRIT SYSTEM UPGRADE PROJECT

GRIT FACILITY
SCADA
ARCHITECTURE

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

DRAWN BY	CHECKED BY	DATE SUBMITTED	RANGE	TWP	SEC
		SEPT 2024			
CONTRACTOR			DATE COMPLETED		
CONTRACT NO. 1677	CONTRACT DATE	MAP NO.	WORK ORDER NO	DRAWING NO Y01	
PROJECT NO 810007999			SHEET	OF	



THE PROFESSIONAL WHOSE SIGNATURE AND PERSONAL SEAL APPEARS HEREON ASSUMES RESPONSIBILITY ONLY FOR WHAT APPEARS ON THIS PAGE, AND DISCLAIMS (PURSUANT TO SECTION 327.411 RSMO) ANY RESPONSIBILITY FOR ALL OTHER PLANS, SPECIFICATIONS, ESTIMATES, REPORTS, OR OTHER DOCUMENTS OR INSTRUMENTS NOT SEALED BY THE UNDERSIGNED PROFESSIONAL RELATING TO OR INTENDED TO BE USED FOR ANY PART OR PARTS OF THE PROJECT TO WHICH THIS PAGE REFERS.

PROFESSIONAL ENGINEER SEAL

30% SUBMITTAL NOT FOR CONSTRUCTION

FOR WSD USE:

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

KANSAS CITY, MISSOURI, WATER SERVICES DEPARTMENT

KC WATER BRWWTP
GRIT SYSTEM UPGRADE PROJECT

ALTERNATIVE NO. 2
GRIT TANKS
P&ID

DRAWN BY	CHECKED BY	DATE SUBMITTED	RANGE	TWP	SEC
		SEPT 2024			

CONTRACTOR | DATE COMPLETED

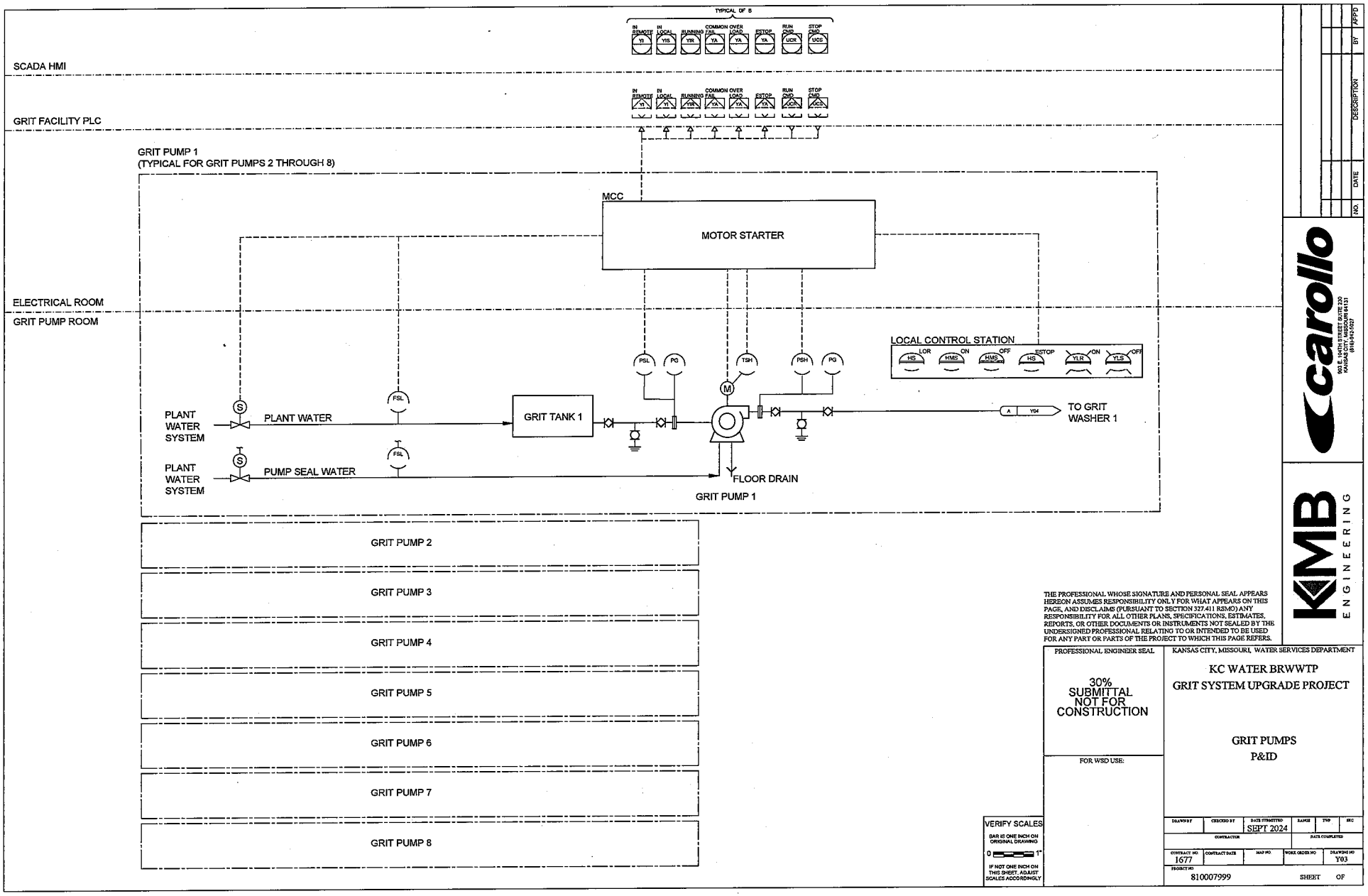
CONTRACT NO	CONTRACT DATE	MAP NO	WORK ORDER NO	DRAWING NO
1677				Y02

PROJECT NO 810007999 SHEET OF

NO.	DATE	DESCRIPTION	BY	APP'D

carollo
ENGINEERS
2912 E. 104TH STREET, SUITE 230
KANSAS CITY, MISSOURI 64131
(816) 945-3027

KMB ENGINEERING



NO.	DATE	DESCRIPTION	BY	APPD

carollo
9401 B LOUISIANA STREET, SUITE 320
KANSAS CITY, MISSOURI 64131
(816) 243-5027

KMB ENGINEERING

THE PROFESSIONAL WHOSE SIGNATURE AND PERSONAL SEAL APPEARS HEREON ASSUMES RESPONSIBILITY ONLY FOR WHAT APPEARS ON THIS PAGE, AND DISCLAIMS (PURSUANT TO SECTION 327.411 RSMO) ANY RESPONSIBILITY FOR ALL OTHER PLANS, SPECIFICATIONS, ESTIMATES, REPORTS, OR OTHER DOCUMENTS OR INSTRUMENTS NOT SEALED BY THE UNDERSIGNED PROFESSIONAL RELATING TO OR INTENDED TO BE USED FOR ANY PART OR PARTS OF THE PROJECT TO WHICH THIS PAGE REFERS.

PROFESSIONAL ENGINEER SEAL

30% SUBMITTAL NOT FOR CONSTRUCTION

FOR WSD USE:

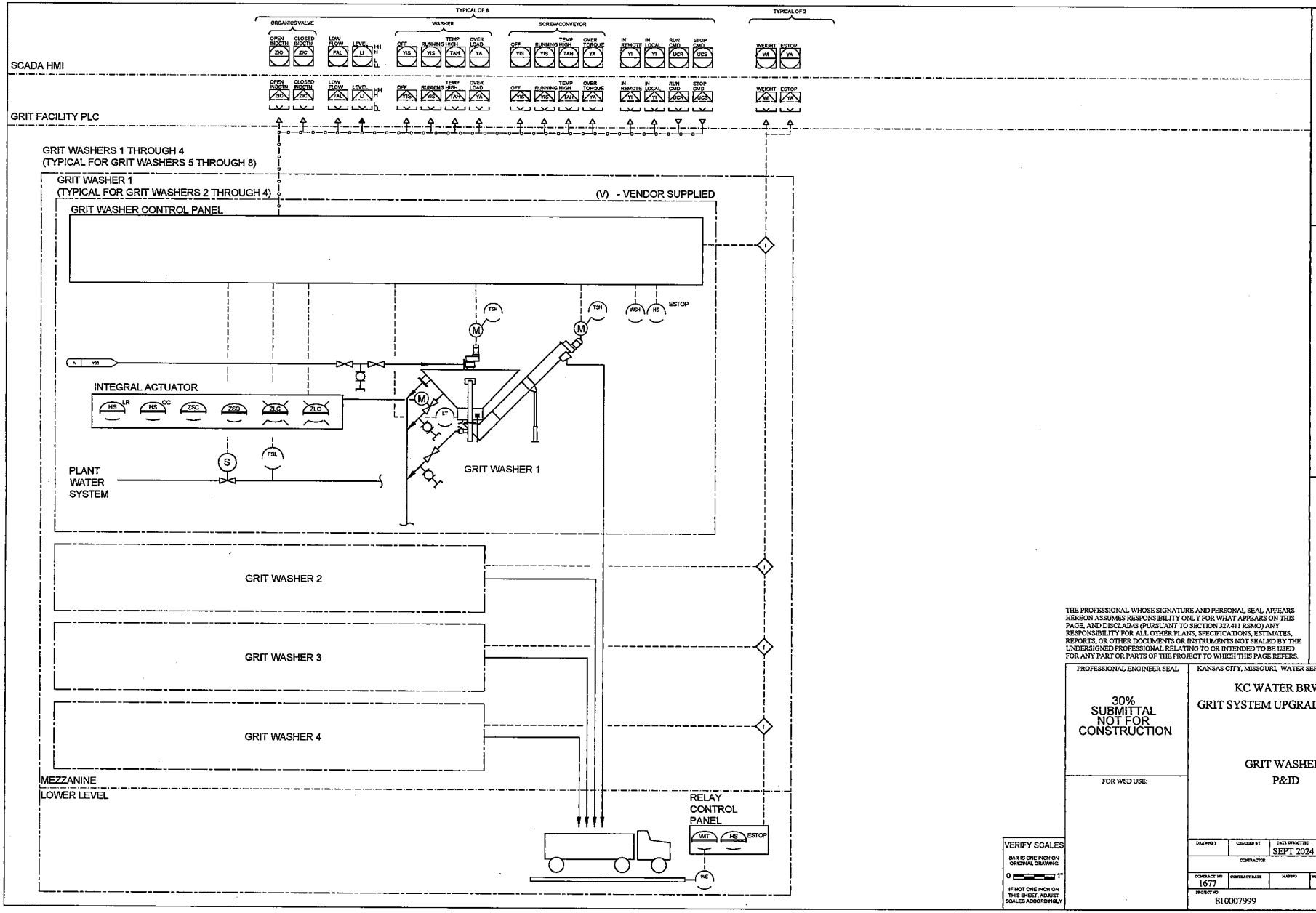
KANSAS CITY, MISSOURI, WATER SERVICES DEPARTMENT

KC WATER BRWWTP
GRIT SYSTEM UPGRADE PROJECT

GRIT PUMPS
P&ID

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

DRAWN BY	CHECKED BY	DATE SUBMITTED	RANGE	TWP	SEC
		SEPT 2024			
CONTRACTOR			DATE COMPLETED		
CONTRACT NO	CONTRACT DATE	MAP NO.	WORK ORDER NO	DRAWING NO	
1677				Y03	
PROJECT NO				SHEET	OF
810007999					



NO.	DATE	DESCRIPTION	BY	APP'D

carollo
903 E. 104TH STREET, SUITE 220
KANSAS CITY, MISSOURI 64131
(816) 943-8027

KMB ENGINEERING

THE PROFESSIONAL WHOSE SIGNATURE AND PERSONAL SEAL APPEARS HEREON ASSUMES RESPONSIBILITY ONLY FOR WHAT APPEARS ON THIS PAGE, AND DISCLAIMS (PURSUANT TO SECTION 327.411 RSMO) ANY RESPONSIBILITY FOR ALL OTHER PLANS, SPECIFICATIONS, ESTIMATES, REPORTS, OR OTHER DOCUMENTS OR INSTRUMENTS NOT SEALED BY THE UNDERSIGNED PROFESSIONAL RELATING TO OR INTENDED TO BE USED FOR ANY PART OR PARTS OF THE PROJECT TO WHICH THIS PAGE REFERS.

PROFESSIONAL ENGINEER SEAL

30% SUBMITTAL NOT FOR CONSTRUCTION

FOR WSD USE:

KANSAS CITY, MISSOURI, WATER SERVICES DEPARTMENT

KC WATER BRWWTP

GRIT SYSTEM UPGRADE PROJECT

GRIT WASHERS

P&ID

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING

0 1"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

DRAWN BY	CHECKED BY	DATE SUBMITTED	RANGE	TWP	SEC
		SEPT 2024			

CONTRACTOR — DATE COMPLETED

CONTRACT NO	CONTRACT DATE	MAP NO	WORK ORDER NO	DRAWING NO
1677				Y04

PROJECT NO 810007999

SHEET OF

APPENDIX G

ENVISION WORKSHEETS

Facilities Worksheet

Quality of Life

QL 1.2 Enhance Public Health and Safety

Intent: Protect and enhance community health and safety during operation.

Metric: Measures taken to increase safety and provide health benefits on the project site, surrounding sites, and the broader community in a just and equitable manner.

	Assessment Questions:	Yes/No	Reference to Documentation:
A	Does the project meet all health and safety regulations and laws for operations?	Yes	CAMP/Sustainability Discussion
B	Has the project exceeded minimum legal health and safety requirements as established by regulations and laws?	Yes	CAMP/Sustainability Discussion
C	Does the project include health and safety improvements for the immediate surroundings?	Yes	CAMP/Sustainability Discussion
D	Does the project include health and safety improvements for the broader host or affected communities?	Yes	CAMP/Sustainability Discussion
E	Can the project team demonstrate that health and safety risks and impacts are not disproportionately borne by one community over another?	Yes	CAMP/Sustainability Discussion
F	Will the project provide critical infrastructure services to communities experiencing, or at risk of experiencing, imminent negative health and/or personal safety impacts?	Yes	CAMP/Sustainability Discussion
		Yes =	6 of 6

Narrative Response:

The project will meet all required health and safety regulations for operation. Since it is an treatment facility, ADA compliance is not required, however the project architect is intentionally designing the project to meet those standards wherever possible, which will generally make the site safer as well. Examples include: eggress pathways, minimizing changes in elevation, using ramps where reasonable, minimizing slip/trip hazards.

The grit handling project is a component of the Blue River Wastewater Treatment Plant Facility Plan, the project will contribute to more efficient plant operations, reducing CSOs and helping the plant stay in compliance with EPA regulations. This improves health and safety for the surroundings and the community as a whole.

QL 1.4 Minimize Noise and Vibration

Intent: Minimize noise and vibrations during operations to maintain and improve community livability.

Metric: The extent that operational noise and vibration is assessed and mitigated, and target levels achieved.

	Assessment Questions:	Yes/No	Reference to Documentation:
A	Has the project team assessed the potential for operational noise impacts on the surrounding community and/or environment?	Yes	CAMP/Sustainability Discussion
B	Has the project mitigated noise generated as a result of the project?	N/A	CAMP/Sustainability Discussion
C	Does the project set or adopt target noise levels?	N/A	CAMP/Sustainability Discussion
D	Has the project team engaged impacted stakeholders on issues of noise and vibration impacts, mitigation strategies, and target levels?	N/A	CAMP/Sustainability Discussion
E	To what extent will the project maintain or reduce existing noise levels? Select one of the following: Noise reduction strategies and controls are sufficient to not increase noise within the surrounding community beyond existing conditions.	Yes	CAMP/Sustainability Discussion
		Yes =	2 of 5

Narrative Response:

The proposed equipment will be in an enclosed space is will be quieter than what is currently being used.

Leadership

LD 1.2 Foster Collaboration and Teamwork

Intent: Enhance project sustainability through interdisciplinary collaboration and teamwork.

Metric: The breadth and inclusivity of interdisciplinary and collaborative meetings and the resulting sustainability performance enhancements.

	Assessment Questions:	Yes/No	Reference to Documentation:
A	Was an interdisciplinary collaborative kickoff meeting held early in the project to define sustainability goals?	Yes	CAMP/Sustainability Discussion
B	Has project sustainability performance been enhanced as a result of the interdisciplinary collaboration?	Yes	CAMP/Sustainability Discussion
C	Did the project team establish regular interdisciplinary and collaborative meetings to set and achieve sustainability goals?	Yes	CAMP/Sustainability Discussion
D	Does the process include construction, operations, or maintenance stakeholders, for better incorporation of considerations in later project phases?	Yes	CAMP/Sustainability Discussion
		Yes =	4 of 4

Narrative Response:

The Carollo Design CAMP is a technique to optimize stakeholder participation, make decisions, solidify process criteria, and critically evaluate the design. It is a structured, repeatable process that yields results. Through a facilitated approach, the combined experiences of key personnel from the client organization, Carollo, and other specialists are leveraged over a short, concentrated effort to accelerate project development.

Goals for efficiency, future needs, and increased community benefit were established the first day of the CAMP, allowing everyone to be in agreement on the sustainble aspects of the project. Due to the intensely collaborative nature of the project, other sustainable ideas were also presented during CAMP. During subsequent sustainability discussion, additional ideas were presented including: stormwater treatment onsite, non-potable water use and recycled content specifications.

LD 1.3 Provide for Stakeholder Involvement

Intent: Early and sustained stakeholder engagement and involvement in project decision making.

Metric: Establishment of sound and meaningful programs for stakeholder identification, early and sustained engagement, and involvement in project decision making.

	Assessment Questions:	Yes/No	Reference to Documentation:
A	Has the project team undertaken a stakeholder mapping exercise to determine stakeholders? Were primary and secondary stakeholders identified through a stakeholder mapping process, and stakeholder concerns and specific objectives for stakeholder engagement defined?	N/A	CAMP/Sustainability Discussion
B	Has the project team analyzed, planned, and executed the engagement for key project stakeholders? Is there a proactive stakeholder engagement process established with clear objectives where: engagement moves beyond education into active dialogue; stakeholder views are monitored, and a two-way line of communication is established to reply to inquiries; and sufficient opportunities are provided for stakeholders to be involved in decision making?	Yes	CAMP/Sustainability Discussion
C	Was a lead member of the project team directly involved with stakeholder groups to understand their needs?	Yes	CAMP/Sustainability Discussion
D	Has stakeholder engagement feedback been incorporated into project plans, design, and/or decision making? Are specific cases in which public input influenced or validated project outcomes, and potentially conflicting stakeholder views were evaluated and addressed equitably during decision making?	Yes	CAMP/Sustainability Discussion
E	Has the project team sought feedback from stakeholders as to their satisfaction with the engagement process and the resulting decisions that were made based on their input?	Yes	CAMP/Sustainability Discussion
F	Has the project engaged one or more stakeholders as partners?	Yes	CAMP/Sustainability Discussion
		Yes =	5 of 6

Narrative Response:

Identification of stakeholders does not apply specifically to this project, since it is only a component of the larger BRWWTP Facility plan. However, during the Design CAMP, stakeholders such as O&M staff who will be most directly impacted by the facility upgrades were included in the discusses and their needs and preferences incorportated (such as interior steps, improved odor control for community benefit, and needing a new grit handling building, versus simply rehabbing the old one due to cost, footprint to accommodate equipment, and sequencing needed to maintain current operations).

LD2.2 Plan for Sustainable Communities

Intent: Incorporate sustainability principles into project selection/identification in order to develop the most sustainable project for the community.

Metric: The degree to which project selection/identification includes sustainability performance assessments and is part of a larger sustainable development plan.

	Assessment Questions:	Yes/No	Reference to Documentation:
A	Was sustainability considered during project selection/identification?	Yes	CAMP/Sustainability Discussion
B	Were alternative analyses conducted on sustainability performance during project identification?	Yes	CAMP/Sustainability Discussion
C	Was an assessment conducted of the project's impacts to broader long-term community or regional sustainability?	Yes	CAMP/Sustainability Discussion
D	Is the project part of a comprehensive sustainable development plan?	Yes	CAMP/Sustainability Discussion
E	Does the project address an inherently unsustainable condition within the community or region?	Yes	Goal is to meet EPA expectation
		Yes = 5 of 5	

Narrative Response:

ASK LOONEY ABOUT BR WWTP FACILITY PLAN

LD3.3 Conduct a Life-Cycle Economic Evaluation

Intent: Utilize economic analyses to identify the full economic implications and the broader social and environmental benefits of the project.

Metric: The comprehensiveness of the economic analyses used to determine the net impacts of the project, and their use in assessing alternatives to inform decision making.

	Assessment Questions:	Yes/No	Reference to Documentation:
A	Has a life-cycle cost analysis been conducted to identify the financial impacts of the whole project?	Yes	QBL
B	Have life-cycle cost analyses been used to compare alternatives for at least one major project component?	Yes	QBL
C	Has the project team mapped the social, environmental, and financial costs and benefits of the project?	Yes	QBL
D	Has a cost benefit analysis been conducted to identify the financial, social, and environmental impacts of the whole project?	Yes	QBL
E	Have cost benefit analyses, including financial, environmental, and social benefits, been used to compare the alternatives for at least one major project component?	Yes	QBL
		Yes = 5 of 5	

Narrative Response:

The life cycle costs would be included in the Quadruple Bottom Line assessment Carollo will be conducting on the grit handling project alternatives.

Resource Allocation

RA1.2 Use Recycled Materials

Intent: Reduce the use of virgin natural resources and avoid sending useful materials to landfills by specifying reused materials, including structures, and material with recycled content.

Metric: Percentage of project materials that are reused or recycled. Plants, soil, rock, and water are not included in this credit.

	Assessment Questions:	Yes/No	Reference to Documentation:
A	To what extent has the project team used recycled materials, including materials with recycled content and/or reused existing structures or materials? Select one of the following: None	No	CAMP/Sustainability Discussion

Yes = 0 of 1

Narrative Response:

The City allows for requiring up to 50% recycled asphalt in the specifications, however these project specifications have not yet been written. Other components that may use recycled materials have not yet been identified.

RA1.5 Balance Earthwork On Site

Intent: Minimize the movement of soils and other excavated materials off site to reduce transportation and environmental impacts.

Metric: Percentage of excavated material retained on site or nearby.

	Assessment Questions:	Yes/No	Reference to Documentation:
A	To what extent has the project team designed the project to balance cut and fill to reduce the excavated material taken off site? Select one of the following: None	No	CAMP/Sustainability Discussion

Yes = 0 of 1

Narrative Response:

Based on the current design, the grade will be slightly raised to encourage positive drainage, however the amount of cut/fill has not yet been determined.

RA2.1 Reduce Operational Energy Consumption

Intent: Conserve energy by reducing overall operational energy consumption throughout the project life.

Metric: Percentage of operational energy reductions achieved.

	Assessment Questions:	Yes/No	Reference to Documentation:
A	Has the project team determined the estimated annual energy consumption of the project during operations?	Yes	CAMP/Sustainability Discussion
B	To what extent has the project reduced operational energy consumption? Select one of the following: -	-	CAMP/Sustainability Discussion

Yes = 1 of 2

Narrative Response:

Since the future equipment used will no longer aerate grit, fans will be removed, reducing the power consumption by hundreds of horsepower.

POWELL TO GET ESTIMATES OF CURRENT VERSUS FUTURE

RA3.1 Preserve Water Resources

Intent: Assess and reduce the negative net impact on fresh water availability, quantity, and quality at a watershed scale to positively impact the region's water resources.

Metric: The extent to which the project considers and contributes to positively addressing broader watershed issues.

	Assessment Questions:	Yes/No	Reference to Documentation:
A	Has the project team conducted a watershed assessment?	No	CAMP/Sustainability Discussion
B	Has the project team estimated the water usage and wastewater generation over the life of the project?	Yes	CAMP/Sustainability Discussion
C	Does the project include features to minimize the negative impacts of water usage, and/or watershed-scale issues?	No	CAMP/Sustainability Discussion
D	Does the project have a net-zero impact on the quantity and availability of fresh surface water and groundwater supplies without compromising water quality?	Yes	CAMP/Sustainability Discussion
E	Is the project part of a watershed-level or regional plan?	Yes	CAMP/Sustainability Discussion
F	Does the project make a direct net-positive improvement to the watershed?	Yes	CAMP/Sustainability Discussion
		Yes =	4 of 6

Narrative Response:

The project has a net-zero impact on the quantity and availability of fresh surface water and groundwater supplies, however it does contribute to a net-positive improvement to the watershed by supporting the overall efficient operations of the Blue River WWTP and their attempts to reduce or eliminate combined sewer overflows (CSOs) in the future.

POWELL TO GET ESTIMATES OF CURRENT VERSUS FUTURE

RA3.2 Reduce Operational Water Consumption

Intent: Reduce overall water consumption while encouraging the use of greywater, recycled water, and stormwater to meet water needs.

Metric: Percentage reduction in potable water use and overall water use.

	Assessment Questions:	Yes/No	Reference to Documentation:
A	Has the project team conducted planning and design reviews to identify potable water reduction strategies during operation of the project?	-	CAMP/Sustainability Discussion
B	To what extent has the project reduced potable water use? Select one of the following: -	-	CAMP/Sustainability Discussion
C	To what extent has the project reduced overall water use (including potable and nonpotable water)? Select one of the following: -	-	CAMP/Sustainability Discussion
D	Does the project have a net positive impact on water use?	-	CAMP/Sustainability Discussion
		Yes =	0 of 4

Narrative Response:

TEAM IS LOOKING INTO POTENTIAL FOR NON-POTABLE WATER USE FOR GRIT WASHING/HANDLING (check with Mary Beth, Powell or Maya)

Natural World

NW1.1 Preserve Sites of High Ecological Value

Intent: Avoid placing the project and temporary works on a site that has been identified as being of high ecological value.

Metric: Avoidance of high ecological value sites and establishment of protective buffer zones.

	Assessment Questions:	Yes/No	Reference to Documentation:
A	Has the project team identified whether the site contains areas of high ecological value?	Yes	CAMP/Sustainability Discussion
B	Has the project mitigated any areas of high ecological value that are disturbed? Select one of the following: N/A	N/A	CAMP/Sustainability Discussion
C	Does the project avoid developing or disturbing areas of high ecological value on site?	N/A	CAMP/Sustainability Discussion
D	Does the project preserve an effective protective buffer zone around areas of high ecological value?	N/A	CAMP/Sustainability Discussion
E	Was the project intentionally sited to avoid areas of high ecological value?	N/A	CAMP/Sustainability Discussion
F	Does the project significantly increase the area of high ecological value?	N/A	CAMP/Sustainability Discussion
	Yes =	1 of 6	

Narrative Response:

Though the project does not negatively impact areas with high ecological value, siting of the project was determined by previously existing infrastructure.

NW1.4 Preserve Undeveloped Land

Intent: Conserve undeveloped land by locating projects on previously developed land.

Metric: Percentage of project development that is located on previously developed land.

	Assessment Questions:	Yes/No	Reference to Documentation:
A	To what extent is the project located on previously developed land? Select one of the following: N/A	N/A	CAMP/Sustainability Discussion
B	Has the project returned developed areas to a condition that supports natural open space, habitat, or natural hydrology?	N/A	CAMP/Sustainability Discussion
	Yes =	0 of 2	

Narrative Response:

Siting of the project was determined by previously existing infrastructure. The site is not an undeveloped area that needs to be preserved.

NW2.2 Manage Stormwater

Intent: Minimize the impact of development on stormwater runoff quantity, rate, and quality.

Metric: Degree to which the project infiltrates, evapotranspirates, reuses, and/or treats stormwater while not exceeding rate or quantity runoff targets.

	Assessment Questions:	Yes/No	Reference to Documentation:
A	To what extent does the project infiltrate, evapotranspirate, reuse, and/or treat stormwater on site? Enter response below:	Yes	CAMP/Sustainability Discussion
	100% of the runoff is treated on site		
B	To what extent does the completed project limit rate or quantity of runoff compared to existing conditions? Enter response below:	Yes	CAMP/Sustainability Discussion
	There is a slight increase in impervious area due to this project, but runoff will continue to be treated on site.		
C	Does the project include an erosion, sedimentation, and pollution control plan for all construction activities?	Yes	CAMP/Sustainability Discussion
D	Does the project treat stormwater from other sites or does it function as part of a larger stormwater management plan?	Yes	CAMP/Sustainability Discussion
		Yes = 4 of 4	

Narrative Response:

There are erosion, sediment and pollution control plans for the overall project site. Additional stormwater is treated on site, since this is a city WWTP.

NW2.4 Protect Surface and Groundwater Quality

Intent: Preserve water resources by preventing pollutants from contaminating surface water and groundwater and monitoring impacts during construction and operations.

Metric: Designs, plans, and programs instituted to prevent and monitor surface water and groundwater contamination during construction and operations.

	Assessment Questions:	Yes/No	Reference to Documentation:
A	Has project team determined the potential for surface water and/or groundwater contamination during construction and operations?	Yes	CAMP/Sustainability Discussion
B	Does the project include spill and leak prevention and response plans, and avoid creating new pathways for contamination during construction and operations?	N/A	CAMP/Sustainability Discussion
C	Based on the types of impacts identified in criterion A, does the project reduces the risk of quality degradation to surface water and/or groundwater? This should include water temperature.	Yes	CAMP/Sustainability Discussion
D	Have adequate and responsive surface water and/or groundwater quality monitoring and reporting systems been incorporated into the project?	N/A	CAMP/Sustainability Discussion
E	Has the project actively eliminated at least one source of hazardous and/or potentially polluting substances, or replaced them with nonhazardous or nonpolluting substances or materials?	N/A	CAMP/Sustainability Discussion
F	Does the project improve surface water and/or groundwater quality?	Yes	CAMP/Sustainability Discussion
		Yes = 3 of 6	

Narrative Response:

The team determined potential surface and groundwater contamination during construction and operation is minimal. Since the grit handling project is a component of the Blue River Wastewater Treatment Plant Facility Plan, the project will contribute to more efficient plant operations, reducing CSOs and helping the plant stay in compliance with EPA regulations. This reduces the risk of surface and groundwater contamination.

NW3.3 Maintain Floodplain Functions

Intent: Preserve floodplain functions by limiting development and impacts of development in the floodplain.

Metric: Efforts to avoid floodplains or maintain natural-acting floodplain functions.

	Assessment Questions:	Yes/No	Reference to Documentation:
A	Has the project team identified the 100-year or design frequency floodplain in relation to the project location?	Yes	CAMP/Sustainability Discussion
B	To what extent does the project preserve vegetated zones within the floodplain? Select one of the following: N/A	N/A	CAMP/Sustainability Discussion
C	Does the project mitigate impacts to floodplain functions?	Yes	CAMP/Sustainability Discussion
D	Was the project intentionally sited to avoid floodplains?	N/A	CAMP/Sustainability Discussion
E	Does the project remove structures from the floodplain or return previously developed areas to a vegetated state?	N/A	CAMP/Sustainability Discussion
		Yes = 2 of 5	

Narrative Response:

Since the grit handling project is a component of the Blue River Wastewater Treatment Plant Facility Plan, the project will contribute to more efficient plant operations, reducing CSOs and helping the plant stay in compliance with EPA regulations. This reduces CSO impacts downstream and within the floodplain.

Climate And Resilience

CR1.2 Reduce Greenhouse Gas Emissions

Intent: Reduce greenhouse gas emissions during the operation of the project, reducing project contribution to climate change.

Metric: Percentage of reduction in operational greenhouse gas emissions.

	Assessment Questions:	Yes/No	Reference to Documentation:
A	To what extent does the project reduce greenhouse gas emissions during its operational life? Select one of the following: None	No	CAMP/Sustainability Discussion
B	Has the project team calculated and reported the annual greenhouse gas emissions of the project?	N/A	CAMP/Sustainability Discussion
		Yes = 0 of 2	

Narrative Response:

The city compared the greenhouse gas emissions for the grit handling alternatives and saw no significant difference between the two options.

CR1.3 Reduce Air Pollutant Emissions

Intent: Reduce emissions of air pollutants: particulate matter (including dust), ground-level ozone, carbon monoxide, sulfur oxides, nitrogen oxides, lead, and volatile organic compounds.

Metric: Reduction of air pollutants compared to baseline.

	Assessment Questions:	Yes/No	Reference to Documentation:
A	Does the project meet all relevant minimum air quality standards and regulations?	Yes	CAMP/Sustainability Discussion
B	To what extent does the project reduce air pollutant emissions during operations? Select one of the following: N/A	N/A	CAMP/Sustainability Discussion
C	Does the project include the ongoing monitoring and management of direct air pollutant emissions?	N/A	CAMP/Sustainability Discussion
D	Has the project team assessed the materiality of volatile organic compounds to the health of construction workers and the project operators?	N/A	CAMP/Sustainability Discussion
E	Does the project remove existing air pollutant sources?	N/A	CAMP/Sustainability Discussion
		Yes = 1 of 5	

Narrative Response:

CR2.6 Improve Infrastructure Integration

Intent: Enhance the operational relationships and strengthen the functional integration of the project into connected, efficient, and diverse infrastructure systems.

Metric: The degree to which the project is integrated into other connected systems, where beneficial and appropriate, in order to increase resilience and systems performance.

	Assessment Questions:	Yes/No	Reference to Documentation:
A	Does the project increase internal systems integration?	Yes	CAMP/Sustainability Discussion
B	Will the infrastructure integration reduce the risk of systemic or cascading failures?	Yes	CAMP/Sustainability Discussion
C	Does the project increase external systems integration?	Yes	CAMP/Sustainability Discussion
D	Does the project integrate infrastructure networks?	Yes	CAMP/Sustainability Discussion
E	Does the project integrate data or monitoring systems in order to improve performance?	Yes	CAMP/Sustainability Discussion
		Yes = 5 of 5	

Narrative Response:

Yes, the project will increase system integration by creating a more efficient and grit handling process at the BR WWTP (replace aging, non-functional processes and equipment, streamline unit process efficiency, and enhance automation and control with SCADA). Redunancy and minimizing risks to the system (new, finer screens to protect grit equipment, layouts that reduce the risk of clogging, and selecting materials with a longer-life) as well as efforts to support CSO efforts through adjustments to this project (minimizing double pumping in order to be as energy efficient as possible) are all goals for the project design. These improvements will reduce the risk of system failure and increase capacity for the future while positively impacting overall WWTP performance.

Facilities Results

			Credit Assessment Status	Assessment Questions			
				Yes	No	N/A	Incomplete
Quality of Life	Wellbeing	QL1.2 Enhance Public Health & Safety	Assessed	6	0	0	0
		QL1.4 Minimize Noise & Vibration	Partially Assessed	2	0	3	0
Leadership	Collaboration	LD1.2 Foster Collaboration & Teamwork	Assessed	4	0	0	0
		LD1.3 Provide for Stakeholder Involvement	Partially Assessed	5	0	1	0
	Planning	LD2.2 Plan for Sustainable Communities	Assessed	5	0	0	0
	Economy	LD3.3 Conduct a Life-Cycle Economic Evaluation	Assessed	5	0	0	0
Resource Allocation	Materials	RA1.2 Use Recycled Materials	Assessed	0	1	0	0
		RA1.5 Balance Earthwork On Site	Assessed	0	1	0	0
	Energy	RA2.1 Reduce Operational Energy Consumption	Partially Assessed	1	0	0	1
	Water	RA3.1 Preserve Water Resources	Assessed	4	2	0	0
		RA3.2 Reduce Operational Water Consumption	Not Assessed	0	0	0	4
Natural World	Siting	NW1.1 Preserve Sites of High Ecological Value	Partially Assessed	1	0	5	0
		NW1.4 Preserve Undeveloped Land	Not Assessed	0	0	2	0
	Conservation	NW2.2 Manage Stormwater	Assessed	4	0	0	0
		NW2.4 Protect Surface & Groundwater Quality	Partially Assessed	3	0	3	0
	Ecology	NW3.3 Maintain Floodplain Functions	Partially Assessed	2	0	3	0
Climate and Resilience	Emissions	CR1.2 Reduce Greenhouse Gas Emissions	Partially Assessed	0	1	1	0
		CR1.3 Reduce Air Pollutant Emissions	Not Assessed	0	0	4	0
	Resilience	CR2.6 Improve Infrastructure Integration	Assessed	5	0	0	0

Credit Assessment Status	Assessment Questions			
	Yes	No	N/A	Incomplete
3 Not Assessed	47	5	22	5

Credits	Facilities	Underground Systems	Linear Surface Systems	Area Surface Systems
QL1.1 Improve Community Quality of Life		X	X	X
QL1.2 Enhance Public Health & Safety	X	X	X	X
QL1.3 Improve Construction Safety		X		
QL1.4 Minimize Noise & Vibration	X	X		
QL2.1 Improve Community Mobility & Access		X		
QL2.3 Improve Access & Wayfinding			X	
QL3.3 Enhance Views & Local Character			X	X
QL3.4 Enhance Public Space & Amenities			X	X
LD1.2 Foster Collaboration & Teamwork	X	X	X	X
LD1.3 Provide for Stakeholder Involvement	X	X	X	X
LD2.2 Plan for Sustainable Communities	X	X	X	X
LD3.1 Stimulate Economic Prosperity & Development				X
LD3.3 Conduct a Life-Cycle Economic Evaluation	X	X	X	X
RA1.1 Support Sustainable Procurement Practices		X		
RA1.2 Use Recycled Materials	X	X	X	X
RA1.5 Balance Earthwork On Site	X	X	X	X
RA2.1 Reduce Operational Energy Consumption	X			
RA3.1 Preserve Water Resources	X		X	X
RA3.2 Reduce Operational Water Consumption	X	X		
NW1.1 Preserve Sites of High Ecological Value	X			X
NW1.4 Preserve Undeveloped Land	X			
NW2.2 Manage Stormwater	X		X	X
NW2.4 Protect Surface & Groundwater Quality	X	X	X	X
NW3.2 Enhance Wetland & Surface Water Functions			X	X
NW3.3 Maintain Floodplain Functions	X	X	X	X
CR1.2 Reduce Greenhouse Gas Emissions	X			
CR1.3 Reduce Air Pollutant Emissions	X			
CR2.6 Improve Infrastructure Integration	X	X	X	X
Total Credits	19	16	17	18

APPENDIX H

DESIGN CRITERIA SUMMARY

Basis of Design

The following is a summary of the projected influent flow criteria and grit removal and handling equipment design criteria.

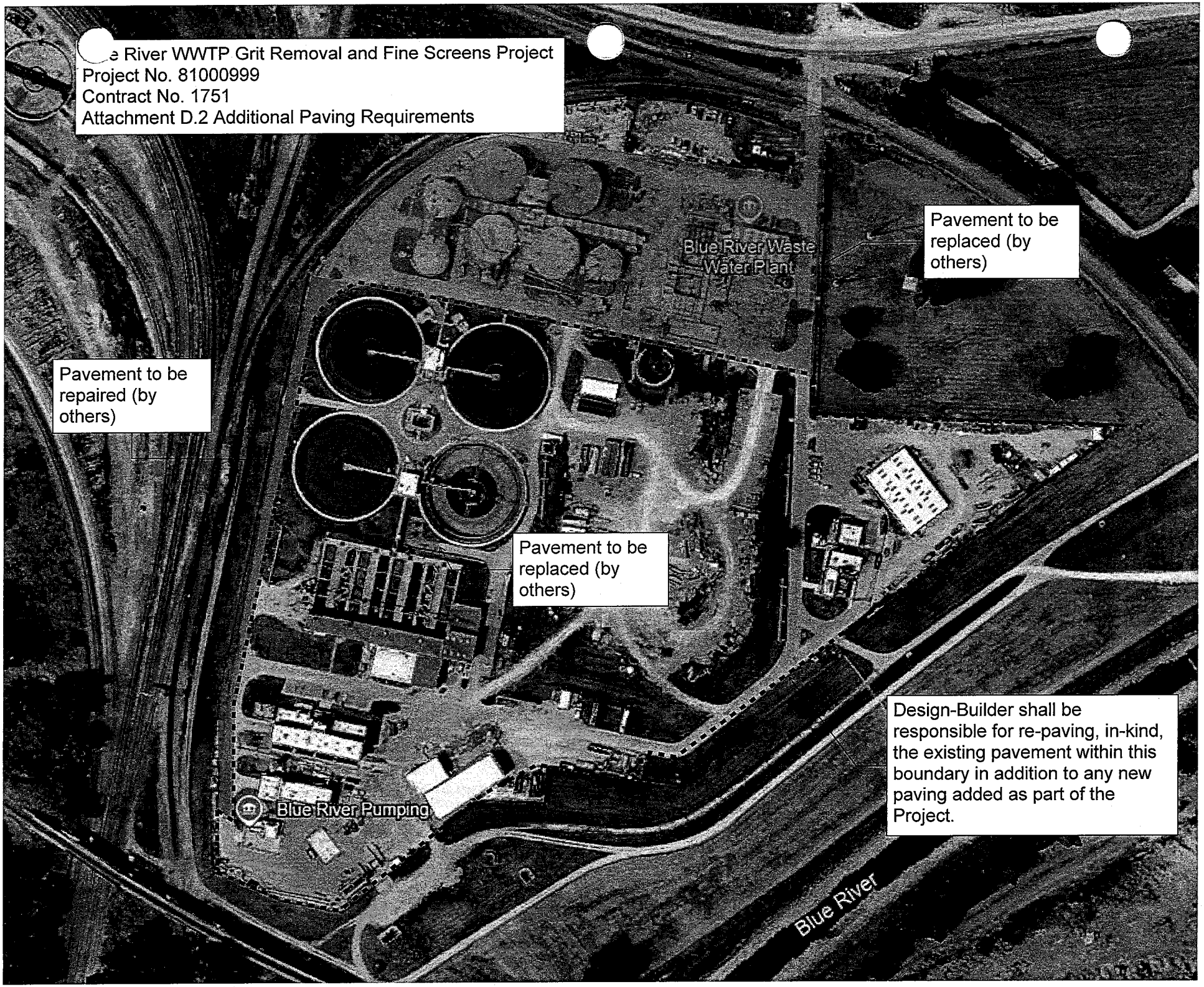
Table H.1 Basis of Design Flows

Flow Condition[1]	BRWWTP		
	Grit Facilities	Wet Weather (CSO) Treatment	Primary Treatment
AADF, mgd	91	0	91
PHF, mgd	210	70	140
Potential Modified PHF, mgd[2]	270	130	140

Notes:
Abbreviations: CSO - combined sewer overflow.
(1) Basis of flows for initial planning in Year 1.
(2) Ongoing discussions to increase the PHF wet weather flow to 270 mgd.

Table H.2 Grit Alternative No. 2 Conceptual Design Criteria

Parameter	Design Criteria
Grit Removal	
Type	Multi tray vortex, Headcell®
Number	8
Tray Diameter	12 feet
Number of Trays	12
Capacity	
Annual Average Daily Flow, 91 mgd	11.4 mgd each, with 95% removal of grit > 75 microns
Peak Day, 210 mgd	26.25 mgd each, with 95% removal of grit > 125 microns
Peak Hour Flow, 270 mgd	35 mgd each, with 95% removal of grit > 150 microns
Grit Pumps	
Type	Recessed impeller
Number	8, plus shelf spares
Capacity	500 gpm
Grit Washer Classifier	
Type	Huber COANDA® fine grit washer
Number	8
Hydraulic Capacity (Design/Peak)	400 gpm / 500 gpm


e River WWTP Grit Removal and Fine Screens Project
Project No. 81000999
Contract No. 1751
Attachment D.2 Additional Paving Requirements
Blue River Waste Water Plant
Pavement to be replaced (by others)
Pavement to be repaired (by others)
Pavement to be replaced (by others)
Design-Builder shall be responsible for re-paving, in-kind, the existing pavement within this boundary in addition to any new paving added as part of the Project.
Blue River Pumping
Blue River

ATTACHMENT E: Cost Proposal Forms

Form E.1: General Conditions and Design-Builder's Fee

PROPOSAL:

Pursuant to and in compliance with the Request for Proposals, the Proposer certifies, having carefully examined the draft contract documents (Attachment B – Draft Contract for Progressive Design-Build Services) and conditions affecting the work, and being familiar with the site; proposes to furnish all labor, materials, equipment and services necessary to complete the work, as follows in Bid Items A, B, and D of the Proposal Price Calculation Table below:

Proposal Price Calculation Table

Description of Bid Item:	Percentage	Total Estimated GMP	Bid Amount
A. Proposed General Conditions Percentage	_____%(1)	$100,000,000	$_____(2)
B. Design-Builder's Fee Percentage	_____%	$100,000,000	$_____(3)
C. Preconstruction Services Fee	*Provided from Form E.2*		$_____(4)
Proposal Price (A + B + C Bid Amounts):			**$** _____

Notes:
(1) General Conditions cost shall be based on Division 00 and 01 Specifications provided in draft Exhibit 2.3.2 Phase 2 Services of the draft Contract for Progressive Design-Build Services.
(2) Bid Amount = GC % (A) x $100,000,000
(3) Design-Builder's Fee = Design-Builder's Fee (B) x $100,000,000
(4) Preconstruction Services Fee based on draft Exhibit 2.2.1, Phase 1 Scope of Services, total from Form E.2

SALES TAX:
None of the sums stated in the foregoing include Missouri State Sales Tax.

GENERAL CONDITIONS COST
Proposed General Conditions cost may be negotiated with selected Design-Builder prior to award of the Contract for Progressive Design-Build Services or the Phase 2 Contract Price Amendment. Shortlisted Proposer shall express its price as a percentage to the two decimal places, such as X.XX.

Percentage shall be based on the following:

- Exclusive of Fee;
- 28-month construction duration (Phase 1 completion to Final Completion Date); and

- *Exhibit 2.1.1 Phase 1 Scope of Services.*

- The Division 00 and 01 Specifications as provided in Exhibit 2.3.2 Phase 2 Services of the draft Contract for Progressive Design-Build Services, *exclusive of Section 01400 – Quality Control and Section 01757 – Commissioning.*

DESIGN-BUILDER'S FEE Percentage

Proposed Design-Builder's Fee Percentage may be negotiated with selected Design-Builder prior to award of Contract for Progressive Design-Build Services to be the Design-Builder's Fee incorporated in the Phase 2 Contract Price Amendment of the Contract for Progressive Design-Build Services. The Design-Builder's Fee Percentage shall be applied to the Cost of the Work, including the Cost of the Work Contingency and any Allowance Item(s). The Design-Builder's Fee Percentage shall be used to negotiate and determine the Design-Builder's Fee.

Design-Builder's Fee Percentage shall not apply to any other items, such as (without limitation) the Design-Builder's Contingency and premiums for bonds and insurance required under the Contract for Progressive Design-Build Services.

Respondent shall express its percentage fee to two decimal places, such as X.XX%.

TIME OF COMPLETION AND LIQUIDATED DAMAGES:

The undersigned agrees, if awarded the Contract, to complete the Work of the Contract within the number of calendar days specified in the Contract, and also agrees to the amounts specified for Liquidated Damages in the Contract.

CONTRACT AND BOND:

For the purposes of calculating the cost of the Payment and Performance Bonds and insurance, the Respondent shall assume an estimated GMP as referenced above in this General Conditions and Design-Builder's Fee Proposal Form.

If a GMP is agreed to between Owner and Respondent a Total Contract Price will be established by Owner consisting of the negotiated GMP, the resulting fixed dollar amount for General Conditions work, and the Design-Builder's Fee based on the negotiated GMP and General Conditions.

Form E.2: Proposal for Phase 1 Services
Preconstruction Services Price

The Proposer shall produce the following summary table for the Phase 1 Services based on the tasks and other information described in the RFP Attachment B (Draft Contract for Progressive Design-Build Services) and draft Exhibit 2.2.1 Phase 1 Scope of Services. Proposer shall adjust the number of "Personnel Title/Classification" columns as required to include all personnel who will perform Phase 1 Work, including Key Personnel, Subconsultants/Subcontractors, and others.

Fee shall not reflect any proposed modifications (Alternative Technical Concepts, ATCs) to the Preconstruction Services Scope and serve as the basis for negotiation with the Successful Shortlisted Respondent. Proposer shall prepare a separate table to include any proposed tasks or subtasks added or removed to match the work breakdown structure proposed within the Technical Proposal inclusive of incorporated ATCs.

Cost of the Work for Task 403 shall be inclusive of the $29.91/ton tipping fee plus $4.99/ton State & City Fee (effective 1/1/2025).

Personnel Title/Classification (including subconsultants)										
Hourly Rate										
Preconstruction Services Tasks	**Hours**	**Hours**	**Hours**	**Hours**	**Hours**	**Hours**	**Hours**	**Total Personnel Costs**	**Direct Costs**	**Cost of the Work**
100. Project Management and Coordination										
200. Meetings										
300. Permitting Assistance										
400. Site Investigations										
401. Subsurface Utility Investigations										
402. Verification of As-Builts										
403. Biosolids Ash South Pond Closure									$35/ton tipping fee	
500. Basis of Design										
600. 30% Design Documents										
700. 60% Design Documents										
800. 90% Design Documents										
900. Phase 2 Proposal(s)										
Total (Tasks 100 through 900)										

Form E.3: Fee for Design Completion

Design Completion Fee: Identify a not to exceed amount for design completion (from 90% design to construction-ready set) in the event a Phase 2 Contract Price Amendment is not executed and the Owner and Design-Builder elect to complete the design. The basis of fee shall be inclusive of expenses.

Blue River WWTP Grit Removal and Fine Screens Project Design-Builder's Fee for Design Completion	
Proposed Not to Exceed Amount ($)	Proposed Not to Exceed Amount (in words)
$_____	_____dollars

Form E.4: Phase 2 Rates and Prices – Personnel Rates

PHASE 2: PERSONNEL RATES		
Personnel Title/Classification	**Firm**	**Hourly Rate**
Note to Proposers: Include any additional personnel anticipated to perform Phase 2 Work. This table is subject to amendment during Phase 1, but must be finalized and submitted with the Phase 2 Proposal. Additional personnel proposed to be added after that time will be subject to item 3, below.]		

1. Provide hourly rates for all personnel who will perform Phase 2 Work, including Key Personnel, Subcontractors, and others.
2. The Proposer shall commit to using the hourly rates listed above for all such personnel for the duration of Phase 2.
3. Additional personnel proposed to be added during Phase 2 must be approved by the Owner. Any such personnel will be assigned an hourly rate consistent with the equivalent personnel listed above.

Form E.5: Phase 2 Rates and Prices – Equipment Rates

Equipment	Hourly Rate
[Note to Proposers: Include any Design-Builder-owned equipment anticipated to be used during Phase 2 Work. This table is subject to amendment during Phase 1, but must be finalized and submitted with the Phase 2 Proposal. Additional equipment proposed to be added after that time will be subject to item 3, below.]	

1. Provide hourly rates for all Design-Builder-owned equipment to be used during Phase 2.
2. The Proposer shall commit to using the hourly rates listed above for all such equipment for the duration of Phase 2.
3. Additional Design-Builder-owned equipment proposed to be added during Phase 2 must be approved by the Owner. Any such equipment will be assigned an hourly rate consistent with the equivalent equipment listed above.

Form E.6: Authorized Signature

The undersigned certifies that all necessary corporate acts have been taken to authorize the Proposer's representative to sign this document and that all information provided in Forms E.1 through E.5 are an accurate representation of the information the Proposer is providing. Further, the undersigned agrees to execute a contract for the above work for the Total Contract Price on the Contract for Progressive Design-Build Services based on this form provided with the Request for Final Proposals (RFP) issued by the Owner, and to furnish bonds and evidence of insurance as required by the Contract Documents.

Respondent's Business Name			
Type of Business: ☐ Sole Proprietorship ☐ Partnership ☐ Corporation (State of Incorporation:_____) ☐ Other			
Business Address:	City:	State:	Zip Code:
Business Telephone Number:	Business Fax Number:	Business E-mail Address:	
Receipt is hereby acknowledged of RFP Addenda No(s): ____ ____ ____ ____ ____			

REPRESENTATIVE AUTHORIZED TO SIGN FOR RESPONDENT:

"I certify (or declare) under penalty of perjury under the laws of the State of Missouri that the foregoing is true and correct":	
Signature:	Date:
Print Name and Title	Location or Place Executed: (City, State)

ATTACHMENT F: Submission Forms including CREO Documents and Other Contracting Documents

CITY OF FOUNTAINS
HEART OF THE NATION
CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

DESIGN-BUILD BACKGROUND INFORMATION FORM

Project Number 81000999/1751

Project Title Blue River WWTP Grit Removal and Fine Screens

(Proposer shall complete this form and return it as part of the **TECHNICAL APPROACH PART I – EXPERIENCE AND QUALIFICATIONS** submittal)

Each question below shall be answered on behalf of each of the Bidder, the DOR, and the GC by circling the appropriate response. Unless specifically stated otherwise in a question, the terms "you" or "your" refer to each of the Bidder, the DOR, and the GC. If any response is "Yes," provide a detailed explanation (attach additional sheets as necessary) that includes identification of the entity in question (i.e., Bidder, DOR, and/or GC) and all relevant information, including appropriate contact information.

Have any of your licenses and/or certificates of authority, or any of those of the DOR and any other design professional you anticipate involving in the Project, been subject to disciplinary action, in Missouri or in any other State, resulting in suspension, revocation, censure, probation, reprimand, or other discipline; or has such license number or certificate of authority number changed within the past five (5) years?

CIRCLE ONE: Yes No

Are you currently for sale or involved in any transaction to become acquired by another business entity?

CIRCLE ONE: Yes No

Are you currently in default on any loan agreement or financing agreement with any bank, financial institution, or other entity? If so, please specify date(s), details, circumstances, and prospects for resolution.

CIRCLE ONE: Yes No

Have you, your predecessor, successors, or Affiliates ever been found guilty in a criminal action or liable in a civil suit for fraud, any act of dishonesty, making any false claim or material misrepresentation, or violating any federal, state or local statute, law, Code regulation, or order related to design or construction?

CIRCLE ONE: Yes No

Are you a subsidiary, parent, holding company, or Affiliate of another company? If so, identify the other company and describe the relationship.

CIRCLE ONE: Yes No

Have you ever filed a claim against the City?

CIRCLE ONE: Yes No

Answer the following questions No. 7 through 20 with respect to the five (5) years immediately preceding the issue date of this RFQ.

Have you been a debtor in any bankruptcy proceeding?

CIRCLE ONE: Yes No

Have you, your predecessors, successors, or Affiliates been debarred, disqualified, declared ineligible, removed from, or otherwise prevented from bidding on, being awarded, or being allowed to perform on a government contract?

CIRCLE ONE: Yes No

Have you changed names?

CIRCLE ONE: Yes No

Has the U.S. Department of Labor's Occupational Safety and Health Administration or any State's workers' safety and health enforcement department cited and assessed penalties against you?

CIRCLE ONE: Yes No

Has there ever been a period when you were required by Missouri law or the law of any other State to maintain workers' compensation insurance but you were without workers' compensation insurance and were not a State-approved self-insurer?

CIRCLE ONE: Yes No

Have you (Bidder or GC) been required to pay back wages and/or penalties for your failure (not the failure of a subcontractor) to comply with the federal Davis-Bacon prevailing wage requirements or any State's prevailing wage requirements?

CIRCLE ONE: Yes No

Have you, your predecessors, successors, or Affiliates been found in violation of any U.S. or State regulations relating to taxes, employment matters (including wage scales, discrimination claims, collective bargaining matters, etc.), permit or licensing requirements, etc.?

CIRCLE ONE: Yes No

Has a citation or notice of violation been issued pursuant to any state or local environmental laws, the U.S. Clean Air Act, Clean Water Act, CERCLA, RCRA, TSCA, or similar environmental protection statute against you on a project, or against the owner of a project on which you were involved?

CIRCLE ONE: Yes No

Have you, your predecessors, successors, or Affiliates defaulted on a design or construction contract?

CIRCLE ONE: Yes No

Have you been required to pay liquidated damages on a construction project, public or private?

CIRCLE ONE: Yes No

Has any surety company made any payments on your behalf, or on behalf of any of your predecessors, successors, or Affiliates, as the result of a default or to satisfy any other claims made against a performance or payment bond, in connection with a public or private construction project?

CIRCLE ONE: Yes No

Has any insurance carrier cancelled or refused to renew any of your insurance policies, for any type of insurance?

CIRCLE ONE: Yes No

Have you, your predecessors, successors, or Affiliates filed a claim, for payment or otherwise, in a court or arbitration tribunal against the owner of any public or private construction project, or has any owner of any construction project filed a claim against you or any of your predecessors, successors, or Affiliates? Information need not be provided about disputes with another contractor, a subcontractor, or a supplier; about "pass-through" disputes in which the actual dispute was between a subcontractor and the project owner; or about disputes involving amounts less than $50,000.

CIRCLE ONE: Yes No

Provide the following information:

ENTITY	YEARS IN BUSINESS	NUMBER OF EMPLOYEES	2009 GROSS RECEIPTS	2010 GROSS RECEIPTS	2011 GROSS RECEIPTS
Bidder					
DOR					
GC					

21. Provide the following information for all surety companies that have written bonds for Proposer and GC during the past five (5) years:

BIDDER		
Surety Company	Address & Telephone No.	Dates during which bonds were written

GC		
Surety Company	Address & Telephone No.	Dates during which bonds were written

CITY OF FOUNTAINS
HEART OF THE NATION
KANSAS CITY
MISSOURI

CONTRACTOR UTILIZATION PLAN/REQUEST FOR WAIVER

Project Number _____

Project Title _____

_____ _____
(Department Project) Department

_____
(Bidder/Proposer)

STATE OF_____)
) ss
COUNTY OF_____)

I,_____, of lawful age and upon my oath state as follows:

1. This Affidavit is made for the purpose of complying with the provisions of the MBE/WBE submittal requirements on the above project and the MBE/WBE Program and is given on behalf of the Bidder/Proposer listed below. It sets out the Bidder/Proposer's plan to utilize MBE and/or WBE contractors on the project.

2. The project target goals are_____**% MBE** and_____**% WBE.**

3. Bidder/Proposer assures that it will utilize a minimum of the following percentages of MBE/WBE participation in the above project:

   - **BIDDER/PROPOSER PARTICIPATION:_____% MBE_____% WBE**

   - **POST-BID/POST-RFP ESTIMATED BUDGET: $_____**

4. The following are the M/WBE subcontractors whose utilization Bidder/Proposer warrants will meet or exceed the above-listed Bidder/Proposer Participation. Bidder/Proposer warrants that it will utilize the M/WBE subcontractors to provide the goods/services described in the applicable Letter(s) of Intent to Subcontract, copies of which shall collectively be deemed incorporated herein). ***(All firms must currently be certified by Kansas City, Missouri)***

   - Name of M/WBE Firm _____
     Address_____
     Telephone No. _____
     I.R.S. No. _____

Name of M/WBE Firm _____
Address _____
Telephone No. _____
I.R.S. No. _____

Name of M/WBE Firm _____
Address _____
Telephone No. _____
I.R.S. No. _____

Name of M/WBE Firm _____
Address _____
Telephone No. _____
I.R.S. No. _____

Name of M/WBE Firm _____
Address _____
Telephone No. _____
I.R.S. No. _____

Name of M/WBE Firm _____
Address _____
Telephone No. _____
I.R.S. No. _____

(List additional M/WBEs, if any, on additional page and attach to this form)

4. The following is a breakdown of the percentage of the total contract amount that Bidder/Proposer agrees to pay to each listed M/WBE:

MBE/WBE BREAKDOWN SHEET

MBE FIRMS:

Name of MBE Firm	Supplier/Broker/Contractor	Subcontract Amount*	Weighted Value**	% of Total Contract

_____	_____	_____	_____	_____

TOTAL MBE $ / TOTAL MBE %: $_____ _____%

WBE FIRMS:

Name of WBE Firm	Supplier/Broker/Contractor	Subcontract Amount*	Weighted Value**	% of Total Contract
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

TOTAL WBE $ / TOTAL WBE %: $_____ _____%

*"Subcontract Amount" refers to the dollar amount that Bidder/Proposer has agreed to pay each M/WBE subcontractor as of the date of contracting and is indicated here solely for the purpose of calculating the percentage that this sum represents in proportion to the total contract amount. Any contract amendments and/or change orders changing the total contract amount may alter the amount due an M/WBE under their subcontract for purposes of meeting or exceeding the Bidder/Proposer participation.

**"Weighted Value" means the portion of the subcontract amount that will be credited towards meeting the Bidder/Proposer participation. See CREO KC Forms and Instructions for allowable credit and special instructions for suppliers.

5. Bidder/Proposer acknowledges that the monetary amount to be paid each listed M/WBE for their work, and which is approved herein, is an amount corresponding to the percentage of the total contract amount allocable to each listed M/WBE as calculated in the MBE/WBE Breakdown Sheet. Bidder/Proposer further acknowledges that this amount may be higher than the subcontract amount listed therein as change orders and/or amendments changing the total contract amount may correspondingly increase the amount of compensation due an M/WBE for purposes of meeting or exceeding the Bidder/Proposer participation

6. Bidder/Proposer acknowledges that it is responsible for considering the effect that any change orders and/or amendments changing the total contract amount may have on its ability to meet or exceed the Bidder/Proposer participation. Bidder/Proposer further acknowledges that it is responsible for submitting a Request for Modification or Substitution if it will be unable to meet or exceed the Bidder/Proposer participation set forth herein.

7. If Bidder/Proposer has not achieved both the M/WBE goal(s) set for this Project, Bidder/Proposer hereby requests a waiver of the MBE and/or WBE goal(s) that Bidder/Proposer has failed to achieve

8. Bidder/Proposer will present documentation of its good faith efforts, a narrative summary detailing its efforts and the reasons its efforts were unsuccessful when requested bythe City.

9. I hereby certify that I am authorized to make this Affidavit on behalf of the Bidder/Proposer named below and who shall abide by the terms set forth herein:

Bidder/Proposer primary contact: _____
Address: _____
_____
Phone Number: _____
Facsimile number: _____
E-mail Address: _____

By:_____
Title:_____
Date:_____
(Attach corporate seal if applicable)

Subscribed and sworn to before me this_____day of_____, 20____.

My Commission Expires: _____ _____
Notary Public

CITY OF FOUNTAINS
HEART OF THE NATION
KANSAS CITY
MISSOURI

LETTER OF INTENT TO SUBCONTRACT

Check one:
Original LOI: ☐
Updated LOI: ☐

Project Name/Title _____

Project Location/Number _____

PART I: Prime Contractor_____agrees to enter into a contractual agreement with M/W/DBE Subcontractor_____who will provide the following goods/services in connection with the above-reference contract: [Insert a brief narrative describing goods/services to be provided. Broad Categorizations (e.g., "electrical," "plumbing," etc.) or the listing of NAICS Codes in which M/W/DBE Subcontractor is certified are insufficient and may result in denial of this Letter of Intent to Subcontract.]

_____

_____

_____

for an estimated amount of $_____(or_____% of the total estimated contract value.)

M/WBE Vendor type:
- ☐ Subcontractor/manufacturer (counts as 100% of contract value towards goals)
- ☐ Supplier (counts as 60% of the total dollar amount paid or to be paid by a prime contractor for supplies or goods towards goals)
- ☐ Broker (counts as 10% of the total dollar amount paid or to be paid by a prime contractor for supplies or goods towards goals)

M/W/DBE Subcontractor is, to the best of Prime Contractor's knowledge, currently certified with the City of Kansas City's Civil Rights & Equal Opportunity Department to perform in the capacities indicated herein. Prime Contractor agrees to utilize M/W/DBE Subcontractor in the capacities indicated herein, and M/W/DBE Subcontractor agrees to work on the above-referenced contract in the capacities indicated herein, contingent upon award of the contract to Prime Contractor.

PART 2: This section is to be completed by the M/W/DBE subcontractor listed above. Please attach additional sheets as needed for more than one intended sub-tier contract. **IMPORTANT: Falsification of this document will result in denial and other remedies available under City Code.**

Select one:
- ☐ The M/W/DBE Subcontractor listed above **IS NOT** subcontracting any portions of the above-stated scope of work(s). (Continue to Part 3.)
- ☐ The M/W/DBE Subcontractor listed above **IS** subcontracting certain portions of the above stated scope of work(s) to:

(1) Company name: _____

Full address: _____
Street number and name City, State and Zip Code

Primary contact: _____
Name Phone

a) This subcontractor is (select one): ☐MBE ☐WBE ☐DBE ☐N/A

i: If this subcontractor is an M/W/DBE certified with the City of Kansas City, Missouri, a separate Letter of Intent must be attached to this document.

ii. If this subcontractor is NOT a certified M/W/DBE certified with the City of Kansas City, Missouri, the firm must still be listed for reporting purposes but a Letter of Intent is not required.

b) Scope of work to be performed: _____

c) The dollar value of this agreement is: _____

PART 3:

NOTE: SIGNATURES AND NOTARIZATIONS REQUIRED FOR NEW LETTERS OF INTENT (LOI); <u>SIGNATURES ONLY</u> FOR UPDATED LOI (ADDING VALUE TO EXISTING CONTRACT).

PRIME CONTRACTOR BUSINESS NAME: _____

_____ _____
Signature: Prime Contractor Print Name

_____ _____
Title Date

State of)

County of)

I,_____, state that the above and foregoing is based on my best knowledge and belief.

Subscribed and sworn to before me, a notary public, on this day of_____, 20_____

My Commission Expires: _____ _____
Notary Public

STAMP:

MWDBE SUBCONTRACTOR BUSINESS NAME: _____

_____ _____
Signature: Subcontractor Print Name

_____ _____
Title Date

State of)

County of)

I,_____, state that the above and foregoing is based on my best knowledge and belief.

Subscribed and sworn to before me, a notary public, on this day of_____, 20_____

My Commission Expires: _____ _____
Notary Public

STAMP:

TIMETABLE FOR MBE/WBE UTILIZATION

(This form should be submitted to the City after contract award.)

I, _____, acting in my capacity as _____
(Name) *(Position with Firm)*
of _____, with the submittal of this Timetable, certify that
(Name of Firm)
the following timetable for MBE/WBE utilization in the fulfillment of this contract is correct and true to the best of my knowledge.

ALLOTTED TIME FOR THE COMPLETION OF THIS CONTRACT
(Check one only)

15 days	___	75 days	___	135 days	___
30 days	___	90 days	___	150 days	___
45 days	___	105 days	___	165 days	___
60 days	☐	120 days	☐	180 days	☐

Other _____ (Specify)

Throughout _____ Beginning 1/3 _____
Middle 1/3 _____ Final 1/3 _____
Beginning 1/3 _____% Middle 1/3 _____% Final 1/3 _____%

PLEASE NOTE: Any changes in this timetable require approval of the Civil Rights & Equal Opportunity Department in advance of the change.

If you have any questions regarding the completion of this form, please contact the Civil Rights & Equal Opportunity Department at: (816) 513-1836.

_____
(Signature)

_____
(Position with Firm)

_____
(Date)

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

REQUEST FOR MODIFICATION OR SUBSTITUTION

*(This Form **must** be submitted to CREO KC to request substitutions for an MBE/WBE listed in the Contractor Utilization Plan or for modification of the amount of MBE/WBE participation listed in the Contractor Utilization Plan. This Form shall be an amendment to the Contractor Utilization Plan.)*

BIDDER/PROPOSER/CONTRACTOR: _____
ADDRESS: _____
PROJECT NUMBER OR TITLE: _____
AMENDMENT/CHANGE ORDER NO: (if applicable) _____

Project Goals:	_____% MBE	_____% WBE
Contractor Utilization Plan:	_____% MBE	_____% WBE

1. I am the duly authorized representative of the above Bidder/Contractor/Proposer and am authorized to request this substitution or modification on behalf of the Bidder/Contractor/Proposer.

2. I hereby request that the Director of CREO KC recommend or approve: (check appropriate space(s))

   a. ☐ A substitution of the certified MBE/WBE firm _____,
   (Name of new firm)
   to perform _____,
   (Scope of work to be performed by new firm)
   for the MBE/WBE firm _____ which is currently
   (Name of old firm)
   listed on the Bidder's/Contractor's/Proposer's Contractor Utilization Plan to
   perform the following scope of work: _____.
   (Scope of work of old firm)

   b. ☐ A modification of the amount of MBE/WBE participation currently listed on the Bidder's/Contractor's/Proposer's Contractor Utilization Plan from

   _____% MBE_____% WBE *(Fill in % of MBE/WBE Participation currently listed on Contractor Utilization Plan)*

   TO

   _____% MBE _____% WBE *(Fill in New % of MBE/WBE Participation requested for Contractor Utilization Plan)*

   c. Attach 00450.01 Letter of Intent to Subcontract letter for each new MBE/WBE to be added.
   d. Attach a copy of the most recent 00485.01 or on-line M/WBE Monthly Utilization Report

3. Bidder/Contractor/Proposer states that a substitution or modification is necessary because: (check applicable reason(s))

☐ The MBE/WBE listed on the Contractor Utilization Plan is non-responsive or cannot perform.

☐ The MBE/WBE listed on the Contractor Utilization Plan has increased its previously quoted price without a corresponding change in the scope of work.

☐ The MBE/WBE listed on the Contractor Utilization Plan has committed a material default or breach of its contract.

☐ Requirements of the scope of work of the contract have changed and make subcontracting not feasible or not feasible at the levels required by the goals established for the contract.

☐ The MBE/WBE listed on the Contractor Utilization Plan is unacceptable to the City contracting department.

☐ Bidder/Contractor/Proposer has not attempted intentionally to evade the requirements of the Act and it is in the best interests of the City to allow a modification or substitution.

4. The following is a narrative summary of the Bidder's/Contractor's/Proposer's good faith efforts exhausted in attempts to substitute the MBE/WBE firm named above which is currently listed on the Contractor Utilization Plan with other qualified, certified MBE/WBE firms for the listed scope of work or any other scope of work in the project:

5. Bidder/Proposer/Contractor will present documentation when requested by the City to evidence its good faith efforts.

Dated:_____

_____
(Bidder/Proposer/Contractor)

By: _____
(Authorized Representative)

CREO KC MONTHLY REPORTING INSTRUCTIONS

M/WBE Monthly Utilization Report Instructions

1. MBE/WBE Reporting applies to Contracts that have approved MBE/WBE goals assigned.
2. The City will utilize a web-based MBE/WBE Reporting System in the administration of this Contract. This web-based application database is a collaboration tool selected and provided by the City, which will allow Contractors and Consultants/Subcontractors and Subconsultants to enter data and report on compliance.

Prevailing Wage Certified Payroll Report Instructions

1. Prevailing Wage Certified Payroll Report applies to Contracts that include Prevailing Wage or Davis Bacon Provisions.
2. This web-based application database is provided by the City for reporting certified payrolls and other related prevailing wage data.
3. Computer Requirements: Minimum Intel Pentium® 4 Processor 2.4 GHz or equivalent processor with 512MB of RAM; recommended Centrino Duo® Processors 1.6 GHz or equivalent with 2GB of RAM, or higher.
    a. Computer Operation System: Windows XP, Windows Vista, or Windows 7
    b. Web Browser: Google Chrome
    c. Connection Speed/Minimum Bandwidth: DSL, ADSL or T1 Line for transferring a minimum of 3 Mbps Downstream and 512 Kbps Upstream
4. City will assist Contractor in providing training of personnel and Subcontractor's personnel.
5. Contractor and Subcontractors shall have the responsibility for visiting the web site and entering data in on timely basis, and as necessary to be in compliance with Prevailing Wage Requirements included in their contracts.

Workforce Monthly Report Instructions

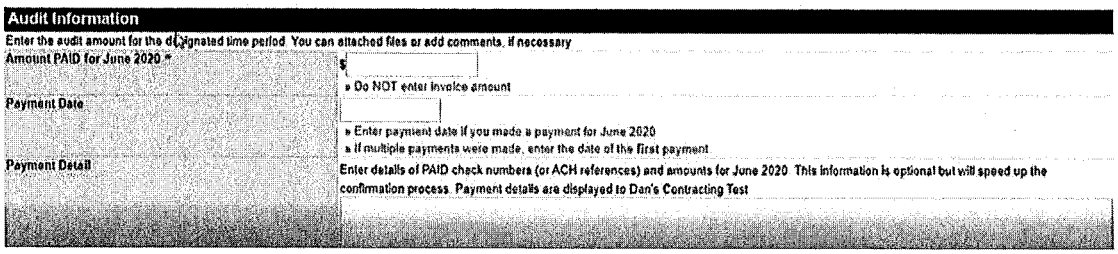
1. Workforce Monthly Reporting only applies to Construction Contracts greater than $300,000 and greater than 800 projected labor hours.
2. The City will utilize a web-based Reporting System in the administration of this Contract. This web-based application database is a collaboration tool selected and provided by the City, which will allow Contractors and Subcontractors to enter data and report on Workforce compliance.

M/WBE Monthly Compliance Audit Online Reporting Instructions

PRIME INSTRUCTIONS:

The Prime's responsibility is to report payments made to subcontractors for the prior month.

1. Log into B2GNow Diversity Management System (B2GNow)
2. On the Dashboard, click Contract Audits.
3. Select the specific audit that needs to be completed. Any and all money that changed hands during the month of the audit must be reported to the specific audit month.
4. To complete audit select Report 1 Subcontractor Payment. Under the actions column, select Submit Response for the specific subcontractor that needs reporting or select the Submit ALL Incomplete Records button to go to all the subcontractors to report amounts. Under the audit information answer the following questions:

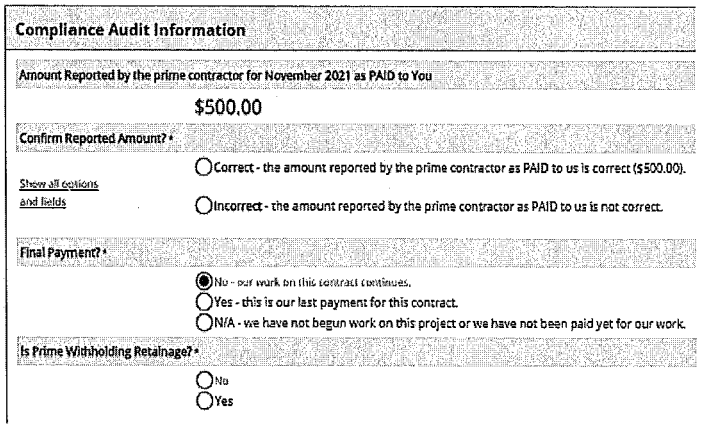


Once information has been entered, select review and save. Complete same steps for all subcontractors. If there were subcontractors that did not receive a payment for the specific audit month, click the Mark Remaining Subcontractors as Zero button to mark remaining subcontractors as 0.

SUBCONTRACTOR INSTRUCTIONS:

The responsibility of the Subcontractor is to confirm payment received for specific audit month.

1. Log in to B2GNow Diversity Management System (B2GNow)
2. On the Dashboard, select Contract Audits.
3. Select the specific audit that needs to be completed.
4. To complete audit, select Confirm Payment Received. There will be two options: correct or incorrect. Select correct if payment was in fact received OR if payment was not received or amount was different select incorrect. Answer all questions and select save to complete.



NOTE: Complete one M/WBE report per project.

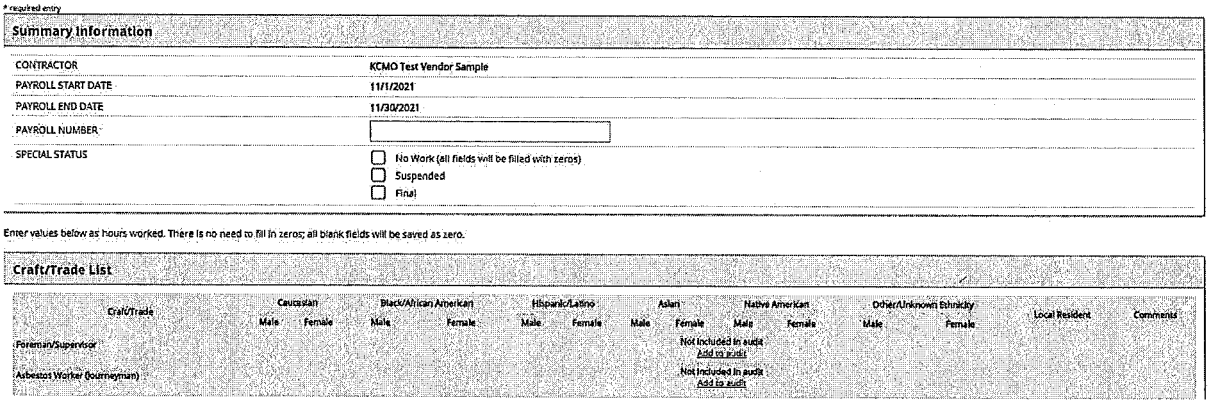
An email notice will be sent from our organization monthly to notify Prime & Subcontractor users of incomplete audits.

Workforce Monthly Report Forms only apply to Construction Contracts greater than $300,000.00 with greater than 800 projected labor hours.

Workforce Monthly Report Instructions

(Instructions for online reporting)

Completing a Workforce Audit:
To report your workforce hours:
1. Log into B2GNow Diversity Management System (B2GNow)
2. Click on the red underlined number of 'Incomplete audits' under Workforce Audits
3. Click View for the incomplete audit that needs to be completed.
4. Click Fill in Audit
5. Complete the form including the Payroll Number. Select Add to Audit to report hours worked for specific Craft/Trade.



* required entry

Summary Information

CONTRACTOR	KCMO Test Vendor Sample
PAYROLL START DATE	11/1/2021
PAYROLL END DATE	11/30/2021
PAYROLL NUMBER*	
SPECIAL STATUS	☐ No Work (all fields will be filled with zeros) ☐ Suspended ☐ Final

Enter values below as hours worked. There is no need to fill in zeros; all blank fields will be saved as zero.

Craft/Trade List

Craft/Trade	Caucasian		Black/African American		Hispanic/Latino		Asian		Native American		Other/Unknown Ethnicity		Local Resident	Comments
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female		
Foreman/Supervisor								Not included in audit Add to audit						
Asbestos Worker (Journeyman)								Not included in audit Add to audit						

6. Scroll down and select review once hours have been reported.
7. Save and Certify to submit OR Save but Certify Later (to save a draft of your audit response). Audit must be certified for the workforce audit to be submitted for review. If there is an audit where no work was performed, and have 0 hours to report, select the Mark as No Work Audit button on step 4 to report 0 hours for all your employees. Select Certify & Release to Organization to complete. Mark Final for Special Status if the audit being completed is the last month of work, this will notify the system to stop generating monthly audits.

NOTE: If subcontractor has completed Workforce Audit, Prime MUST either accept audit and release to the organization or reject audit back to Subcontractor for correction.

An email notice will be sent from our organization monthly to notify Prime & Subcontractor users of incomplete audits.

City of Kansas City, Missouri
Civil Rights & Equal Opportunity Department
Construction Contractor Employee Identification Report

Company Name: _____ **Prime's Name:** _____

Company Address: _____ **KCMO Project Name:** _____

Company City, State, Zip: _____ **KCMO Project Number:** _____

Name of Person Completing Report: _____ **Today's Date:** _____

Phone Number: _____

Email: _____ **City Department:** _____

Instructions:

1) Each applicable Prime Contractors **must complete this form for its company within 48 hours of bid opening**
2) The Civil Rights & Equal Opportunity Department strongly recommends usage of the electronic version of this form. This form may be obtained by visiting www.kcmo.gov website. The website is enabled with a "search" function on the Home page on the right corner. Select the magnifying glass and type in the search field "Contract Central". Select the first result, then click on the link to Standard City Contract Forms. Scroll down to Construction Contractor Employee Identification Report and click the link to open this document. Complete the fields in the Employee section; the Official Use Only section will automatically populate. NOTE: This form can be printed and attached to other required Bid documents.
3) All subcontractors shall be required to complete this form and submit to the Prime Contractor. For each subcontractor, the Prime must submit this form to City at least at least (10) days prior to the date the subcontractor shall commence work under a city construction contract.
4) Complete this form if you are the Prime contractor on a City construction project estimated over **$300,000 & over 800 man hours.**
5) Complete this form with data from your **current construction workforce** (no office personnel).
6) Prime contractor is responsible to ensure subcontractor completes this form as required in #3 above.

Official Use Only

Females		*KCMO Resident*
African American	0	0
Asian/Pacific Islander American	0	0
Caucasian American	0	0
Hispanic/Latino American	0	0
Native American	0	0
Other	0	0
	0	0

Males		*KCMO Resident*
African American	0	0
Asian/Pacific Islander American	0	0
Caucasian American	0	0
Hispanic/Latino American	0	0
Native American	0	0
Other	0	0
	0	0

Number of KCMO Residents	0
Number of Journeyman	0
Number of Apprentice	0

	Journeyman	*Apprentice*
Foreman/Supervisor	0	--
Asbestos Worker	0	0
Boilermaker	0	0
Bricklayer	0	0
Carpenter	0	0
Cement Mason	0	0
Electrician	0	0
Elevator Constructor	0	0
Glazier	0	0
Iron Worker	0	0
Laborer	0	0
	0	0

	Journeyman	*Apprentice*
Operating Engineer	0	0
Painter	0	0
Pipe Fitter/Plumber	0	0
Plasterer	0	0
Roofer	0	0
Sheet Metal	0	0
Sprinkler Fitter	0	0
Truck Driver	0	0
Welder	0	0
Other	0	--
	0	0

Company Name: 0 KCMO Project Name: 0 KCMO Project Number: 0

	Name		Job Title (*use drop down menu*)	Address	City	State	Zip Code	KCMO Resident	Gender	Ethnicity
	Last	First								
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										

Company Name: 0 KCMO Project Name: 0 KCMO Project Number: 0

	Name		Job Title (*use drop down menu*)	Address	City	State	Zip Code	KCMO Resident	Gender	Ethnicity
	Last	First								
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
41										
42										
43										
44										
45										
46										
47										
48										
49										
50										

Company Name: 0 KCMO Project Name: 0 KCMO Project Number: 0

	Name		Job Title (*use drop down menu*)	Address	City	State	Zip Code	KCMO Resident	Gender	Ethnicity
	Last	First								
51										
52										
53										
54										
55										
56										
57										
58										
59										
60										
61										
62										
63										
64										
65										
66										
68										
69										
70										
71										
72										
73										
74										
75										
76										
77										
78										
79										
80										
81										
82										
83										

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

Pre Contract Bidder's Certification

Project Number _____

Project Title _____

STATE OF)
) SS
COUNTY OF)

Before me, the undersigned authority, personally appeared, who, being by me duly sworn deposed as follows:

I am authorized to make this affidavit on behalf of the named Bidder. I am of sound mind, capable of making this affidavit, and personally acquainted with the facts herein stated:

A. Bidder is current on payment of its Federal and State Income tax withholding and unemployment insurance payments, either in Missouri for companies doing business in Missouri, or in the state in which Bidder has its principal office; and

B. Bidder declares one of the following, regarding all work performed two (2) years immediately preceding the date of the Bid (check one):

☐ Contract by contract listing of all of Bidder's written notices of violations of any Federal or State prevailing wage statute in which prevailing wage penalties were assessed against the Bidder or paid by the Bidder (Complete and attach additional sheets if necessary):

1. _____
2. _____
3. _____

☐ There have been no written notices of violations of any Federal or State prevailing wage statute in which prevailing wage penalties were assessed against the Bidder or paid by the Bidder.

C. Bidder is currently in good standing with the Missouri Secretary of State or Bidder has filed a Registration of Fictitious Name with the Missouri Secretary of State.

_____
(Bidder's Name) (Date)

Signature of Person Making This Affidavit

In witness whereof, I have hereunto subscribed my name and affixed my official seal this ___day of , 20__.

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

PERFORMANCE AND MAINTENANCE BOND

Project Number _____

Project Title _____

KNOW ALL MEN BY THESE PRESENTS: That _____, as PRINCIPAL (CONTRACTOR), and _____, (SURETY), licensed to do business as such in the State of Missouri, hereby bind themselves and their respective heirs, executors, administrators, successors, and assigns unto Kansas City, Missouri, a constitutionally chartered municipal corporation, (OWNER), as obligee, in the penal sum of _____ Dollars ($ _____) for the payment whereof CONTRACTOR and SURETY bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS,

CONTRACTOR has entered into a Contract with OWNER for_____ which Contract, including any present or future amendment thereto, is incorporated herein by reference and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if CONTRACTOR shall promptly and faithfully perform said Contract including all duly authorized changes thereto, and including any maintenance requirements contained therein, according to all the terms thereof, including those under which CONTRACTOR agrees to pay legally required wage rates including the prevailing hourly rate of wages in the locality, as determined by the Department of Labor and Industrial Relations or by final judicial determination, for each craft or type of workman required to execute the Contract and, further, shall defend, indemnify, and hold harmless OWNER from all damages, including but not limited to, liquidated damages, loss and expense occasioned by any failure whatsoever of said CONTRACTOR and SURETY to fully comply with and carry out each and every requirement of the Contract, then this obligation shall be void; otherwise, it shall remain in full force and effect.

WAIVER. That SURETY, for value received, hereby expressly agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the Work to be performed thereunder, shall in any way affect the obligations of this Bond; and it does hereby waive notice of any such change, extension of time, or alteration or addition to the terms of the Contract or the Work to be performed thereunder.

IN WITNESS WHEREOF, the above parties have executed this instrument the ____ day of _____, 20__.

CONTRACTOR
Name, address and facsimile number of Contractor

_____
_____
_____
_____

I hereby certify that I have authority to execute
this document on behalf of Contractor.

By: _____
Title:_____

(Attach corporate seal if applicable)

SURETY
Name, address and facsimile number of Surety:

_____
_____
_____
_____

I hereby certify that (1) I have authority to execute this document on behalf of Surety; (2) Surety has an A.M. Best rating of A-, V, or better; (3) Surety is named in the current list of "Companies Holding Certificates of Authority as Acceptable Reinsuring Companies: as published in Circular 570 (most current revision) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury; and (4) Surety is duly licensed to issue bonds in the State of Missouri and in the jurisdiction in which the Project is located.

By:_____
Title:_____
Date:_____

(Attach seal and Power of Attorney)

CITY OF FOUNTAINS
HEART OF THE NATION



KANSAS CITY
MISSOURI

PAYMENT BOND

Project Number _____

Project Title _____

KNOW ALL MEN BY THESE PRESENTS: That _____, as PRINCIPAL (CONTRACTOR), and_____, (SURETY), licensed to do business as such in the State of Missouri, hereby bind themselves and their respective heirs, executors, administrators, successors, and assigns unto Kansas City, Missouri, a constitutionally chartered municipal corporation, (OWNER), as obligee, in the penal sum of _____ Dollars ($_____) for the payment whereof CONTRACTOR and SURETY bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS,

CONTRACTOR has entered into a contract with OWNER for_____, which Contract, including any present or future amendment thereto, is incorporated herein by reference and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if in connection with the Contract, including all duly authorized modifications thereto, prompt payment shall be made to all laborers, subcontractors, teamsters, truck drivers, owners or other suppliers or for equipment employed on the job, and other claimants, for all labor performed in such work whether done for CONTRACTOR, a subcontractor, SURETY, a completion contractor or otherwise (at the full wage rates required by any law of the United States or of the State of Missouri, where applicable), for services furnished and consumed, for repairs on machinery, for equipment, tools, materials, lubricants, oil, gasoline, water, gas, power, light, heat, oil, telephone service, grain, hay, feed, coal, coke, groceries and foodstuffs, either consumed, rented, used or reasonably required for use in connection with the construction of the work or in the performance of the Contract and all insurance premiums, both for compensation and for all other kinds of insurance on the work, for sales taxes and for royalties in connection with, or incidental to, the completion of the Contract, in all instances whether the claim be directly against CONTRACTOR, against SURETY or its completion contractor, through a subcontractor or otherwise, and, further, if CONTRACTOR shall defend, indemnify and hold harmless OWNER from all such claims, demands or suits by any such person or entity, then this obligation shall be void; otherwise, it shall remain in full force and effect.

Any conditions legally required to be included in a Payment Bond on this Contract, including but not limited to those set out in §107.170 RSMo.are included herein by reference.

SURETY agrees that, in the event that CONTRACTOR fails to make payment of the obligations covered by this Bond, it will do so and, further, that within forty-five (45) days of receiving, at the address given below, a claim hereunder stating the amount claimed and the basis for the claim in reasonable detail, it (a) will send an answer to the claimant, with a copy to OWNER stating the amounts that are undisputed and the basis for challenging any amounts that are disputed, and (b) will pay any amounts that are undisputed. The amount of this Bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder.

While this Bond is in force, it may be sued on at the instance of any party to whom any such payment is due, in the name of OWNER to the use for such party. OWNER shall not be liable for the payment of any costs or expenses of any such suit.

No suit shall be commenced or pursued hereunder other than in a state court of competent jurisdiction in Jackson, Clay or Platte County, Missouri, or in the United States District Court for the Western District of Missouri.

WAIVER. That SURETY, for value received, hereby expressly agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the Work to be performed thereunder, shall in any way affect the obligations of this Bond; and it does hereby waive notice of any such change, extension of time, or alteration or addition to the terms of the Contract or the Work to be performed thereunder.

IN WITNESS WHEREOF, the above parties have executed this instrument the _____ day of_____ _____, 20____.

CONTRACTOR
Name, address and facsimile number of Contractor

_____
_____
_____
_____

I hereby certify that I have authority to execute this document on behalf of Contractor.

By: _____
Title:_____

(Attach corporate seal if applicable)

SURETY
Name, address and facsimile number of Surety:

_____
_____
_____
_____

I hereby certify that (1) I have authority to execute this document on behalf of Surety; (2) Surety has an A.M. Best rating of A-. or better; (3) Surety is named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (most current revision) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury; and(4) Surety is duly licensed to issue bonds in the State of Missouri and in the jurisdiction in which the Project is located.

By:_____
Title:_____
Date:_____

(Attach seal and Power of Attorney)

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

CONTRACTOR AFFIDAVIT FOR FINAL PAYMENT

Project Number 81000999

Project Title Blue River WWTP Grit Removal and Fine Screens Project

STATE OF _____)
)SS
COUNTY OF _____)

The Undersigned, _____ of lawful
(Name)
age, being first duly sworn, states under oath as follows:

1. I am the _____ of _____ who is the general
(Title) (CONTRACTOR)
CONTRACTOR for the CITY on Project No. _____ and Project Title _____.

2. All payrolls, material bills, use of equipment and other indebtedness connected with the Work for this Project have been paid and all Claims of whatever nature have been satisfied, as required by the Contract.

3 (✓) ____Prevailing wage does not apply; or

(✓) ____All provisions and requirements set forth in Chapter 290, Section 290.210 through and including 290.340, Missouri Revised Statutes, pertaining to the payment of wages to workmen employed on public works projects have been fully satisfied and there has been no exception to the full and complete compliance with these provisions and requirements and the Annual Wage Order contained in the Contract in carrying out the Contract and Work. CONTRACTOR has fully complied with the requirements of the prevailing wage law as required in the Contract and has attached affidavits from all Subcontractors on this Project, regardless of tier, affirming compliance with the prevailing wage law as stipulated in the Contract.

4. I hereby certify that (a) at project completion and pursuant to contractor's final request for payment, contractor achieved (_____%) Minority Business Enterprise (MBE) participation and (_____%) Women Business Enterprise (WBE) participation on this contract, and (b) listed herein are the names of all certified M/WBE subcontractors, regardless of tier, with whom I, or my subcontractors contracted.

1. Name of MBE/WBE Firm _____
Address _____
_____
Telephone Number (_____) _____
IRS Number _____
Area/Scope*of Work _____
Subcontract Final Amount _____

2. Name of MBE/WBE Firm _____
Address _____
_____
Telephone Number (_____) _____
IRS Number _____
Area/Scope*of Work _____
Subcontract Final Amount _____

List additional subcontractors, if any, on a similar form and attach to the bid.

Supplier** Final Amount: _____

*Reference to specification sections or bid item number.

(✓) ____ Met or exceeded the Contract utilization goals; or
(✓) ____ Failed to meet the Contract utilization goals (attach waiver, substitution or modification); or
(✓) ____ No goals applied to this Project.

5. CONTRACTOR certifies that each Subcontractor has received full payment for its respective work in connection with the Contract.

6. If applicable, I hereby certify that (a) at project completion and pursuant to contractor's final request for payment, contractor achieved, company-wide, at least ten percent (10%) minority workforce participation and two percent (2%) women workforce participation and (2) a true and accurate copy of my final project workforce monthly report (HRD Form 00485.02 and final company-wide workforce monthly report (HRD Form 00485.03) are attached. **NOTE: This paragraph is only applicable if you completed a construction contract that was estimated by the City, prior to solicitation, as requiring more than 800 construction labor hours and costing in excess of $324,000.01. If applicable you MUST attach copies of your final monthly workforce reports.**

7. This affidavit is made in behalf of the CONTRACTOR for the purpose of securing from Kansas City, Missouri, the certification of completion of the Project and receiving payment therefore.

8. If the Contract amount exceeded $150,000, CONTRACTOR has submitted proof of compliance with the City tax ordinances administered by the City's Commissioner of Revenue and has on file proof of tax compliance from all Subcontractors. If the Contract term exceeded one (1) year, CONTRACTOR has provided proof of compliance with the City tax ordinances administered by the City's Commissioner of Revenue prior to receiving final payment and has on file proof of tax compliance from all Subcontractors prior to the Subcontractor receiving final payment from CONTRACTOR.

CONTRACTOR_____

By _____
(Authorized Signature)

Title _____

On this _____ day of _____, _____, before me

appeared _____, to me personally known to be the

_____of the_____,

and who executed the foregoing instrument and acknowledged that (s)he executed the same on behalf of

_____ as its free act and deed.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal on the day and year first above written.

My commission expires:

_____ _____
Notary Public

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

SUBCONTRACTOR AFFIDAVIT FOR FINAL PAYMENT

Project Number 81000999

Project Title Blue River WWTP Grit Removal and Fine Screens Project

STATE OF MISSOURI)
) ss:
COUNTY OF _____)

After being duly sworn the person whose name and signature appears below hereby states under penalty of perjury that:

1. I am the duly authorized officer of the business indicated below (hereinafter Subcontractor) and I make this affidavit on behalf of Subcontractor in accordance with the requirements set forth in Section 290.290, RSMo. Subcontractor has completed all of the Work required under the terms and conditions of a subcontract as follows:

Subcontract with: _____, Contractor

Work Performed: _____

Total Dollar Amount of Subcontract and all Change Orders: $_____

City Certified ☐MBE ☐ WBE ☐ DBE ☐ NA
List certifications: _____

2. Subcontractor fully complied with the provisions and requirements of the Missouri Prevailing Wage Law set forth in Sections 290.210, RSMo through 290.340, RSMo.

Business Entity Type:
(___) Missouri Corporation
(___) Foreign Corporation
(___) Fictitious Name Corporation
(___) Sole Proprietor
(___) Limited Liability Company
(___) Partnership
(___) Joint Venture
(___) Other (Specify)

Subcontractor's Legal Name and Address

_____

_____

Phone No. _____
Fax: _____
E:mail: _____
Federal ID No. _____

I hereby certify that I have the authority to execute this affidavit on behalf of Subcontractor.

By: _____ _____
(Signature) (Print Name)

_____ _____
(Title) (Date)

NOTARY

Subscribed and sworn to before me this _____ day of _____, 20_____.

My Commission Expires: _____ By _____

_____ _____
Print Name Title

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

AFFIDAVIT OF TRAINING PROGRAM

This form must be submitted with 48 hours of Bid Opening

Bidder _____

Project Title and Number _____

STATE OF MISSOURI)
) ss:
COUNTY OF _____)

After being duly sworn the person whose name and signature appears below hereby states under penalty of perjury that:

1. I am the duly authorized officer of the business indicated above ("Bidder") and I make this affidavit on behalf of Bidder.
2. Bidder certifies that it presently participates in a training program that facilitates entry into the construction industry and which may include an on-the-job or in-house training program, further described as follows:

(attach additional pages, if necessary)

3. If requested by the City, Bidder agrees to provide City further documentation of, or other information about, this training program within 48 hours of the request.
4. Bidder acknowledges that failure to submit this form to the City within 48 hours of the Bid Opening will automatically render its bid non-responsive.

I am authorized to make this Affidavit on behalf of the Bidder named below as:

_____ of _____
(Title) (Name of Bidder)

Dated: _____ By: _____
(Affiant)

Subscribed and sworn to before me this _____ day of _____, 20____.

My Commission Expires: _____ _____
Notary Public