



MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY
WATER RESOURCES DIVISION
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
*Authorized by Part 31, Water Resources Protection, of the
Natural Resources and Environmental Protection Act, 1994 PA 451, as Amended*

CERTIFICATE OF COVERAGE (COC)

**Under General Permit No. MIG080000
Groundwater Cleanup Wastewater General Permit**

COC NO.: MIG081302
DESIGNATED NAME: Kalamazoo DPS - Burdick St Water Main GWCU
PERMITTEE: City of Kalamazoo
ADDRESS: 415 East Stockbridge Avenue
Kalamazoo, MI 49001

This COC authorizes the permittee to discharge treated construction dewatering water from the Kalamazoo DPS – Burdick Street Water Main facility located at 415 East Stockbridge Avenue, Kalamazoo, Michigan 49001, in Kalamazoo County. Consistent with the criteria and requirements established in General Permit No. MIG080000, the permittee is authorized to discharge the following:

2.16 MGD of treated construction dewatering water from Monitoring Point 001A through a storm sewer and Outfall 001. Outfall 001 discharges to Axtell Creek at Latitude 42.281099, Longitude -85.58019.

Sections of the General Permit applicable to this facility include: the cover pages, Part I.A.1., Part I.A.5., and Part I.A.17. through Part II. inclusive.

References in the General Permit to the Department shall be defined as the Kalamazoo District Supervisor of the Water Resources Division. The Kalamazoo District Office is located at 7953 Adobe Road, Kalamazoo, MI 49009-5025; Telephone: 269-567-3500; Fax: 269-567-9440.

Any person who is aggrieved by this COC may file a sworn petition with the Michigan Administrative Hearing System within the Department of Licensing and Regulatory Affairs, c/o the Michigan Department of Environment, Great Lakes, and Energy setting forth the conditions of the COC that are being challenged and specifying the grounds for the challenge. The Michigan Administrative Hearing System may reject any petition filed more than 60 days after issuance as being untimely.

The issuance of this COC does not authorize violation of any federal, state, or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other Department of Environment, Great Lakes, and Energy permits, or approvals from other units of government as may be required by law.

This COC is based on an application received on June 20, 2025, and completed on August 6, 2025. The permittee is subject to the conditions specified in General Permit No. MIG080000, issued October 30, 2024, expiring April 1, 2030. This COC may be modified, terminated, reissued, or revoked as allowed for in General Permit No. MIG080000.

This COC and the authorization to discharge shall expire at midnight on **April 1, 2030**. In order to receive authorization to discharge beyond the date of expiration, the permittee shall submit an application that contains such information, forms, and fees as are required by the Department by **October 1, 2029**.

This COC takes effect on October 1, 2025.

Issued September 30, 2025.

Original signed by Tarek Buckmaster
Tarek Buckmaster, Supervisor
Industrial Permits Unit
Permits Section
Water Resources Division

NPDES APPLICATION PACKAGE

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Attachments

24G0124 HoltGeneralFormat FINAL 08 13 24 1125	(9 pages)
Copy of A21804 report QC COC CN	(14 pages)
Treatment_Process_Layout_Example	(1 page)
093008.01_08012025_Project Narrative	(27 pages)
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National Pollutant Discharge Elimination System (NPDES) Industrial/Commercial Application Form

version 3.7

(Submission #: HQA-W1G7-7TQCV, version 3)

Details

Submission ID HQA-W1G7-7TQCV

Status Complete

Fees

Fee \$75.00

Payments/Adjustments (\$75.00)

Balance Due \$0.00 (Paid)

NOTE (CREATED)

Correction Request: 7-18-2025

Thank you for your application. Please provide clarification and/or corrections to the noted items. Please provide this information by August 1, 2025, if possible. Further processing of your application will be placed on hold until we receive the information and your application is considered complete. Please let me know if you have questions concerning this Correction Request or about how to revise the submission in MiEnviro.

Created on 7/11/2025 4:18 PM by **Hannah Schroeder-Larkins**

Form Input

Applicant Information

Applicant Information

Enter name of legal entity:

Organization Name

City of Kalamazoo

Phone Type	Number	Extension
-------------------	---------------	------------------

Mobile	269-337-8000	
--------	--------------	--

Email

jungd@kalamazoocity.org

Fax

NONE PROVIDED

Enter address of legal entity:

415 E Stockbridge Ave

Kalamazoo, MI 49001

United States

Facility Information

Facility/Site Name (Read Only)

Kalamazoo DPS - Burdick St Water Main GWCU

Facility Name 1 - Company Name

City of Kalamazoo

Facility Name 2 - Division Name

Department of Public Services - Water Resources Division

Facility Name 3 - Plant Name

Burdick St Water Main

Which of the following best describes this facility?

Local Government/District

Facility Location

42.27793800000000,-85.57789800000001

415 East Stockbridge Avenue, Kalamazoo, MI

Site/Facility Location Address

415 East Stockbridge Avenue

Kalamazoo, MI 49001

NAICS (North American Industry Classification System) code:

237110

SIC (Standard Industrial Classification) code:

1623

Is this facility a primary industry? Refer to Table 1 of the Appendix to make this determination.

No, this facility is not a primary industry.

Enter the name of the Local Unit of Government (LUG) in which the facility is located:

Kalamazoo

Provide an e-mail address for an appropriate LUG contact, such as a clerk, who can be notified about the public notice period:

cokcityclerk@kalamazoocity.org

CORRECTION REQUEST (APPROVED)

LUG Contact

The clerk for the City of Kalamazoo is Scott Borling. Please update the email address to cokcityclerk@kalamazoocity.org.
Created on 7/14/2025 11:20 AM by **Hannah Schroeder-Larkins**

Does the facility have an EGLE-certified operator at the appropriate level?

YES

Contacts (1 of 3)

Additional Instructions for completing this portion of the application are provided in the Appendix.

[Appendix to the Permit Application](#)

CONTACTS

At a minimum the following contact types are required:

- Annual Permit Billing Contact
- Application Contact
- Facility Contact
- DMR Contact
- Certified Operator

- If a single person has multiple roles, please enter that person's information once and assign them multiple roles.
- To add additional contacts, use the "Add New" button at the bottom of this page, or select "Duplicate" to copy the contact information and edit a portion of the contact fields.

Contact

DMR Contact
Application Contact

Required Contact Types:

At minimum the following contact types must be provided:

Annual Permit Billing Contact; Application Contact; Facility Contact; DMR Contact; Certified Operator

Contact Information

Prefix

NONE PROVIDED

First Name Last Name

Jeffrey Lanier

Title

Project Director

Organization Name

SME

Phone Type Number Extension

Mobile 5864053521

Email

Jeff.Lanier@sme-usa.com

Fax

NONE PROVIDED

Address

15825 Leone Drive
Macomb, MI 48042
United States

Contacts (2 of 3)

Additional Instructions for completing this portion of the application are provided in the Appendix.

[Appendix to the Permit Application](#)

CONTACTS

At a minimum the following contact types are required:

Annual Permit Billing Contact
Application Contact
Facility Contact
DMR Contact
Certified Operator

- If a single person has multiple roles, please enter that person's information once and assign them multiple roles.
- To add additional contacts, use the "Add New" button at the bottom of this page, or select "Duplicate" to copy the contact information and edit a portion of the contact fields.

Contact

- Annual Permit Billing Contact
- Facility Contact
- Application Contact
- DMR Contact
- Off-Season Contact
- Certified Operator
- Storm Water Operator

Required Contact Types:

At minimum the following contact types must be provided:

Annual Permit Billing Contact; Application Contact; Facility Contact; DMR Contact; Certified Operator

Contact Information

Prefix

NONE PROVIDED

First Name Last Name

Eric Sajtar

Title

Civil Engineer

Organization Name

City of Kalamazoo

Phone Type Number Extension

Business 269-337-8533

Email

sajtare@kalamazocity.org

Fax

NONE PROVIDED

Address

415 East Stockbridge Avenue
Kalamazoo, MI 49001
United States

Certification Number(s)

C-14989, I-10281, W 6491

Certification Classification(s)

A-1j, A-1i, A-2b, A-2d, B-3b

Contacts (3 of 3)

Additional Instructions for completing this portion of the application are provided in the Appendix.

[Appendix to the Permit Application](#)

CONTACTS

At a minimum the following contact types are required:

- Annual Permit Billing Contact
- Application Contact
- Facility Contact
- DMR Contact
- Certified Operator

- If a single person has multiple roles, please enter that person’s information once and assign them multiple roles.
- To add additional contacts, use the “Add New” button at the bottom of this page, or select “Duplicate” to copy the contact informa and edit a portion of the contact fields.

Contact

Application Contact
Other: Project Engineer

Required Contact Types:

At minimum the following contact types must be provided:

Annual Permit Billing Contact; Application Contact; Facility Contact; DMR Contact; Certified Operator

Contact Information

Prefix

NONE PROVIDED

First Name Last Name

Alex Phelan

Title

Project Manager

Organization Name

Hurley and Stewart

Phone Type Number Extension

Mobile 269-757-6259

Email

aphelan@hurleystewart.com

Fax

NONE PROVIDED

Address

2800 South 11th Street
Kalamazoo, MI 49009
United States

Antidegradation

Will this discharge represent an increased loading of pollutants to the surface waters of the state?

YES

Is the increased loading of pollutants exempt from Antidegradation Demonstration?

YES -- Select the exemption(s) that applies from the Exemptions List below

Reasons for exemption from antidegradation demonstration (Select all that apply):

- A) A short-term (weeks to months) or temporary lowering of water quality
- H) Discharges authorized by Certificates of Coverage (COC) and Notices of Coverage

CORRECTION REQUEST (APPROVED)

Antidegradation

As the discharge can be authorized under a Certificate of Coverage, please also indicate Item H Discharges authorized by a Certificate of Coverage or Notice of Coverage as an exemption.

Created on 7/14/2025 11:21 AM by **Hannah Schroeder-Larkins**

Additional Information

Other Environmental Permits

Provide the information requested in the table for any other federal, state, or local environmental permits in effect or applied for at the time of submittal of this Application, including, but not limited to, permits issued under any of the following programs: Air Pollution Control, Hazardous Waste Management, Wetlands Protection, Soil Erosion and Sedimentation Control, and other NPDES permits.

Other Environmental Permits (Hit 'Add Row' for each environmental permit)

Issuing Agency:	Permit or COC Number:	Permit type:
NONE PROVIDED	NONE PROVIDED	NONE PROVIDED

WATER FLOW DIAGRAM

[Figure No. 1_Discharge Points_093008.01_AUG012025.pdf - 08/01/2025 04:46 PM](#)

[Treatment_Process_Layout_Example.pdf - 08/01/2025 04:47 PM](#)

Comment

NONE PROVIDED

CORRECTION REQUEST (APPROVED)

Water Flow Diagram

Please provide a flow diagram showing the wastewater flow through the facility (from intake through discharge), including all processes and treatment units used for wastewater treatment or storage.

Created on 7/14/2025 11:27 AM by **Hannah Schroeder-Larkins**

1 COMMENT

JoBeth Peterson (jobeth.peterson@sme-usa.com) (8/1/2025 4:48 PM)

The attached treatment process is similar to what we expect for the project, but the final design will be complete once the dewatering contractor is confirmed.

◆ **Surface waters of the state** ◆ means all the following: The Great Lakes and their connecting waters, all inland lakes, rivers, streams, impoundments, open drains, wetlands, and other surface bodies of water within the confines of the state but does not include drainage ways and ponds used solely for wastewater conveyance, treatment, or control. A storm sewer is not a surface water of the state.

NARRATIVE

[093008.01_08012025_Project_Narrative.pdf - 08/01/2025 05:42 PM](#)

[Treatment_Process_Layout_Example.pdf - 08/01/2025 05:43 PM](#)

Comment

NONE PROVIDED

CORRECTION REQUEST (APPROVED)

Narrative

Based on the information provided, GAC treatment will be required prior to discharge. Please provide additional information on the GAC treatment system. Additionally, please provide a brief history on the contamination in the area.

Created on 7/14/2025 11:29 AM by **Hannah Schroeder-Larkins**

1 COMMENT

JoBeth Peterson (jobeth.peterson@sme-usa.com) (8/1/2025 5:45 PM)

The attached treatment process is similar to what we expect for the project, but the final design will be complete once the dewatering contractor is confirmed. The source of the contamination is unknown.

MAP OF FACILITY AND DISCHARGE LOCATION

[Figure No. 1_Discharge Points_093008.01_AUG012025.pdf - 08/01/2025 04:49 PM](#)

Comment

NONE PROVIDED

CORRECTION REQUEST (APPROVED)

Discharge Points

Based on the map provided, it appears that there are 6 discharge points along the storm sewer where construction dewatering wastewater will be discharged. Can you confirm that this is correct? Additionally, please provide additional information on the receiving water, Axtell Creek. Is this a natural waterbody or a county drain?

Created on 7/18/2025 2:39 PM by **Hannah Schroeder-Larkins**

2 COMMENTS

JoBeth Peterson (jobeth.peterson@sme-usa.com) (8/1/2025 5:01 PM)

Axtell Creek is a natural waterbody, not a county drain. It discharges into Portage Creek.

JoBeth Peterson (jobeth.peterson@sme-usa.com) (8/1/2025 5:01 PM)

There are 9 potential discharge points. The plan is to use one catch basin at a time as the constructions moves along Burdick St.

Laboratory Services (1 of 1)

Laboratory: Metiri

To add additional laboratories, please use the [Add New Section](#) button at the bottom of this page, or select [Duplicate Section](#) to copy the laboratory information and edit a portion of the fields.

Laboratory Name

Metiri

Lab Type

Contract Laboratory

Laboratory Street Address

1914 Holloway Dr
Holt, MI 48842

Laboratory Phone

517-699-0345

Laboratory Email

NONE PROVIDED

Analyses Performed

VOCs, PNAs, PCBs, Metals, PFOS, PFOA, Ammonia, SGT-HEM, CN, CBOD, TSS, pH

Water Source and Discharge Type

1. WATER SUPPLY INFORMATION

Identify all water sources entering the facility and treatment systems, and provide average flows. The volume may be estimated from water supply meter readings, pump capacities, etc. Provide the name of the source where appropriate (e.g., Grand River, Lake Michigan, City of Millpond, etc.).

Water Supply Type	Name and Location of Source	Average Volume or Flow Rate	Units
Other: Dewatering Wells	Water Main construction at South Burdick Street near the intersection of East Crosstown Parkway	1500	Other: GPM

2. WATER DISCHARGE INFORMATION

Select all wastewater types discharged from this facility.

Other: Dewatering for construction

Groundwater Cleanup

CORRECTION REQUEST (APPROVED)

Water Discharge Information

Please also select "groundwater cleanup wastewater" as this will generate an additional set of questions that will need to be answered.

Created on 7/14/2025 11:33 AM by **Hannah Schroeder-Larkins**

Identify water discharged by the facility and treatment systems, and provide average flows. If water is first used for one purpose and then is subsequently used for another purpose, indicate the type and amount of the last use. For example, if the water is initially used for noncontact cooling water and then for process water, indicate the amount of process water. The amount of water from sources should approximate the amount of water usage. If the amounts are different,

provide an explanation.

Discharge Type	Average Flow Rate	Units
Other: Dewatering	1500	Other: GPM

Briefly explain why the combined water from all sources does not equal the total approximate water usage, if applicable.

NONE PROVIDED

3. PRELIMINARY COOLING WATER QUESTIONS

Does the facility use water for cooling purposes?

NO

4. WHOLE EFFLUENT TOXICITY (WET) TESTS.

Have any acute or chronic WET tests been conducted on any discharge(s) or receiving water(s) in relation to this facility's discharge within the last three (3) years? This includes WET tests conducted for water treatment additive approval.

NO

Is the groundwater contaminated with petroleum compounds characterized by benzene, ethylbenzene, toluene, and xylenes (BTEX)?

YES

CORRECTION REQUEST (APPROVED)

Groundwater Cleanup Questions

Please answer "yes" to this question, as there is known petroleum contamination in the groundwater at sites in the area surrounding the dewatering project.

Created on 8/6/2025 3:20 PM by **Hannah Schroeder-Larkins**

Is the groundwater contaminated with kerosene and/or diesel fuel?

NO

What type of groundwater treatment method is this facility using? If more than one treatment method is being used, identify the FINAL treatment method in the sequence:

Multi-Stage Activated Carbon

Is in-situ bioremediation with nutrient addition being used in conjunction with the selected treatment method?

NO

Is chlorine used in the operation and maintenance of the treatment system and subsequently discharged?

NO

Analytical Data Required for Certain Wastewater Types

Attach Required Analytical Results or Estimates for Groundwater Cleanup Discharges

[Copy of A21804 report QC COC CN.pdf - 08/01/2025 05:50 PM](#)

[24G0124 HoltGeneralFormat FINAL 08 13 24 1125.pdf - 08/01/2025 05:50 PM](#)

Comment

NONE PROVIDED

Outfall Information and Effluent Characteristics (1 of 1)

Outfall:001 Receiving water:Axtell Creek

1. OUTFALL INFORMATION

Enter the outfall number (e.g., 001):

001

Outfall Description

Storm Sewer

Enter the name of the receiving water:

Axtell Creek

Outfall

42.281547,-85.578535

2. TYPE OF WASTEWATER DISCHARGED THROUGH THIS OUTFALL**Type(s) of Wastewater Discharged (check all that apply to this outfall):**

Other (see Table 8 ♦ Other Common Types of Wastewater, in the Appendix)

Groundwater Cleanup

CORRECTION REQUEST (APPROVED)

Types of Wastewater Discharged

Please also select "groundwater cleanup wastewater".

Created on 7/14/2025 11:34 AM by **Hannah Schroeder-Larkins****3. FLOW**

DEFINITIONS: A facility is considered to have a SEASONAL discharge if wastewater is treated AND STORED throughout a portion of the year and then discharged over a specified period or periods of days, weeks, or months. Batch process discharges are not seasonal discharges. Any facility that does not discharge seasonally is considered to have a CONTINUOUS discharge. Batch discharges are a type of continuous discharge.

Is the discharge continuous or seasonal?

Continuous

What maximum daily flow rate are you requesting authorization to discharge from this outfall during the next five years? Enter a numeric value only based on the units Million Gallons Per Day. If the requested flow rate is less than 1,000 gallons per day, please enter a minimum of "0.001".

2.16

How often is there a discharge from this outfall (on average)?

Hours per day:	Days per year:
24	60

Does this outfall have batch discharges?

NO

4. PROCESS STREAMS CONTRIBUTING TO OUTFALL DISCHARGE

The information requested below is used to determine the applicable federal regulations for this facility. For each industrial process at the facility, provide the name, the SIC or the NAICS code, and a brief description of the process. As part of each description, identify a reasonable measure of the facility's actual long-term daily production and average number of production days per year. In many cases, this is the average daily or average annual production rate from the last five years. Some federal regulations require that certain industries report different information, depending on the type of process. The Summary of Information to Be Reported by Industry Type, pages 10-11 of the Appendix, includes an abbreviated list of industrial categories and their specific Application requirements. If the industrial process does not have specific Application requirements and recent long-term production rates are not an appropriate measure of future production, report the expected annual production rate for the next five (5) years, or for the life of the permit.

[Appendix to the Permit Application](#)**PROCESS STREAMS CONTRIBUTING TO OUTFALL DISCHARGE**

Name of the process contributing to the discharge	SIC or NAICS code:	Describe the process and provide measures of production:
Water Main Construction	1623	Dewatering to lower groundwater table for construction

5. EFFLUENT CHARACTERISTICS - CONVENTIONAL POLLUTANTS

Please confirm that you have read the statements above.

I CONFIRM

Effluent Characteristics - Conventional Pollutants

Conventional Pollutants	HOW ARE RESULTS PROVIDED?	Waiver Information	Provide Rationale Here to Support Waiver Request
Biochemical Oxygen Demand - five day (BOD5)	NONE	I request a waiver for this parameter based on the following rationale:	CBOD5 data is provided in lab report.
Chemical Oxygen Demand (COD)	NONE	I request a waiver for this parameter based on the following rationale:	CBOD5 data is provided. Source of water is groundwater from dewatering. No significant amount of organic material is anticipated.
Total Organic Carbon (TOC)	NONE	I request a waiver for this parameter based on the following rationale:	Source of water is groundwater from dewatering. No significant amount of organic material is anticipated.
Ammonia Nitrogen (as N)	LAB REPORT		
Total Suspended Solids	LAB REPORT		
Temperature, Summer	LAB REPORT		
Temperature, Winter	NONE	I request a waiver for this parameter based on the following rationale:	Water main work is anticipated in the spring/summer. Source of water is groundwater from dewatering.
pH	LAB REPORT		
Total Dissolved Solids	NONE	Waiver request not required.	
Total Phosphorus (as P)	NONE	Waiver request not required.	
Fecal Coliform Bacteria	NONE	Waiver request not required.	
Escherichia coli	NONE	Waiver request not required.	
Total Residual Chlorine	NONE	Waiver request not required.	
Dissolved Oxygen	NONE	Waiver request not required.	
Oil & Grease	NONE	Waiver request not required.	

CORRECTION REQUEST (APPROVED)

Conventional Pollutants

Results for Oil & Grease were not included in the attached lab report. Please either upload these results or request a waiver. Created on 7/14/2025 11:35 AM by **Hannah Schroeder-Larkins**

Please attach lab reports for conventional pollutants here.

[24G0124 HoltGeneralFormat FINAL 08 13 24 1125.pdf - 03/14/2025 12:37 PM](#)

[Copy of A21804 report QC COC CN.pdf - 03/14/2025 12:37 PM](#)

Comment

The attached lab reports are for one sample collected from a temporary well and the water was not treated prior to collection. Please refer to the project narrative for the location of collected sample.

6. EFFLUENT CHARACTERISTICS - TOXIC POLLUTANTS

Instructions: Carefully review each of the toxic pollutant groups below and respond as appropriate. For guidance concerning test procedures, see Part II.B.2. of your NPDES permit.

Tables 1 – 6, referenced below, are located in the [Appendix](#).

Do you have analytical results of this type to report?

NO

Do you have analytical results of this type to report?

NO

Do you have analytical results of this type to report?

NO

ADDITIONAL TOXIC AND OTHER POLLUTANT INFORMATION

All existing industries, regardless of discharge type, are required to provide the results of at least one analysis for any chemical listed in Table 4 known or believed to be present in the facility's effluent, and a measured or estimated effluent concentration for any chemical listed in Table 5 known or believed to be present in the facility's effluent. In addition, submit the results of any effluent analysis performed within the last three years for any chemical listed in Tables 4 and 5.

Do you have analytical results of this type to report?

NO

Water Treatment Additives

Water Treatment Additives (WTAs)

Approvals to use WTAs are authorized by the Michigan Department of Environment, Great Lakes, and Energy under separate correspondence. Issuance of a permit/COC does not authorize the use of water treatment additives. Written approval from the Department must be obtained prior to using water treatment additives at the facility.

Water treatment additives (WTAs) include any material that is added to water used at the facility or to wastewater generated by the facility to condition or treat the water. Examples of WTAs include biocides, flocculants, water conditioners, pH adjusting agents, etc.

Are any WTAs added to water used at the facility or to wastewater generated by the facility?

NO

PFAS

"Surface waters of the state" means all of the following: The Great Lakes and their connecting waters, all inland lakes, rivers, streams, impoundments, open drains, wetlands, and other surface bodies of water within the confines of the state but does not include drainage ways and ponds used solely for wastewater conveyance, treatment, or control.

1. Is this facility known to have PFOS and/or PFOA present in wastewater discharged to surface waters of the state?

YES

2. Is this facility a landfill for solid or hazardous waste with a discharge of leachate to a surface water of the state?

NO

3. Is this facility a metal finisher that discharges wastewater associated with this activity to a surface water of the state?

NO

4. Is the discharge from the remediation of a contaminated site to a surface water of the state?

YES

CORRECTION REQUEST (APPROVED)

PFAS Questions

Please also select "yes" to question 4, as this is a groundwater cleanup site.

Created on 7/14/2025 11:37 AM by **Hannah Schroeder-Larkins**

4a.-----Is the remediation site an active or closed solid waste landfill?

NO

4b.-----Were any of the following performed at the facility being remediated: Hexavalent chrome plating; chromate conversion coating; leather tanning; paper/cardboard/paperboard manufacturing; paint formulation/manufacturing; AFFF use, training, and/or storage; or chemical manufacturing?

NO

4c.-----Is the source of contamination currently unknown?

YES

5. Does the facility manufacture paper, corrugated paper, cardboard, paperboard, or packaging paper (coated or uncoated), and discharge wastewater associated with this activity to a surface water of the state?

NO

6. Does the facility conduct car washing as all or part of its operations and discharge car wash wastewater to a surface water of the state?

NO

7. Is this facility a commercial industrial laundry that discharges wastewater associated with this activity to a surface water of the state?

NO

8. Is this facility a chemical manufacturer with a discharge of wastewater associated with this activity to a surface water of the state?

NO

9. Has Aqueous Film-Forming Foam (AFFF) ever been used at the facility for training or testing, or to respond to a fire emergency? Has AFFF ever been stored at this facility? If yes to either, please select "YES."

NO

10. Does this facility manufacture, formulate, or mix paints/pigments and discharge wastewater from these operations to a surface water of the state?

NO

11. Does this facility have a discharge from a leather or hide tanning/finishing operation to a surface water of the state?

NO

12. Does this facility perform carpet and/or upholstery cleaning and discharge wastewater from these operations to a surface water of the state?

NO

13. Is the facility a carpet, rug, or textile manufacturer that discharges wastewater associated with this activity to a surface water of the state?

NO

14. Is this facility a centralized waste treater? Centralized Waste Treaters treat or recover metal-bearing, oily, and organic wastes, wastewater, or used material received from off site, and are regulated under 40 CFR Part 437.

NO

15. Does this facility apply a stain-, dirt-, water-, or fire-resistant coating and/or protectant, and discharge wastewater associated with this activity to a surface water of the state?

NO

One or more responses within this section require the submittal of PFAS sample results, and a space to attach these is provided below.

Consult the [General PFAS Sampling Guidance](#) and [Wastewater PFAS Sampling Guidance](#) available to ensure that appropriate sample collection, handling, and analytical methods are used. Consult the [PFAS Minimum Laboratory Analyte List](#) at the link below to identify the 28 analytes you are required to sample.

PFAS ANALYTICAL RESULTS

24G0124 HoltGeneralFormat FINAL 08 13 24 1125.pdf - 03/14/2025 12:41 PM

Comment

NONE PROVIDED

Storm Water

Please confirm that you have read all terms and their definitions above:

I Confirm

Is the storm water from this facility discharged to a surface water of the state, either directly or through another conveyance such as a municipal separate storm sewer system? **IMPORTANT: You may select "NO" here ONLY IF the storm water is discharged to a municipal combined storm sewer system, a municipal wastewater treatment system, or a privately-owned activated sludge treatment system.**

YES

The applicant must determine whether this facility is engaged in a regulated "industrial activity" as defined in 40 CFR 122.26(b)(14).

TO MAKE THIS DETERMINATION, carefully review the [Primary Activities & Standard Industrial Classification \(SIC\) Codes](#) document.

Please confirm that you have reviewed the document referenced above.

I Confirm

Is this facility engaged in a regulated industrial activity according to the document referenced above?

NO

Other Information

Under Michigan law, EGLE has 180 days from receipt of a complete application in which to completely process the application. That said, if you need your permit expedited, please indicate the desired permit effective date below and we will make every effort to accommodate your request. Keep in mind that the more quickly and accurately you respond to requests from EGLE for information needed to complete your application, including requests to correct or clarify your application, the more likely it is that EGLE will be able to accommodate your request to expedite your permit. My desired permit effective date is:

NONE PROVIDED

Comments (As needed)

NONE PROVIDED

Additional Documents (As needed)

NONE PROVIDED

Comment

NONE PROVIDED

Attachments

Date	Attachment Name	Context	User
8/1/2025 5:50 PM	24G0124 HoltGeneralFormat FINAL 08 13 24 1125.pdf	Attachment	JoBeth Peterson
8/1/2025 5:50 PM	Copy of A21804 report QC COC CN.pdf	Attachment	JoBeth Peterson
8/1/2025 5:43 PM	Treatment_Process_Layout_Example.pdf	Attachment	JoBeth Peterson
8/1/2025 5:42 PM	093008.01_08012025_Project_Narrative.pdf	Attachment	JoBeth Peterson
8/1/2025 4:49 PM	Figure No. 1_Discharge Points _093008.01_AUG012025.pdf	Attachment	JoBeth Peterson
8/1/2025 4:47 PM	Treatment_Process_Layout_Example.pdf	Attachment	JoBeth Peterson
8/1/2025 4:46 PM	Figure No. 1_Discharge Points _093008.01_AUG012025.pdf	Attachment	JoBeth Peterson
3/14/2025 12:41 PM	24G0124 HoltGeneralFormat FINAL 08 13 24 1125.pdf	Attachment	JoBeth Peterson
3/14/2025 12:37 PM	Copy of A21804 report QC COC CN.pdf	Attachment	JoBeth Peterson
3/14/2025 12:37 PM	24G0124 HoltGeneralFormat FINAL 08 13 24 1125.pdf	Attachment	JoBeth Peterson

Status History

	User	Processing Status
8/6/2025 3:44:42 PM	JoBeth Peterson	Draft
8/6/2025 3:45:57 PM	JoBeth Peterson	Submitting
8/6/2025 3:46:24 PM	JoBeth Peterson	Submitted
8/6/2025 3:46:32 PM	JoBeth Peterson	In Process
10/14/2025 7:37:09 AM	Hannah Schroeder-Larkins	Complete

Revisions

Revision	Revision Date	Revision By
Revision 1	3/5/2025 12:35 PM	JoBeth Peterson
Revision 2	7/22/2025 11:28 AM	JoBeth Peterson
Revision 3	8/6/2025 3:44 PM	JoBeth Peterson



Metiri Group - Holt
1914 Holloway Dr, Holt, MI 48842 - Phone (517) 699-0345 - www.metirigroup.com

August 13, 2024

Aaron Reed
Soil and Materials Engineers, Inc. - Kalamazoo
3301 Tech Circle Drive
Kalamazoo, MI 49008-5611

RE: City of Kalamazoo Dewatering
24G0124

Thank you for selecting Metiri Group - Holt as your analytical laboratory. The samples submitted have been analyzed in accordance with all method and NELAC standards, as applicable. Any exceptions to compliance are noted in the report.

Please note that TO-15 samples will be disposed of 7 calendar days after the reporting date. All other samples will be disposed of 30 days after the reporting date.

If you have any questions regarding these results, or if we may be of further assistance to you, please contact us at (517) 699-0345.

Sincerely,

A handwritten signature in black ink, appearing to read 'Jacob Sutherland'.

Jacob Sutherland
Project Manager
jacob.sutherland@metirigroup.com
517-273-4922

Table of Contents

Cover Letter	1
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Soil and Materials Engineers, Inc. - Kalamazoo
3301 Tech Circle Drive
Kalamazoo, MI 49008-5611

Project: City of Kalamazoo Dewatering
Project Number: 093008.00
Project Manager: Aaron Reed

Reported: 08/13/2024 11:25

Samples in this Report

Lab ID	Sample	Matrix	Date Sampled	Date Received
24G0124-01	B5	Water	07/22/2024 11:10	07/23/2024

Soil and Materials Engineers, Inc. - Kalamazoo
 3301 Tech Circle Drive
 Kalamazoo, MI 49008-5611

Project: City of Kalamazoo Dewatering
 Project Number: 093008.00
 Project Manager: Aaron Reed

Reported: 08/13/2024 11:25

Sample Results

Sample: B5
24G0124-01 (Water)

Analyte	Result/Qual	PQL	Units	Date Analyzed	DF	Method	Prep Batch
---------	-------------	-----	-------	---------------	----	--------	------------

Per- and Polyfluoroalkyl Substances

1	PFOA	1.9	0.80	ng/L	08/09/24	1	EPA 537M	BDH0028
2	PFOS	3.0	0.80	ng/L	08/09/24	1	EPA 537M	BDH0028
<i>Extracted Internal Standards (EIS): 13C8-PFOA</i>		<i>79%</i>	<i>40-130</i>		<i>08/09/24</i>	<i>1</i>	<i>EPA 537M</i>	
<i>Extracted Internal Standards (EIS): 13C8-PFOS</i>		<i>49%</i>	<i>40-130</i>		<i>08/09/24</i>	<i>1</i>	<i>EPA 537M</i>	

Soil and Materials Engineers, Inc. - Kalamazoo
 3301 Tech Circle Drive
 Kalamazoo, MI 49008-5611

Project: City of Kalamazoo Dewatering
 Project Number: 093008.00
 Project Manager: Aaron Reed

Reported: 08/13/2024 11:25

PREPARATION BATCH SUMMARY

EPA 537M

Laboratory: Metiri Group - Holt

Client:

Batch: BDH0028 Batch Matrix: Water Preparation: 537M

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT mL	FINAL VOL. mL
B5	24G0124-01RE1	08/01/24 11:16	260.0000	2
Blank	BDH0028-BLK1	08/09/24 09:02	250.0000	2
LCS	BDH0028-BS1	08/09/24 09:02	250.0000	2
LCS Dup	BDH0028-BSD1	08/09/24 09:02	250.0000	2

Soil and Materials Engineers, Inc. - Kalamazoo
 3301 Tech Circle Drive
 Kalamazoo, MI 49008-5611

Project: City of Kalamazoo Dewatering
 Project Number: 093008.00
 Project Manager: Aaron Reed

Reported: 08/13/2024 11:25

Quality Control

Per- and Polyfluoroalkyl Substances

Analyte	Result/ Qual	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Method: EPA 537M

Batch: BDH0028 - 537M

Blank (BDH0028-BLK1)

Prepared & Analyzed: 08/09/24 18:31

PFOA	ND	0.80	ng/L						
PFOS	ND	0.80	ng/L						

<i>Extracted Internal Standards (EIS):</i>	<i>14</i>		<i>ng/L</i>	<i>16.0</i>		<i>87</i>	<i>40-130</i>		
<i>13C8-PFOA</i>									
<i>Extracted Internal Standards (EIS):</i>	<i>12</i>		<i>ng/L</i>	<i>15.3</i>		<i>78</i>	<i>40-130</i>		
<i>13C8-PFOS</i>									

LCS (BDH0028-BS1)

Prepared & Analyzed: 08/09/24 18:45

PFOA	17	0.80	ng/L	16.0		104	70-150		
PFOS	15	0.80	ng/L	14.9		98	55-150		

<i>Extracted Internal Standards (EIS):</i>	<i>14</i>		<i>ng/L</i>	<i>16.0</i>		<i>86</i>	<i>40-130</i>		
<i>13C8-PFOA</i>									
<i>Extracted Internal Standards (EIS):</i>	<i>11</i>		<i>ng/L</i>	<i>15.3</i>		<i>75</i>	<i>40-130</i>		
<i>13C8-PFOS</i>									

LCS Dup (BDH0028-BSD1)

Prepared & Analyzed: 08/09/24 18:58

PFOA	15	0.80	ng/L	16.0		91	70-150	13	30
PFOS	14	0.80	ng/L	14.9		94	55-150	4	30

<i>Extracted Internal Standards (EIS):</i>	<i>11</i>		<i>ng/L</i>	<i>16.0</i>		<i>69</i>	<i>40-130</i>		
<i>13C8-PFOA</i>									
<i>Extracted Internal Standards (EIS):</i>	<i>9.2</i>		<i>ng/L</i>	<i>15.3</i>		<i>60</i>	<i>40-130</i>		
<i>13C8-PFOS</i>									

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document. No duplication of this report is allowed, except in its entirety.

Soil and Materials Engineers, Inc. - Kalamazoo
 3301 Tech Circle Drive
 Kalamazoo, MI 49008-5611

Project: City of Kalamazoo Dewatering
 Project Number: 093008.00
 Project Manager: Aaron Reed

Reported: 08/13/2024 11:25

Notes and Definitions

Item	Definition
Dry	Sample results reported on a dry weight basis.
MDL	Method Detection Limit (only displays if reported to the MDL)
ND	Analyte NOT DETECTED at or above the reporting limit.
DF	Dilution Factor
DL	Detection Limit
‡	Parameter not included in NELAC Scope of Analysis.
Soil pH measured in water at degree C	
RPD	Relative Percent Difference
%REC	Percent Recovery
Source	Sample that was matrix spiked or duplicated.
PQL, Practical Quantitation Limit = Method Reporting Limit (MRL).	



Accreditation Number(s):
MI001292024-1

Soil and Materials Engineers, Inc. - Kalamazoo
 3301 Tech Circle Drive
 Kalamazoo, MI 49008-5611

Project: City of Kalamazoo Dewatering
 Project Number: 093008.00
 Project Manager: Aaron Reed

Reported: 08/13/2024 11:25



WORK ORDER

24G0124

Printed: 08/13/2024 11:25 am

Project: City of Kalamazoo Dewatering
Project Number: 093008.00
Project Manager: Jacob Sutherland
PO Number:

Report To:

Soil and Materials Engineers, Inc. - Kalamazoo
 Aaron Reed
 3301 Tech Circle Drive
 Kalamazoo, MI 49008-5611
 Phone: 2693233555
 Fax: 2693233553

Invoice To:

Soil and Materials Engineers, Inc. - Kalamazoo
 Aaron Reed
 3301 Tech Circle Drive
 Kalamazoo, MI 49008-5611
 Phone: 2693233555
 Fax: 2693233553

Date Received: 07/23/2024 04:11 PM
 Date Due: 08/01/2024 (7.00 day TAT)

Logged In By: Tristen Rhines
 Received By: Kelly Williams

Analysis	Comments
24G0124-01 B5 [Water] Sampled 7/22/2024 11:10:00AM 537M-MI PFOA/PFOS only	PFOA/PFOS only

24G0124 Sample Receipt Log

Default Cooler

Samples Received at: **1.3°C**

Were Custody Seals present and signed?	No	Container/preservative correct for test requested?	Yes
Received on Ice and within proper temp?	Yes	Sufficient amount sent for tests requested?	Yes
Were all Air Hg and PCB tubes received at ambient?	No	Required containers sealed in separate bags?	No
Were all TO-15 samples received at ambient?	No	Were all samples inspected and sampled correctly?	Yes
Was a chain of custody received?	Yes	Were bubbles absent in volatile samples?	No
COCs complete/signed in the appropriate places?	Yes	Sufficient remaining holding time for analyses?	Yes
Were all samples listed on COC received?	Yes	If Applicable pH documented for necessary samples?	No
Did all samples/container labels agree with COCs?	Yes	If applicable, was the chlorine test negative?	No
Did all containers arrive in good condition?	Yes	If applicable, samples free of oxidizers?	No
Containers Intact	Yes	Thermometer # : 10003954 used?	Yes

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
 No duplication of this report is allowed, except in its entirety.



A METIRI GROUP COMPANY

Wednesday, August 7, 2024

Fibertec Project Number: A21804
Project Identification: City Of Kzoo Dewatering/093008.00 /093008.00
Submittal Date: 07/23/2024

Mr. Aaron Reed
Soil and Materials Engineers, Inc. - Kalamazoo
3301 Tech Circle Drive
Kalamazoo, MI 49008-5611

Dear Mr. Reed,

Thank you for selecting Fibertec Environmental Services as your analytical laboratory. The samples you submitted have been analyzed in accordance with NELAC standards and the results compiled in the attached report. Any exceptions to NELAC compliance are noted in the report. These results apply only to those samples submitted. Please note TO-15 samples will be disposed of 7 calendar days after the reporting date. All other samples will be disposed of 30 days after the reporting date.

The data associated for the PFAS analysis was performed by Metiri Holt in report 24G0124. This report will be sent in a separate email once completed.

If you have any questions regarding these results or if we may be of further assistance to you, please contact me at (517) 699-0345.

Sincerely,

A handwritten signature in black ink that reads "Katherine Jones".

By Katherine Jones at 9:36 AM, Aug 07, 2024

For Robert J. Morelli
Director of Laboratory Operations

Enclosures

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F: (231) 775-8584



A METIRI GROUP COMPANY

Analytical Laboratory Report
 Laboratory Project Number: A21804
 Laboratory Sample Number: A21804-001

Order: A21804
 Date: 08/07/24

Client Identification:	Soil and Materials Engineers, Inc. - Kalamazoo	Sample Description:	B5	Chain of Custody:	225537
Client Project Name:	City Of Kzoo Dewatering/093008.00	Sample No:		Collect Date:	07/22/24
Client Project No:	093008.00	Sample Matrix:	Ground Water	Collect Time:	11:10

Sample Comments:

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

Cyanide, Total						Aliquot ID: A21804-001G		Matrix: Ground Water		
Method: ASTM D7511-12						Description: B5				
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
‡ 1. Cyanide, Total	8.3		µg/L	5.0	1.0	07/29/24	PW24G29A	07/29/24	WQ24G29A	MJS

Silica Gel Treated - Hexane Extractable Material						Aliquot ID: A21804-001D		Matrix: Ground Water		
Method: EPA 1664B						Description: B5				
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
‡ 1. SGT-HEM	U	F-J	mg/L	2.0	1.0	NA	NA	07/30/24	WH24G30A	AVC

Trace Elements by ICP/MS, Total Recoverable						Aliquot ID: A21804-001E		Matrix: Ground Water		
Method: EPA 3005A (Total Recoverable)/EPA 6020B						Description: B5				
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
1. Cadmium	U		µg/L	1.0	10	07/31/24	PT24G31D	07/31/24	T424G31E	JJS
2. Chromium	U		µg/L	10	10	07/31/24	PT24G31D	07/31/24	T424G31E	JJS
3. Copper	U		µg/L	4.0	10	07/31/24	PT24G31D	07/31/24	T424G31E	JJS
4. Lead	8.9		µg/L	3.0	10	07/31/24	PT24G31D	07/31/24	T424G31E	JJS
5. Nickel	U		µg/L	20	10	07/31/24	PT24G31D	07/31/24	T424G31E	JJS
6. Zinc	U		µg/L	50	10	07/31/24	PT24G31D	07/31/24	T424G31E	JJS

Mercury by CVAAS, Dissolved						Aliquot ID: A21804-001E		Matrix: Ground Water		
Method: EPA 7470A						Description: B5				
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
1. Mercury	U		µg/L	0.20	1.0	07/25/24	PM24G25A	07/25/24	M724G25A	AVC

Polychlorinated Biphenyls (PCBs)						Aliquot ID: A21804-001		Matrix: Ground Water		
Method: EPA 3510C/EPA 8082A						Description: B5				
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
1. Aroclor-1016	U		µg/L	0.20	1.0	07/25/24	PS24G25F	08/01/24 13:26	SO24H01A	TKT
2. Aroclor-1221	U		µg/L	0.20	1.0	07/25/24	PS24G25F	08/01/24 13:26	SO24H01A	TKT
3. Aroclor-1232	U		µg/L	0.20	1.0	07/25/24	PS24G25F	08/01/24 13:26	SO24H01A	TKT
4. Aroclor-1242	U		µg/L	0.20	1.0	07/25/24	PS24G25F	08/01/24 13:26	SO24H01A	TKT

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 T: (231) 775-8368

F: (517) 699-0388
 F: (810) 220-3311
 F: (231) 775-8584

Analytical Laboratory Report
Laboratory Project Number: A21804
Laboratory Sample Number: A21804-001

Order: A21804
 Date: 08/07/24

Client Identification:	Soil and Materials Engineers, Inc. - Kalamazoo	Sample Description:	B5	Chain of Custody:	225537
Client Project Name:	City Of Kzoo Dewatering/093008.00	Sample No:		Collect Date:	07/22/24
Client Project No:	093008.00	Sample Matrix:	Ground Water	Collect Time:	11:10

Sample Comments:

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

Polychlorinated Biphenyls (PCBs)						Aliquot ID: A21804-001		Matrix: Ground Water			
Method: EPA 3510C/EPA 8082A						Description: B5					
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis			
						P. Date	P. Batch	A. Date	A. Batch	Init.	
5. Aroclor-1248	U		µg/L	0.20	1.0	07/25/24	PS24G25F	08/01/24	13:26	SO24H01A	TKT
6. Aroclor-1254	U		µg/L	0.20	1.0	07/25/24	PS24G25F	08/01/24	13:26	SO24H01A	TKT
7. Aroclor-1260	U		µg/L	0.20	1.0	07/25/24	PS24G25F	08/01/24	13:26	SO24H01A	TKT
‡ 8. Aroclor-1262	U		µg/L	0.20	1.0	07/25/24	PS24G25F	08/01/24	13:26	SO24H01A	TKT
‡ 9. Aroclor-1268	U		µg/L	0.20	1.0	07/25/24	PS24G25F	08/01/24	13:26	SO24H01A	TKT

Volatile Organic Compounds (VOCs) by GC/MS						Aliquot ID: A21804-001H		Matrix: Ground Water			
Method: EPA 5030C/EPA 8260D						Description: B5					
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis			
						P. Date	P. Batch	A. Date	A. Batch	Init.	
1. Benzene	U		µg/L	1.0	1.0	07/29/24	VM24G29C	07/30/24	02:15	VM24G29C	BRC
2. Ethylbenzene	U		µg/L	1.0	1.0	07/29/24	VM24G29C	07/30/24	02:15	VM24G29C	BRC
3. Toluene	U		µg/L	1.0	1.0	07/29/24	VM24G29C	07/30/24	02:15	VM24G29C	BRC
4. m&p-Xylene	U		µg/L	2.0	1.0	07/29/24	VM24G29C	07/30/24	02:15	VM24G29C	BRC
5. o-Xylene	U		µg/L	1.0	1.0	07/29/24	VM24G29C	07/30/24	02:15	VM24G29C	BRC
‡ 6. Xylenes	U		µg/L	3.0	1.0	07/29/24	VM24G29C	07/30/24	02:15	VM24G29C	BRC

pH, electrometric, Measured at the Reported Temperature						Aliquot ID: A21804-001		Matrix: Ground Water			
Method: EPA 9040C						Description: B5					
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis			
						P. Date	P. Batch	A. Date	A. Batch	Init.	
1. pH	7.55	H	pH Units	-1.00	1.0	NA	NA	07/29/24	11:07	WD24G29A	JWS
‡ 2. Temperature	20.6		°C	0.0	1.0	NA	NA	07/29/24	11:07	WD24G29A	JWS

Residue, Non-Filterable (TSS)						Aliquot ID: A21804-001A		Matrix: Ground Water			
Method: SM 2540 D-2015						Description: B5					
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis			
						P. Date	P. Batch	A. Date	A. Batch	Init.	
1. Total Suspended Solids	540		mg/L	50	20	NA	NA	07/29/24		WH24G29A	MJS

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A METIRI GROUP COMPANY

Analytical Laboratory Report
Laboratory Project Number: A21804
Laboratory Sample Number: A21804-001

Order: A21804
 Date: 08/07/24

Client Identification:	Soil and Materials Engineers, Inc. - Kalamazoo	Sample Description:	B5	Chain of Custody:	225537
Client Project Name:	City Of Kzoo Dewatering/093008.00	Sample No:		Collect Date:	07/22/24
Client Project No:	093008.00	Sample Matrix:	Ground Water	Collect Time:	11:10

Sample Comments:

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

Nitrogen, Ammonia (Auto Analyzer)						Aliquot ID: A21804-001F		Matrix: Ground Water		
Method: SM 4500-NH3 G-2011						Description: B5				
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
1. Ammonia-N	6900		µg/L	10	1.0	07/25/24	PW24G25B	07/25/24	WU24G25C	ARC

Carbonaceous Biochemical Oxygen Demand, 5 Day (CBOD5)						Aliquot ID: A21804-001B		Matrix: Ground Water		
Method: SM 5210 B-2016						Description: B5				
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
1. CBOD	U		mg/L	6.0	3.0	07/24/24	10:24 WZ24G24A	07/29/24	14:15 WZ24G24A	MJS

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 F: (231) 775-8584

Analytical Laboratory Report
Laboratory Project Number: A21804

Order: A21804
Date: 08/07/24

Definitions/ Qualifiers:

- A:** Spike recovery or precision unusable due to dilution.
- B:** The analyte was detected in the associated method blank.
- E:** The analyte was detected at a concentration greater than the calibration range, therefore the result is estimated.
- J:** The concentration is an estimated value.
- M:** Modified Method
- U:** The analyte was not detected at or above the reporting limit.
- X:** Matrix Interference has resulted in a raised reporting limit or distorted result.
- W:** Results reported on a wet-weight basis.
- *:** Value reported is outside QC limits

Exception Summary:

- F-** : Recovery from the spiked aliquot exceeds the lower control limit (matrix spike or matrix spike duplicate).
- H** : Hold time exceeded.
- J-** : The result is an estimated quantity, but the result may be biased low.

Analysis Locations:

All analyses performed in Holt.



Accreditation Number(s):

MI001292024-1 (UT)

1914 Holloway Drive
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F: (231) 775-8584

PM24G25A: Method Blank (MB)

EPA 7470A

Run Time: PM24G25A.MB 07/25/2024 12:48 [M724G25A]

Analyte	MB Result	MB Qualifier	MB RDL
	µg/L		µg/L
Mercury	U		0.20

PM24G25A: Laboratory Control Sample (LCS)

EPA 7470A

Run Time: PM24G25A.LCS: 07/25/2024 12:50 [M724G25A]

Analyte	LCS Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	µg/L	µg/L	%	%	
Mercury	0.250	0.264	106	85-115	

PS24G25F: Method Blank (MB)

EPA 8082A

Run Time: PS24G25F.MB 07/25/2024 17:29 [SO24G25A]

Analyte	MB Result µg/L	MB Qualifier	MB RDL µg/L
Aroclor-1016	U		0.20
Aroclor-1260	U		0.20
Decachlorobiphenyl-PCB(S)	67		14-124
2,4,5,6-Tetrachloro-m-xylene-PCB(S)	76		26-136

PS24G25F: Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD)

EPA 8082A

Run Time: PS24G25F.LCS: 07/25/2024 17:46 [SO24G25A] PS24G25F.LCSD: 07/25/2024 18:04 [SO24G25A]

Analyte	LCS Spike Amount µg/L	LCS Result µg/L	LCS Rec. %	Rec. Limits %	LCS Qualifier	LCSD Spike Amount µg/L	LCSD Result µg/L	LCSD Rec. %	LCSD Qualifier	RPD %	RPD Limits %	RPD Qualifier
Aroclor-1016	2.00	1.95	97	60-120		2.00	1.99	99		2	20	
Aroclor-1260	2.00	2.16	108	60-120		2.00	2.17	108		0	20	
Decachlorobiphenyl-PCB(S)			71	14-124				71				
2,4,5,6-Tetrachloro-m-xylene-PCB(S)			81	26-136				70				

PT24G31D: Method Blank (MB)

EPA 6020B

Run Time: PT24G31D.MB 07/31/2024 13:56 [T424G31E]

Analyte	MB Result	MB Qualifier	MB RDL
	µg/L		µg/L
Cadmium	U		1.0
Chromium	U		10
Copper	U		4.0
Lead	U		3.0
Nickel	U		20

PT24G31D: Method Blank (MB)

EPA 6020B

Run Time: PT24G31D.MB 08/01/2024 14:01 [T424H01C]

Analyte	MB Result	MB Qualifier	MB RDL
	µg/L		µg/L
Zinc	U		50

PT24G31D: Laboratory Control Sample (LCS)

EPA 6020B

Run Time: PT24G31D.LCS: 08/01/2024 11:12 [T424H01C]

Analyte	LCS Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	µg/L	µg/L	%	%	
Cadmium	100	107	107	85-115	
Chromium	200	217	109	85-115	
Copper	200	216	108	85-115	
Lead	200	215	108	85-115	
Nickel	200	215	108	85-115	
Zinc	500	547	109	85-115	

PW24G25B: Method Blank (MB)

SM 4500-NH3 G-2011

Run Time: PW24G25B.MB 07/25/2024 14:04 [WU24G25C]

Analyte	MB Result	MB Qualifier	MB RDL
	µg/L		µg/L
Ammonia-N	U		10

PW24G25B: Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD)

SM 4500-NH3 G-2011

Run Time: PW24G25B.LCS: 07/25/2024 14:06 [WU24G25C] PW24G25B.LCSD: 07/25/2024 14:09 [WU24G25C]

Analyte	LCS Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier	LCSD Spike Amount	LCSD Result	LCSD Rec.	LCSD Qualifier	RPD	RPD Limits	RPD Qualifier
	µg/L	µg/L	%	%		µg/L	µg/L	%		%	%	
Ammonia-N	5000	5020	100	90-110		5000	5030	101		1	20	

PW24G29A: Method Blank (MB)

ASTM D7511-12

Run Time: PW24G29A.MB 07/29/2024 12:03 [WQ24G29A]

Analyte	MB Result	MB Qualifier	MB RDL
	µg/L		µg/L
Cyanide, Total	U		5.0

PW24G29A: Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD)

ASTM D7511-12

Run Time: PW24G29A.LCS: 07/29/2024 12:05 [WQ24G29A] PW24G29A.LCSD: 07/29/2024 12:06 [WQ24G29A]

Analyte	LCS Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier	LCSD Spike Amount	LCSD Result	LCSD Rec.	LCSD Qualifier	RPD	RPD Limits	RPD Qualifier
	µg/L	µg/L	%	%		µg/L	µg/L	%		%	%	
Cyanide, Total	99.9	90.7	91	84-116		99.9	92.3	92		1	12	

VM24G29C: Method Blank (MB)

EPA 8260D

Run Time: VM24G29C.MB 07/30/2024 01:49 [VM24G29C]

Analyte	MB Result	MB Qualifier	MB RDL
	µg/L		µg/L
Benzene	U		1.0
Ethylbenzene	U		1.0
Toluene	U		1.0
m&p-Xylene	U		2.0
o-Xylene	U		1.0
4-Bromofluorobenzene(S)	101		80-120
Dibromofluoromethane(S)	98		80-120
1,2-Dichloroethane-d4(S)	103		80-120
Toluene-d8(S)	98		80-120

VM24G29C: Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD)

EPA 8260D

Run Time: VM24G29C.LCS: 07/30/2024 00:29 [VM24G29C] VM24G29C.LCSD: 07/30/2024 00:56 [VM24G29C]

Analyte	LCS	LCS Result	LCS Rec.	Rec. Limits	LCS	LCSD	LCSD	LCSD	LCSD	RPD	RPD Limits	RPD
	Spike Amount	µg/L	%	%	Qualifier	Spike Amount	Result	Rec.	Qualifier	%	%	Qualifier
	µg/L	µg/L				µg/L	µg/L	%				
Benzene	50.0	46.5	93	80-120		50.0	47.1	94		1	20	
Ethylbenzene	50.0	43.8	88	80-120		50.0	44.9	90		2	20	
Toluene	50.0	43.0	86	80-120		50.0	44.6	89		3	20	
m&p-Xylene	100	86.6	87	75-130		100	88.4	88		1	20	
o-Xylene	50.0	42.6	85	80-120		50.0	43.1	86		1	20	
4-Bromofluorobenzene(S)			98	80-120				98				
Dibromofluoromethane(S)			99	80-120				99				
1,2-Dichloroethane-d4(S)			103	80-120				108				
Toluene-d8(S)			99	80-120				99				

Definitions/Qualifiers:

- U: The analyte was not detected at or above the Reporting Limit (RL).
- *: Value reported is outside QC limits

Exception Summary:

Exceptions have been properly noted on reported results or affected samples have been scheduled for reanalysis when appropriate.

Report Generated By:



By Katherine Jones at 9:38 AM, Aug 07, 2024

Client Name: SME			PARAMETERS										Matrix Code			Deliverables	
Contact Person: AARON REED													HOLD SAMPLE				
Project Name/ Number: CITY OF K200 Dewatering / 093008.00			# OF CONTAINERS 6/15			A Air	SW	Surface Water		Level 3							
Email distribution list: AARON.REED@SME-USA.COM						O Oil	WW	Waste Water		Level 4							
Quote# SME 021824-CITY OF KALAMAZOO Dewatering						P Wipe	X	Other: Specify		EDD							
Purchase Order#																	
Date						Time			Sample #			Client Sample Descriptor			Remarks:		
7/22/24			11:10			B5			B5			SEE QUOTE					
<p>Received By Lab</p> <p style="color: red;">JUL 23 2024</p> <p>Initials: <u>kw</u></p>																	
Comments:																	
Sampled/Relinquished By: ANTHONY HOSBEIN				Date/Time: 7/22/24 13:15				Received By: SME Cold Storage									
Relinquished By: SME Cold Storage				Date/Time: 7-23-24 11:14				Received By: [Signature]									
Relinquished By: [Signature]				Date/Time: 7-23-24 16:11				Received By Laboratory: [Signature] 11:26									
Turnaround Time ALL RESULTS WILL BE SENT BY THE END OF THE BUSINESS DAY																	
<input type="checkbox"/> 1 bus. day <input type="checkbox"/> 2 bus. days <input type="checkbox"/> 3 bus. days <input type="checkbox"/> 4 bus. days <input checked="" type="checkbox"/> 5-7 bus. days (standard)				Other (specify time/date requirement): _____				LAB USE ONLY 2450124 Fibertec project number: A21804 Temperature upon receipt at Lab: 1.30C <div style="border: 2px solid red; padding: 5px; display: inline-block; color: red; font-weight: bold;">Received On Ice</div>									
Please see back for terms and conditions																	



Case Narrative

Client: Soil and Materials Engineers, Inc.
Project Name: City of Kzoo Dewatering/093008.00

One water sample was collected on July 22, 2024 and received by Fibertec, Inc. on July 23, 2024. The shipping cooler temperature was within specifications (0 – 6 °C), and the sample containers arrived without any visible signs of tampering or breakage. Containers were checked for correct pH, where appropriate.

The data associated for the PFAS analysis was performed by Metiri Holt in report 24G0124. This report will be sent in a separate email once completed.

Exceptions are noted below.

Cross Reference

Lab ID #	Client ID #	Matrix	Requested Tests
A21804-001	B5	Water	Total Cyanide, SGT-HEM, Trace Metals, PCBs, VOCs, pH, TSS, Ammonia, CBOD

Exceptions

Silica Gel Treated Method: EPA 1664B

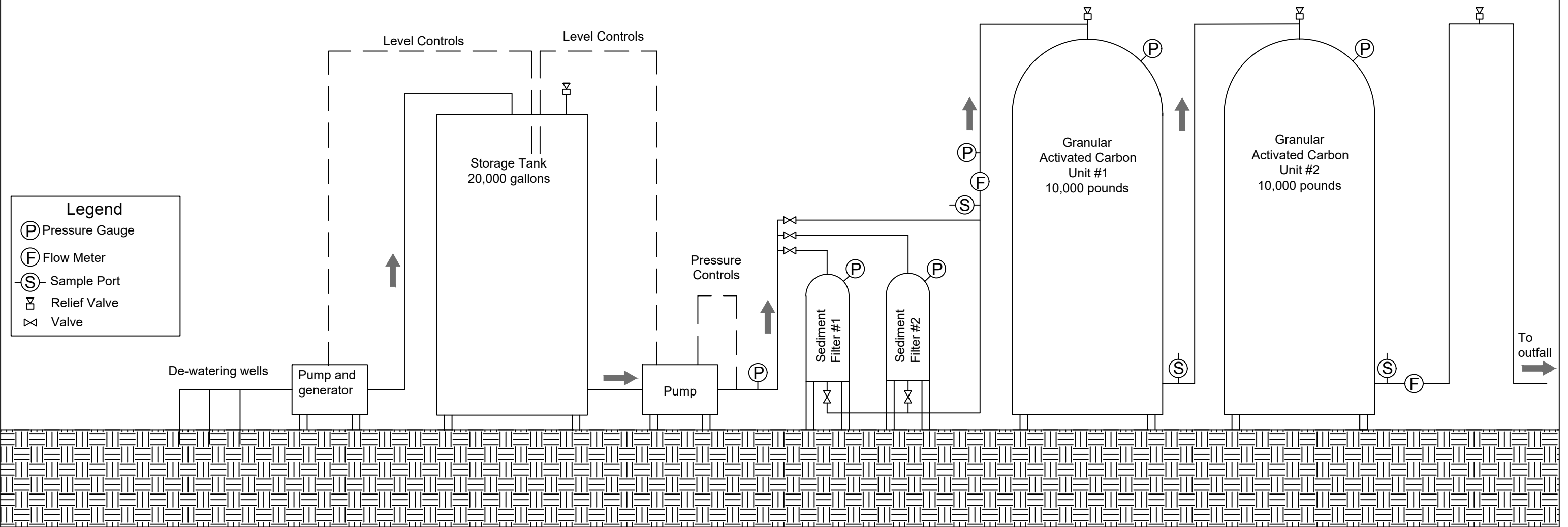
Sample -001 was qualified for SGT-HEM as the spiked sample recovery was low for the Matrix Spike (26.5% recovery) with criteria being 64-132%. The Laboratory Control Sample was acceptable at 71.5%. Results may be biased low.

Sample -001 was qualified as potential biased low due the initial pH being ≥ 2 , which is above method criteria.

pH Method: EPA 9040C

Sample -001 was qualified as having estimated results for pH due to exceeding the hold time (time from sampling to analysis should be within 15 minutes).

No further exceptions were observed.



- Legend**
- (P) Pressure Gauge
 - (F) Flow Meter
 - (S) Sample Port
 - ⌵ Relief Valve
 - ⊗ Valve

Figure 4
Treatment Process
Flow Diagram

Drawn: DLL
Checked: SB





TO: EGLE

FROM: SME on behalf of the City of Kalamazoo

DATE: August 1, 2025

PROJECT: Burdick Street and Vandersalm Court Water Main Replacement
SME Project No. 093008.01

SUBJECT: Project Narrative
NPDES Permit Application

LOCATION: Intersection of East Crosstown Parkway and South Burdick Street and Vandersalm Court,
Kalamazoo, Michigan

PROJECT DESCRIPTION

The City of Kalamazoo (City) is planning to construct a new water main and various service leads along South Burdick Street between the cross streets of Lovell Street and West Emerson Street in Kalamazoo, Michigan and along Vandersalm Court between the South Burdick Street/East Crosstown intersection and South Rose Street. In addition, upgrades are proposed to an existing sanitary sewer along South Burdick Street between Lovell Street and Vine Street. The proposed water main will consist of both 16-inch diameter and 24-inch diameter ductile iron pipe (DIP) that has a general invert elevation of about 6 feet to 13 feet below existing grades. The proposed gravity sanitary sewer will consist of a 12-inch diameter pipe that has an invert elevation of about 9 feet to 10 feet below existing grades.

The proposed water main and sanitary sewers will be constructed primarily using the open-cut method and using temporary earth retention measures, as needed. At the intersection of East Crosstown Parkway and South Burdick Street, the proposed water main will extend below two parallel storm culverts that connect with a collection chamber that spans across the intersection. It is our understanding the two culverts have an invert elevation of about 6 feet below existing grades. At this crossing location, the design team is proposing the water main be installed using the horizontal auger bore (HAB) trenchless installation method as shown in Image 1.

To complete the crossing using HAB installation methods, the shown receiving and launch pits will need to be dewatered, as well as the area between the two pits along the water main alignment. A similar dewatering project in Kalamazoo was recently permitted under a groundwater model that an estimated total flow of up to 1,500 gallons per minute (gpm). This model/pump rate appears to be appropriate for future dewatering wells within this area to achieve the groundwater drawdown needed to complete the construction of the pits and the HAB crossing. The City sanitary sewer in the area does not have this flow capacity, and therefore, this NPDES permit application is submitted.

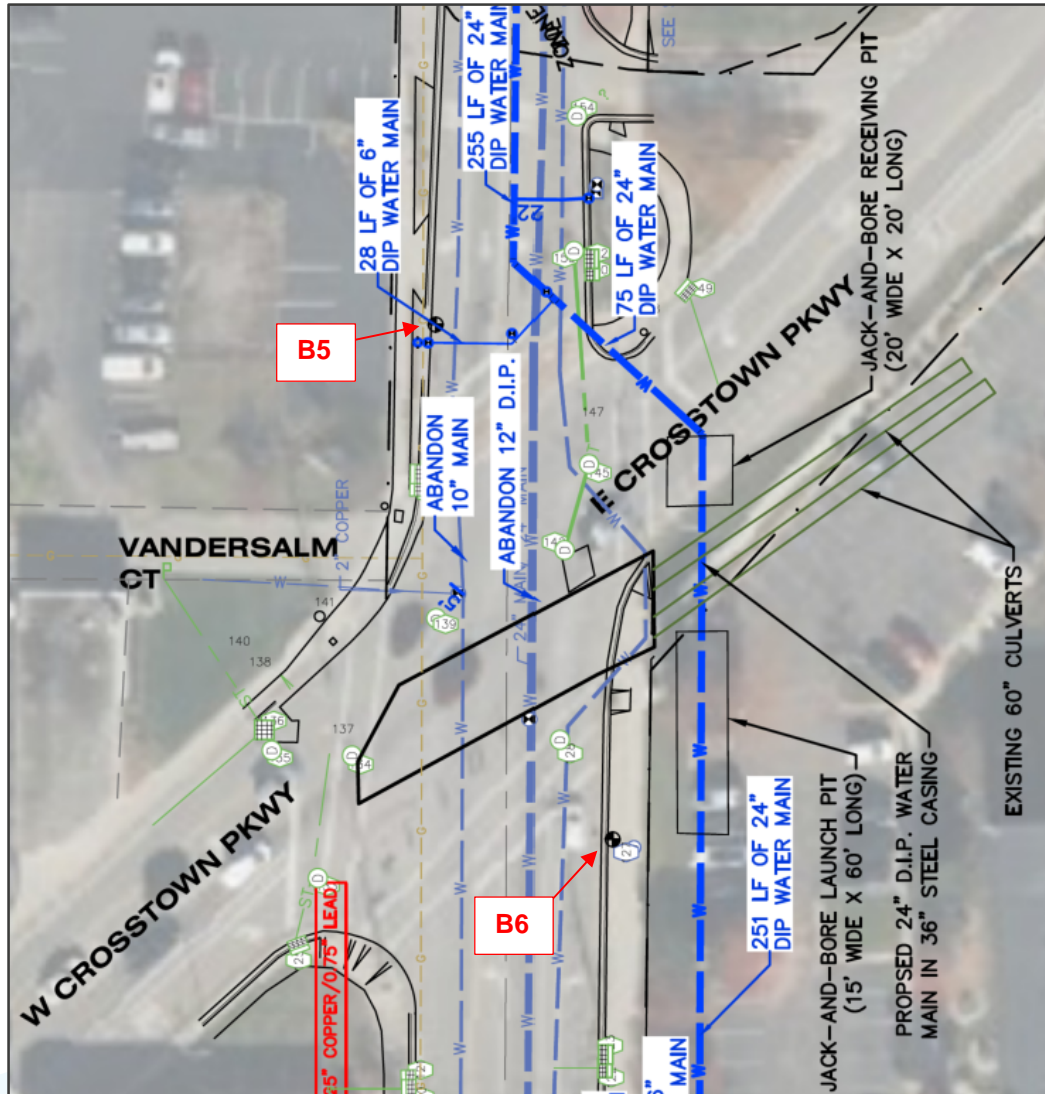


IMAGE 1: Proposed water main crossing below twin culvert at the intersection of East Crosstown Parkway and Burdick Street.

ENVIRONMENTAL ASSESSMENT – GROUNDWATER

SME completed two borings, B5 and B6 as shown in Image 1, in the area of the intersection for the purposes of completing a geotechnical evaluation for the project. At boring B5, SME collected groundwater samples to evaluate potential impact prior to discharging groundwater offsite (e.g., storm sewer). The sample was tested for volatile organic compounds (VOCs); Polychlorinated Biphenyls (PCBs); Metals; cyanide, total suspended solids, pH, Carbonaceous Biochemical Oxygen Demand, 5 Day (CBOD5); Ammonia; Per- and Polyfluoroalkyl Substances (PFOA and PFOS).

The groundwater sample analyzed from B-5 contained concentrations of cyanide, lead ammonia, and PFOS exceeding laboratory reporting limits. The source of the contamination is currently unknown.

DEWATERING PLAN

For the Burdick Street intersection, construction groundwater will be pumped at both north and south pits and along water main alignment between the pits using multiple dewatering wells. These dewatering wells will be manifolded to a pump at the ground surface. The pump with generator at the ground surface extracts groundwater from the dewatering wells and pumps into a water storage container. Similarly, the groundwater from water main installation along Vandersalm Court and Burdick Street as shown in the areas identified on the attached Figure No. 1 will be pumped from the work area using either pumps or dewatering wells to a water storage container.

The water from the storage container will be pumped through sediment filters capable of treating the entire flow. Higher micron filter bags will be utilized during startup and lower micron filter bags will be utilized once the initial surge of sediment flow ceased. The sediment filters may be bypassed if there is no visible sediment in the extracted groundwater and during weekend and overnight dewatering operations.

If required by EGLE, the groundwater from the sediment filters will flow through granular activated carbon units rated for the entire flow rate. The carbon units are anticipated to provide a minimum of 10 minutes of retention (contact) time.

The treated water from the Burdick Street intersection will be discharged to the storm sewer catch basin located east of the dewatered area on the south side of East Crosstown Parkway. The water from the storm sewer discharges into the Axtell Creek culvert which travels east to discharge into Axtell Creek.

The treated water from the Vandersalm Court work area will be discharged to the storm sewer catch basin located on South Rose Street. The water from the storm sewer discharges into the basin to the west, which travels east to discharge into Axtell Creek.

The Discharge Point figure attached to the permit application identifies the treated water discharge flow path to surface waters. A totalizing flow meter will be installed on the treatment system discharge line to monitor the discharge flow. When determining the maximum daily flow rate for the permit application, it is assumed that the project will be dewatering for approximately 24 hours a day.

PREPARED BY:



JoBeth L. Peterson
Sr. Staff Specialist

REVIEWED BY:



Jeffrey R. Lanier, PE
Project Director

Attachments: Analytical Results
Figure 1 – Discharge Points Diagram



Metiri Group - Holt
1914 Holloway Dr, Holt, MI 48842 - Phone (517) 699-0345 - www.metirigroup.com

August 13, 2024

Aaron Reed
Soil and Materials Engineers, Inc. - Kalamazoo
3301 Tech Circle Drive
Kalamazoo, MI 49008-5611

RE: City of Kalamazoo Dewatering
24G0124

Thank you for selecting Metiri Group - Holt as your analytical laboratory. The samples submitted have been analyzed in accordance with all method and NELAC standards, as applicable. Any exceptions to compliance are noted in the report.

Please note that TO-15 samples will be disposed of 7 calendar days after the reporting date. All other samples will be disposed of 30 days after the reporting date.

If you have any questions regarding these results, or if we may be of further assistance to you, please contact us at (517) 699-0345.

Sincerely,

A handwritten signature in black ink, appearing to read 'Jacob Sutherland'.

Jacob Sutherland
Project Manager
jacob.sutherland@metirigroup.com
517-273-4922

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Soil and Materials Engineers, Inc. - Kalamazoo
3301 Tech Circle Drive
Kalamazoo, MI 49008-5611

Project: City of Kalamazoo Dewatering
Project Number: 093008.00
Project Manager: Aaron Reed

Reported: 08/13/2024 11:25

Samples in this Report

Lab ID	Sample	Matrix	Date Sampled	Date Received
24G0124-01	B5	Water	07/22/2024 11:10	07/23/2024

Soil and Materials Engineers, Inc. - Kalamazoo
 3301 Tech Circle Drive
 Kalamazoo, MI 49008-5611

Project: City of Kalamazoo Dewatering
 Project Number: 093008.00
 Project Manager: Aaron Reed

Reported: 08/13/2024 11:25

Sample Results

Sample: B5
24G0124-01 (Water)

Analyte	Result/Qual	PQL	Units	Date Analyzed	DF	Method	Prep Batch
---------	-------------	-----	-------	---------------	----	--------	------------

Per- and Polyfluoroalkyl Substances

1	PFOA	1.9	0.80	ng/L	08/09/24	1	EPA 537M	BDH0028
2	PFOS	3.0	0.80	ng/L	08/09/24	1	EPA 537M	BDH0028
<i>Extracted Internal Standards (EIS): 13C8-PFOA</i>		<i>79%</i>	<i>40-130</i>		<i>08/09/24</i>	<i>1</i>	<i>EPA 537M</i>	
<i>Extracted Internal Standards (EIS): 13C8-PFOS</i>		<i>49%</i>	<i>40-130</i>		<i>08/09/24</i>	<i>1</i>	<i>EPA 537M</i>	

Soil and Materials Engineers, Inc. - Kalamazoo
 3301 Tech Circle Drive
 Kalamazoo, MI 49008-5611

Project: City of Kalamazoo Dewatering
 Project Number: 093008.00
 Project Manager: Aaron Reed

Reported: 08/13/2024 11:25

PREPARATION BATCH SUMMARY

EPA 537M

Laboratory: Metiri Group - Holt

Client:

Batch: BDH0028 Batch Matrix: Water Preparation: 537M

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT mL	FINAL VOL. mL
B5	24G0124-01RE1	08/01/24 11:16	260.0000	2
Blank	BDH0028-BLK1	08/09/24 09:02	250.0000	2
LCS	BDH0028-BS1	08/09/24 09:02	250.0000	2
LCS Dup	BDH0028-BSD1	08/09/24 09:02	250.0000	2

Soil and Materials Engineers, Inc. - Kalamazoo
 3301 Tech Circle Drive
 Kalamazoo, MI 49008-5611

Project: City of Kalamazoo Dewatering
 Project Number: 093008.00
 Project Manager: Aaron Reed

Reported: 08/13/2024 11:25

Quality Control

Per- and Polyfluoroalkyl Substances

Analyte	Result/ Qual	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Method: EPA 537M

Batch: BDH0028 - 537M

Blank (BDH0028-BLK1)

Prepared & Analyzed: 08/09/24 18:31

PFOA	ND	0.80	ng/L						
PFOS	ND	0.80	ng/L						

<i>Extracted Internal Standards (EIS):</i>	<i>14</i>		<i>ng/L</i>	<i>16.0</i>		<i>87</i>	<i>40-130</i>		
<i>13C8-PFOA</i>									
<i>Extracted Internal Standards (EIS):</i>	<i>12</i>		<i>ng/L</i>	<i>15.3</i>		<i>78</i>	<i>40-130</i>		
<i>13C8-PFOS</i>									

LCS (BDH0028-BS1)

Prepared & Analyzed: 08/09/24 18:45

PFOA	17	0.80	ng/L	16.0		104	70-150		
PFOS	15	0.80	ng/L	14.9		98	55-150		

<i>Extracted Internal Standards (EIS):</i>	<i>14</i>		<i>ng/L</i>	<i>16.0</i>		<i>86</i>	<i>40-130</i>		
<i>13C8-PFOA</i>									
<i>Extracted Internal Standards (EIS):</i>	<i>11</i>		<i>ng/L</i>	<i>15.3</i>		<i>75</i>	<i>40-130</i>		
<i>13C8-PFOS</i>									

LCS Dup (BDH0028-BSD1)

Prepared & Analyzed: 08/09/24 18:58

PFOA	15	0.80	ng/L	16.0		91	70-150	13	30
PFOS	14	0.80	ng/L	14.9		94	55-150	4	30

<i>Extracted Internal Standards (EIS):</i>	<i>11</i>		<i>ng/L</i>	<i>16.0</i>		<i>69</i>	<i>40-130</i>		
<i>13C8-PFOA</i>									
<i>Extracted Internal Standards (EIS):</i>	<i>9.2</i>		<i>ng/L</i>	<i>15.3</i>		<i>60</i>	<i>40-130</i>		
<i>13C8-PFOS</i>									

Soil and Materials Engineers, Inc. - Kalamazoo
 3301 Tech Circle Drive
 Kalamazoo, MI 49008-5611

Project: City of Kalamazoo Dewatering
 Project Number: 093008.00
 Project Manager: Aaron Reed

Reported: 08/13/2024 11:25

Notes and Definitions

Item	Definition
Dry	Sample results reported on a dry weight basis.
MDL	Method Detection Limit (only displays if reported to the MDL)
ND	Analyte NOT DETECTED at or above the reporting limit.
DF	Dilution Factor
DL	Detection Limit
‡	Parameter not included in NELAC Scope of Analysis.
Soil pH measured in water at degree C	
RPD	Relative Percent Difference
%REC	Percent Recovery
Source	Sample that was matrix spiked or duplicated.
PQL, Practical Quantitation Limit = Method Reporting Limit (MRL).	



Accreditation Number(s):
MI001292024-1

Soil and Materials Engineers, Inc. - Kalamazoo
 3301 Tech Circle Drive
 Kalamazoo, MI 49008-5611

Project: City of Kalamazoo Dewatering
 Project Number: 093008.00
 Project Manager: Aaron Reed

Reported: 08/13/2024 11:25



WORK ORDER

24G0124

Printed: 08/13/2024 11:25 am

Project: City of Kalamazoo Dewatering
Project Number: 093008.00
Project Manager: Jacob Sutherland
PO Number:

Report To:

Soil and Materials Engineers, Inc. - Kalamazoo
 Aaron Reed
 3301 Tech Circle Drive
 Kalamazoo, MI 49008-5611
 Phone: 2693233555
 Fax: 2693233553

Invoice To:

Soil and Materials Engineers, Inc. - Kalamazoo
 Aaron Reed
 3301 Tech Circle Drive
 Kalamazoo, MI 49008-5611
 Phone: 2693233555
 Fax: 2693233553

Date Received: 07/23/2024 04:11 PM
 Date Due: 08/01/2024 (7.00 day TAT)

Logged In By: Tristen Rhines
 Received By: Kelly Williams

Analysis	Comments
24G0124-01 B5 [Water] Sampled 7/22/2024 11:10:00AM 537M-MI PFOA/PFOS only	PFOA/PFOS only

24G0124 Sample Receipt Log

Default Cooler

Samples Received at: **1.3°C**

Were Custody Seals present and signed?	No	Container/preservative correct for test requested?	Yes
Received on Ice and within proper temp?	Yes	Sufficient amount sent for tests requested?	Yes
Were all Air Hg and PCB tubes received at ambient?	No	Required containers sealed in separate bags?	No
Were all TO-15 samples received at ambient?	No	Were all samples inspected and sampled correctly?	Yes
Was a chain of custody received?	Yes	Were bubbles absent in volatile samples?	No
COCs complete/signed in the appropriate places?	Yes	Sufficient remaining holding time for analyses?	Yes
Were all samples listed on COC received?	Yes	If Applicable pH documented for necessary samples?	No
Did all samples/container labels agree with COCs?	Yes	If applicable, was the chlorine test negative?	No
Did all containers arrive in good condition?	Yes	If applicable, samples free of oxidizers?	No
Containers Intact	Yes	Thermometer # : 10003954 used?	Yes

Analytical Laboratory
1914 Holloway Drive
Holt, MI 48842
Phone: 517 699 0345
Fax: 517 699 0388
email: lab@fibertec.us

Geoprobe
11766 E. Grand River Rd.
Brighton, MI 48116
Phone: 810 220 3300
Fax: 810 220 3311

093008.01_08012025_Project_Narrative

Client Name: SME		Contact Person: ARON REED		Project Name/Number: CITY OF KNOX BATTERINGS / 093008.01		Email distribution list: ARON, REED @SME-USA.COM		Quote #: SME 021824-CITY OF KNOX BATTERINGS		Purchase Order #:	
Date	Time	Sample #	Client Sample Descriptor	MATRIX (SEE RIGHT CORNER FOR CODE)		# OF CONTAINERS		PARAMETERS			
7/22/24	11:10	B5		4015				HOLD SAMPLE			
				S Soil		GW Ground Water		Deliverables			
				A Air		SW Surface Water		Level 2			
				O Oil		WW Waste Water		Level 3			
				P Wipe		Other: Specify		Level 4			
				X				EDD			
Comments:				Remarks: SFE QDDTE				Received By Lab JUL 23 2024 Initials: WR			
Sampled/Relinquished By: ANTHONY HOSBEND				Date/Time: 7/22/24 13:15				Received By: SME Lab STORAGE			
Relinquished By: SME Lab STORAGE				Date/Time: 7-23-24 11:14				Received By: [Signature]			
Relinquished By: [Signature]				Date/Time: 7-23-24 16:11				Received By: [Signature]			
Turnaround Time ALL RESULTS WILL BE SENT BY THE END OF THE BUSINESS DAY											
1 bus. day		2 bus. days		3 bus. days		4 bus. days		Fibertec project number: A21804			
5-7 bus. days (standard)		Other (specify time/date/requirements):		Temperature upon receipt of lab: 1.30C		LAB USE ONLY		Received On Ice			
						2460124					

Please see back for terms and conditions



A METIRI GROUP COMPANY

Wednesday, August 7, 2024

Fibertec Project Number: A21804
Project Identification: City Of Kzoo Dewatering/093008.00 /093008.00
Submittal Date: 07/23/2024

Mr. Aaron Reed
Soil and Materials Engineers, Inc. - Kalamazoo
3301 Tech Circle Drive
Kalamazoo, MI 49008-5611

Dear Mr. Reed,

Thank you for selecting Fibertec Environmental Services as your analytical laboratory. The samples you submitted have been analyzed in accordance with NELAC standards and the results compiled in the attached report. Any exceptions to NELAC compliance are noted in the report. These results apply only to those samples submitted. Please note TO-15 samples will be disposed of 7 calendar days after the reporting date. All other samples will be disposed of 30 days after the reporting date.

The data associated for the PFAS analysis was performed by Metiri Holt in report 24G0124. This report will be sent in a separate email once completed.

If you have any questions regarding these results or if we may be of further assistance to you, please contact me at (517) 699-0345.

Sincerely,

A handwritten signature in black ink that reads "Katherine Jones".

By Katherine Jones at 9:36 AM, Aug 07, 2024

For Robert J. Morelli
Director of Laboratory Operations

Enclosures

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Analytical Laboratory Report
Laboratory Project Number: A21804
Laboratory Sample Number: A21804-001

Order: A21804
 Date: 08/07/24

A METIRI GROUP COMPANY

Client Identification:	Soil and Materials Engineers, Inc. - Kalamazoo	Sample Description:	B5	Chain of Custody:	225537
Client Project Name:	City Of Kzoo Dewatering/093008.00	Sample No.:		Collect Date:	07/22/24
Client Project No.:	093008.00	Sample Matrix:	Ground Water	Collect Time:	11:10

Sample Comments:

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

Cyanide, Total						Aliquot ID:	A21804-001G	Matrix:	Ground Water	
Method: ASTM D7511-12						Description:	B5			
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
‡ 1. Cyanide, Total	8.3		µg/L	5.0	1.0	07/29/24	PW24G29A	07/29/24	WQ24G29A	MJS

Silica Gel Treated - Hexane Extractable Material						Aliquot ID:	A21804-001D	Matrix:	Ground Water	
Method: EPA 1664B						Description:	B5			
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
‡ 1. SGT-HEM	U	F-J	mg/L	2.0	1.0	NA	NA	07/30/24	WH24G30A	AVC

Trace Elements by ICP/MS, Total Recoverable						Aliquot ID:	A21804-001E	Matrix:	Ground Water	
Method: EPA 3005A (Total Recoverable)/EPA 6020B						Description:	B5			
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
1. Cadmium	U		µg/L	1.0	10	07/31/24	PT24G31D	07/31/24	T424G31E	JJS
2. Chromium	U		µg/L	10	10	07/31/24	PT24G31D	07/31/24	T424G31E	JJS
3. Copper	U		µg/L	4.0	10	07/31/24	PT24G31D	07/31/24	T424G31E	JJS
4. Lead	8.9		µg/L	3.0	10	07/31/24	PT24G31D	07/31/24	T424G31E	JJS
5. Nickel	U		µg/L	20	10	07/31/24	PT24G31D	07/31/24	T424G31E	JJS
6. Zinc	U		µg/L	50	10	07/31/24	PT24G31D	07/31/24	T424G31E	JJS

Mercury by CVAAS, Dissolved						Aliquot ID:	A21804-001E	Matrix:	Ground Water	
Method: EPA 7470A						Description:	B5			
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
1. Mercury	U		µg/L	0.20	1.0	07/25/24	PM24G25A	07/25/24	M724G25A	AVC

Polychlorinated Biphenyls (PCBs)						Aliquot ID:	A21804-001	Matrix:	Ground Water	
Method: EPA 3510C/EPA 8082A						Description:	B5			
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
1. Aroclor-1016	U		µg/L	0.20	1.0	07/25/24	PS24G25F	08/01/24 13:26	SO24H01A	TKT
2. Aroclor-1221	U		µg/L	0.20	1.0	07/25/24	PS24G25F	08/01/24 13:26	SO24H01A	TKT
3. Aroclor-1232	U		µg/L	0.20	1.0	07/25/24	PS24G25F	08/01/24 13:26	SO24H01A	TKT
4. Aroclor-1242	U		µg/L	0.20	1.0	07/25/24	PS24G25F	08/01/24 13:26	SO24H01A	TKT

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Analytical Laboratory Report
Laboratory Project Number: A21804
Laboratory Sample Number: A21804-001

Order: A21804
 Date: 08/07/24

Client Identification:	Soil and Materials Engineers, Inc. - Kalamazoo	Sample Description:	B5	Chain of Custody:	225537
Client Project Name:	City Of Kzoo Dewatering/093008.00	Sample No:		Collect Date:	07/22/24
Client Project No:	093008.00	Sample Matrix:	Ground Water	Collect Time:	11:10

Sample Comments:

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

Polychlorinated Biphenyls (PCBs)						Aliquot ID: A21804-001		Matrix: Ground Water			
Method: EPA 3510C/EPA 8082A						Description: B5					
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis			
						P. Date	P. Batch	A. Date	A. Batch	Init.	
5. Aroclor-1248	U		µg/L	0.20	1.0	07/25/24	PS24G25F	08/01/24	13:26	SO24H01A	TKT
6. Aroclor-1254	U		µg/L	0.20	1.0	07/25/24	PS24G25F	08/01/24	13:26	SO24H01A	TKT
7. Aroclor-1260	U		µg/L	0.20	1.0	07/25/24	PS24G25F	08/01/24	13:26	SO24H01A	TKT
‡ 8. Aroclor-1262	U		µg/L	0.20	1.0	07/25/24	PS24G25F	08/01/24	13:26	SO24H01A	TKT
‡ 9. Aroclor-1268	U		µg/L	0.20	1.0	07/25/24	PS24G25F	08/01/24	13:26	SO24H01A	TKT

Volatile Organic Compounds (VOCs) by GC/MS						Aliquot ID: A21804-001H		Matrix: Ground Water			
Method: EPA 5030C/EPA 8260D						Description: B5					
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis			
						P. Date	P. Batch	A. Date	A. Batch	Init.	
1. Benzene	U		µg/L	1.0	1.0	07/29/24	VM24G29C	07/30/24	02:15	VM24G29C	BRC
2. Ethylbenzene	U		µg/L	1.0	1.0	07/29/24	VM24G29C	07/30/24	02:15	VM24G29C	BRC
3. Toluene	U		µg/L	1.0	1.0	07/29/24	VM24G29C	07/30/24	02:15	VM24G29C	BRC
4. m&p-Xylene	U		µg/L	2.0	1.0	07/29/24	VM24G29C	07/30/24	02:15	VM24G29C	BRC
5. o-Xylene	U		µg/L	1.0	1.0	07/29/24	VM24G29C	07/30/24	02:15	VM24G29C	BRC
‡ 6. Xylenes	U		µg/L	3.0	1.0	07/29/24	VM24G29C	07/30/24	02:15	VM24G29C	BRC

pH, electrometric, Measured at the Reported Temperature						Aliquot ID: A21804-001		Matrix: Ground Water			
Method: EPA 9040C						Description: B5					
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis			
						P. Date	P. Batch	A. Date	A. Batch	Init.	
1. pH	7.55	H	pH Units	-1.00	1.0	NA	NA	07/29/24	11:07	WD24G29A	JWS
‡ 2. Temperature	20.6		°C	0.0	1.0	NA	NA	07/29/24	11:07	WD24G29A	JWS

Residue, Non-Filterable (TSS)						Aliquot ID: A21804-001A		Matrix: Ground Water			
Method: SM 2540 D-2015						Description: B5					
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis			
						P. Date	P. Batch	A. Date	A. Batch	Init.	
1. Total Suspended Solids	540		mg/L	50	20	NA	NA	07/29/24		WH24G29A	MJS

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Analytical Laboratory Report
Laboratory Project Number: A21804
Laboratory Sample Number: A21804-001

Order: A21804
 Date: 08/07/24

A METIRI GROUP COMPANY

Client Identification:	Soil and Materials Engineers, Inc. - Kalamazoo	Sample Description:	B5	Chain of Custody:	225537
Client Project Name:	City Of Kzoo Dewatering/093008.00	Sample No:		Collect Date:	07/22/24
Client Project No:	093008.00	Sample Matrix:	Ground Water	Collect Time:	11:10

Sample Comments:

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

Nitrogen, Ammonia (Auto Analyzer)						Aliquot ID: A21804-001F		Matrix: Ground Water		
Method: SM 4500-NH3 G-2011						Description: B5				
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
1. Ammonia-N	6900		µg/L	10	1.0	07/25/24	PW24G25B	07/25/24	WU24G25C	ARC

Carbonaceous Biochemical Oxygen Demand, 5 Day (CBOD5)						Aliquot ID: A21804-001B		Matrix: Ground Water		
Method: SM 5210 B-2016						Description: B5				
Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
1. CBOD	U		mg/L	6.0	3.0	07/24/24 10:24	WZ24G24A	07/29/24 14:15	WZ24G24A	MJS

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Analytical Laboratory Report
Laboratory Project Number: A21804

Order: A21804
Date: 08/07/24

Definitions/ Qualifiers:

- A:** Spike recovery or precision unusable due to dilution.
- B:** The analyte was detected in the associated method blank.
- E:** The analyte was detected at a concentration greater than the calibration range, therefore the result is estimated.
- J:** The concentration is an estimated value.
- M:** Modified Method
- U:** The analyte was not detected at or above the reporting limit.
- X:** Matrix Interference has resulted in a raised reporting limit or distorted result.
- W:** Results reported on a wet-weight basis.
- *:** Value reported is outside QC limits

Exception Summary:

- F-** : Recovery from the spiked aliquot exceeds the lower control limit (matrix spike or matrix spike duplicate).
- H** : Hold time exceeded.
- J-** : The result is an estimated quantity, but the result may be biased low.

Analysis Locations:

All analyses performed in Holt.



Accreditation Number(s):

MI001292024-1 (UT)

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PM24G25A: Method Blank (MB)

EPA 7470A

Run Time: PM24G25A.MB 07/25/2024 12:48 [M724G25A]

Analyte	MB Result	MB Qualifier	MB RDL
	µg/L		µg/L
Mercury	U		0.20

PM24G25A: Laboratory Control Sample (LCS)

EPA 7470A

Run Time: PM24G25A.LCS: 07/25/2024 12:50 [M724G25A]

Analyte	LCS Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	µg/L	µg/L	%	%	
Mercury	0.250	0.264	106	85-115	

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093008.01_08012025_Project_Narrative

Quality Control Report

Laboratory Project Number: A21804

Order ID: A21804
 Page: 2 of 7
 Date: 08/07/24

EPA 8082A

PS24G25F: Method Blank (MB)

Run Time: PS24G25F.MB 07/25/2024 17:29 [SO24G25A]

Analyte	MB Result	MB Qualifier	MB RDL
	µg/L		µg/L
Aroclor-1016	U		0.20
Aroclor-1260	U		0.20
Decachlorobiphenyl-PCB(S)	67		14-124
2,4,5,6-Tetrachloro-m-xylene-PCB(S)	76		26-136

PS24G25F: Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD)

EPA 8082A

Run Time: PS24G25F.LCS: 07/25/2024 17:46 [SO24G25A] PS24G25F.LCSD: 07/25/2024 18:04 [SO24G25A]

Analyte	LCS	LCS Result	LCS Rec.	Rec. Limits	LCS	LCSD	LCSD	LCSD	LCSD	RPD	RPD Limits	RPD
	Spike Amount	µg/L	%	%	Qualifier	Spike Amount	Result	Rec.	Qualifier	%	%	Qualifier
	µg/L	µg/L				µg/L	µg/L	%		%		
Aroclor-1016	2.00	1.95	97	60-120		2.00	1.99	99		2	20	
Aroclor-1260	2.00	2.16	108	60-120		2.00	2.17	108		0	20	
Decachlorobiphenyl-PCB(S)			71	14-124				71				
2,4,5,6-Tetrachloro-m-xylene-PCB(S)			81	26-136				70				

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093008.01_08012025_Project_Narrative

Quality Control Report

Laboratory Project Number: A21804

Order ID: A21804
 Page: 3 of 7
 Date: 08/07/24

PT24G31D: Method Blank (MB)

EPA 6020B

Run Time: PT24G31D.MB 07/31/2024 13:56 [T424G31E]

Analyte	MB Result	MB Qualifier	MB RDL
	µg/L		µg/L
Cadmium	U		1.0
Chromium	U		10
Copper	U		4.0
Lead	U		3.0
Nickel	U		20

PT24G31D: Method Blank (MB)

EPA 6020B

Run Time: PT24G31D.MB 08/01/2024 14:01 [T424H01C]

Analyte	MB Result	MB Qualifier	MB RDL
	µg/L		µg/L
Zinc	U		50

PT24G31D: Laboratory Control Sample (LCS)

EPA 6020B

Run Time: PT24G31D.LCS: 08/01/2024 11:12 [T424H01C]

Analyte	LCS Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	µg/L	µg/L	%	%	
Cadmium	100	107	107	85-115	
Chromium	200	217	109	85-115	
Copper	200	216	108	85-115	
Lead	200	215	108	85-115	
Nickel	200	215	108	85-115	
Zinc	500	547	109	85-115	

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093008.01_08012025_Project_Narrative

Quality Control Report

Laboratory Project Number: A21804

Order ID: A21804
 Page: 4 of 7
 Date: 08/07/24

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PW24G25B: Method Blank (MB)

SM 4500-NH3 G-2011

Run Time: PW24G25B.MB 07/25/2024 14:04 [WU24G25C]

Analyte	MB Result	MB Qualifier	MB RDL
	µg/L		µg/L
Ammonia-N	U		10

PW24G25B: Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD)

SM 4500-NH3 G-2011

Run Time: PW24G25B.LCS: 07/25/2024 14:06 [WU24G25C] PW24G25B.LCSD: 07/25/2024 14:09 [WU24G25C]

Analyte	LCS Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier	LCSD Spike Amount	LCSD Result	LCSD Rec.	LCSD Qualifier	RPD	RPD Limits	RPD Qualifier
	µg/L	µg/L	%	%		µg/L	µg/L	%		%	%	
Ammonia-N	5000	5020	100	90-110		5000	5030	101		1	20	

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093008.01_08012025_Project_Narrative

Quality Control Report

Laboratory Project Number: A21804

Order ID: A21804
 Page: 5 of 7
 Date: 08/07/24

22/27

PW24G29A: Method Blank (MB)

ASTM D7511-12

Run Time: PW24G29A.MB 07/29/2024 12:03 [WQ24G29A]

Analyte	MB Result	MB Qualifier	MB RDL
	µg/L		µg/L
Cyanide, Total	U		5.0

PW24G29A: Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD)

ASTM D7511-12

Run Time: PW24G29A.LCS: 07/29/2024 12:05 [WQ24G29A] PW24G29A.LCSD: 07/29/2024 12:06 [WQ24G29A]

Analyte	LCS Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier	LCSD Spike Amount	LCSD Result	LCSD Rec.	LCSD Qualifier	RPD	RPD Limits	RPD Qualifier
	µg/L	µg/L	%	%		µg/L	µg/L	%		%	%	
Cyanide, Total	99.9	90.7	91	84-116		99.9	92.3	92		1	12	

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VM24G29C: Method Blank (MB)

Run Time: VM24G29C.MB 07/30/2024 01:49 [VM24G29C]

Analyte	MB Result	MB Qualifier	MB RDL
µg/L			µg/L
Benzene	U		1.0
Ethylbenzene	U		1.0
Toluene	U		1.0
m&p-Xylene	U		2.0
o-Xylene	U		1.0
4-Bromofluorobenzene(S)	101		80-120
Dibromofluoromethane(S)	98		80-120
1,2-Dichloroethane-d4(S)	103		80-120
Toluene-d8(S)	98		80-120

VM24G29C: Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD)

Run Time: VM24G29C.LCS: 07/30/2024 00:29 [VM24G29C] VM24G29C.LCSD: 07/30/2024 00:56 [VM24G29C]

Analyte	LCS Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier	LCSD Spike Amount	LCSD Result	LCSD Rec.	LCSD Qualifier	RPD	RPD Limits	RPD Qualifier
µg/L	µg/L	%	%			µg/L	µg/L	%		%	%	
Benzene	50.0	46.5	93	80-120		50.0	47.1	94		1	20	
Ethylbenzene	50.0	43.8	88	80-120		50.0	44.9	90		2	20	
Toluene	50.0	43.0	86	80-120		50.0	44.6	89		3	20	
m&p-Xylene	100	86.6	87	75-130		100	88.4	88		1	20	
o-Xylene	50.0	42.6	85	80-120		50.0	43.1	86		1	20	
4-Bromofluorobenzene(S)			98	80-120				98				
Dibromofluoromethane(S)			99	80-120				99				
1,2-Dichloroethane-d4(S)			103	80-120				108				
Toluene-d8(S)			99	80-120				99				

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A METIRI GROUP COMPANY

093008.01_08012025_Project_Narrative

Quality Control Report

Laboratory Project Number: A21804

Order ID: A21804
Page: 7 of 7
Date: 08/07/24

Definitions/Qualifiers:

- U: The analyte was not detected at or above the Reporting Limit (RL).
- *: Value reported is outside QC limits

Exception Summary:

Exceptions have been properly noted on reported results or affected samples have been scheduled for reanalysis when appropriate.

Report Generated By:

By Katherine Jones at 9:38 AM, Aug 07, 2024

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225537
 PAGE ___ of ___

Client Name: SME		PARAMETERS										Matrix Code		Deliverables			
Contact Person: AARON REED												S Soil		GW Ground Water		Level 2	
Project Name/ Number: CITY OF K200 Dewatering / 093008.00												A Air		SW Surface Water		Level 3	
Email distribution list: AARON.REED@SME-USA.COM												O Oil		WW Waste Water		Level 4	
Quote# SME 021824-CITY OF KALAMAZOO Dewatering												P Wipe		X Other: Specify		EDD	
Purchase Order#																	
Date	Time	Sample #	Client Sample Descriptor	MATRIX (SEE RIGHT CORNER FOR CODE)	# OF CONTAINERS	Remarks:											
7/22/24	11:10		B5		6/15	SEE QUOTE											
Received By Lab																	
JUL 23 2024																	
Initials: <u>kw</u>																	
Comments:																	
Sampled/Relinquished By: ANTHONY HOSBEIN				Date/Time: 7/22/24 13:15		Received By: SME Cold Storage											
Relinquished By: SME Cold Storage				Date/Time: 7-23-24 11:14		Received By: [Signature]											
Relinquished By: [Signature]				Date/Time: 7-23-24 16:11		Received By Laboratory: [Signature] 11:26											
Turnaround Time ALL RESULTS WILL BE SENT BY THE END OF THE BUSINESS DAY																	
<input type="checkbox"/> 1 bus. day <input type="checkbox"/> 2 bus. days <input type="checkbox"/> 3 bus. days <input type="checkbox"/> 4 bus. days <input checked="" type="checkbox"/> 5-7 bus. days (standard)				Other (specify time/date requirement): _____				fibertec project number: A21804 Temperature upon receipt at Lab: 1.30C									
LAB USE ONLY 2450124 Received On Ice																	
Please see back for terms and conditions																	



Case Narrative

Client: Soil and Materials Engineers, Inc.
 Project Name: City of Kzoo Dewatering/093008.00

One water sample was collected on July 22, 2024 and received by Fibertec, Inc. on July 23, 2024. The shipping cooler temperature was within specifications (0 – 6 °C), and the sample containers arrived without any visible signs of tampering or breakage. Containers were checked for correct pH, where appropriate.

The data associated for the PFAS analysis was performed by Metiri Holt in report 24G0124. This report will be sent in a separate email once completed.

Exceptions are noted below.

Cross Reference

Lab ID #	Client ID #	Matrix	Requested Tests
A21804-001	B5	Water	Total Cyanide, SGT-HEM, Trace Metals, PCBs, VOCs, pH, TSS, Ammonia, CBOD

Exceptions

Silica Gel Treated Method: EPA 1664B

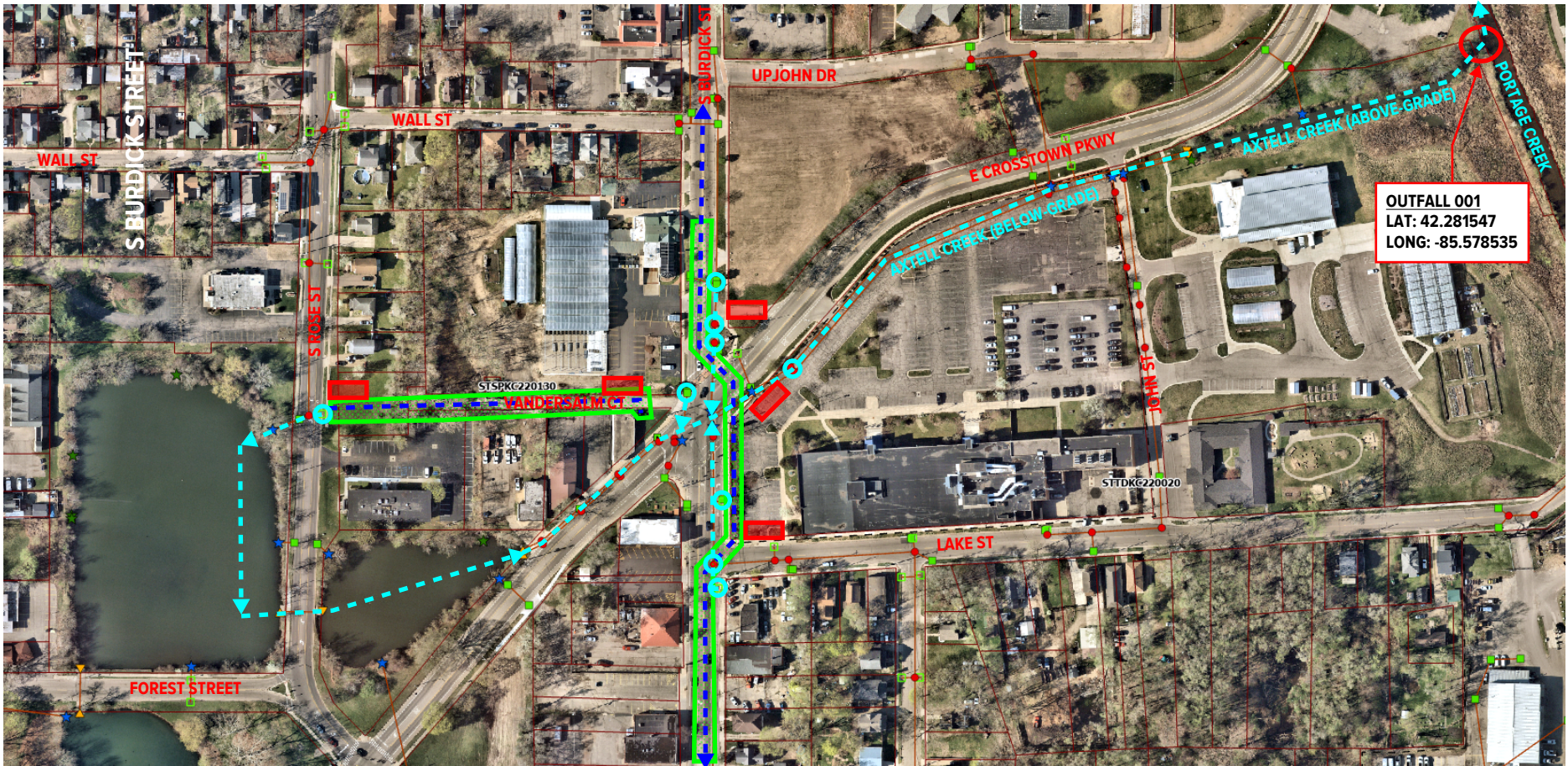
Sample -001 was qualified for SGT-HEM as the spiked sample recovery was low for the Matrix Spike (26.5% recovery) with criteria being 64-132%. The Laboratory Control Sample was acceptable at 71.5%. Results may be biased low.

Sample -001 was qualified as potential biased low due the initial pH being ≥ 2 , which is above method criteria.

pH Method: EPA 9040C

Sample -001 was qualified as having estimated results for pH due to exceeding the hold time (time from sampling to analysis should be within 15 minutes).

No further exceptions were observed.



LEGEND

- PROPOSED WATER MAIN
- DIRECTION OF STORM WATER DISCHARGE FLOW
- DISCHARGE POINTS (MANHOLES/STORM GRATES)
- APPROXIMATE TREATMENT TRAIN LOCATION (IF REQUIRED)

APPROXIMATE AREA TO DEWATER FOR WATER MAIN INSTALLATION



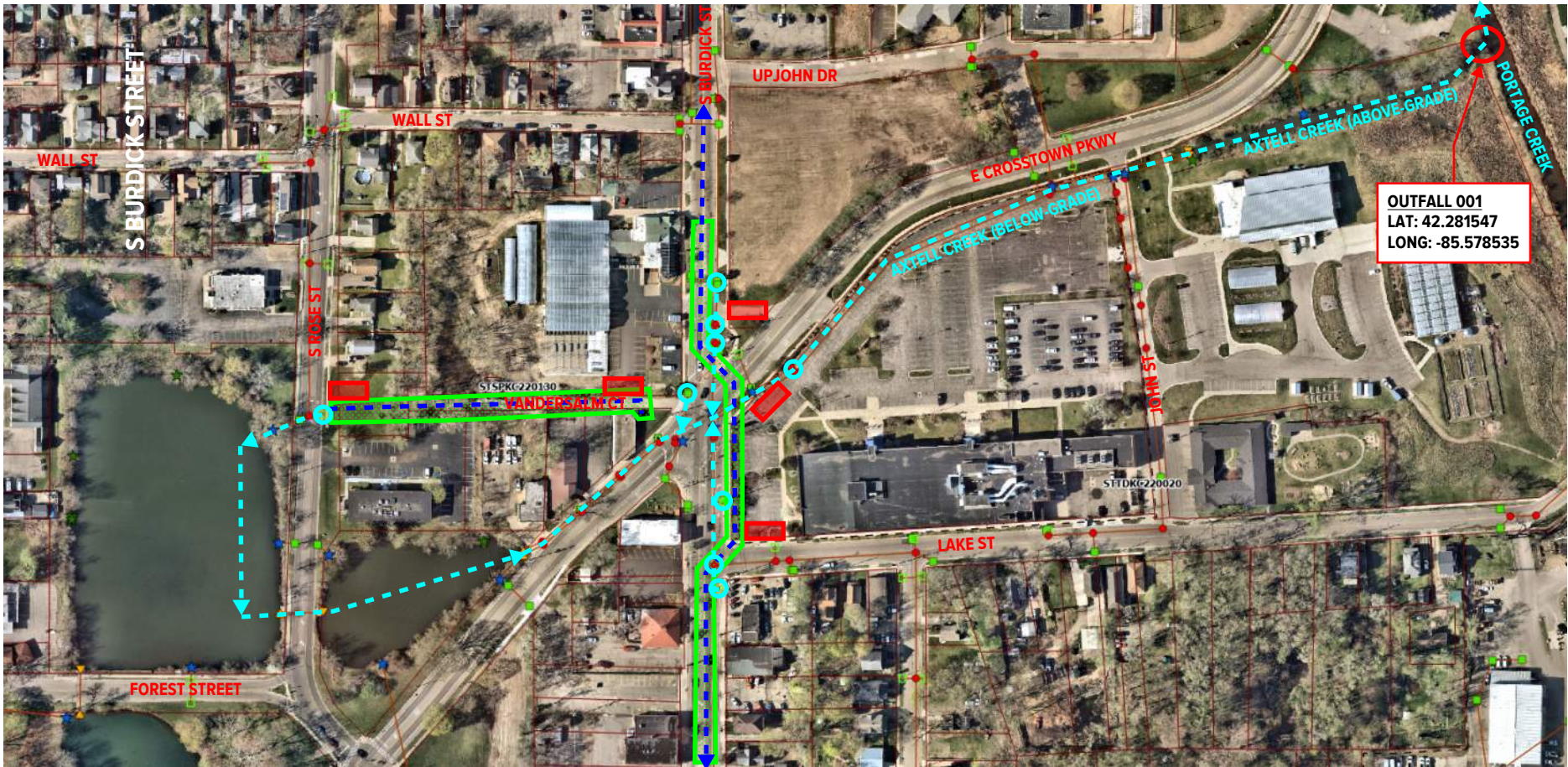
No.	Revision Date	Date:	6/19/2025
	8/1/2025	Drawn By:	AJR
		Designed By:	AJR
		Scale:	NTS
		Project:	093008.01

**DISCHARGE POINTS
BURDICK STREET IMPROVEMENTS NPDES PERMIT
KALAMAZOO, MICHIGAN**



www.sme-usa.com

Figure No. 1



LEGEND

- PROPOSED WATER MAIN
- DIRECTION OF STORM WATER DISCHARGE FLOW
- DISCHARGE POINTS (MANHOLES/STORM GRATES)
- APPROXIMATE TREATMENT TRAIN LOCATION (IF REQUIRED)

APPROXIMATE AREA TO DEWATER FOR WATER MAIN INSTALLATION



No.	Revision Date	Date:	6/19/2025
	8/1/2025	Drawn By:	AJR
		Designed By:	AJR
		Scale:	NTS
		Project:	093008.01

**DISCHARGE POINTS
BURDICK STREET IMPROVEMENTS NPDES PERMIT
KALAMAZOO, MICHIGAN**



www.sme-usa.com

PERMIT NO. MIG080000



AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM GROUNDWATER CLEANUP WASTEWATER

In compliance with the provisions of the federal Clean Water Act (federal Water Pollution Control Act, 33 U.S.C., Section 1251 *et seq.*, as amended); Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA); Part 41, Sewerage Systems, of the NREPA; and Michigan Executive Order 2019-06, treated contaminated groundwater and other wastewaters of similar quality are authorized to be discharged from facilities specified in individual Certificates of Coverage (COCs) in accordance with effluent limitations, monitoring requirements and other conditions set forth in this general National Pollutant Discharge Elimination System (NPDES) permit (permit). Groundwater cleanup wastewater includes but is not limited to groundwater contaminated with the following:

- Petroleum products, which include crude oil, gasoline, diesel fuel, and kerosene, and chemicals used in the recovery and refining of crude oil and added to petroleum products such as brine, lead, and methyl tert-butyl ether (MTBE),
- Chlorinated volatile organic compounds (VOCs),
- Perfluoroalkyl and polyfluoroalkyl substances (PFAS), and
- Other parameters that have the potential to be discharged at levels of concern.

The applicability of this permit shall be limited to discharges of contaminated groundwater and miscellaneous wastewaters of similar quality that contain pollutants for which treatment efficiency and discharge quality can be adequately characterized by the surrogate parameters specified in this permit and have been treated using multistage granular activated carbon adsorption, ion exchange resin, air stripping, ultraviolet/oxidation, biological treatment or other similar treatment systems representing "best available technology economically achievable" (BAT); and that have been determined by the Michigan Department of Environment, Great Lakes, and Energy (Department) not to need an individual NPDES permit. Discharges that may cause or contribute to a violation of a water quality standards are not authorized by this permit.

In order to constitute a valid authorization to discharge, this permit must be complemented by a COC issued by the Department. The COC will specify the effective date of the authorization and which sections of the general permit apply to the permittee based on an evaluation by the Department of site-specific information submitted in a permit application. The final effluent limitations in Part I.A.1. through Part I.A.4. will be applicable depending on the treatment method employed. If any requirements in Part I.A.5. through I.A.18. are applicable, they will be indicated on the COC.

Unless specified otherwise, all contact with the Department required by this permit shall be to the position(s) indicated in the COC.

This permit takes effect on April 1, 2025. The provisions of this permit are severable. After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term in accordance with applicable laws and rules.

This permit shall expire at midnight on **April 1, 2030.**

Issued: October 30, 2024.

Original signed by Christine Alexander
Christine Alexander, Manager
Permits Section
Water Resources Division

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PERMIT FEE REQUIREMENTS

In accordance with Section 324.3120 of the NREPA, the permittee shall make payment of an annual permit fee to the Department for each October 1 the permit is in effect regardless of occurrence of discharge. The permittee shall submit the fee in response to the Department's annual notice. Payment may be made electronically via the Department's MiEnviro Portal system. The MiEnviro Portal website is located at <https://MiEnviro.Michigan.gov/ncore/>. Payment shall be submitted or postmarked by January 15 for notices mailed by December 1. Payment shall be submitted or postmarked no later than 45 days after receiving the notice for notices mailed after December 1.

CONTESTED CASE INFORMATION

Any person who is aggrieved by this permit may file a sworn petition with the Michigan Administrative Hearing System within the Michigan Department of Licensing and Regulatory Affairs, c/o the Michigan Department of Environment, Great Lakes, and Energy, setting forth the conditions of the permit which are being challenged and specifying the grounds for the challenge. The Department of Licensing and Regulatory Affairs may reject any petition filed more than 60 days after issuance as being untimely.

APPLYING FOR PERMIT COVERAGE

In order to obtain permit coverage to discharge to surface waters of the state under this general permit, the permittee shall submit a permit application to the Department via the MiEnviro Portal (<https://MiEnviro.Michigan.gov/ncore/>). At a minimum, the permit application shall include the legal name and address of the owner or operator, receiving water, and water quality data. Permit application definitions and requirements can be found in Part 21 Wastewater Discharge Permits.

INDIAN COUNTRY

This general permit issued under section 402 of the Clean Water Act, 33 U.S.C. 1342, is not intended to cover and does not authorize discharges to waters of the United States inside of Indian country as defined in 18 U.S.C. § 1151. To determine whether any other permit or regulatory requirements apply to a discharge to surface waters within Indian country, consult federal, state, and tribal environmental laws, regulations, and regulatory agencies.

PART I

Section A. Limitations and Monitoring Requirements

1. Final Effluent Limitations for Granular Activated Carbon Facilities

This condition is required if specified in the COC. During the period beginning on the effective date of this permit and the effective date of an individual COC and lasting until the expiration date of this permit or termination of the individual COC, the permittee is authorized to discharge treated contaminated groundwater to the surface waters of the state. This section of the permit shall apply to wastewaters that have been treated using a multi-stage granular activated carbon (or similar media) adsorption treatment system. Such discharge shall be limited and monitored by the permittee as specified below.

<u>Parameter</u>	<u>Maximum Limits for Quantity or Loading</u>			<u>Maximum Limits for Quality or Concentration</u>			<u>Monitoring Frequency</u>	<u>Sample Type</u>
	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>		
Flow	(report)	(report)	MGD	---	---	---	Daily	Report Total Daily Flow
Outfall Observation	(report)	---	---	---	---	---	3x Weekly	Visual
Equipment Inspection	(report)	---	---	---	---	---	3x Weekly	Visual
Tank Rotation and/or Media Replacement	(report)	---	---	---	---	---	Monthly	Report
				Minimum Daily				
Dissolved Oxygen	---	---	---	4.0	---	mg/l	Monthly	Grab
pH	---	---	---	6.5	9.0	S.U.	Monthly	Grab

- a. Narrative Standard
The receiving water shall contain no turbidity, color, oil films, floating solids, foams, settleable solids, suspended solids, or deposits as a result of this discharge in unnatural quantities which are or may become injurious to any designated use.
- b. Monitoring Location
Samples, measurements, and observations taken in compliance with the monitoring requirements above shall be taken prior to mixing with surface waters of the state or any other waste stream for flow; and prior to mixing with surface waters of the state for dissolved oxygen and pH.
- c. Proper Operation and Maintenance
For all treatment systems that do not include PFAS, the permittee shall operate the multi-stage granular activated carbon (or similar media) treatment system such that the rotation of treatment units and/or the replacement of spent media shall be initiated when an analytical result at or above the quantification level is obtained for any parameter monitored at the intermediate stage. Upon request from the permittee, the Department may approve an alternate schedule for the tank rotation and/or replacement of spent media in the treatment units.

For treatment systems that include PFAS, the permittee shall operate the multi-stage activated carbon (or similar media) treatment system such that tank rotation and/or replacement of spent media shall be initiated before the treatment effectiveness of the last treatment unit is compromised. Upon request from the permittee, the Department may approve an alternate schedule for tank rotation and/or replacement of spent media in the treatment units.
- d. Outfall Observation
Outfall observation shall be reported as "yes" or "no." The permittee shall report yes if this requirement was completed and no if this requirement was not completed. Any unusual characteristics of the discharge (i.e., unnatural turbidity, color, oil film, floating solids, foams, settleable solids, suspended solids, or deposits) shall be reported verbally **within 24 hours** to the Department followed with a written

PART I

Section A. Limitations and Monitoring Requirements

report **within five (5) days** detailing the findings of the investigation and the steps taken to correct the condition.

- e. **Equipment Inspection**
Equipment inspection shall be reported as "yes" or "no." The permittee shall report yes if this requirement was completed and no if this requirement was not completed. The permittee shall inspect the treatment systems used to achieve compliance with the terms of the permit. The permittee shall immediately implement any corrective action for the treatment system that is noted during the inspection.
- f. **Tank Rotation and/or Media Replacement**
Tank rotation and/or media replacement shall be reported as "yes" or "no." On the day(s) in which the treatment tanks (containing granular activated carbon or similar media) are rotated and/or media replaced, the permittee shall report "yes" on the Discharge Monitoring Report (DMR) Daily tab and "yes" on the DMR Summary tab for the respective day(s) of the month. If the tanks were not rotated and/or media replaced during the month, the permittee shall report "no" once on the DMR Daily tab and once on the DMR Summary tab for that month.
- g. **Remote Monitoring**
Outfall observation and equipment inspection shall be conducted three (3) days per week through on-site visual inspection by qualified personnel. If qualified personnel will not be on site three (3) days per week and the treatment system has continuous remote monitoring equipment, the permittee may request, in writing, Department approval to conduct less frequent on-site visual inspections. Upon receipt of written approval and consistent with such approval, the permittee may monitor the treatment system remotely and shall conduct on-site visual inspections at the frequency specified in the Department's approval letter. At a minimum, on-site visual inspections shall be conducted two (2) days per month, approximately once every 14 days. If the remote monitoring equipment becomes temporarily inoperable, outfall observation and equipment inspection shall be conducted through on-site visual inspection by qualified personnel three (3) days per week or the Department's approval for reduced monitoring, until the remote monitoring equipment is once again operable. The qualified personnel conducting the monitoring shall identify and record the dates and times of remote monitoring vs. on-site monitoring, and these records shall be retained in accordance with Part II.B.5. of this permit.

2. Final Effluent Limitations for Air Stripper Facilities

This condition is required if specified in the COC. During the period beginning on the effective date of this permit and the effective date of an individual COC and lasting until the expiration date of this permit or termination of the individual COC, the permittee is authorized to discharge treated contaminated groundwater to the surface waters of the state. This section of the permit shall apply to wastewaters that have been treated using an air stripping treatment system. Such discharge shall be limited and monitored by the permittee as specified below.

<u>Parameter</u>	<u>Maximum Limits for Quantity or Loading</u>			<u>Maximum Limits for Quality or Concentration</u>			<u>Monitoring Frequency</u>	<u>Sample Type</u>
	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>		
Flow	(report)	(report)	MGD	---	---	---	Daily	Report Total Daily Flow
Outfall Observation	(report)	---	---	---	---	---	3x Weekly	Visual
Equipment Inspection	(report)	---	---	---	---	---	3x Weekly	Visual
Air Stripper Cleaning	(report)	---	---	---	---	---	Monthly	Report
				Minimum Daily				
pH	---	---	---	6.5	9.0	S.U.	Monthly	Grab

PART I

Section A. Limitations and Monitoring Requirements

- a. **Narrative Standard**
The receiving water shall contain no turbidity, color, oil films, floating solids, foams, settleable solids, suspended solids, or deposits as a result of this discharge in unnatural quantities which are or may become injurious to any designated use.
- b. **Monitoring Location**
Samples, measurements, and observations taken in compliance with the monitoring requirements above shall be taken prior to mixing with surface waters of the state or any other waste stream for flow; and prior to mixing with surface waters of the state for pH.
- c. **Proper Operation and Maintenance**
The permittee shall not discharge sludges, suspended solids, or settleable solids to the surface waters of the state during periodic cleaning of the air stripper.
- d. **Outfall Observation**
Outfall observation shall be reported as "yes" or "no." The permittee shall report yes if this requirement was completed and no if this requirement was not completed. Any unusual characteristics of the discharge (i.e., unnatural turbidity, color, oil film, floating solids, foams, settleable solids, suspended solids, or deposits) shall be reported verbally **within 24 hours** to the Department followed with a written report **within five (5) days** detailing the findings of the investigation and the steps taken to correct the condition.
- e. **Equipment Inspection**
Equipment inspection shall be reported as "yes" or "no." The permittee shall report yes if this requirement was completed and no if this requirement was not completed. The permittee shall inspect the treatment systems used to achieve compliance with the terms of the permit. The permittee shall immediately implement any corrective action for the treatment system that is noted during the inspection.
- f. **Remote Monitoring**
Outfall observation and equipment inspection shall be conducted three (3) days per week through on-site visual inspection by qualified personnel. If qualified personnel will not be on site three (3) days per week and the treatment system has continuous remote monitoring equipment, the permittee may request, in writing, Department approval to conduct less frequent on-site visual inspections. Upon receipt of written approval and consistent with such approval, the permittee may monitor the treatment system remotely and shall conduct on-site visual inspections at the frequency specified in the Department's approval letter. At a minimum, on-site visual inspections shall be conducted two (2) days per month, approximately once every 14 days. If the remote monitoring equipment becomes temporarily inoperable, outfall observation and equipment inspection shall be conducted through on-site visual inspection by qualified personnel three (3) days per week or the Department's approval for reduced monitoring, until the remote monitoring equipment is once again operable. The qualified personnel conducting the monitoring shall identify and record the dates and times of remote monitoring vs. on-site monitoring, and these records shall be retained in accordance with Part II.B.5. of this permit.
- g. **Air Stripper Cleaning**
Air Stripper Cleaning shall be reported as "yes" or "no." On day(s) in which the air stripper(s) are cleaned, the permittee shall report "yes" on the DMR Daily tab and "yes" on the DMR Summary tab for the respective day(s) of the month. If the air stripper(s) are not cleaned during the month, the permittee shall report "no" once on the DMR Daily tab and once on the DMR Summary tab for that month.

PART I

Section A. Limitations and Monitoring Requirements

3. Final Effluent Limitations for Ultraviolet/Oxidation Facilities

This condition is required if specified in the COC. During the period beginning on the effective date of this permit and the effective date of an individual COC and lasting until the expiration date of this permit or termination of the individual COC, the permittee is authorized to discharge treated contaminated groundwater to the surface waters of the state. This section of the permit shall apply to wastewaters that have been treated using an ultraviolet/oxidation treatment system. Such discharge shall be limited and monitored by the permittee as specified below.

Parameter	Maximum Limits for Quantity or Loading			Maximum Limits for Quality or Concentration			Monitoring Frequency	Sample Type
	Monthly	Daily	Units	Monthly	Daily	Units		
Flow	(report)	(report)	MGD	---	---	---	Daily	Report Total Daily Flow
Hydrogen Peroxide	---	---	---	<50	(report)	ug/l	Weekly	Grab
Additive Dose Rate	---	---	---	---	(report)	mg/l	Daily	Calculation
Outfall Observation	(report)	---	---	---	---	---	3x Weekly	Visual
Equipment Inspection	(report)	---	---	---	---	---	3x Weekly	Visual
				Minimum Daily				
pH	---	---	---	6.5	9.0	S.U.	Monthly	Grab

- a. Narrative Standard
The receiving water shall contain no turbidity, color, oil films, floating solids, foams, settleable solids, suspended solids, or deposits as a result of this discharge in unnatural quantities which are or may become injurious to any designated use.
- b. Monitoring Location
Samples, measurements, and observations taken in compliance with the monitoring requirements above shall be taken prior to mixing with surface waters of the state or any other waste stream for flow; and prior to mixing with surface waters of the state for hydrogen peroxide and pH.
- c. Limits Below the Quantification Level – Hydrogen Peroxide
The sampling procedures, preservation and handling, and analytical protocol for compliance monitoring for hydrogen peroxide shall use Chemetrics, Hydrogen Peroxide Chemets Kit K-5510 (Ferric Thiocyanate Method). The quantification level shall be 50 ug/l unless higher levels are appropriate because of sample matrix interference. Justification for a higher quantification level shall be submitted to the Department **within 30 days** of such determination. Other analytical methods may be used upon approval of the Department.

The water quality-based effluent limitation for hydrogen peroxide is 10 ug/l as a maximum monthly average. This is less than the quantification level. Control requirements are therefore established consistent with R 323.1213. **Any discharge of hydrogen peroxide at or above the quantification level is a specific violation of this permit.** If concentrations in all samples representing a monitoring period are less than the quantification level, the permittee will be considered to be in compliance with the permit for the monitoring period that the samples represent, provided that the permittee is also in full compliance with the operation of the ultraviolet/oxidation treatment system. For the purpose of reporting on the Daily tab of the DMR, individual sample results less than the quantification level shall be reported as "<50." Calculations shall be made using the quantification level in place of any sample result less than the quantification level, and the calculated value ("X") resulting from any calculation made using one or more sample results below quantification shall be reported as less than the calculated value X (i.e., "<X"). For additional guidance including examples, see the document entitled "Reporting Results

PART I

Section A. Limitations and Monitoring Requirements

Below Quantification," available at: <https://www.michigan.gov/egle/-/media/Project/Websites/egle/Documents/Programs/WRD/MiEnviro/results-below-quantification.pdf>

This permit condition does not authorize the discharge of this parameter at levels that are injurious to the designated uses of the waters of the state or that constitute a threat to the public health or welfare.

- d. **Outfall Observation**
Outfall observation shall be reported as "yes" or "no." The permittee shall report yes if this requirement was completed and no if this requirement was not completed. Any unusual characteristics of the discharge (i.e., unnatural turbidity, color, oil film, floating solids, foams, settleable solids, suspended solids, or deposits) shall be reported verbally **within 24 hours** to the Department followed with a written report **within five (5) days** detailing the findings of the investigation and the steps taken to correct the condition.
- e. **Equipment Inspection**
Equipment inspection shall be reported as "yes" or "no." The permittee shall report yes if this requirement was completed and no if this requirement was not completed. The permittee shall inspect the treatment systems used to achieve compliance with the terms of the permit. The permittee shall immediately implement any corrective action for the treatment system that is noted during the inspection.
- f. **Remote Monitoring**
Outfall observation and equipment inspection shall be conducted three (3) days per week through on-site visual inspection by qualified personnel. If qualified personnel will not be on site three (3) days per week and the treatment system has continuous remote monitoring equipment, the permittee may request, in writing, Department approval to conduct less frequent on-site visual inspections. Upon receipt of written approval and consistent with such approval, the permittee may monitor the treatment system remotely and shall conduct on-site visual inspections at the frequency specified in the Department's approval letter. At a minimum, on-site visual inspections shall be conducted two (2) days per month, approximately once every 14 days. If the remote monitoring equipment becomes temporarily inoperable, outfall observation and equipment inspection shall be conducted through on-site visual inspection by qualified personnel three (3) days per week or the Department's approval for reduced monitoring, until the remote monitoring equipment is once again operable. The qualified personnel conducting the monitoring shall identify and record the dates and times of remote monitoring vs. on-site monitoring, and these records shall be retained in accordance with Part II.B.5. of this permit.
- g. **Oxidation with Hydrogen Peroxide or Ozone**
Use of hydrogen peroxide or ozone as an oxidant requires approval as a water treatment additive in accordance with Part I.A.24. of this permit. Hydrogen peroxide monitoring and reporting is not required if ozone is used as the oxidant source. For the purpose of reporting on the Daily and Summary tabs of the DMR, when ozone is used as the oxidant source, the permittee shall enter "*G" for hydrogen peroxide. (For purposes of reporting on the Daily tab of the DMR, the permittee shall enter "*G" on the first day of the month only).
- h. **Additive Dose Rate**
If specified on the COC, the permittee shall report the amount of the specified additive used per day. The Department may specify on the COC that the dose rates of multiple additives be reported. The Department may revise this requirement upon notification to the permittee.

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4. Final Effluent Limitations for Biological Treatment Facilities

This condition is required if specified in the COC. During the period beginning on the effective date of this permit and the effective date of an individual COC and lasting until the expiration date of this permit or termination of the individual COC, the permittee is authorized to discharge treated contaminated groundwater to the surface waters of the state. This section of the permit shall apply to wastewaters that have been treated using a biological treatment system. Such discharge shall be limited and monitored by the permittee as specified below.

Parameter	Maximum Limits for Quantity or Loading			Maximum Limits for Quality or Concentration			Monitoring Frequency	Sample Type
	Monthly (report)	Daily (report)	Units MGD	Monthly	Daily	Units		
Flow	(report)	(report)	MGD	---	---	---	Daily	Report Total Daily Flow
Total Suspended Solids (TSS)		---	---	20	30	mg/l	Weekly	24-Hr Composite
Carbonaceous Biochemical Oxygen Demand (CBOD5) – See f. below	---	---	---	4	10	mg/l	Weekly	24-Hr Composite
Ammonia Nitrogen (as N) – See f. below	---	---	---	0.5	2.0	mg/l	Weekly	24-Hr Composite
Total Phosphorus	---	---	---	1.0	(report)	mg/l	Weekly	24-Hr Composite
Outfall Observation	(report)	---	---	---	---	---	3x Weekly	Visual
Equipment Inspection	(report)	---	---	---	---	---	3x Weekly	Visual
				Minimum Daily				
Dissolved Oxygen – See f. below		---	---	4.0	---	mg/l	Weekly	Grab
pH	---	---	---	6.5	9.0	S.U.	Monthly	Grab

- a. Narrative Standard
The receiving water shall contain no turbidity, color, oil films, floating solids, foams, settleable solids, or deposits as a result of this discharge in unnatural quantities which are or may become injurious to any designated use.
- b. Monitoring Location
Samples, measurements, and observations taken in compliance with the monitoring requirements above shall be taken prior to mixing with surface waters of the state or any other waste stream for total suspended solids and flow; and prior to mixing with surface waters of the state for TSS, CBOD5, ammonia nitrogen, total phosphorus, dissolved oxygen, and pH.
- c. Outfall Observation
Outfall observation shall be reported as "yes" or "no." The permittee shall report yes if this requirement was completed and no if this requirement was not completed. Any unusual characteristics of the discharge (i.e., unnatural turbidity, color, oil film, floating solids, foams, settleable solids, suspended solids, or deposits) shall be reported verbally **within 24 hours** to the Department followed with a written report **within five (5) days** detailing the findings of the investigation and the steps taken to correct the condition.

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- d. **Equipment Inspection**
Equipment inspection shall be reported as "yes" or "no." The permittee shall report yes if this requirement was completed and no if this requirement was not completed. The permittee shall inspect the treatment systems used to achieve compliance with the terms of the permit. The permittee shall immediately implement any corrective action for the treatment system that is noted during the inspection.
- e. **Remote Monitoring**
Outfall observation and equipment inspection shall be conducted three (3) days per week through on-site visual inspection by qualified personnel. If qualified personnel will not be on site three (3) days per week and the treatment system has continuous remote monitoring equipment, the permittee may request, in writing, Department approval to conduct less frequent on-site visual inspections. Upon receipt of written approval and consistent with such approval, the permittee may monitor the treatment system remotely and shall conduct on-site visual inspections at the frequency specified in the Department's approval letter. At a minimum, on-site visual inspections shall be conducted two (2) days per month, approximately once every 14 days. If the remote monitoring equipment becomes temporarily inoperable, outfall observation and equipment inspection shall be conducted through on-site visual inspection by qualified personnel three (3) days per week or the Department's approval for reduced monitoring, until the remote monitoring equipment is once again operable. The qualified personnel conducting the monitoring shall identify and record the dates and times of remote monitoring vs. on-site monitoring, and these records shall be retained in accordance with Part II.B.5. of this permit.
- f. **CBOD5, Ammonia Nitrogen, and Dissolved Oxygen Requirements**
The Department may determine that a particular discharge does not have the reasonable potential to exceed water quality-based effluent limitations for CBOD5, ammonia nitrogen, and/or dissolved oxygen and therefore the effluent limitations for these parameters specified in Part I.A.4. of this permit are not applicable. In this case, the Department may only require the permittee to monitor the concentrations of these parameters in the discharge. If these determinations have been made for any or all of these parameters, the individual COC will either indicate that the effluent limitations shall not apply or that the effluent limitations and monitoring requirements shall not apply.

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5. Additional Final Effluent Limitations for BETX

This condition is required if specified in the COC. If petroleum products are the source of contamination or if it is determined by the Department to be necessary to ensure compliance with water quality standards and/or BAT limitations/requirements, the following additional final effluent limitations shall apply, and the discharge shall be limited and monitored by the permittee as specified below.

<u>Parameter</u>	<u>Maximum Limits for Quantity or Loading</u>			<u>Maximum Limits for Quality or Concentration</u>			<u>Monitoring Frequency</u>	<u>Sample Type</u>
	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>		
Influent Monitoring and Reporting								
Benzene	---	---	---	---	(report)	ug/l	Weekly	Grab
Ethylbenzene	---	---	---	---	(report)	ug/l	Weekly	Grab
Toluene	---	---	---	---	(report)	ug/l	Weekly	Grab
Xylenes	---	---	---	---	(report)	ug/l	Weekly	Grab
Intermediate Stage Monitoring and Reporting								
Benzene	---	---	---	---	(report)	ug/l	Weekly	Grab
Ethylbenzene	---	---	---	---	(report)	ug/l	Weekly	Grab
Toluene	---	---	---	---	(report)	ug/l	Weekly	Grab
Xylenes	---	---	---	---	(report)	ug/l	Weekly	Grab
Final Effluent Limitations, Monitoring, and Reporting								
Total BETX	---	---	---	---	20	ug/l	Weekly	Calculation
Benzene	---	---	---	---	5	ug/l	Weekly	Grab
Ethylbenzene	---	---	---	---	(report)	ug/l	Weekly	Grab
Toluene	---	---	---	---	(report)	ug/l	Weekly	Grab
Xylenes	---	---	---	---	(report)	ug/l	Weekly	Grab

- a. **Monitoring Location**
 Samples and measurements taken in compliance with the monitoring requirements above shall be taken prior to treatment for all influent monitoring and prior to the final treatment for intermediate-stage monitoring (not applicable for air stripper treatment systems), and after treatment but prior to mixing with surface waters of the state or any other waste stream for all effluent monitoring.

- b. **Total BETX (Benzene, Ethylbenzene, Toluene, and Xylenes)**
 Total BETX is the arithmetic sum of the sample concentrations of benzene, ethylbenzene, toluene, and xylenes. For the purpose of reporting on the Daily tab of the DMR, individual sample results less than the quantification level shall be reported using the less than sign "<" and the quantification value (e.g., <1.0 ug/L). Calculations shall be made using the quantification level in place of any sample result less than the quantification level, and the calculated value ("X") resulting from any calculation made using one or more sample results below quantification shall be reported as less than the calculated value X (i.e., "<X"). For example calculations, see page 3 of the document entitled "Reporting Results Below Quantification," available at <https://www.michigan.gov/egle/-/media/Project/Websites/egle/Documents/Programs/WRD/MiEnviro/results-below-quantification.pdf>

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6. Additional Final Effluent Limitations for Polynuclear Aromatic Hydrocarbons (PAHs)

This condition is required if specified in the COC. If it is determined by the Department to be necessary to ensure compliance with water quality standards and/or BAT limitations/requirements, the following additional final effluent limitations shall apply, and the discharge shall be limited and monitored by the permittee as specified below.

<u>Parameter</u>	<u>Maximum Limits for Quantity or Loading</u>			<u>Maximum Limits for Quality or Concentration</u>			<u>Monitoring Frequency</u>	<u>Sample Type</u>
	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>		
Acenaphthene	---	---	---	---	5	ug/l	Weekly	Grab
Acenaphthylene	---	---	---	---	5	ug/l	Weekly	Grab
Anthracene	---	---	---	---	5	ug/l	Weekly	Grab
Benzo(a)Anthracene	---	---	---	0.31	(report)	ug/l	Weekly	Grab
Benzo(a)Pyrene	---	---	---	0.31	(report)	ug/l	Weekly	Grab
Benzo(b)Fluoranthene	---	---	---	0.31	(report)	ug/l	Weekly	Grab
Benzo(g,h,i)Perylene	---	---	---	---	5	ug/l	Weekly	Grab
Benzo(k)Fluoranthene	---	---	---	0.31	(report)	ug/l	Weekly	Grab
Chrysene	---	---	---	0.31	(report)	ug/l	Weekly	Grab
Dibenzo(a,h)Anthracene	---	---	---	0.31	(report)	ug/l	Weekly	Grab
Fluoranthene	---	---	---	1.6	5	ug/l	Weekly	Grab
Fluorene	---	---	---	---	5	ug/l	Weekly	Grab
Indeno(1,2,3-c,d)Pyrene	---	---	---	0.31	(report)	ug/l	Weekly	Grab
Naphthalene	---	---	---	---	5	ug/l	Weekly	Grab
Phenanthrene	---	---	---	1.7	5	ug/l	Weekly	Grab
Pyrene	---	---	---	---	5	ug/l	Weekly	Grab

- a. Monitoring Location
Samples, measurements, and observations taken in compliance with the monitoring requirements above shall be taken prior to mixing with surface waters of the state or any other waste stream.

7. Additional Final Effluent Limitations for In-Situ Bio-Remediation

This condition is required if specified in the COC. If the discharge is the result of a groundwater remediation that includes in-situ bio-remediation with nutrient addition as part of a corrective action program, the following additional final effluent limitations shall apply, and the discharge shall be limited and monitored by the permittee as specified below.

<u>Parameter</u>	<u>Maximum Limits for Quantity or Loading</u>			<u>Maximum Limits for Quality or Concentration</u>			<u>Monitoring Frequency</u>	<u>Sample Type</u>
	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>		
Total Phosphorus	---	---	---	1.0	(report)	mg/l	2x Monthly	Grab
Ammonia Nitrogen (as N)	---	---	---	0.5	(report)	mg/l	2x Monthly	Grab

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- a. **Monitoring Location**
 Samples and measurements taken in compliance with the monitoring requirements above shall be taken prior to mixing with surface waters of the state.

8. Additional Final Effluent Limitations for MTBE

This condition is required if specified in the COC. If gasoline is the source of contamination and the gasoline contained MTBE as an additive, or if it is determined by the Department to be necessary to ensure compliance with water quality standards and/or BAT limitations/requirements, the following additional final effluent limitations shall apply, and the discharge shall be limited and monitored by the permittee as specified below.

<u>Parameter</u>	<u>Maximum Limits for Quantity or Loading</u>			<u>Maximum Limits for Quality or Concentration</u>			<u>Monitoring Frequency</u>	<u>Sample Type</u>
	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>		
MTBE	---	---	---	---	100	ug/l	Weekly	Grab

- a. **Monitoring Location**
 Samples and measurements taken in compliance with the monitoring requirements above shall be taken prior to mixing with surface waters of the state or any other waste stream.

9. Additional Final Effluent Limitations for Diesel Range Organics (DRO)

This condition is required if specified in the COC. If petroleum products are a source of contamination and treatment may not sufficiently be monitored by the BETX parameters, the following additional final effluent limitations shall apply, and the discharge shall be limited and monitored by the permittee as specified below.

<u>Parameter</u>	<u>Maximum Limits for Quantity or Loading</u>			<u>Maximum Limits for Quality or Concentration</u>			<u>Monitoring Frequency</u>	<u>Sample Type</u>
	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>		
Influent Monitoring and Reporting								
DRO	---	---	---	---	(report)	ug/l	Weekly	Grab
Intermediate Stage Monitoring and Reporting								
DRO	---	---	---	---	(report)	ug/l	Weekly	Grab
Final Effluent Limitations, Monitoring, and Reporting								
DRO	---	---	---	---	100	ug/l	Weekly	Grab

- a. **Monitoring Location**
 Samples and measurements taken in compliance with the monitoring requirements above shall be taken prior to treatment for all influent monitoring and prior to the final treatment for intermediate-stage monitoring (not applicable for air stripper treatment systems), and after treatment but prior to mixing with surface waters of the state or any other waste stream for all effluent monitoring.

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10. Additional Final Effluent Limitations for Total Phosphorus

This condition is required if specified in the COC. If it is determined by the Department to be necessary to ensure compliance with water quality standards and/or BAT limitations/requirements, the following additional final effluent limitations shall apply, and the discharge shall be limited and monitored by the permittee as specified below.

<u>Parameter</u>	<u>Maximum Limits for Quantity or Loading</u>			<u>Maximum Limits for Quality or Concentration</u>			<u>Monitoring Frequency</u>	<u>Sample Type</u>
	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>		
Total Phosphorus	See COC	(report)	lbs/day	See COC	(report)	mg/l	2x Monthly	Grab

- a. **Monitoring Location**
Samples and measurements taken in compliance with the monitoring requirements above shall be taken prior to mixing with surface waters of the state.
- b. **Effluent Limitations**
If the Department determines that final effluent limitations for Total Phosphorus (as P) are necessary, the applicable maximum monthly average concentration limit and loading rate limit will be specified in the COC.

11. Additional Final Effluent Limitations for Total Residual Chlorine (TRC)

This condition is required if specified in the COC. If it is determined by the Department to be necessary to ensure compliance with water quality standards and/or BAT limitations/requirements, the following additional final effluent limitations shall apply, and the discharge shall be limited and monitored by the permittee as specified below.

<u>Parameter</u>	<u>Maximum Limits for Quantity or Loading</u>			<u>Maximum Limits for Quality or Concentration</u>			<u>Monitoring Frequency</u>	<u>Sample Type</u>
	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>		
Total Residual Chlorine								
Continuous (greater than 160 min/day)		---	---		38	ug/l	Daily	Grab
TRC Discharge Duration		(report)	min/day		---	---	Daily	Report Total Discharge Duration
				Instantaneous Maximum				
Intermittent (less than/equal to 160 min/day)		---		300	200	ug/l	Daily	Grab
TRC Discharge Duration		160	min/day	---	---	---	Daily	Report Total Discharge Duration

- a. **Monitoring Location**
Samples and measurements taken in compliance with the monitoring requirements above shall be taken prior to mixing with surface waters of the state.
- b. **Total Residual Chlorine**
TRC shall be analyzed in accordance with Part II.B.2. of this permit. If chlorine discharge is intermittent, TRC monitoring is only required during periods of chlorine use and subsequent discharge. Limitations

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for the intermittent discharge of chlorine apply only when the discharge of chlorine is less than or equal to 160 minutes per day; otherwise, the limitations for continuous discharge of chlorine apply.

During the intermittent discharge of chlorine, the daily concentration value reported for TRC shall be the average of a minimum of three (3) equally spaced grab samples taken during a chlorine discharge event, with the additional limitation that no single sample may exceed 300 ug/l.

The permittee shall enter "*G" on the DMR for the TRC discharge modes not being used. (For purposes of reporting on the Daily tab of the DMR, the permittee shall enter "*G" on the first day of the month only).

Upon written approval from the Department, the permittee may use a dechlorinating reagent as a water treatment additive, including but not limited to sodium thiosulfate, sodium bisulfite, and sodium sulfite, to achieve applicable TRC limitations. Requests for such approval shall be submitted in accordance with Part I.A.24. of this permit. The quantity of the reagent(s) used shall be limited to 0.6 times the stoichiometric amount of TRC for sodium thiosulfate, 1.5 times the stoichiometric amount of TRC for sodium bisulfite, and 1.8 times the stoichiometric amount of TRC for sodium sulfite. For guidance and example calculations, see the Department's "Calculator to Determine Stoichiometric Amount of Dechlor Agent," available at <https://www.Michigan.gov/EGLE/About/Organization/Water-Resources/NPDES/Compliance-Assistance>. TRC samples taken to determine the amount of each reagent to add shall be taken upstream of dechlorination.

- c. Chlorine Use
Use of chlorine requires approval as a water treatment additive in accordance with Part I.A.24. of this permit. If chlorine containing wastewaters are treated with granular activated carbon filtration, monitoring for TRC is not required. If TRC monitoring is not required due to GAC treatment the permittee shall enter *G on the DMR. (For purposes of reporting on the Daily tab of the DMR, the permittee shall enter "*G" on the first day of the month only).

12. Additional Final Effluent Limitations for Total Lead

This condition is required if specified in the COC. If it is determined by the Department to be necessary to ensure compliance with water quality standards and/or BAT limitations/requirements, the following additional final effluent limitations shall apply, and the discharge shall be limited and monitored by the permittee as specified below.

<u>Parameter</u>	<u>Maximum Limits for Quantity or Loading</u>			<u>Maximum Limits for Quality or Concentration</u>			<u>Monitoring Frequency</u>	<u>Sample Type</u>
	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>		
Total Lead	(See COC)	(report)	lbs/day	(See COC)	(report)	ug/l	Monthly	Grab

- a. Monitoring Location
Samples and measurements taken in compliance with the monitoring requirements above shall be take prior to mixing with surface waters of the state.
- b. Effluent Limitations
If the Department determines that final effluent limitations for Total Lead are necessary, the applicable maximum monthly average concentration limit and loading rate limit will be specified in the COC.

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13. Additional Final Effluent Limitations for Tetrachloroethylene

This condition is required if specified in the COC. If it is determined by the Department to be necessary to ensure compliance with water quality standards and/or BAT limitations/requirements, the following additional final effluent limitations shall apply, and the discharge shall be limited and monitored by the permittee as specified below.

<u>Parameter</u>	<u>Maximum Limits for Quantity or Loading</u>			<u>Maximum Limits for Quality or Concentration</u>			<u>Monitoring Frequency</u>	<u>Sample Type</u>
	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>		
Influent Monitoring and Reporting								
Tetrachloroethylene	---	---	---	---	(report)	ug/l	Weekly	Grab
Intermediate Stage Monitoring and Reporting								
Tetrachloroethylene	---	---	---	---	(report)	ug/l	Weekly	Grab
Final Effluent Limitations, Monitoring and Reporting								
Tetrachloroethylene	---	---	---	---	5	ug/l	Weekly	Grab

- a. **Monitoring Location**
 Samples and measurements taken in compliance with the monitoring requirements above shall be taken prior to treatment for all influent monitoring and prior to the final treatment for intermediate-stage monitoring (not applicable for air stripper treatment systems), and after treatment but prior to mixing with surface waters of the state or any other waste stream for all effluent monitoring.

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14. Final Effluent Limitations for Trichloroethylene (TCE) and Degradation Products

This condition is required if specified in the COC. If it is determined by the Department to be necessary to ensure compliance with water quality standards and/or BAT limitations/requirements, the following additional final effluent limitations shall apply, and the discharge shall be limited and monitored by the permittee as specified below.

<u>Parameter</u>	<u>Maximum Limits for Quantity or Loading</u>			<u>Maximum Limits for Quality or Concentration</u>			<u>Monitoring Frequency</u>	<u>Sample Type</u>
	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>		
Influent Monitoring and Reporting								
TCE	---	---	---	---	(report)	ug/l	Weekly	Grab
1,1-Dichloroethene	---	---	---	---	(report)	ug/l	Weekly	Grab
Trans-1,2-Dichloroethene	---	---	---	---	(report)	ug/l	Weekly	Grab
Cis-1,2-Dichloroethene	---	---	---	---	(report)	ug/l	Weekly	Grab
Vinyl Chloride	---	---	---	---	(report)	ug/l	Weekly	Grab
Intermediate Stage Monitoring and Reporting								
TCE	---	---	---	---	(report)	ug/l	Weekly	Grab
1,1-Dichloroethene	---	---	---	---	(report)	ug/l	Weekly	Grab
Trans-1,2-Dichloroethene	---	---	---	---	(report)	ug/l	Weekly	Grab
Cis-1,2-Dichloroethene	---	---	---	---	(report)	ug/l	Weekly	Grab
Vinyl Chloride	---	---	---	---	(report)	ug/l	Weekly	Grab
Final Effluent Limitations, Monitoring, and Reporting								
TCE	---	---	---	---	5	ug/l	Weekly	Grab
1,1-Dichloroethene	---	---	---	---	5	ug/l	Weekly	Grab
Trans-1,2-Dichloroethene	---	---	---	---	5	ug/l	Weekly	Grab
Cis-1,2-Dichloroethene	---	---	---	---	5	ug/l	Weekly	Grab
Vinyl Chloride	---	---	---	---	3	ug/l	Weekly	Grab

- a. **Monitoring Location**
 Samples and measurements taken in compliance with the monitoring requirements above shall be taken prior to treatment for all influent monitoring and prior to the final treatment for intermediate-stage monitoring (not applicable for air stripper treatment systems), and after treatment but prior to mixing with surface waters of the state or any other waste stream for all effluent monitoring.

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15. Final Effluent Limitations for 1,1,1-Trichloroethane and 1,1-Dichloroethane

This condition is required if specified in the COC. If it is determined by the Department to be necessary to ensure compliance with water quality standards and/or BAT limitations/requirements, the following additional final effluent limitations shall apply, and the discharge shall be limited and monitored by the permittee as specified below.

<u>Parameter</u>	<u>Maximum Limits for Quantity or Loading</u>			<u>Maximum Limits for Quality or Concentration</u>			<u>Monitoring Frequency</u>	<u>Sample Type</u>
	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>		
Influent Monitoring and Reporting								
1,1,1-Trichloroethane	---	---	---	---	(report)	ug/l	Weekly	Grab
1,1-Dichloroethane	---	---	---	---	(report)	ug/l	Weekly	Grab
Intermediate Stage Monitoring and Reporting								
1,1,1-Trichloroethane	---	---	---	---	(report)	ug/l	Weekly	Grab
1,1-Dichloroethane	---	---	---	---	(report)	ug/l	Weekly	Grab
Final Effluent Limitations, Monitoring, and Reporting								
1,1,1-Trichloroethane	---	---	---	---	5	ug/l	Weekly	Grab
1,1-Dichloroethane	---	---	---	---	5	ug/l	Weekly	Grab

- a. **Monitoring Location**
 Samples and measurements taken in compliance with the monitoring requirements above shall be taken prior to treatment for all influent monitoring and prior to the final treatment for intermediate-stage monitoring (not applicable for air stripper treatment systems), and after treatment but prior to mixing with waters of the state or any other waste stream for all effluent monitoring.

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16. Final Effluent Limitations for Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS)

This condition is required if specified in the COC. If it is determined by the Department to be necessary to ensure compliance with water quality standards and/or BAT limitations/requirements, the following additional final effluent limitations shall apply, and the discharge shall be limited and monitored by the permittee as specified below.

Parameter	Maximum Limits for Quantity or Loading			Maximum Limits for Quality or Concentration			Monitoring Frequency	Sample Type
	Monthly	Daily	Units	Monthly	Daily	Units		
Influent Monitoring and Reporting								
Perfluorooctanoic Acid (PFOA)	---	---	---	---	(report)	ng/l	Weekly	Grab
Perfluorooctane Sulfonate (PFOS)	---	---	---	---	(report)	ng/l	Weekly	Grab
Perfluorobutanesulfonic Acid (PFBS)	---	---	---	---	(report)	ng/l	Weekly	Grab
Perfluorononanoic Acid (PFNA)	---	---	---	---	(report)	ng/l	Weekly	Grab
Perfluorohexanesulphonic Acid (PFHxS)	---	---	---	---	(report)	ng/l	Weekly	Grab
Intermediate Stage Monitoring and Reporting								
PFOA	---	---	---	---	(report)	ng/l	Weekly	Grab
PFOS	---	---	---	---	(report)	ng/l	Weekly	Grab
PFBS	---	---	---	---	(report)	ng/l	Weekly	Grab
PFNA	---	---	---	---	(report)	ng/l	Weekly	Grab
PFHxS	---	---	---	---	(report)	ng/l	Weekly	Grab
Final Effluent Limitations, Monitoring, and Reporting								
PFOA	---	---	---	---	40	ng/l	Weekly	Grab
PFOS	---	---	---	12	15	ng/l	Weekly	Grab
PFBS	---	---	---	---	250	ng/l	Weekly	Grab
PFNA	---	---	---	30	(report)	ng/l	Weekly	Grab
PFHxS	---	---	---	210	(report)	ng/l	Weekly	Grab

- a. Monitoring Location
 Samples and measurements taken in compliance with the monitoring requirements above shall be taken prior to treatment for all influent monitoring and prior to the final treatment for intermediate-stage monitoring (not applicable for air stripper treatment systems), and after treatment but prior to mixing with waters of the state or any other waste stream for all effluent monitoring.

- b. Data Reporting Requirements for Perfluoroalkyl and Polyfluoroalkyl Substances
On or before the 20th day of the month following each month of the authorized discharge period, the permittee shall submit to the Department the complete laboratory analysis of each sample analyzed for PFAS during the month. This reporting requirement is in addition to required DMR reporting for PFAS. Submittals shall be made via the MiEnviro Portal using the form PFAS Monitoring Report. Until EPA Method 1633 is promulgated, the complete laboratory analysis of each PFAS sample shall constitute the first 28 analytes identified on the PFAS Monitoring Report. Following promulgation of EPA Method 1633, the complete laboratory analysis of each PFAS sample shall constitute all 40 analytes identified on the PFAS Monitoring Report. The Department may modify these requirements upon notification to the permittee.

PART I

Section A. Limitations and Monitoring Requirements

17. Additional Final Effluent Limitations During Air Stripper and/or Well Screen Cleaning

During the period beginning on the effective date of this permit and the effective date of an individual COC and lasting until the expiration of this permit or termination of the individual COC, the permittee is authorized to discharge treated air stripper and/or well screen cleaning water to the surface waters of the state when chlorine or acid is used to clean the air stripper and/or purge well screens. Such discharge shall be limited and monitored by the permittee as specified below.

<u>Parameter</u>	<u>Maximum Limits for Quantity or Loading</u>			<u>Maximum Limits for Quality or Concentration</u>			<u>Monitoring Frequency</u>	<u>Sample Type</u>
	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>	<u>Monthly</u>	<u>Daily</u>	<u>Units</u>		
Total Residual Chlorine	---	---	---	---	38	ug/l	Daily	Grab
pH	---	---	---	<u>Minimum Daily</u> 6.5	9.0	S.U.	Daily	Grab

a. **Monitoring Location**
 Samples and measurements taken in compliance with the monitoring requirements above shall be taken after treatment by the systems specified under Parts I.A.1. or I.A.2. but prior to mixing with waters of the state or any other waste stream. For the purpose of reporting on the Daily and Summary tabs of the DMR, when air stripping cleaning or well screen cleaning did not occur for the month, the permittee shall enter *G for the effluent mode. (For purposes of reporting on the Daily tab of the DMR, the permittee shall enter “*G” on the first day of the month only).

b. **Total Residual Chlorine**
 Monitoring for TRC shall be in addition to all other monitoring requirements specified by the individual COC for this discharge. TRC shall be analyzed in accordance with Part II.B.2. of this permit. TRC monitoring is only required during periods of chlorine use and subsequent discharge.

Upon written approval from the Department, the permittee may use a dechlorinating reagent as a water treatment additive, including but not limited to sodium thiosulfate, sodium bisulfite, and sodium sulfite, to achieve applicable TRC limitations. Requests for such approval shall be submitted in accordance with Part I.A.24. of this permit. The quantity of the reagent(s) used shall be limited to 0.6 times the stoichiometric amount of TRC for sodium thiosulfate, 1.5 times the stoichiometric amount of TRC for sodium bisulfite, and 1.8 times the stoichiometric amount of TRC for sodium sulfite. For guidance and example calculations, see the Department’s “Calculator to Determine Stoichiometric Amount of Dechlor Agent,” available at <https://www.Michigan.gov/EGLE/About/Organization/Water-Resources/NPDES/Compliance-Assistance>. TRC samples taken to determine the amount of each reagent to add shall be taken upstream of dechlorination.

c. **Chlorine and/or Acid Use**
 Use of chlorine or acid requires approval as a water treatment additive in accordance with Part I.A.24. of this permit. If chlorine containing wastewaters are treated with granular activated carbon filtration, monitoring for TRC is not required.

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Section A. Limitations and Monitoring Requirements

18. Additional Monitoring

The Department may determine that additional monitoring and/or effluent limitations are necessary to ensure adequate operation of the treatment system and/or to ensure that the discharge will not cause or contribute to a violation of water quality standards. If such a determination is made, the COC will specify these requirements, or the Department will notify the permittee in writing of the additional monitoring requirements.

For short-term discharges, the Department may require more frequent monitoring for the applicable final effluent limitations than the monitoring frequencies specified in Part I.A.1. through Part I.A.16. of this general permit. If more frequent monitoring is required, the monitoring frequency will be specified on the COC.

19. Continuous Monitoring

If continuous monitoring equipment is used and becomes temporarily inoperable, the permittee shall manually obtain a minimum of three (3) equally spaced grab samples/readings within each 24-hour period for the affected parameter(s). On such days, in the comment field on the Daily tab of the DMR, the permittee shall indicate "continuous monitoring system inoperable," the date on which the system is expected to become operable again, and the number of samples/readings obtained during each 24-hour period.

20. Monitoring Frequency Reduction

After steady-state conditions have been achieved and at least 12 months of data have been submitted, the permittee may request, in writing, Department approval for a reduction in monitoring frequency for selected parameters. This request shall contain an explanation as to why the reduced monitoring is appropriate. For short-term discharges, the Department may allow a shorter timeframe for requesting a reduced monitoring frequency for some parameters. If this is the case, the time frame will be indicated on the COC. Upon receipt of written approval and consistent with such approval, the permittee may reduce the monitoring frequency specified in this permit. Parameter-specific considerations are set forth below.

Monitoring for BETX, DRO, PAHs, MTBE, chlorinated VOCs under Parts I.A.13, Part I.A.14., and Part I.A.15, and PFAS may be reduced to a frequency the permittee has demonstrated, in writing, will ensure proper operation of the treatment system and not cause or contribute to a violation of water quality standards. The monitoring frequency for BETX, DRO, PAHs, MTBE, chlorinated VOCs under Parts I.A.13, Part I.A.14., and Part I.A.15, and PFAS shall not be reduced to less than monthly.

The monitoring frequency for total lead, total phosphorus (for facilities not covered under Part I.A.4., Final Effluent Limitations for Biological Treatment Systems, or Part I.A.7., Additional Final Effluent Limitations for In-Situ Bio-Remediation), dissolved oxygen, and pH may be reduced upon written demonstration by the permittee that these parameters consistently meet water quality standards.

On-site equipment inspection and outfall observation shall not be reduced to less than 2x monthly. Proper installation and operation of continuous remote monitoring equipment in conjunction with on-site visual inspection performed by qualified personnel shall be considered by the Department when evaluating requests for monitoring frequency reductions for equipment inspection and outfall observation.

Monitoring for total suspended solids, CBOD5, ammonia nitrogen, total phosphorus (for facilities covered under Part I.A.4., Final Effluent Limitations for Biological Treatment Systems, or Part I.A.7., Additional Final Effluent Limitations for In-Situ Bio-Remediation), and hydrogen peroxide shall not be reduced.

Reissuance or modification of the facility's individual COC or reissuance or modification of this permit shall not affect previously approved monitoring frequency reductions unless the permittee is provided written notification of such changes from the Department. The Department may revoke any approval for reduced monitoring at any time upon notification to the permittee.

PART I**Section A. Limitations and Monitoring Requirements****21. Authorization to Discharge**

Coverage under this permit does not confer approval to discharge to any ditch, storm sewer, private property, or other method of routing the effluent from the site of origin to the waters of the state. Nor does issuance of this permit or an individual COC constitute approval by the Department for a groundwater remediation plan. It shall be the permittee's responsibility to seek, apply for, and obtain any additional authorizations necessary to initiate the discharge proposed in the permittee's application. The authorization to discharge under an individual COC is based upon the permittee providing treatment as identified in the application. If the permittee proposes to modify the treatment system, the permittee shall notify the Department. The Department may request that the permittee submit a modification request to amend the treatment system described in the application. Upon review of the proposed changes, the Department may terminate the individual COC, modify the COC, or require an individual NPDES permit for the proposed discharge.

22. Aquifer Testing, Monitoring, and Reporting

All limitations, terms, conditions, and treatment requirements of this permit shall apply during periods of short-term aquifer testing. During aquifer testing, additional monitoring and reporting may be required by the Department to ensure that the discharge is meeting the applicable BAT requirements and water quality standards.

23. Discharge to Groundwaters

A facility covered under this permit is a known source of groundwater pollution. This permit does not authorize any discharge to the groundwaters of the state or venting of contaminated groundwaters to the surface waters of the state, nor does it constitute a release of liability for any groundwater contamination at or around the site. The state reserves its rights to seek remedies to abate any groundwater contamination.

24. Request for Approval to Use Water Treatment Additives

This permit does not authorize the use of any water treatment additive without prior written approval from the Department. Such approval is authorized under separate correspondence. Water treatment additives include any materials that are added to water used at the facility, or to wastewater generated by the facility, to condition or treat the water. Permittees proposing to use water treatment additives, including a proposed increased concentration of a previously approved water treatment additive, shall submit a request for approval via the Department's MiEnviro Portal system. The MiEnviro Portal website is located at <https://MiEnviro.Michigan.gov/ncore/>. Instructions for submitting such a request may be obtained at <https://www.Michigan.gov/EGLNPDES> (near the bottom of that page, click on one or both of the links located under the Water Treatment Additives banner). Additional monitoring and reporting may be required as a condition of approval to use the water treatment additive.

A request for approval to use water treatment additives shall include all of the following usage and discharge information for each water treatment additive proposed to be used:

- a. The Safety Data Sheet (SDS);
- b. Ingredient information, including the name of each ingredient, CAS number for each ingredient, and fractional content by weight for each ingredient;
- c. The proposed water treatment additive discharge concentration with supporting calculations;
- d. The discharge frequency (i.e., number of hours per day and number of days per year);
- e. The outfall(s) and monitoring point(s) from which the water treatment additive is to be discharged;
- f. The type of removal treatment, if any, that the water treatment additive receives prior to discharge;
- g. The water treatment additive's function (i.e., microbiocide, flocculant, etc.);

PART I**Section A. Limitations and Monitoring Requirements**

- h. The SDS shall include a 48-hour LC50 or EC50 for a North American freshwater planktonic crustacean (either *Ceriodaphnia sp.*, *Daphnia sp.*, or *Simocephalus sp.*). The results shall be based on the whole water treatment additive, shall not be results based on a similar product, and shall not be estimated; and
- i. The SDS shall include the results of a toxicity test for one (1) other North American freshwater aquatic species (other than a planktonic crustacean) that meets a minimum requirement of R 323.1057(2) of the Water Quality Standards. The results shall be based on the whole water treatment additive, shall not be results based on a similar product, and shall not be estimated. Examples of tests that would meet this requirement include a 96-hour LC50 for rainbow trout, bluegill, or fathead minnow.

PART I

Section A. Limitations and Monitoring Requirements

25. Quantification Levels and Analytical Methods for Selected Parameters

Maximum acceptable quantification levels (QLs) are specified for selected parameters in the table below. These QLs apply to all monitoring conducted in compliance with this permit if and when the parameters specified herein are monitored. This includes monitoring conducted to meet the requirements of the application for permit reissuance. These QLs shall be considered the maximum acceptable unless a higher QL is appropriate because of sample matrix interference. Justification for higher QLs shall be submitted to the Department **within 30 days** of such determination.

Where necessary to help ensure that the QLs specified herein can be achieved, analytical methods may also be specified in the table below. The sampling procedures, preservation and handling, and analytical protocol for all monitoring conducted in compliance with this permit, including monitoring conducted to meet the requirements of the application for permit reissuance, shall be in accordance with the methods specified herein, or in accordance with Part II.B.2. of this permit if no method is specified herein, unless an alternate method is approved by the Department. The Department will consider only alternate methods that meet the requirements of Part II.B.2. and whose QLs are at least as sensitive (i.e., low) as those specified herein. **Not all QLs are expressed in the same units in the table below.** The table is continued on the following page:

Parameter	QL	Units	Analytical Method
1,2-Diphenylhydrazine (as Azobenzene)	3.0	ug/l	
2,4,6-Trichlorophenol	5.0	ug/l	
2,4-Dinitrophenol	19	ug/l	
3,3'-Dichlorobenzidine	1.5	ug/l	
4-Chloro-3-Methylphenol	7.0	ug/l	
4,4'-DDD	0.01	ug/l	
4,4'-DDE	0.01	ug/l	
4,4'-DDT	0.01	ug/l	
Acrylonitrile	1.0	ug/l	
Aldrin	0.01	ug/l	
Alpha-Endosulfan	0.01	ug/l	
Alpha-Hexachlorocyclohexane	0.01	ug/l	
Antimony, Total	1	ug/l	
Arsenic, Total	1	ug/l	
Barium, Total	5	ug/l	
Benzidine	0.1	ug/l	
Beryllium, Total	1	ug/l	
Beta-Endosulfan	0.01	ug/l	
Beta-Hexachlorocyclohexane	0.01	ug/l	
Bis (2-Chloroethyl) Ether	1.0	ug/l	
Bis (2-Ethylhexyl) Phthalate	5.0	ug/l	
Boron, Total	20	ug/l	
Cadmium, Total	0.2	ug/l	
Chlordane	0.01	ug/l	
Chloride	1.0	mg/l	
Chromium, Hexavalent	5	ug/l	
Chromium, Total	10	ug/l	
Copper, Total	1	ug/l	
Cyanide, Available	2	ug/l	EPA Method OIA 1677
Cyanide, Total	5	ug/l	
Delta-Hexachlorocyclohexane	0.01	ug/l	

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Parameter	QL	Units	Analytical Method
Dieldrin	0.01	ug/l	
Di-N-Butyl Phthalate	9.0	ug/l	
Endosulfan Sulfate	0.01	ug/l	
Endrin	0.01	ug/l	
Endrin Aldehyde	0.01	ug/l	
Fluoranthene	1.0	ug/l	
Heptachlor	0.01	ug/l	
Heptachlor Epoxide	0.01	ug/l	
Hexachlorobenzene	0.01	ug/l	
Hexachlorobutadiene	0.01	ug/l	
Hexachlorocyclopentadiene	0.01	ug/l	
Hexachloroethane	5.0	ug/l	
Lead, Total	1	ug/l	
Lindane	0.01	ug/l	
Lithium, Total	10	ug/l	
Mercury, Total	0.5	ng/l	EPA Method 1631E
Nickel, Total	5	ug/l	
PCB-1016	0.1	ug/l	
PCB-1221	0.1	ug/l	
PCB-1232	0.1	ug/l	
PCB-1242	0.1	ug/l	
PCB-1248	0.1	ug/l	
PCB-1254	0.1	ug/l	
PCB-1260	0.1	ug/l	
Pentachlorophenol	1.8	ug/l	
Perfluorooctanesulfonic acid (PFOS)	2.0	ng/l	Until one or more methods are promulgated by the USEPA for the analysis of PFAS in wastewater in 40 CFR Part 136, analyses may be performed using EPA Method 1633 or another method of analysis that achieves required quantification levels. Once the USEPA promulgates one or more methods for the analysis of PFAS in wastewater, only promulgated methods may be used for aqueous analysis for compliance determination with Part 31 of the NREPA.
Perfluorooctanoic acid (PFOA)			
Perfluorobutanesulfonic acid (PFBS)			
Perfluorononanoic acid (PFNA)			
Perfluorohexanesulfonic acid (PFHxS)			
Phenanthrene	1.0	ug/l	
Phosphorus (as P), Total	10	ug/l	
Selenium, Total	1.0	ug/l	
Silver, Total	0.5	ug/l	
Strontium, Total	1000	ug/l	
Sulfate	2.0	mg/l	
Sulfide, Total	20	ug/l	
Thallium, Total	1	ug/l	
Toxaphene	0.1	ug/l	
Vinyl Chloride	1.0	ug/l	
Zinc, Total	10	ug/l	

PART I

Section A. Limitations and Monitoring Requirements

26. Total Maximum Daily Load (TMDL)

The Department has determined that the limitations within this permit meet the wasteload allocation established in the applicable TMDL for pollutants in this discharge. If additional control measures are necessary, the Department will notify the permittee to implement control measures and reduce pollutant loadings or concentrations to consistently meet the assigned wasteload allocation.

27. Facility Contact

The "Facility Contact" was specified in the application. The permittee may replace the facility contact at any time and shall notify the Department in writing **within 10 days** after replacement (including the name, address and telephone number of the new facility contact).

- a. The facility contact shall be (or a duly authorized representative of this person):
 - for a corporation, a principal executive officer of at least the level of vice president; or a designated representative if the representative is responsible for the overall operation of the facility from which the discharge originates, as described in the permit application or other NPDES form,
 - for a partnership, a general partner,
 - for a sole proprietorship, the proprietor, or
 - for a municipal, state, or other public facility, either a principal executive officer, the mayor, village president, city or village manager or other duly authorized employee.
- b. A person is a duly authorized representative only if:
 - the authorization is made in writing to the Department by a person described in paragraph a. of this section; and
 - the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the facility (a duly authorized representative may thus be either a named individual or any individual occupying a named position).

Nothing in this section releases the permittee from properly submitting reports and forms as required by law.

28. Expiration and Reissuance

On or before **October 1, 2029**, a permittee seeking continued authorization to discharge under this permit beyond the permit's expiration date shall submit to the Department an application for reissuance via the Department's MiEnviro Portal system. The MiEnviro Portal website is located at <https://MiEnviro.Michigan.gov/ncore/>. Without a timely application for reissuance, the permittee's authorization to discharge will expire on **April 1, 2030**. With a timely application for reissuance, the permittee shall continue to be subject to the terms and conditions of the expired permit until the Department takes action on the application, unless this permit is terminated or revoked.

If this permit is terminated or revoked, the Department will notify the permittee in writing and all authorizations to discharge under the permit shall expire on the date of termination or revocation. If this permit is modified, the Department will notify the permittee in writing of any required action. Upon the effective date of the modified permit, the permittee shall be subject to the terms and conditions of the modified permit, unless the Department notifies the permittee otherwise.

If the discharge authorized under this permit is terminated, the permittee shall submit to the Department an NPDES Permit Notice of Termination request via MiEnviro Portal at <https://MiEnviro.Michigan.gov/ncore/>.

PART I**Section A. Limitations and Monitoring Requirements****29. Requirement to Obtain Individual Permit**

The Department may require any person who is authorized to discharge, by a COC and this permit, to apply for and obtain an individual NPDES permit if any of the following circumstances apply:

- a. the discharger is a significant contributor to pollution as determined by the Department on a case-by-case basis;
- b. the discharger is not complying or has not complied with the conditions of this permit;
- c. a change has occurred in the availability of demonstrated technology or practices for the control or abatement of waste applicable to the point source discharge;
- d. effluent standards and limitations are promulgated for point source discharges subject to this permit; and/or
- e. the Department determines that the criteria under which the COC was issued no longer apply.

Any person may request the Department to take action pursuant to the provisions of Rule 2191 of the Part 21 Rules, Wastewater Discharge Permits, promulgated under Part 31 of the NREPA (R 323.2191 of the Michigan Administrative Code).

PART II

Section A. Definitions

Part II may include terms and /or conditions not applicable to discharges covered under this permit.

Acute toxic unit (TUA) means 100/LC50 where the LC50 is determined from a whole effluent toxicity (WET) test which produces a result that is statistically or graphically estimated to be lethal to 50% of the test organisms.

Annual monitoring frequency refers to a calendar year beginning on January 1 and ending on December 31. When required by this permit, an analytical result, reading, value or observation shall be reported for that period if a discharge occurs during that period.

Authorized public agency means a state, local, or county agency that is designated pursuant to the provisions of Section 9110 of Part 91, Soil and Sedimentation Control, of the NREPA, to implement soil erosion and sedimentation control requirements with regard to construction activities undertaken by that agency.

Best management practices (BMPs) means structural devices or nonstructural practices that are designed to prevent pollutants from entering into storm water, to direct the flow of storm water, or to treat polluted storm water.

Bioaccumulative chemical of concern (BCC) means a chemical which, upon entering the surface waters, by itself or as its toxic transformation product, accumulates in aquatic organisms by a human health bioaccumulation factor of more than 1000 after considering metabolism and other physiochemical properties that might enhance or inhibit bioaccumulation. The human health bioaccumulation factor shall be derived according to R 323.1057(5). Chemicals with half-lives of less than 8 weeks in the water column, sediment, and biota are not BCCs. The minimum bioaccumulation concentration factor (BAF) information needed to define an organic chemical as a BCC is either a field-measured BAF or a BAF derived using the biota-sediment accumulation factor (BSAF) methodology. The minimum BAF information needed to define an inorganic chemical as a BCC, including an organometal, is either a field-measured BAF or a laboratory-measured bioconcentration factor (BCF). The BCCs to which these rules apply are identified in Table 5 of R 323.1057 of the Water Quality Standards.

Biosolids are the solid, semisolid, or liquid residues generated during the treatment of sanitary sewage or domestic sewage in a treatment works. This includes, but is not limited to, scum or solids removed in primary, secondary, or advanced wastewater treatment processes and a derivative of the removed scum or solids.

Bulk biosolids means biosolids that are not sold or given away in a bag or other container for application to a lawn or home garden.

CAFO means concentrated animal feeding operation.

Certificate of Coverage (COC) is a document, issued by the Department, which authorizes a discharge under a general permit.

Chronic toxic unit (TUC) means 100/MATC or 100/IC25, where the maximum acceptable toxicant concentration (MATC) and IC25 are expressed as a percent effluent in the test medium.

Class B biosolids refers to material that has met the Class B pathogen reduction requirements or equivalent treatment by a Process to Significantly Reduce Pathogens (PSRP) in accordance with the Part 24 Rules, Land Application of Biosolids, promulgated under Part 31 of the NREPA. Processes include aerobic digestion, composting, anaerobic digestion, lime stabilization and air drying.

Combined sewer system is a sewer system in which storm water runoff is combined with sanitary wastes.

Composite sample is a sample collected over time, either by continuous sampling or by mixing discrete samples. A composite sample represents the average wastewater characteristics present during the

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Section A. Definitions

compositing period. Various methods for compositing are available and are based on either time or flow-proportioning, the choice of which will depend on the permit requirements.

Continuous monitoring refers to sampling/readings that occur at regular and consistent intervals throughout a 24-hour period and at a frequency sufficient to capture data that are representative of the discharge. The maximum acceptable interval between samples/readings shall be one (1) hour.

Daily concentration

FOR PARAMETERS OTHER THAN pH, DISSOLVED OXYGEN, TEMPERATURE, AND CONDUCTIVITY – Daily concentration is the sum of the concentrations of the individual samples of a parameter taken within a calendar day divided by the number of samples taken within that calendar day. The daily concentration will be used to determine compliance with any maximum and minimum daily concentration limitations. For guidance and examples showing how to report and perform calculations using results below quantification levels, see the document entitled “Reporting Results Below Quantification,” available at <https://www.Michigan.gov/-/Media/Project/Websites/EGL/EGLE/Documents/Programs/WRD/MiEnviro/Results-Below-Quantification.pdf>.

FOR pH, DISSOLVED OXYGEN, TEMPERATURE, AND CONDUCTIVITY – The daily concentration used to determine compliance with maximum daily pH, temperature, and conductivity limitations is the highest pH, temperature, and conductivity readings obtained within a calendar day. The daily concentration used to determine compliance with minimum daily pH and dissolved oxygen limitations is the lowest pH and dissolved oxygen readings obtained within a calendar day.

Daily loading is the total discharge by weight of a parameter discharged during any calendar day. This value is calculated by multiplying the daily concentration by the total daily flow and by the appropriate conversion factor. The daily loading will be used to determine compliance with any maximum daily loading limitations. When required by the permit, report the maximum calculated daily loading for the month in the “MAXIMUM” column under “QUANTITY OR LOADING” on the DMRs.

Daily monitoring frequency refers to a 24-hour day. When required by this permit, an analytical result, reading, value or observation shall be reported for that period if a discharge occurs during that period.

Department means the Michigan Department of Environment, Great Lakes, and Energy.

Detection level means the lowest concentration or amount of the target analyte that can be determined to be different from zero by a single measurement at a stated level of probability.

Discharge means the addition of any waste, waste effluent, wastewater, pollutant, or any combination thereof to any surface water of the state.

EC₅₀ means a statistically or graphically estimated concentration that is expected to cause 1 or more specified effects in 50% of a group of organisms under specified conditions.

Fecal coliform bacteria monthly

FOR WWSLs THAT COLLECT AND STORE WASTEWATER AND ARE AUTHORIZED TO DISCHARGE ONLY IN THE SPRING AND/OR FALL ON AN INTERMITTENT BASIS – Fecal coliform bacteria monthly is the geometric mean of all daily concentrations determined during a discharge event. Days on which no daily concentration is determined shall not be used to determine the calculated monthly value. The calculated monthly value will be used to determine compliance with the maximum monthly fecal coliform bacteria limitations. When required by the permit, report the calculated monthly value in the “AVERAGE” column under “QUALITY OR CONCENTRATION” on the DMR. If the period in which the discharge event occurred was partially in each of two months, the calculated monthly value shall be reported on the DMR of the month in which the last day of discharge occurred.

FOR ALL OTHER DISCHARGES – Fecal coliform bacteria monthly is the geometric mean of all daily concentrations determined during a reporting month. Days on which no daily concentration is determined shall

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not be used to determine the calculated monthly value. The calculated monthly value will be used to determine compliance with the maximum monthly fecal coliform bacteria limitations. When required by the permit, report the calculated monthly value in the "AVERAGE" column under "QUALITY OR CONCENTRATION" on the DMR.

Fecal coliform bacteria 7-day

FOR WWSLs THAT COLLECT AND STORE WASTEWATER AND ARE AUTHORIZED TO DISCHARGE ONLY IN THE SPRING AND/OR FALL ON AN INTERMITTENT BASIS – Fecal coliform bacteria 7-day is the geometric mean of the daily concentrations determined during any 7 consecutive days of discharge during a discharge event. If the number of daily concentrations determined during the discharge event is less than 7 days, the number of actual daily concentrations determined shall be used for the calculation. Days on which no daily concentration is determined shall not be used to determine the value. The calculated 7-day value will be used to determine compliance with the maximum 7-day fecal coliform bacteria limitations. When required by the permit, report the maximum calculated 7-day geometric mean value for the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs. If the 7-day period was partially in each of two months, the value shall be reported on the DMR of the month in which the last day of discharge occurred.

FOR ALL OTHER DISCHARGES – Fecal coliform bacteria 7-day is the geometric mean of the daily concentrations determined during any 7 consecutive days in a reporting month. If the number of daily concentrations determined is less than 7, the actual number of daily concentrations determined shall be used for the calculation. Days on which no daily concentration is determined shall not be used to determine the value. The calculated 7-day value will be used to determine compliance with the maximum 7-day fecal coliform bacteria limitations. When required by the permit, report the maximum calculated 7-day geometric mean for the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs. The first calculation shall be made on day 7 of the reporting month, and the last calculation shall be made on the last day of the reporting month.

Flow-proportioned composite sample is a composite sample in which either a) the volume of each portion of the composite is proportional to the effluent flow rate at the time that portion is obtained; or b) a constant sample volume is obtained at varying time intervals proportional to the effluent flow rate.

General permit means an NPDES permit authorizing a category of similar discharges.

Geometric mean is the average of the logarithmic values of a base 10 data set, converted back to a base 10 number.

Grab sample is a single sample taken at neither a set time nor flow.

IC₂₅ means the toxicant concentration that would cause a 25% reduction in a nonquantal biological measurement for the test population.

Illicit connection means a physical connection to a municipal separate storm sewer system that primarily conveys non-storm water discharges other than uncontaminated groundwater into the storm sewer; or a physical connection not authorized or permitted by the local authority, where a local authority requires authorization or a permit for physical connections.

Illicit discharge means any discharge to, or seepage into, a municipal separate storm sewer system that is not composed entirely of storm water or uncontaminated groundwater. Illicit discharges include non-storm water discharges through pipes or other physical connections; dumping of motor vehicle fluids, household hazardous wastes, domestic animal wastes, or litter; collection and intentional dumping of grass clippings or leaf litter; or unauthorized discharges of sewage, industrial waste, restaurant wastes, or any other non-storm water waste directly into a separate storm sewer.

Individual permit means a site-specific NPDES permit.

PART II

Section A. Definitions

Inlet means a catch basin, roof drain, conduit, drain tile, retention pond riser pipe, sump pump, or other point where storm water or wastewater enters into a closed conveyance system prior to discharge off site or into waters of the state.

Interference is a discharge which, alone or in conjunction with a discharge or discharges from other sources, both: 1) inhibits or disrupts a POTW, its treatment processes or operations, or its sludge processes, use or disposal; and 2) therefore, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or, of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent state or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including Title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including state regulations contained in any state sludge management plan prepared pursuant to Subtitle D of the SWDA), the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act. [This definition does not apply to sample matrix interference].

Land application means spraying or spreading biosolids or a biosolids derivative onto the land surface, injecting below the land surface, or incorporating into the soil so that the biosolids or biosolids derivative can either condition the soil or fertilize crops or vegetation grown in the soil.

LC₅₀ means a statistically or graphically estimated concentration that is expected to be lethal to 50% of a group of organisms under specified conditions.

Maximum acceptable toxicant concentration (MATC) means the concentration obtained by calculating the geometric mean of the lower and upper chronic limits from a chronic test. A lower chronic limit is the highest tested concentration that did not cause the occurrence of a specific adverse effect. An upper chronic limit is the lowest tested concentration which did cause the occurrence of a specific adverse effect and above which all tested concentrations caused such an occurrence.

Maximum extent practicable means implementation of best management practices by a public body to comply with an approved storm water management program as required by a national permit for a municipal separate storm sewer system, in a manner that is environmentally beneficial, technically feasible, and within the public body's legal authority.

MBTU/hr means million British Thermal Units per hour.

MGD means million gallons per day.

Monthly concentration is the sum of the daily concentrations determined during a reporting period divided by the number of daily concentrations determined. The calculated monthly concentration will be used to determine compliance with any maximum monthly concentration limitations. Days with no discharge shall not be used to determine the value. When required by the permit, report the calculated monthly concentration in the "AVERAGE" column under "QUALITY OR CONCENTRATION" on the DMR. For guidance and examples showing how to report and perform calculations using results below quantification levels, see the document entitled "Reporting Results Below Quantification," available at <https://www.Michigan.gov/-/Media/Project/Websites/EGLE/Documents/Programs/WRD/MiEnviro/Results-Below-Quantification.pdf>.

For minimum percent removal requirements, the monthly influent concentration and the monthly effluent concentration shall be determined. The calculated monthly percent removal, which is equal to 100 times the quantity [1 minus the quantity (monthly effluent concentration divided by the monthly influent concentration)], shall be reported in the "MINIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs.

Monthly loading is the sum of the daily loadings of a parameter divided by the number of daily loadings determined during a reporting period. The calculated monthly loading will be used to determine compliance with any maximum monthly loading limitations. Days with no discharge shall not be used to determine the value.

PART II

Section A. Definitions

When required by the permit, report the calculated monthly loading in the "AVERAGE" column under "QUANTITY OR LOADING" on the DMR.

Monthly monitoring frequency refers to a calendar month. When required by this permit, an analytical result, reading, value or observation shall be reported for that period if a discharge occurs during that period.

Municipal separate storm sewer means a conveyance or system of conveyances designed or used for collecting or conveying storm water which is not a combined sewer and which is not part of a POTW as defined in the Code of Federal Regulations at 40 CFR 122.2.

Municipal separate storm sewer system (MS4) means all separate storm sewers that are owned or operated by the United States, a state, city, village, township, county, district, association, or other public body created by or pursuant to state law, having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under state law, such as a sewer district, flood control district, or drainage district, or similar entity, or a designated or approved management agency under Section 208 of the Clean Water Act that discharges to the waters of the state. This term includes systems similar to separate storm sewer systems in municipalities, such as systems at military bases, large hospital or prison complexes, and highways and other thoroughfares. The term does not include separate storm sewers in very discrete areas, such as individual buildings.

National Pretreatment Standards are the regulations promulgated by or to be promulgated by the Federal Environmental Protection Agency pursuant to Section 307(b) and (c) of the Clean Water Act. The standards establish nationwide limits for specific industrial categories for discharge to a POTW.

No observed adverse effect level (NOAEL) means the highest tested dose or concentration of a substance which results in no observed adverse effect in exposed test organisms where higher doses or concentrations result in an adverse effect.

Noncontact cooling water is water used for cooling which does not come into direct contact with any raw material, intermediate product, by-product, waste product or finished product.

Nondomestic user is any discharger to a POTW that discharges wastes other than or in addition to water-carried wastes from toilet, kitchen, laundry, bathing or other facilities used for household purposes.

Nonstructural controls are practices or procedures implemented by employees at a facility to manage storm water or to prevent contamination of storm water.

NPDES means National Pollutant Discharge Elimination System.

Outfall is the location at which a point source discharge first enters a surface water of the state.

Part 91 agency means an agency that is designated by a county board of commissioners pursuant to the provisions of Section 9105 of Part 91 of the NREPA; an agency that is designated by a city, village, or township in accordance with the provisions of Section 9106 of Part 91 of the NREPA; or the Department for soil erosion and sedimentation control activities under Part 615, Supervisor of Wells; Part 631, Reclamation of Mining Lands; or Part 632, Nonferrous Metallic Mineral Mining, of the NREPA, pursuant to the provisions of Section 9115 of Part 91 of the NREPA.

Part 91 permit means a soil erosion and sedimentation control permit issued by a Part 91 agency pursuant to the provisions of Part 91 of the NREPA.

Partially treated sewage is any sewage, sewage and storm water, or sewage and wastewater, from domestic or industrial sources that is treated to a level less than that required by the permittee's NPDES permit, or that is not treated to national secondary treatment standards for wastewater, including discharges to surface waters from retention treatment facilities.

PART II

Section A. Definitions

PFAS means perfluoroalkyl and polyfluoroalkyl substances.

Point of discharge is the location of a point source discharge where storm water is discharged directly into a separate storm sewer system.

Point source discharge means a discharge from any discernible, confined, discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, or rolling stock. Changing the surface of land or establishing grading patterns on land will result in a point source discharge where the runoff from the site is ultimately discharged to waters of the state.

Polluting material means any material, in solid or liquid form, identified as a polluting material under the Part 5 Rules, Spillage of Oil and Polluting Materials, promulgated under Part 31 of the NREPA (R 324.2001 through R 324.2009 of the Michigan Administrative Code).

POTW is a publicly owned treatment work.

Predevelopment is the last land use prior to the planned new development or redevelopment.

Pretreatment is reducing the amount of pollutants, eliminating pollutants, or altering the nature of pollutant properties to a less harmful state prior to discharge into a public sewer. The reduction or alteration can be by physical, chemical, or biological processes, process changes, or by other means. Dilution is not considered pretreatment unless expressly authorized by an applicable National Pretreatment Standard for a particular industrial category.

Public (as used in the MS4 individual permit) means all persons who potentially could affect the authorized storm water discharges, including, but not limited to, residents, visitors to the area, public employees, businesses, industries, and construction contractors and developers.

Public body means the United States; the state of Michigan; a city, village, township, county, school district, public college or university, or single-purpose governmental agency; or any other body which is created by federal or state statute or law.

Qualified Personnel means an individual who meets qualifications acceptable to the Department and who is authorized by an Industrial Storm Water Certified Operator to collect the storm water sample.

Qualifying storm event means a precipitation event that results in a measurable amount of precipitation (i.e., a storm event that results in an actual discharge), and that follows the preceding storm event by at least 72 hours (i.e., three days). The 72-hour storm interval does not apply if documentation is provided showing that less than a 72-hour interval is representative for local storm events.

Quantification level means the measurement of the concentration of a contaminant obtained by using a specified laboratory procedure calculated at a specified concentration above the detection level. It is considered the lowest concentration at which a particular contaminant can be quantitatively measured using a specified laboratory procedure for monitoring of the contaminant.

Quarterly monitoring frequency refers to a three-month period, defined as January through March, April through June, July through September, and October through December (or otherwise defined in the permit). When required by this permit, an analytical result, reading, value or observation shall be reported for that period if a discharge occurs during that period.

Regional Administrator is the Region 5 Administrator, U.S. EPA, located at R-19J, 77 W. Jackson Blvd., Chicago, Illinois 60604.

PART II

Section A. Definitions

Regulated area means the permittee's urbanized area, where urbanized area is defined as a place and its adjacent densely populated territory that together have a minimum population of 50,000 people as defined by the United States Bureau of the Census and as determined by the latest available decennial census.

Secondary containment structure means a unit, other than the primary container, in which significant materials are packaged or held, which is required by state or federal law to prevent the escape of significant materials by gravity into sewers, drains, or otherwise directly or indirectly into any sewer system or to the surface waters or groundwaters of the state.

Separate storm sewer system means a system of drainage, including, but not limited to, roads, catch basins, curbs, gutters, parking lots, ditches, conduits, pumping devices, or man-made channels, which is not a combined sewer where storm water mixes with sanitary wastes, and is not part of a POTW.

Significant industrial user is a nondomestic user that: 1) is subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N; or 2) discharges an average of 25,000 gallons per day or more of process wastewater to a POTW (excluding sanitary, noncontact cooling and boiler blowdown wastewater); contributes a process waste stream which makes up five (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 permittee as defined in 40 CFR 403.12(a) on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's treatment plant operation or violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

Significant materials means any material which could degrade or impair water quality, including but not limited to: raw materials; fuels; solvents, detergents, and plastic pellets; finished materials such as metallic products; hazardous substances designated under Section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (see 40 CFR 372.65); any chemical the facility is required to report pursuant to Section 313 of Emergency Planning and Community Right-to-Know Act (EPCRA); polluting materials as identified under the Part 5 Rules (R 324.2001 through R 324.2009 of the Michigan Administrative Code); Hazardous Wastes as defined in Part 111, Hazardous Waste Management, of the NREPA; fertilizers; pesticides; and waste products such as ashes, slag, and sludge that have the potential to be released with storm water discharges.

Significant spills and significant leaks means any release of a polluting material reportable under the Part 5 Rules (R 324.2001 through R 324.2009 of the Michigan Administrative Code).

Special-use area means storm water discharges for which the Department has determined that additional monitoring is needed from: secondary containment structures required by state or federal law; lands on Michigan's List of Sites of Environmental Contamination pursuant to Part 201, Environmental Remediation, of the NREPA; and/or areas with other activities that may contribute pollutants to the storm water.

Stoichiometric means the quantity of a reagent calculated to be necessary and sufficient for a given chemical reaction.

Storm water means storm water runoff, snowmelt runoff, surface runoff and drainage, and non-storm water included under the conditions of this permit.

Storm water discharge point is the location where the point source discharge of storm water is directed to surface waters of the state or to a separate storm sewer. It includes the location of all point source discharges where storm water exits the facility, including outfalls which discharge directly to surface waters of the state, and points of discharge which discharge directly into separate storm sewer systems.

Structural controls are physical features or structures used at a facility to manage or treat storm water.

SWPPP means the Storm Water Pollution Prevention Plan prepared in accordance with this permit.

PART II

Section A. Definitions

Tier I value means a value for aquatic life, human health or wildlife calculated under R 323.1057 of the Water Quality Standards using a tier I toxicity database.

Tier II value means a value for aquatic life, human health or wildlife calculated under R 323.1057 of the Water Quality Standards using a tier II toxicity database.

Total maximum daily loads (TMDLs) are required by the Clean Water Act for waterbodies that do not meet water quality standards. TMDLs represent the maximum daily load of a pollutant that a waterbody can assimilate and meet water quality standards, and an allocation of that load among point sources, nonpoint sources, and a margin of safety.

Toxicity reduction evaluation (TRE) means a site-specific study conducted in a stepwise process designed to identify the causative agents of effluent toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in effluent toxicity.

Water Quality Standards means the Part 4 Water Quality Standards promulgated pursuant to Part 31 of the NREPA, being R 323.1041 through R 323.1117 of the Michigan Administrative Code.

Weekly monitoring frequency refers to a calendar week which begins on Sunday and ends on Saturday. When required by this permit, an analytical result, reading, value, or observation shall be reported for that period if a discharge occurs during that period. If the calendar week begins in one month and ends in the following month, the analytical result, reading, value, or observation shall be reported in the month in which monitoring was conducted.

WWSL is a wastewater stabilization lagoon.

WWSL discharge event is a discrete occurrence during which effluent is discharged to the surface water up to 10 days of a consecutive 14-day period.

3-portion composite sample is a sample consisting of three equal-volume grab samples collected at equal intervals over an 8-hour period.

7-day concentration

FOR WWSLs THAT COLLECT AND STORE WASTEWATER AND ARE AUTHORIZED TO DISCHARGE ONLY IN THE SPRING AND/OR FALL ON AN INTERMITTENT BASIS – The 7-day concentration is the sum of the daily concentrations determined during any 7 consecutive days of discharge during a WWSL discharge event divided by the number of daily concentrations determined. If the number of daily concentrations determined during the WWSL discharge event is less than 7 days, the number of actual daily concentrations determined shall be used for the calculation. The calculated 7-day concentration will be used to determine compliance with any maximum 7-day concentration limitations. When required by the permit, report the maximum calculated 7-day concentration for the WWSL discharge event in the “MAXIMUM” column under “QUALITY OR CONCENTRATION” on the DMR. If the WWSL discharge event was partially in each of two months, the value shall be reported on the DMR of the month in which the last day of discharge occurred.

FOR ALL OTHER DISCHARGES – The 7-day concentration is the sum of the daily concentrations determined during any 7 consecutive days in a reporting month divided by the number of daily concentrations determined. If the number of daily concentrations determined is less than 7, the actual number of daily concentrations determined shall be used for the calculation. The calculated 7-day concentration will be used to determine compliance with any maximum 7-day concentration limitations in the reporting month. When required by the permit, report the maximum calculated 7-day concentration for the month in the “MAXIMUM” column under “QUALITY OR CONCENTRATION” on the DMR. The first 7-day calculation shall be made on day 7 of the reporting month, and the last calculation shall be made on the last day of the reporting month.

PART II

Section A. Definitions

7-day loading

FOR WWSLs THAT COLLECT AND STORE WASTEWATER AND ARE AUTHORIZED TO DISCHARGE ONLY IN THE SPRING AND/OR FALL ON AN INTERMITTENT BASIS – The 7-day loading is the sum of the daily loadings determined during any 7 consecutive days of discharge during a WWSL discharge event divided by the number of daily loadings determined. If the number of daily loadings determined during the WWSL discharge event is less than 7 days, the number of actual daily loadings determined shall be used for the calculation. The calculated 7-day loading will be used to determine compliance with any maximum 7-day loading limitations. When required by the permit, report the maximum calculated 7-day loading for the WWSL discharge event in the “MAXIMUM” column under “QUANTITY OR LOADING” on the DMR. If the WWSL discharge event was partially in each of two months, the value shall be reported on the DMR of the month in which the last day of discharge occurred.

FOR ALL OTHER DISCHARGES – The 7-day loading is the sum of the daily loadings determined during any 7 consecutive days in a reporting month divided by the number of daily loadings determined. If the number of daily loadings determined is less than 7, the actual number of daily loadings determined shall be used for the calculation. The calculated 7-day loading will be used to determine compliance with any maximum 7-day loading limitations in the reporting month. When required by the permit, report the maximum calculated 7-day loading for the month in the “MAXIMUM” column under “QUANTITY OR LOADING” on the DMR. The first 7-day calculation shall be made on day 7 of the reporting month, and the last calculation shall be made on the last day of the reporting month.

12-month rolling average

When required by the permit, the 12-month rolling average is determined by adding the present monthly average result to the preceding 11 monthly average results and dividing the sum by 12. If sufficient data needed to calculate the 12-month rolling average is not yet available, enter “*E” on the monthly DMR until 12 months, or the equivalent of 12 months, of monthly monitoring data have been obtained, then begin reporting the calculated 12-month rolling average as required. If quarterly monitoring requirements apply, quarterly monitoring shall be equivalent to three (3) months of monitoring in calculating the 12-month rolling average. If monitoring more frequent than monthly applies, determine the monthly average result by summing the results of all data obtained in a given month and dividing that sum by the total number of samples taken in that month.

24-hour composite sample is a flow-proportioned composite sample consisting of hourly or more frequent portions that are taken over a 24-hour period and in which the volume of each portion is proportional to the discharge flow rate at the time that portion is taken. A time-proportioned composite sample may be used upon approval from the Department if the permittee demonstrates it is representative of the discharge.

PART II

Section B. Monitoring Procedures

1. Representative Samples

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge.

2. Test Procedures

Test procedures for the analysis of pollutants shall conform to regulations promulgated pursuant to Section 304(h) of the Clean Water Act (40 CFR Part 136 – Guidelines Establishing Test Procedures for the Analysis of Pollutants), unless specified otherwise in this permit. Test procedures used shall be sufficiently sensitive to determine compliance with applicable effluent limitations. For lists of approved test methods, go to <https://www.EPA.gov/CWA-Methods>. Requests to use test procedures not promulgated under 40 CFR Part 136 for pollutant monitoring required by this permit shall be made in accordance with the Alternate Test Procedures regulations specified in 40 CFR 136.4. These requests shall be submitted to the Manager of the Permits Section, Water Resources Division, Michigan Department of Environment, Great Lakes, and Energy, P.O. Box 30458, Lansing, Michigan, 48909-7958. The permittee may use such procedures upon approval.

The permittee shall periodically calibrate and perform maintenance procedures on all analytical instrumentation at intervals to ensure accuracy of measurements. The calibration and maintenance shall be performed as part of the permittee's laboratory Quality Assurance/Quality Control program.

3. Instrumentation

The permittee shall periodically calibrate and perform maintenance procedures on all monitoring instrumentation at intervals to ensure accuracy of measurements.

4. Recording Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information: 1) the exact place, date, and time of measurement or sampling; 2) the person(s) who performed the measurement or sample collection; 3) the dates the analyses were performed; 4) the person(s) who performed the analyses; 5) the analytical techniques or methods used; 6) the date of and person responsible for equipment calibration; and 7) the results of all required analyses.

5. Records Retention

All records and information resulting from the monitoring activities required by this permit, including all records of analyses performed, calibration and maintenance of instrumentation, and recordings from continuous monitoring instrumentation, shall be retained for a minimum of three (3) years, or longer if requested by the Regional Administrator or the Department.

PART II

Section C. Reporting Requirements

1. Start-Up Notification

The permittee shall notify the Department of start-up if one of the following conditions applies and in accordance with the applicable condition:

a. Non-CAFOs

1) If this is an individual permit and the permittee will not discharge during the first 60 days following the effective date of this permit, the permittee shall notify the Department via MiEnviro Portal **within 14 days** following the effective date of this permit, and then again **60 days prior** to commencement of the discharge.

2) If this is a general permit and the permittee will not discharge during the first 60 days following the effective date of the Certificate of Coverage (COC) issued under this general permit, the permittee shall notify the Department via MiEnviro Portal **within 14 days** following the effective date of the COC, and then again **60 days prior** to commencement of the discharge.

b. CAFOs

1) If this is an individual permit and the permittee will not populate with animals during the first 60 days following the effective date of this permit, the permittee shall notify the Department via MiEnviro Portal **within 14 days** following the effective date of this permit, and then again **60 days prior** to populating with animals.

2) If this is a general permit and the permittee will not populate with animals during 60 days following the effective date of the Certificate of Coverage (COC) issued under this general permit, the permittee shall notify the Department via MiEnviro Portal **within 14 days** following the effective date of the COC, and then again **60 days prior** to populating with animals.

2. Submittal Requirements for Self-Monitoring Data

Part 31 of the NREPA (specifically Section 324.3110(7)); and R 323.2155(2) of Part 21, Wastewater Discharge Permits, promulgated under Part 31 of the NREPA, allow the Department to specify the forms to be utilized for reporting the required self-monitoring data. Unless instructed on the effluent limitations page to conduct "Retained Self-Monitoring," the permittee shall submit self-monitoring data via the Department's MiEnviro Portal system.

The permittee shall utilize the information provided on the MiEnviro Portal website, located at <https://MiEnviro.Michigan.gov/ncore/>, to access and submit the electronic forms. Both monthly summary and daily data shall be submitted to the Department no later than the **20th day of the month** following each month of the authorized discharge period(s). The permittee may be allowed to submit the electronic forms after this date if the Department has granted an extension to the submittal date.

3. Retained Self-Monitoring Requirements

If instructed on the effluent limits page (or otherwise authorized by the Department in accordance with the provisions of this permit) to conduct retained self-monitoring, the permittee shall maintain a year-to-date log of retained self-monitoring results and, upon request, provide such log for inspection to the staff of the Department. Retained self-monitoring results are public information and shall be promptly provided to the public upon request.

The permittee shall certify, in writing, to the Department, on or before **January 10 (April 1 for animal feeding operation facilities) of each year**, that: 1) all retained self-monitoring requirements have been complied with and a year-to-date log has been maintained; and 2) the application on which this permit is based still accurately describes the discharge. With this annual certification, the permittee shall submit a summary of the previous year's monitoring data. The summary shall include maximum values for samples to be reported as daily maximums and/or monthly maximums and minimum values for any daily minimum samples.

PART II

Section C. Reporting Requirements

Retained self-monitoring may be denied to a permittee by notification in writing from the Department. In such cases, the permittee shall submit self-monitoring data in accordance with Part II.C.2., above. Such a denial may be rescinded by the Department upon written notification to the permittee. Reissuance or modification of this permit or reissuance or modification of an individual permittee's authorization to discharge shall not affect previous approval or denial for retained self-monitoring unless the Department provides notification in writing to the permittee.

4. Additional Monitoring by Permittee

If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report. Such increased frequency shall also be indicated.

Monitoring required pursuant to Part 41 of the NREPA or Rule 35 of the Mobile Home Park Commission Act, 1987 PA 96, as amended, for assurance of proper facility operation, shall be submitted as required by the Department.

5. Compliance Dates Notification

Within 14 days of every compliance date specified in this permit, the permittee shall submit a written notification to the Department via MiEnviro Portal (<https://MiEnviro.Michigan.gov/ncore/>) indicating whether or not the particular requirement was accomplished. If the requirement was not accomplished, the notification shall include an explanation of the failure to accomplish the requirement, actions taken or planned by the permittee to correct the situation, and an estimate of when the requirement will be accomplished. If a written report is required to be submitted by a specified date and the permittee accomplishes this, a separate written notification is not required.

6. Noncompliance Notification

Compliance with all applicable requirements set forth in the Clean Water Act, Parts 31 and 41 of the NREPA, and related regulations and rules is required. All instances of noncompliance shall be reported as follows:

- a. 24-Hour Reporting
Any noncompliance which may endanger health or the environment (including maximum and/or minimum daily concentration discharge limitation exceedances) shall be reported, verbally, **within 24 hours** from the time the permittee becomes aware of the noncompliance by calling the Department at the number indicated on the second page of this permit (or, if this is a general permit, on the COC). A written submission shall also be provided via MiEnviro Portal (<https://MiEnviro.Michigan.gov/ncore/>) **within five (5) days**.
- b. Other Reporting
The permittee shall report, in writing via MiEnviro Portal (<https://MiEnviro.Michigan.gov/ncore/>), all other instances of noncompliance not described in a. above **at the time monitoring reports are submitted**; or, in the case of retained self-monitoring, **within five (5) days** from the time the permittee becomes aware of the noncompliance.

Reporting shall include: 1) a description of the discharge and cause of noncompliance; and 2) the period of noncompliance, including exact dates and times, or, if not yet corrected, the anticipated time the noncompliance is expected to continue, and the steps taken to reduce, eliminate and prevent recurrence of the noncomplying discharge.

PART II

Section C. Reporting Requirements

7. Spill Notification

The permittee shall immediately report any release of any polluting material which occurs to the surface waters or groundwaters of the state, unless the permittee has determined that the release is not in excess of the threshold reporting quantities specified in the Part 5 Rules (R 324.2001 through R 324.2009 of the Michigan Administrative Code), by calling the Department at the number indicated on the second page of this permit (or, if this is a general permit, on the COC); or, if the notice is provided after regular working hours, by calling the Department's 24-hour Pollution Emergency Alerting System telephone number, 1-800-292-4706.

Within 10 days of the release, the permittee shall submit to the Department via MiEnviro Portal (<https://MiEnviro.Michigan.gov/ncore/>) a full written explanation as to the cause of the release, the discovery of the release, response measures (clean-up and/or recovery) taken, and preventive measures taken or a schedule for completion of measures to be taken to prevent reoccurrence of similar releases.

8. Upset Noncompliance Notification

If a process "upset" (defined as 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) has occurred, the permittee who wishes to establish the affirmative defense of upset shall notify the Department by telephone **within 24 hours** of becoming aware of such conditions; and **within five (5) days**, provide in writing, the following information:

- a. that an upset occurred and that the permittee can identify the specific cause(s) of the upset;
- b. that the permitted wastewater treatment facility was, at the time, being properly operated and maintained (note that 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); and
- c. that the permittee has specified and taken action on all responsible steps to minimize or correct any adverse impact in the environment resulting from noncompliance with this permit.

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.

In any enforcement proceedings, the permittee, seeking to establish the occurrence of an upset, has the burden of proof.

9. Bypass Prohibition and Notification

- a. Bypass Prohibition
Bypass is prohibited, and the Department may take an enforcement action, 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 backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass; and
 - 3) the permittee submitted notices as required under 9.b. or 9.c. below.
- b. Notice of Anticipated Bypass

PART II

Section C. Reporting Requirements

If the permittee knows in advance of the need for a bypass, the permittee shall submit written notification to the Department before the anticipated date of the bypass. This notification shall be submitted **at least 10 days before** the date of the bypass; however, the Department will accept fewer than 10 days advance notice if adequate explanation for this is provided. The notification shall provide information about the anticipated bypass as required by the Department. The Department may approve an anticipated bypass, after considering its adverse effects, if it will meet the three (3) conditions specified in a. above.

c. Notice of Unanticipated Bypass

As soon as possible but no later than 24 hours from the time the permittee becomes aware of the unanticipated bypass, the permittee shall notify the Department by calling the number indicated on the second page of this permit (or, if this is a general permit, on the COC); or, if notification is provided after regular working hours, call the Department's 24-hour Pollution Emergency Alerting System telephone number, 1-800-292-4706.

d. Written Report of Bypass

A written submission shall be provided within five (5) working days of commencing any bypass to the Department, and at additional times as directed by the Department. The written submission shall contain a description of the bypass and its cause; the period of bypass, including exact dates and times, and if the bypass has not been corrected, the anticipated time it is expected to continue; steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass; and other information as required by the Department.

e. 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 ensure efficient operation. These bypasses are not subject to the provisions of 9.a., 9.b., 9.c., and 9.d., above. This provision does not relieve the permittee of any notification responsibilities under Part II.C.11. of this permit.

f. Definitions

- 1) Bypass means the intentional diversion of waste streams from any portion of a treatment facility.
- 2) Severe property damage means 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.

10. Bioaccumulative Chemicals of Concern (BCC)

Consistent with the requirements of R 323.1098 and R 323.1215 of the Michigan Administrative Code, the permittee is prohibited from undertaking any action that would result in a lowering of water quality from an increased loading of a BCC unless an increased use request and antidegradation demonstration have been submitted and approved by the Department.

11. Notification of Changes in Discharge

The permittee shall notify the Department via MiEnviro Portal (<https://MiEnviro.Michigan.gov/ncore/>), as soon as possible but **within no more than 10 days** of knowing, or having reason to believe, that any activity or change has occurred or will occur which would result in the discharge of: 1) detectable levels of chemicals on the current Michigan Critical Materials Register, priority pollutants or hazardous substances set forth in 40 CFR 122.21, Appendix D, or the Pollutants of Initial Focus in the Great Lakes Water Quality Initiative specified in 40 CFR 132.6, Table 6, which were not acknowledged in the application or listed in the application at less than detectable levels; 2) detectable levels of any other chemical not listed in the application or listed at less than detection, for which the application specifically requested information; or 3) any chemical at levels greater than

PART II

Section C. Reporting Requirements

five times the average level reported in the complete application (see the first page of this permit, for the date(s) the complete application was submitted). Any other monitoring results obtained as a requirement of this permit shall be reported in accordance with the compliance schedules.

12. Changes in Facility Operations

Any anticipated action or activity, including but not limited to facility expansion, production increases, or process modification, which will result in new or increased loadings of pollutants to the receiving waters must be reported to the Department by a) submission of an increased use request (application) and all information required under R 323.1098 (Antidegradation) of the Water Quality Standards or b) by written notice if the following conditions are met: 1) the action or activity will not result in a change in the types of wastewater discharged or result in a greater quantity of wastewater than currently authorized by this permit; 2) the action or activity will not result in violations of the effluent limitations specified in this permit; 3) the action or activity is not prohibited by the requirements of Part II.C.10.; and 4) the action or activity will not require notification pursuant to Part II.C.11. Following such written notice, the permit or, if applicable, the facility's COC, may be modified according to applicable laws and rules to specify and limit any pollutant not previously limited.

13. Transfer of Ownership or Control

In the event of any change in ownership or control of facilities from which the authorized discharge emanates, the following requirements apply: Not less than **30 days prior** to the actual transfer of ownership or control – for non-CAFOs, or **within 30 days** of the actual transfer of ownership or control – for CAFOs, the permittee shall submit to the Department via MiEnviro Portal (<https://MiEnviro.Michigan.gov/ncore/>) a written agreement between the current permittee and the new permittee containing: 1) the legal name and address of the new owner; 2) a specific date for the effective transfer of permit responsibility, coverage and liability; and 3) a certification of the continuity of or any changes in operations, wastewater discharge, or wastewater treatment.

If the new permittee is proposing changes in operations, wastewater discharge, or wastewater treatment, the Department may propose modification of this permit in accordance with applicable laws and rules.

14. Operations and Maintenance Manual

For wastewater treatment facilities that serve the public (and are thus subject to Part 41 of the NREPA), Section 4104 of Part 41 and associated Rule 2957 of the Michigan Administrative Code allow the Department to require an Operations and Maintenance (O&M) Manual from the facility. An up-to-date copy of the O&M Manual shall be kept at the facility and shall be provided to the Department upon request. The Department may review the O&M Manual in whole or in part at its discretion and require modifications to it if portions are determined to be inadequate.

At a minimum, the O&M Manual shall include the following information: permit standards; descriptions and operation information for all equipment; staffing information; laboratory requirements; record keeping requirements; a maintenance plan for equipment; an emergency operating plan; safety program information; and copies of all pertinent forms, as-built plans, and manufacturer's manuals.

Certification of the existence and accuracy of the O&M Manual shall be submitted to the Department at least sixty days prior to start-up of a new wastewater treatment facility. Recertification shall be submitted **60 days prior to start-up** of any substantial improvements or modifications made to an existing wastewater treatment facility.

15. Signatory Requirements

All applications, reports, or information submitted to the Department in accordance with the conditions of this permit and that require a signature shall be signed and certified as described in the Clean Water Act and the NREPA.

PART II

Section C. Reporting Requirements

The 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 noncompliance, shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

The NREPA (Section 3115(2)) provides that a person who at the time of the violation knew or should have known that he or she discharged a substance contrary to this part, or contrary to a permit, COC, or order issued or rule promulgated under this part, or who intentionally makes a false statement, representation, or certification in an application for or form pertaining to a permit or COC or in a notice or report required by the terms and conditions of an issued permit or COC, or who intentionally renders inaccurate a monitoring device or record required to be maintained by the Department, is guilty of a felony and shall be fined not less than \$2,500.00 or more than \$25,000.00 for each violation. The court may impose an additional fine of not more than \$25,000.00 for each day during which the unlawful discharge occurred. If the conviction is for a violation committed after a first conviction of the person under this subsection, the court shall impose a fine of not less than \$25,000.00 per day and not more than \$50,000.00 per day of violation. Upon conviction, in addition to a fine, the court in its discretion may sentence the defendant to imprisonment for not more than 2 years or impose probation upon a person for a violation of this part. With the exception of the issuance of criminal complaints, issuance of warrants, and the holding of an arraignment, the circuit court for the county in which the violation occurred has exclusive jurisdiction. However, the person shall not be subject to the penalties of this subsection if the discharge of the effluent is in conformance with and obedient to a rule, order, permit, or COC of the Department. In addition to a fine, the attorney general may file a civil suit in a court of competent jurisdiction to recover the full value of the injuries done to the natural resources of the state and the costs of surveillance and enforcement by the state resulting from the violation.

16. Electronic Reporting

Upon notice by the Department that electronic reporting tools are available for specific reports or notifications, the permittee shall submit electronically via MiEnviro Portal (<https://MiEnviro.Michigan.gov/ncore/>) all such reports or notifications as required by this permit, on forms provided by the Department.

PART II

Section D. Management Responsibilities

1. Duty to Comply

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit, more frequently than, or at a level in excess of, that authorized, shall constitute a violation of the permit.

It is the duty of the permittee to comply with all the terms and conditions of this permit. Any noncompliance with the Effluent Limitations, Special Conditions, or terms of this permit constitutes a violation of the NREPA and/or the Clean Water Act and constitutes grounds for enforcement action; for permit or COC termination, revocation and reissuance, or modification; or denial of an application for permit or COC renewal.

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.

2. Operator Certification

The permittee shall have the waste treatment facilities under direct supervision of an operator certified at the appropriate level for the facility certification by the Department, as required by Sections 3110 and 4104 of the NREPA. Permittees authorized to discharge storm water shall have the storm water treatment and/or control measures under direct supervision of a storm water operator certified by the Department, as required by Section 3110 of the NREPA.

3. Facilities Operation

The permittee shall, at all times, properly operate and maintain all treatment or control facilities or systems installed or used by the permittee to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance includes adequate laboratory controls and appropriate quality assurance procedures.

4. Power Failures

In order to maintain compliance with the effluent limitations of this permit and prevent unauthorized discharges, the permittee shall either:

- a. provide an alternative power source sufficient to operate facilities utilized by the permittee to maintain compliance with the effluent limitations and conditions of this permit; or
- b. upon the reduction, loss, or failure of one or more of the primary sources of power to facilities utilized by the permittee to maintain compliance with the effluent limitations and conditions of this permit, the permittee shall halt, reduce or otherwise control production and/or all discharge in order to maintain compliance with the effluent limitations and conditions of this permit.

5. Adverse Impact

The permittee shall take all reasonable steps to minimize or prevent any adverse impact to the surface waters or groundwaters of the state resulting from noncompliance with any effluent limitation specified in this permit including, but not limited to, such accelerated or additional monitoring as necessary to determine the nature and impact of the discharge in noncompliance.

6. Containment Facilities

The permittee shall provide facilities for containment of any accidental losses of polluting materials in accordance with the requirements of the Part 5 Rules (R 324.2001 through R 324.2009 of the Michigan Administrative Code). For a POTW, these facilities shall be approved under Part 41 of the NREPA.

PART II

Section D. Management Responsibilities

7. Waste Treatment Residues

Residuals (i.e., solids, sludges, biosolids, filter backwash, scrubber water, ash, grit, or other pollutants or wastes) removed from or resulting from treatment or control of wastewaters, including those that are generated during treatment or left over after treatment or control has ceased, shall be disposed of in an environmentally compatible manner and according to applicable laws and rules. These laws may include, but are not limited to, the NREPA, Part 31 for protection of water resources, Part 55 for air pollution control, Part 111 for hazardous waste management, Part 115 for solid waste management, Part 121 for liquid industrial wastes, Part 301 for protection of inland lakes and streams, and Part 303 for wetlands protection. Such disposal shall not result in any unlawful pollution of the air, surface waters or groundwaters of the state.

8. Right of Entry

The permittee shall allow the Department, any agent appointed by the Department, or the Regional Administrator, upon the presentation of credentials and, for animal feeding operation facilities, following appropriate biosecurity protocols:

- a. to enter upon the permittee's premises where an effluent source is located or any place in which records are required to be kept under the terms and conditions of this permit; and
- b. at reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit; to inspect process facilities, treatment works, monitoring methods and equipment regulated or required under this permit; and to sample any discharge of pollutants.

9. Availability of Reports

Except for data determined to be confidential under Section 308 of the Clean Water Act and Rule 2128 (R 323.2128 of the Michigan Administrative Code), all reports prepared in accordance with the terms of this permit and required to be submitted to the Department shall be available for public inspection via MiEnviro Portal (<https://MiEnviro.Michigan.gov/ncore/>). As required by the Clean Water Act, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the Clean Water Act and Sections 3112, 3115, 4106 and 4110 of the NREPA.

10. Duty to Provide Information

The permittee shall furnish to the Department via MiEnviro Portal (<https://MiEnviro.Michigan.gov/ncore/>), **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 the facility's COC, 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.

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.

PART II

Section E. Activities Not Authorized by This Permit

1. Discharge to the Groundwaters

This permit does not authorize any discharge to the groundwaters. Such discharge may be authorized by a groundwater discharge permit issued pursuant to the NREPA.

2. POTW Construction

This permit does not authorize or approve the construction or modification of any physical structures or facilities at a POTW. Approval for the construction or modification of any physical structures or facilities at a POTW shall be by permit issued under Part 41 of the NREPA.

3. Civil and Criminal Liability

Except as provided in permit conditions on "Bypass" (Part II.C.9. pursuant to 40 CFR 122.41(m)), nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance, whether or not such noncompliance is due to factors beyond the permittee's control, such as accidents, equipment breakdowns, or labor disputes.

4. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee may be subject under Section 311 of the Clean Water Act except as are exempted by federal regulations.

5. State Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by Section 510 of the Clean Water Act.

6. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize violation of any federal, state or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other Department of Environment, Great Lakes, and Energy permits, or approvals from other units of government as may be required by law.



GEOTECHNICAL EVALUATION REPORT

BURDICK STREET IMPROVEMENTS
KALAMAZOO, MICHIGAN

SME Project Number: 093008.00
December 5, 2024





3301 Tech Circle Drive
Kalamazoo, MI 49008-5611

T (269) 323-3555

www.sme-usa.com

December 5, 2024

Mr. Alex Phelan
Hurley & Stewart
2800 South 11th Street
Kalamazoo, Michigan 49009

Via E-mail: aphelan@hurleystewart.com

RE: Geotechnical Evaluation Services
Burdick Street Improvements
Kalamazoo, Michigan
SME Project No. 093008.00

Dear Mr. Phelan:

We have completed our geotechnical evaluation for the subject project. This report presents the results of our observations and analyses and our geotechnical recommendations based on the information disclosed by the borings. This report also presents a brief discussion on construction considerations based on our observations of the subsurface conditions and on our understanding of the proposed improvements.

We appreciate the opportunity to be of service. If you have questions or require additional information, please contact me.

Sincerely,

SME

A handwritten signature in blue ink, appearing to read "A. Reed", is positioned above the printed name.

Aaron J. Reed, PE
Senior Consultant

Enclosure: SME Geotechnical Evaluation Report, Dated December 5, 2024

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APPENDIX A

- BORING LOCATION DIAGRAMS (FIGURE NOS. 1 THROUGH 5)
- BORING LOG TERMINOLOGY
- BORING LOGS (B1 THROUGH B8)
- SUBSURFACE PROFILE A-A' (FIGURE NO. 6)

APPENDIX B

- IMPORTANT INFORMATION ABOUT THIS GEOTECHNICAL-ENGINEERING REPORT
- GENERAL COMMENTS
- LABORATORY TESTING PROCEDURES

1. INTRODUCTION

This report presents the results of the geotechnical evaluation performed by SME for Burdick Street Improvements projects located in Kalamazoo, Michigan. This evaluation was conducted in general accordance with the scope of services outlined in SME Proposal No. P01584.23, dated June 21, 2024. Hurley & Stewart (H&S) authorized SME’s services for this evaluation. However, the following changes were made to our field exploration scope:

- Borings B5 and B6 were extended 17.5 feet and 10 feet, respectively, beyond the planned boring depth due to the presence of organic soils at the proposed termination depth.
- Boring B8 was terminated 2 feet below the existing ground (pavement) surface due to the presence of Portland cement concrete (PCC), discussed later in this report.

To assist with our evaluation and the preparation of this report, SME reviewed the 30 percent plan set dated June 6, 2024, Sheets 1 through 40, and prepared by H&S for the “City of Kalamazoo Water Main & Sanitary Sewer Replacement – Burdick Street – Reed to Lovell” project.

1.1 SITE CONDITIONS AND PROJECT DESCRIPTION

The project consists of constructing a new water main and various service leads along South Burdick Street between the cross streets of Lovell Street and West Emerson Street in Kalamazoo, Michigan. In addition, upgrades are proposed to an existing sanitary sewer along South Burdick Street between Lovell Street and Vine Street. The limits of the project are depicted on the Location Map insets on the Boring Location Diagrams (Figure Nos. 1 through 5) included in Appendix A.

The proposed water main will consist of both 16-inch diameter and 24-inch diameter ductile iron pipe (DIP) that has a general invert elevation of about 6 feet to 7 feet below existing grades. The proposed gravity sanitary sewer will consist of a 12-inch diameter pipe that has an invert elevation of about 9 feet to 10 feet below existing grades. The proposed water main will be lower at the locations listed in Table 1 below in order pass below various pieces of existing infrastructure.

TABLE 1: LOWERED SECTIONS OF WATER MAIN

APPROXIMATE STATION	APPROXIMATE INVERT DEPTH, FEET (FT)
7+65	9 FT
13+20	12-1/2 FT
15+05	9 FT
16+30	10 FT
19+55	11-1/2 FT
21+55	9 FT ⁽¹⁾
24+05	9 FT
33+55	11 FT
40+95	8 FT
47+15	11 FT
49+45	10 FT
51+25	11-1/2 FT
52+80	9-1/2 FT

NOTE:

1. The listed invert depth estimated based on the provided invert depth of the culvert pipes described below.

The proposed water main and sanitary sewers will be constructed primarily using the open-cut method and using temporary earth retention measures, as needed. At approximate Station 21+55, the proposed water main will extend below two parallel storm culverts that connect with a collection chamber that spans across South Burdick Street at the intersection of South Burdick Street and Crosstown Parkway. It is our understanding the two culverts have an invert elevation of about 6 feet below existing grades. At this crossing location, the design team is proposing the water main be installed using the horizontal auger bore (HAB) trenchless installation method.

2. EVALUATION PROCEDURES

2.1 FIELD EXPLORATION

SME completed eight borings (B1 through B8) at the site on July 22 and 23, 2024. The borings extended from 10 feet to 37.5 feet below the existing ground surface. SME and H&S jointly determined the planned number, locations, and depth of the borings. SME retained a subcontractor to provide temporary traffic control to facilitate completion of the borings. SME staked the boring locations by referencing existing site features. The approximate as-drilled locations of the borings are depicted on Figure Nos. 1 through 5. SME located the as-drilled boring locations using a GPS unit with a horizontal and vertical accuracy of 1 foot.

The borings were drilled using a rotary-type drill rig and were advanced using continuous-flight, hollow-stem augers. The borings included soil sampling based upon the Split-Barrel Sampling procedure. Recovered split-barrel samples were sealed in glass jars by the driller. Groundwater observations were recorded during and immediately after completion of each boring. The boreholes were backfilled with auger cuttings after completion, with the exception of borings B5 and B6, which were backfilled with a combination of cement-bentonite grout and auger cuttings. Therefore, long-term groundwater levels were not obtained from the borings. The surface of the boreholes in existing pavement areas were capped with either asphalt cold patch or Quikrete after backfilling.

Soil samples recovered from the field exploration were returned to the SME laboratory for further observation and testing.

2.2 LABORATORY TESTING

The laboratory testing program consisted of performing visual soil classification on recovered samples in general accordance with ASTM D-2488. Moisture content and hand penetrometer tests were performed on portions of recovered cohesive samples. Moisture content tests were also performed on recovered portions of samples that appeared organic in nature. The Laboratory Testing Procedures in Appendix B provides descriptions of the laboratory tests. Based on the laboratory testing, we described the soils and assigned a Unified Soil Classification System (USCS) group symbol to each of the soil strata encountered.

Upon completion of the laboratory testing, boring logs were prepared that include information on materials encountered, the soil descriptions, penetration resistances, pertinent field observations made during the drilling operations, and the results of the laboratory tests. The boring logs also include the existing approximate ground surface elevations as measured by SME, and the approximate Station location based on the referenced plans prepared by H&S. Explanations of symbols and terms used on the boring logs are provided on the Boring Log Terminology sheet included in Appendix A. The boring logs are included in Appendix A.

The Standard Penetration Test (SPT) resistances (N-values) plotted on the boring logs represent a modified N-value based on the correlation between the recorded SPT value and the measured hammer efficiency of the testing equipment (also shown on the boring logs). Specifically, the plotted N-values have been normalized to a 60 percent hammer efficiency (N_{60}).

Soil samples are normally retained in our laboratory for 60 days and are then disposed of, unless instructed otherwise.

3. SUBSURFACE CONDITIONS

3.1 SOIL CONDITIONS

The soil profile described below, and included on the boring logs, is a generalized description of the conditions encountered. The stratification depths shown on the boring logs are intended to indicate a zone of transition from one soil type to another. They are not intended to show exact depths of change from one soil type to another. The soil descriptions are based on visual classification of the soils encountered. Soil conditions may vary between or away from the boring locations. Please refer to the boring logs for the soil conditions at the specific boring locations.

To help depict the subsurface conditions along the project alignment, we developed Subsurface Profile A-A' (Figure No. 6) which is included in Appendix A. The profile was developed based on looking west along South Burdick Street, so north is to the right and south is to the left when looking at the figure. The lithologic symbols from the borings are plotted for each boring, along with N-values with depth and symbols that depict groundwater (where encountered).

SURFICIAL MATERIALS

Borings performed with the existing pavement of South Burdick Street (B1, B3, B4, B5, B7, and B8) encountered asphalt pavement ranging in thickness from 3 inches to 8 inches. At borings B1, B3, and B8, Portland cement concrete (PCC) was encountered below the asphalt pavement and was about 6 inches thick (at borings B1 and B3), or was penetrated 18 inches to the explored depth of boring B8. During drilling, the SME drillers discussed the location of boring B8 with an on-site Consumers Energy representative who stated an old railroad bed used to be in this area. SME could not confirm this by reviewing historical aerial images dating back to 1946. At boring B4, the asphalt pavement was underlain by about 4-inches of brick. Boring B6 was performed in a sidewalk area and encountered about 3.5 inches of PCC at the surface. Boring B2 was performed in a grass area within the road right-of-way and encountered about 3 inches of topsoil.

Thickness measurements of surficial materials, such as pavement and topsoil thicknesses, should be considered approximate since mixing of these materials with the underlying subgrade can occur while advancing the augers, and it is difficult to accurately measure thicknesses in small-diameter boreholes. Therefore, if accurate thickness measurements are required for inclusion in bid documents or for quantity estimates, additional evaluations, such as pavement cores in paved areas should be performed.

SAND FILL

Below the surface pavements and topsoil, sand fill was encountered extending to depths ranging from about 3 feet to 9.5 feet below the existing ground surface. The sand fill contained variable amounts of silt and/or clay and was classified as "SP", "SP-SM", and "SC" according to the USCS. The sand fill was generally encountered in a very loose to medium dense condition, although the shallow sand fill at borings B4 and B5 was encountered in a dense condition.

It is sometimes difficult to distinguish between fill and natural soils based on samples and cuttings from small-diameter boreholes, especially when portions of the fill do not contain man-made materials, debris, topsoil, or organic layers, and when the fill appears similar in composition to the local natural soils. Therefore, the delineation of fill described above and on the appended boring logs should be considered approximate only. A more comprehensive evaluation of the extent and composition of the fill could be made by reviewing former site topography plans, aerial photographs, and other historic site records, and by observing test pit excavations.

ORGANIC SOILS

Underlying the sand fill at borings B5 and B6, about 1.5 feet to 3 feet of peat, underlain by organic silt (also called “marl”) extending to depths of 33.5 feet and 24.5 feet, respectively, was encountered. Moisture contents within the peat ranged from about 117 to 160 percent, while moisture contents within the organic silts ranged from about 47 to 105 percent. A stratum of very loose natural sand was encountered between the peat and organic silt at boring B5 between depths of about 11 feet and 13.5 feet below the existing ground surface.

NATURAL SANDS

Natural sands were encountered below the sand fill at borings B1, B2, B3, B4, and B7, and below the organic soils at borings B5 and B6, and extended to the explored depths of these borings. The natural sands were generally encountered in a loose to dense condition. A stratum of stiff to very stiff natural clay was encountered between the organic silt and underlying natural sands at boring B5 between depths of about 33.5 feet and 37 feet below the existing ground surface.

3.2 GROUNDWATER CONDITIONS

A summary of the groundwater observed at the boring locations is listed in Table 2 below.

TABLE 2: GROUNDWATER OBSERVATIONS

BORING	OBSERVED DURING DRILLING, DEPTH (ELEVATION)	OBSERVED UPON COMPLETION OF DRILLING, DEPTH (ELEVATION)
B1	Not observed above termination elevation of 772 FT (depth of 15 feet)	
B2	Not observed above termination elevation of 767 FT (depth of 15 feet)	
B3	Not observed above termination elevation of 761 FT (depth of 15 feet)	
B4	Not observed above termination elevation of 763 FT (depth of 10 feet)	
B5	3.5 FT (757.5 FT)	3 FT (758 FT)
B6	2 FT (759 FT)	Note 1
B7	8.5 FT (755.5)	Note 2
B8	Boring terminated at a depth of 2 FT in PCC	

NOTES:

1. The borehole was backfilled by tremie method. Therefore, an accurate groundwater level measurement was not obtained after completion of drilling activities.
2. Groundwater was not observed above the borehole cave-in depth upon auger removal.

Hydrostatic groundwater levels should be expected to fluctuate throughout the year, based on variations in precipitation, evaporation, run-off, the water level in Portage Creek and ponds along Crosstown Parkway, and other factors. The groundwater levels reported on the boring logs and presented in this section represent conditions at the time the readings were taken. The groundwater levels at the time of construction may vary from those conditions noted on the logs.

4. ANALYSIS AND RECOMMENDATIONS

4.1 OPEN-CUT INSTALLATIONS

The open-cut installation method is planned for the proposed water and sewer mains outlined in Section 1.1.

4.1.1 GENERAL EXCAVATION CONSIDERATIONS

For open-cut trench installation methods, it is typically difficult to maintain stable excavations through loose, sandy soils unless the side slopes can be adequately sloped. This is especially the case where groundwater seepage is encountered. We recommend excavation sidewalls be adequately sloped back, benched, and/or braced to prevent sloughing and caving of sidewalls. In cases where instability occurs in temporary slopes, it may be necessary to flatten slopes beyond what is required by MI-OSHA in order to provide a stable excavation. Do not place stockpiled soils and/or operate construction equipment near excavations without accounting for (by either shallow slopes or adequate bracing) the increased load along the edges of the excavations that could result in instability of the excavation slope.

Due to the anticipated lateral constraints of working within the existing roadway, utilization of open-cut, sloped, and/or benched excavations may not be feasible at all locations. Where lateral resistance is necessary to maintain a relatively narrow, vertical excavation/trench to limit the impact on adjacent improvements, a temporary earth retention system (TERS) comprised of internally-braced steel sheeting or appropriately sized steel trench boxes can be used to support the relatively shallow utility excavations. Other types of earth retention may be necessary for deeper excavations.

Manufacturer information for trench boxes proposed for use must be checked to verify they are suitable for the specific excavations planned. The design of internally-braced sheeting or other types of TERS required during construction for open-cut installation should be performed by an experienced registered professional engineer and installed by a contractor experienced with this type of construction. Appropriate measures for providing temporary support of existing utilities, pavements, and other improvements will be required where the alignment excavations cross or are in close proximity to existing utilities or structures. Depending on the specific situations, monitoring of existing utilities during construction to identify any movements resulting from the proposed construction activities should be considered.

4.1.2 TEMPORARY GROUNDWATER CONTROL

Groundwater was encountered between about elevations 755 feet and 759 feet at borings B5, B6, and B7. Based on the referenced plan sheets, the proposed water main is to be constructed at invert elevations below 760 feet between about Stations 4+25 and 25+25. Within this area, the water main will be constructed at an invert below elevation 755 feet between about Stations 18+50 and 24+25. Based on the soil and groundwater conditions observed at the boring locations, and on the anticipated depths of excavation, groundwater seepage or accumulations should be expected within excavations between about Stations 18+50 and 24+25, and possibly outside that area between about Stations 4+25 and 25+25. Therefore, temporary dewatering measures will be necessary for the project to maintain a relatively dry excavation for water main construction.

The type of dewatering system will depend on the specific soil conditions and the required depth of excavation below (or near to) the groundwater level. We anticipate dewatering using conventional sump pit and pumping methods will typically be able to control groundwater seepage on a local basis for excavations extending no more than about 1 foot to 2 feet below the encountered groundwater levels. Where sands are exposed in excavation sidewalls or the bottom of excavations, the volume of groundwater seepage will be higher, and multiple, closely-spaced sumps may be required to control accumulations. Groundwater seepage rates could also be controlled (i.e., reduced) by using sheeting as a TERS. Where excavations extend more than about 1 foot to 2 feet below the encountered groundwater levels in sands, more aggressive dewatering techniques, such as dewatering wells or wellpoints, will be required to control accumulations. The groundwater should be temporarily lowered to a minimum of 1-foot below the bottom of the excavation for construction of the water main. It should be noted that, even after dewatering, the subgrade soils near the bottom of the excavation will probably still be wet and sensitive to disturbance. In such cases, a layer of crushed stone may need to be placed over the wet subgrade to protect the subgrade, or to form a stable working platform on which to place pipe bedding materials.

The design of temporary dewatering measures are typically the responsibility of the contractor. We would be pleased to assist you in the development of a performance based specification for this portion of the project.

The proposed sanitary sewer is expected to be located about 9 feet to 10 feet below existing grades between Lovell and Vine Streets. Borings B1 through B3 were located within this portion of the project alignment, and groundwater was below the explored depth (15 feet) of these three borings. Therefore, we anticipate heavy groundwater seepage will not be encountered in excavations for installation of sanitary sewer that remain above a depth of about 10 feet within this portion of the alignment. Seepage that is encountered from perched sources or stormwater runoff above this depth within this portion of the alignment should be able to be controlled using normal sump pit and pumping procedures.

4.1.3 DISCUSSION ON THE PRESENCE OF ORGANIC SOILS

The intersection of South Burdick Street and Crosstown Parkway site is located within a relatively low-lying area within downtown Kalamazoo. As indicated above, organic soils were encountered at borings B5 and B6. Specifically, the organic soils at these boring locations extended to depths ranging from about 33.5 feet to 24.5 feet below the existing ground surface. Similar soil deposits are present along Crosstown Parkway both east and west of South Burdick Street.

Organic soils, such as organic silt and peat, are compressible, meaning they will compress over time, resulting in settlement at the ground surface. The amount of compression or settlement that will be experienced over time is dependent on the thickness of the organic deposit, the compressibility of the material, and the amount of additional stress or load (if any) placed on the organic soils (e.g., due to the construction of overlying improvements or placement of new fill). Organic soils with higher moisture contents are more compressible than similar organic soils with lower moisture contents, and peat tends to be more compressible than organic silts. Because organic soils will continue to compress or settle slowly over time, they can be problematic if left in-place below structures and other improvements due to excessive total and differential settlements that might be experienced over time. For critical utilities that convey fluids by gravity, settlement over time could lead to reduced or compromised hydraulic efficiency (due to changes in the slopes of the pipes), and failures could occur at pipe joints if differential settlements occur over a relatively short distance.

The organic soils encountered within borings B5 and B6 extend relatively far below the anticipated invert levels for the water main. Specifically, the organic soils at these boring locations extended to depths ranging from about 33.5 feet to 24.5 feet below the existing ground surface. Therefore, undercutting to remove the organic soils below new water main infrastructure is not considered feasible in this area of the project. It is likely many of the existing utilities in this area are supported over the existing organic soils without a deep foundation (pile) system for support since undercutting to remove the organic soils was considered impractical when these utilities were installed, and pile support for a utility is not a usual practice and is typically implemented in rare, but unique circumstances. If the vertical pressures on the underlying organic soils are not increased by the proposed improvements, then we anticipate the settlements will be limited to the long-term secondary compression of the organics, which tend to be relatively small, and tend to occur over a very long time frame. Based on our review of the soil information obtained from the borings and the provided project information, we estimate the long-term (about 20 to 30 years) settlements of the proposed water main associated with secondary compression could range from about 1 inch to 2 inches if the water main were to be constructed directly over the existing organic soils, as long as site grades are not raised.

The risks related to the future additional settlement of utilities can be mitigated through various means. The overburden pressure (and long-term settlement) can be reduced by excavation of some of the soils below the water main and replacing with a lightweight fill material. Expanded polystyrene (EPS) is a common "geo-foam" material for this purpose, but there are other options available, such as lightweight aggregates. If the City of Kalamazoo cannot accept the increased risks of supporting the proposed water main over organic soils and accounting for the estimated long-term settlements, then these elements should be supported on deep foundations (piles), or the use of lightweight fill material should be considered.

4.1.4 PIPE SUPPORT

It is our understanding the proposed water main and sanitary sewer pipe are to be supported on existing subgrades. Based on the conditions encountered at borings B1 through B7, primarily sand fill or natural sands, are anticipated within excavations, with the exception of the areas of organic soils discussed above.

Where organic soils extend below the new water main, and where these organic soils cannot be practically undercut and replaced with engineered fill, long-term settlements will occur as described in Section 4.1.3. At a minimum, we recommend existing subgrades be overcut by 2 feet and an MDOT nonwoven stabilization fabric be placed at the base of the excavation to create a more stable subgrade on which to construct the proposed water main within these areas. We recommend the overcut extend at least 2 feet beyond the outside edges of proposed water main pipe. We recommend MDOT 6A crushed aggregate be placed on top of the stabilization fabric and be used to backfill up to the bottom of the bedding material used below the bottom of the pipe. The underlying stabilization fabric should either be wrapped around the MDOT 6A or a separate layer of non-woven fabric be placed over the top of the 6A to prevent the migration of finer particles of the bedding material into the void space of the underlying aggregate. Regardless of the above recommendations, the water main should be expected to settle some over time and including some flexibility into the design of the water main in this area, such as the use of flexible pipe or joint materials, can reduce maintenance and extend the life of the utility.

Outside the areas of organic soils, we anticipate mostly suitable pipe support conditions consisting of sands in at least a loose condition will be encountered at the anticipated pipe invert depths. Stabilization of the bottoms of excavations could be necessary at locations where wet sands are encountered, or at locations that become disturbed due to seepage or for other reasons. Undercut excavations to remove unsuitable soils should be properly oversized beneath utility pipes. Wet or disturbed soils must be undercut to encounter stable conditions, and the undercut soils must be replaced with a layer of crushed aggregate or crushed concrete to provide a stable working surface. The required thickness of this stabilization layer will depend on the severity of the groundwater conditions and depth of weak or unsuitable soils. A non-woven geotextile fabric or a dense-graded aggregate should be placed over the stabilization layer to mitigate the potential for overlying sand fill to migrate into the voids of the underlying aggregate. We recommend an SME representative be onsite during construction to further assess subsurface conditions and to provide field recommendations for stabilization, as needed.

Outside the areas of organic soils, we recommend bedding the new water and sewer mains with an approved granular material meeting the requirements of the appropriate municipal agency and designer. The placement and compaction of the bedding material should also conform to the requirements of the appropriate municipal agency and acceptable buried pipe design practices.

4.2. HORIZONTAL AUGER BORE INSTALLATIONS

Our comments and geotechnical recommendations related to the proposed HAB water main installation below the two parallel storm culverts described in Section 1.1 are presented below. This report does not provide an engineering design, and the means and methods to be used for the proposed crossing are the responsibility of the HAB contractor.

4.2.1 PIT EXCAVATIONS

Bore (launching) and receiving pit excavations will be required on either side of the trenchless crossing location. Proposed pit excavation locations had not been provided to us at the time of this report. We anticipate both the launching and receiving pits will need to include a TERS to confine these pits to a relatively small area. We recommend these pits and the earth retention system, including length, width, and depth, be shown on the project plan sheets.

As outlined in Section 4.1.1 and in the paragraph above, a TERS will likely be required at the pit locations due to the lateral constraints of working within the existing roadway. Earthwork and the excavation for pits should comply with applicable agency requirements, which should be verified prior to the development of the final project plans. Groundwater seepage into the pit excavations should be expected based on the conditions encountered at borings B5 and B6. The HAB contractors typically design the necessary earth retention and dewatering systems for their construction operations, as the means and methods used may vary from contractor to contractor.

4.2.2 TRENCHLESS INSTALLATION METHOD CONSIDERATIONS

At the crossing, the proposed water main is anticipated to have an invert elevation of about 9 feet below existing grades, or situated at about elevation 752 feet. Based on the soils encountered at borings B5 and B6, we anticipate the soils encountered within the alignment of the HAB will alternate between very loose sand fill and organic soils (peat). Groundwater is anticipated to be present about 7 feet to 8 feet above the invert of the HAB alignment. These two conditions make the HAB installation method relatively risky because of the strong potential for damaging existing infrastructure located above or near the proposed alignment. These soils could pose a risk to the long term support of the casing pipe, as previously discussed in Section 4.1.3 unless designed to bridge between two structures located on either side of the crossing. In addition, it may be difficult to adequately dewater the crossing location to the recommended 2 feet below the bottom of the casing pipe with the presence of organic soils near the anticipated invert of the crossing. If wet sand conditions are encountered during boring operations, it will also be difficult to prevent soil from “running” down the bore pipe that would likely cause settlement of the overlying soils that could potentially damage the roadway and overlying or adjacent utilities.

Based on the risks outlined above, we recommend that construction of the crossing not be performed using traditional HAB methods. For the traditional HAB installation method, soils are typically removed from the bore pipe via an auger that is located inside the bore pipe. The lead of the auger can be placed at varying distances from leading edge of the bore pipe based on the soil conditions along the alignment. As the bore pipe is pushed along the alignment from the launching pit, the augers remove soil from within the pipe. Alternatively, Pipe Ramming consists of removing the auger and the bore machine and advancing the casing pipe using a pneumatic ram (hammer) for the entire run. The front of the casing cuts through the soil, leaving soil on the inside of the pipe. After the pipe is in place between the pits, the soils can then be removed from inside the pipe, typically using a sealed plug and compressed air. With Pipe Ramming, the risk of soils caving into the pipe during installation is mitigated since the soils inside the pipe are not removed until the entire length of pipe is in place, and a jacking pit with a reaction frame is not required to install the pipe. However, at this location there is a risk the vibrations from the pneumatic hammer could cause the overlying very loose sand fill to settle. Therefore, we propose a combination of the two methods (HAB and Pipe Ramming) be performed as outlined in the paragraphs below.

We recommend consideration be given to installing the proposed casing pipe using a HAB machine without the augers. The proposed HAB crossing alignment is anticipated to be relatively short, less than 20 feet. Therefore, the risk of the casing pipe deviating from the proposed alignment due to the presence of weak soils is relatively low. In addition, the short distance and existing weak soils should make it relatively easy to advance the casing pipe using only the jacking force of the HAB machine. Once the casing pipe is in place, the soils can be removed via the augers of the bore machine.

This proposed installation method is not a typical HAB procedure. As a result, problems could occur. We recommend the City of Kalamazoo utilize an HAB contractor familiar with boring through similar soil and groundwater conditions. We recommend additional monitoring be performed during construction to ensure the integrity of the roadway be maintained. This could include more monitoring points and more frequent readings, and contingency plans that can be quickly implemented in the event an issue materializes. One contingency plan could include the ability to grout and abandoned the crossing. Specific threshold limits for movement should be set and action (or remedial) plans developed for each alert level encountered during installation.

The contractor must confirm the locations and elevations of existing utilities before proceeding with the work and the contractor must monitor the existing utilities during HAB crossing operations. We recommend the use of soft excavation methods (e.g., hydro-excavation), possibly in conjunction with ground penetrating radar (GPR), to determine the specific location and the amount of ground cover over each utility within the influence of the proposed crossing. Pre-construction and post-construction condition evaluations of the existing utilities that could be affected by the HAB operations should be performed.

Obstructions, such as boulders, cobbles, or man-made structures, could affect HAB operations and could require the use of a larger casing diameter to accommodate removal of the obstructions, should they be encountered. Collapse of overlying soils can result from encountering obstructions, which must be removed during the pushing of the casing into place. The project team should consider how such events would be handled contractually and contractors should be instructed that they must be prepared to handle encountered obstructions without causing subsidence or damage to the roadway or existing utilities.

We recommend the HAB contractor submit the following information to identify the steps being taken to reduce the risk of surface settlements and damage to the existing utilities and infrastructure:

1. A plan identifying proposed drill limits and pit excavations planned to install the water main.
2. A written description of the proposed boring operations, including documentation of the type of equipment, anticipated boring procedures, including the types of additional materials used to complete the bore, such as drilling fluid and pipe lubrication, welding procedures to be used, and a contingency plan to remove obstructions (e.g., cobbles and boulders).
3. A list of back-up equipment that will be available during construction to allow the bore process to proceed uninterrupted in the event of equipment failure.
4. Contact information for a flowable fill/grouting contractor and GPR consultant and that will be on-call for emergency response to pavement distress and surface settlements that might result from the boring operations.
5. A plan identifying the locations, sizes, and elevations of all utilities within the area of work prior to beginning drilling operations.
6. A proposed plan to complete the entire casing pipe installation process (i.e., from the launching pit to the receiving pit) in a continuous operation. Note, the casing should only be advanced by pushing with the bore machine and not through the use of pneumatic, impact, or vibratory methods.
7. A monitoring plan to monitor elevations and site conditions during HAB crossing operations and during installation and removal of the launching and receiving pits and associated TERS, if required.
8. A plan to verify the pre-construction and post-construction conditions of existing underground utilities and adjacent infrastructure.

A more detailed analysis of pipe installation by HAB methods is beyond the scope of this evaluation. The selected contractor should provide detailed HAB means and methods as part of their project bid.

4.3 ENGINEERED FILL REQUIREMENTS

Utility trench and excavation backfill should be an approved material, free of frozen soils, organics, oversized materials greater than 3 inches, or other deleterious materials. Backfill should be spread in level layers not exceeding the depth that can be adequately compacted by the compaction equipment being used, and generally not exceeding 9 inches in loose thickness. Backfill and bedding materials should

meet the requirements of the MDOT *Standard Specifications for Construction* or the requirements of the appropriate governing agency in roadway areas. Fill placed in structural areas for the supporting facilities should be compacted to a minimum of 95 percent of the maximum dry density determined in accordance with the Modified Proctor test. In non-structural areas, fill may be compacted in lifts to a degree where it is stable under construction equipment.

Sand fill should be compacted with a smooth drum vibratory roller or vibratory plate compactors, including either walk-behind types, or plate compactors mounted on a backhoe or excavator (i.e., hoe-pacs). Lifts of fill should not exceed the thickness that can be completely compacted to the specified density by the equipment being used for compaction.

The on-site soils can be considered for reuse as site engineered fill, provided the material meets the requirements in the previous paragraph and the soils are at a suitable moisture content for proper compaction. Clayey and silty soils will likely require moisture conditioning (e.g., aeration and drying) to achieve suitable moisture levels for proper compaction when used as engineered fill. Moisture conditioning of these soils will likely not be feasible during seasonally colder times of the year or during periods of frequent precipitation and may not be feasible if the stockpiled material is confined to a small area. Moisture conditioning of clays and silts will require a suitable open area when these soils can be spread, aerated, and dried.

The upper fill consisting of clayey sands (with a USCS group symbol of "SC") will be difficult to compact in confined areas, such as in utility trenches or other relatively confined excavations, where smaller, walk-behind type compaction equipment is used. Clayey and silty soils should not be used as engineered fill where drainage is required and should only be used as engineered fill in open areas where compaction is achieved with large equipment and where moisture conditioning is feasible. In utility trenches where compaction is required and primarily by smaller plate compaction equipment, an approved granular material, such as MDOT Class II sand, should be used as backfill. Thinner lifts will be required to achieve suitable compaction of the backfill in areas where smaller, walk-behind type compactors are used. Based on the boring information, the cleaner sands with USCS designations of "SP" should meet MDOT Class II sand gradational requirements, provided clay and/or silt seams/layers are segregated from the more suitable soils. SME should verify the suitability of on-site soil proposed for reuse by performing analyses of identified soils during construction.

Coarse crushed aggregate used to backfill undercuts or to stabilize subgrades should consist of a well graded, crushed natural aggregate or crushed concrete ranging from 1 inch to 3 inches in size with no more than 7 percent by weight passing the No. 200 sieve. In cases where granular engineered fill will be placed over the crushed aggregate, the surface of the coarse crushed material should be choked with a layer of at least 6 inches of MDOT 21AA dense-graded aggregate or a suitable non-woven geotextile to reduce the risk of migration of the sand into the coarser crushed material, potentially resulting in localized settlement.

4.4 GENERAL COMMENTS AND CONSTRUCTION CONSIDERATIONS

This report was prepared in accordance with generally accepted geotechnical engineering practices to assist with the review of the proposed water and sewer main installation using open cut and HAB installation methods. If the scope of the project changes from that stated in this report, or if the assumptions stated herein are incorrect, then SME should review the revised information and confirm or revise the conclusions and recommendations of this report.

Our recommendations are based on information developed from small diameter borings and limited sampling. Variations in soil and groundwater conditions commonly occur between or away from sampling locations. The nature and extent of the variations may not become evident until the time of construction. SME should be retained to verify the subsurface conditions encountered during construction are

consistent with the anticipated subsurface conditions indicated by the borings. SME can also assist during the construction process by reviewing contractor submittals, observing subsurface conditions, documenting the open-cut and HAB activities and any resulting concerns, and monitoring settlements during construction.

The design team should perform a desktop review to verify information available that may indicate the locations of abandoned and/or active utilities and other below-grade obstructions in the project area. The contractor(s) should be provided the locations of existing utilities and below-grade obstructions in the area before installing sheeting, dewatering, or excavating. Contractors should be prepared to brace excavations located near utilities, as required. Shoring and bracing should be designed by a qualified professional engineer, and installed by a contractor experienced with applicable type of construction.

Pre-condition and post-condition site surveys should be considered in areas that have a potential of being affected by the proposed construction. Vibration monitoring can be considered to verify vibration levels during critical construction activities that may potentially damage existing structures or cause distress to occupants. Contact SME for additional information regarding condition surveys or vibration monitoring.

The contractor should remove ponded surface water and prevent run-off from reaching utility trench or pit excavations and areas of prepared subgrade. We recommend the contractor establish positive surface drainage at the onset of construction to mitigate the potential for subgrade disturbance. If subgrade disturbance is observed, then construction traffic should be restricted to dedicated areas that are stabilized, as needed, using crushed aggregates, geotechnical fabrics for separation, and/or geogrids for further stabilization.

The need for moisture conditioning (i.e., aerating and drying) existing soils, and the success of moisture conditioning, will be dependent on the weather conditions at the time of construction. During cold and wet periods of the year, the subgrade soils may become saturated and disturbed, which precludes sufficient drying of the soils so they can be compacted in accordance with project requirements. If these conditions occur, it will be necessary for the contractor to import greater quantities of suitable structural fill to use on the site while at the same time, require exporting of excavated wet soils from the site, assuming on-site disposal of unsuitable soils will not be feasible. The potential effects of soil moisture conditions during the anticipated construction season should be considered when developing the project earthwork budget.

The contractor must provide a safely sloped excavation or an adequately constructed and braced shoring system in accordance with federal, state, and local safety regulations for individuals working in an excavation that may expose them to the danger of moving ground. If material is stored or heavy equipment is operated near an excavation, appropriate shoring must be used to resist the extra pressure due to the superimposed loads.

This report has been prepared solely for the use of our client and only for the purposes stated in the report. Any use or reliance on this report by others without SME's express written consent will be at the sole risk of the user. SME is not responsible for the misinterpretation of our geotechnical data and recommendations by others.

5. SIGNATURES

PREPARED BY:



Aaron J. Reed, PE
Senior Consultant

REVIEWED BY:



Jeffery M. Krusinga, PE, GE
Principal Consultant

APPENDIX A

BORING LOCATION DIAGRAMS (FIGURE NOS. 1 THROUGH 5)

BORING LOG TERMINOLOGY

BORING LOGS (B1 THROUGH B8)

SUBSURFACE PROFILE A-A' (FIGURE NO. 6)



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Project

BURDICK STREET IMPROVEMENTS

Project Location

KALAMAZOO, MICHIGAN

Sheet Name

BORING LOCATION DIAGRAM

No. Revision Date

Date 11-21-2024

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Designer AJR

Scale AS NOTED

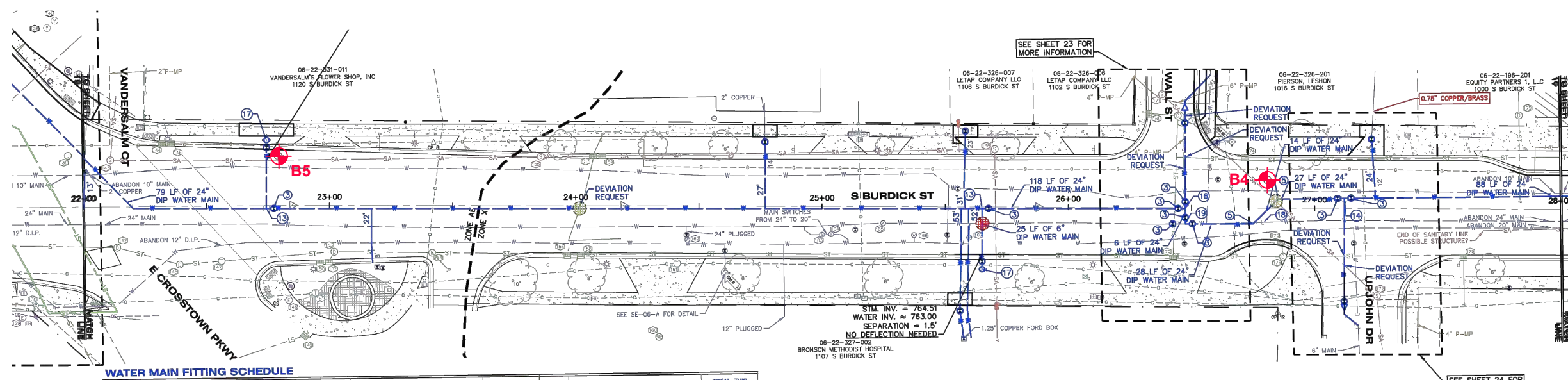
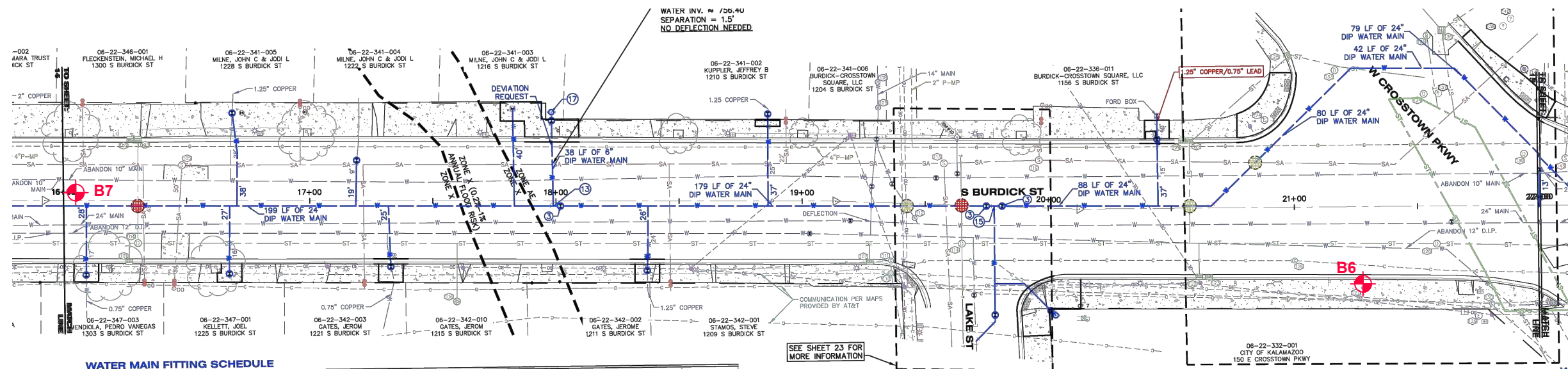
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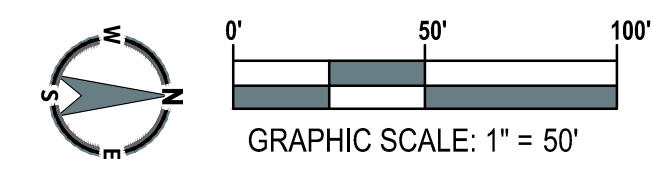
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APPROXIMATE BORING LOCATION

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Project BURDICK STREET IMPROVEMENTS

Project Location
**KALAMAZOO,
MICHIGAN**

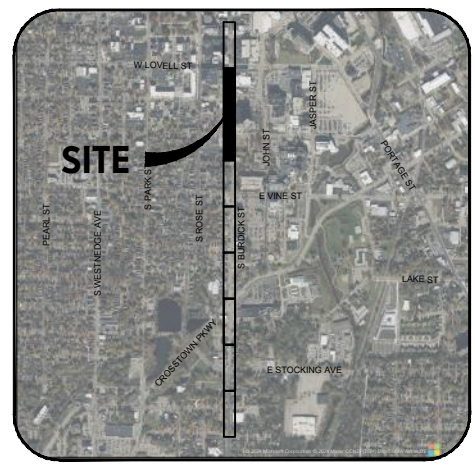
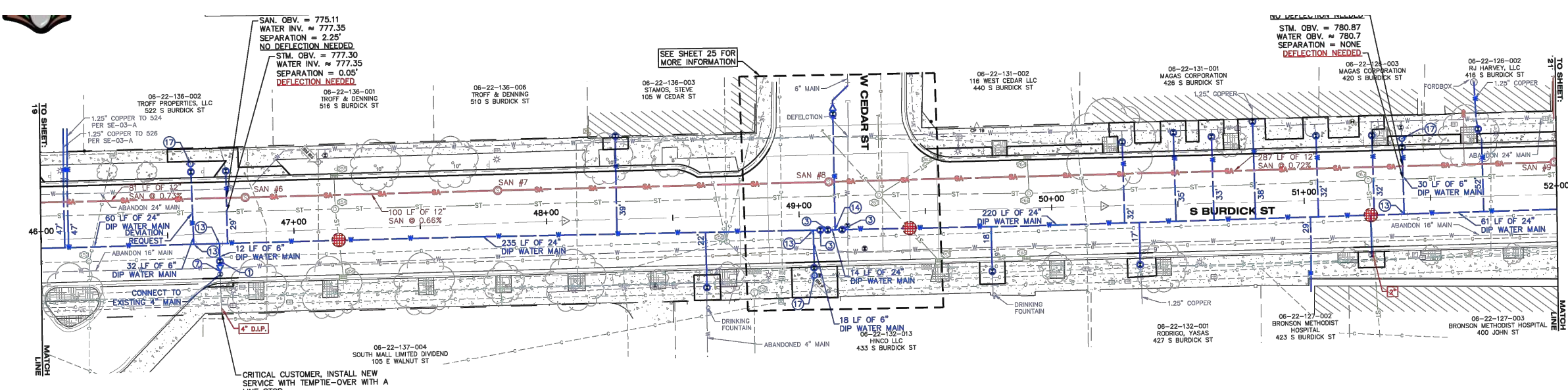
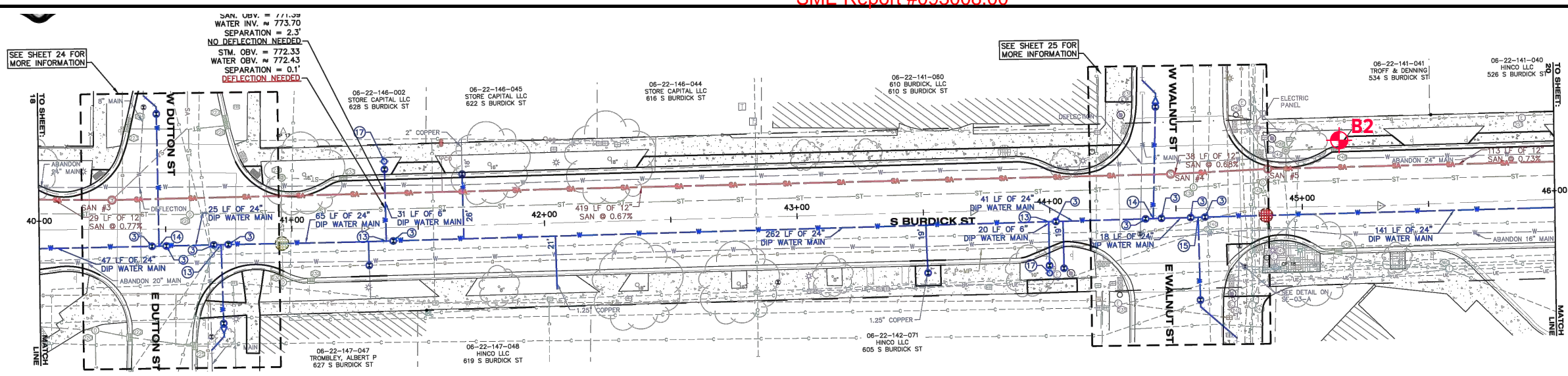
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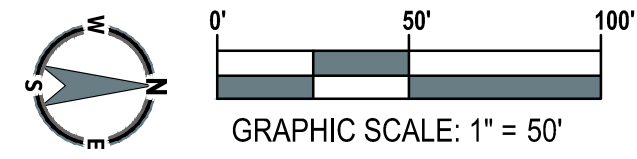
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Project
BURDICK STREET IMPROVEMENTS

Project Location
KALAMAZOO, MICHIGAN

Sheet Name
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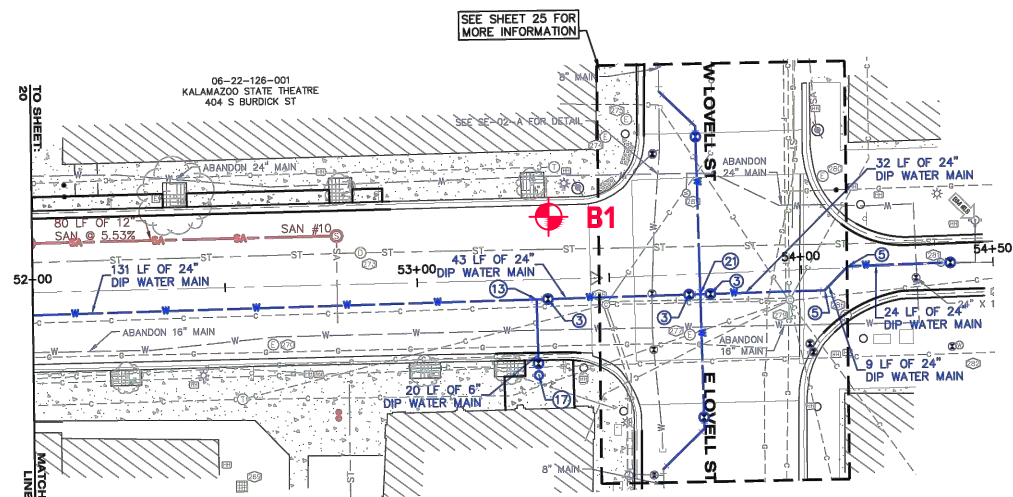
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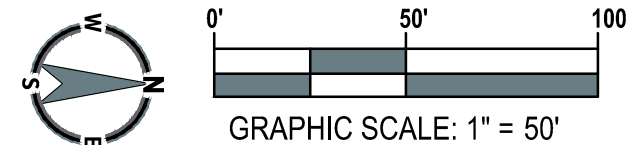
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Figure No.
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SEE SHEET 25 FOR MORE INFORMATION



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UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART		
COARSE-GRAINED SOIL (more than 50% of material is larger than No. 200 sieve size.)		
Clean Gravel (Less than 5% fines)		
GRAVEL More than 50% of coarse fraction larger than No. 4 sieve size		GW Well-graded gravel; gravel-sand mixtures, little or no fines
		GP Poorly-graded gravel; gravel-sand mixtures, little or no fines
	Gravel with fines (More than 12% fines)	
		GM Silty gravel; gravel-sand-silt mixtures
		GC Clayey gravel; gravel-sand-clay mixtures
Clean Sand (Less than 5% fines)		
SAND 50% or more of coarse fraction smaller than No. 4 sieve size		SW Well-graded sand; sand-gravel mixtures, little or no fines
		SP Poorly graded sand; sand-gravel mixtures, little or no fines
	Sand with fines (More than 12% fines)	
		SM Silty sand; sand-silt-gravel mixtures
		SC Clayey sand; sand-clay-gravel mixtures
FINE-GRAINED SOIL (50% or more of material is smaller than No. 200 sieve size)		
SILT AND CLAY Liquid limit less than 50%		ML Inorganic silt; sandy silt or gravelly silt with slight plasticity
		CL Inorganic clay of low plasticity; lean clay, sandy clay, gravelly clay
		OL Organic silt and organic clay of low plasticity
SILT AND CLAY Liquid limit 50% or greater		MH Inorganic silt of high plasticity, elastic silt
		CH Inorganic clay of high plasticity, fat clay
		OH Organic silt and organic clay of high plasticity
HIGHLY ORGANIC SOIL		PT Peat and other highly organic soil

OTHER MATERIAL SYMBOLS		

LABORATORY CLASSIFICATION CRITERIA	
GW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}^2}{D_{10} \times D_{60}}$ between 1 and 3
GP	Not meeting all gradation requirements for GW
GM	Atterberg limits below "A" line or PI less than 4
GC	Atterberg limits above "A" line with PI greater than 7
SW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_c = \frac{D_{30}^2}{D_{10} \times D_{60}}$ between 1 and 3
SP	Not meeting all gradation requirements for SW
SM	Atterberg limits below "A" line or PI less than 4
SC	Atterberg limits above "A" line with PI greater than 7

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:

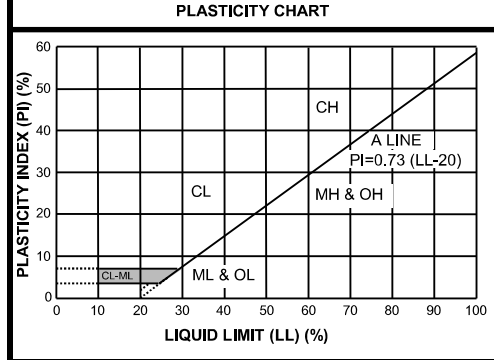
Less than 5 percent.....GW, GP, SW, SP
 More than 12 percent.....GM, GC, SM, SC
 5 to 12 percent.....Cases requiring dual symbols

- SP-SM or SW-SM (SAND with Silt or SAND with Silt and Gravel)
- SP-SC or SW-SC (SAND with Clay or SAND with Clay and Gravel)
- GP-GM or GW-GM (GRAVEL with Silt or GRAVEL with Silt and Sand)
- GP-GC or GW-GC (GRAVEL with Clay or GRAVEL with Clay and Sand)

If the fines are CL-ML:

- SC-SM (SILTY CLAYEY SAND or SILTY CLAYEY SAND with Gravel)
- SM-SC (CLAYEY SILTY SAND or CLAYEY SILTY SAND with Gravel)
- GC-GM (SILTY CLAYEY GRAVEL or SILTY CLAYEY GRAVEL with Sand)

PARTICLE SIZES	
Boulders	- Greater than 12 inches
Cobbles	- 3 inches to 12 inches
Gravel- Coarse	- 3/4 inches to 3 inches
Gravel- Fine	- No. 4 to 3/4 inches
Sand- Coarse	- No. 10 to No. 4
Sand- Medium	- No. 40 to No. 10
Sand- Fine	- No. 200 to No. 40
Silt and Clay	- Less than (0.074 mm)



VISUAL MANUAL PROCEDURE

When laboratory tests are not performed to confirm the classification of soils exhibiting borderline classifications, the two possible classifications would be separated with a slash, as follows:

For soils where it is difficult to distinguish if it is a coarse or fine-grained soil:

- SC/CL (CLAYEY SAND to Sandy LEAN CLAY)
- SM/ML (SILTY SAND to SANDY SILT)
- GC/CL (CLAYEY GRAVEL to Gravelly LEAN CLAY)
- GM/ML (SILTY GRAVEL to Gravelly SILT)

For soils where it is difficult to distinguish if it is sand or gravel, poorly or well-graded sand or gravel; silt or clay; or plastic or non-plastic silt or clay:

- SP/GP or SW/GW (SAND with Gravel to GRAVEL with Sand)
- SC/GC (CLAYEY SAND with Gravel to CLAYEY GRAVEL with Sand)
- SM/GM (SILTY SAND with Gravel to SILTY GRAVEL with Sand)
- SW/SP (SAND or SAND with Gravel)
- GP/GW (GRAVEL or GRAVEL with Sand)
- SC/SM (CLAYEY to SILTY SAND)
- GM/GC (SILTY to CLAYEY GRAVEL)
- CL/ML (SILTY CLAY)
- ML/CL (CLAYEY SILT)
- CH/MH (FAT CLAY to ELASTIC SILT)
- CL/CH (LEAN to FAT CLAY)
- MH/ML (ELASTIC SILT to SILT)

DRILLING AND SAMPLING ABBREVIATIONS	
2ST	- Shelby Tube - 2" O.D.
3ST	- Shelby Tube - 3" O.D.
AS	- Auger Sample
GS	- Grab Sample
LS	- Liner Sample
NR	- No Recovery
PM	- Pressuremeter
RC	- Rock Core diamond bit, NX size, except where noted
SB	- Split Barrel Sample 1-3/8" I.D., 2" O.D., except where noted
VS	- Vane Shear
WS	- Wash Sample

OTHER ABBREVIATIONS	
WOH	- Weight of Hammer
WOR	- Weight of Rods
SP	- Soil Probe
PID	- Photo Ionization Device
FID	- Flame Ionization Device

DEPOSITIONAL FEATURES	
Parting	- as much as 1/16 inch thick
Seam	- 1/16 inch to 1/2 inch thick
Layer	- 1/2 inch to 12 inches thick
Stratum	- greater than 12 inches thick
Pocket	- deposit of limited lateral extent
Lens	- lenticular deposit
Hardpan/Till	- an unstratified, consolidated or cemented mixture of clay, silt, sand and/or gravel, the size/shape of the constituents vary widely
Lacustrine	- soil deposited by lake water
Mottled	- soil irregularly marked with spots of different colors that vary in number and size
Varved	- alternating partings or seams of silt and/or clay
Occasional	- one or less per foot of thickness
Frequent	- more than one per foot of thickness
Interbedded	- strata of soil or beds of rock lying between or alternating with other strata of a different nature

DESCRIPTION OF RELATIVE QUANTITIES	
The visual-manual procedure uses the following terms to describe the relative quantities of notable foreign materials, gravel, sand or fines:	
Trace	- particles are present but estimated to be less than 5%
Few	- 5 to 10%
Little	- 15 to 25%
Some	- 30 to 45%
Mostly	- 50 to 100%

CLASSIFICATION TERMINOLOGY AND CORRELATIONS			
Cohesionless Soils		Cohesive Soils	
Relative Density	N₆₀ (N-Value) (Blows per foot)	Consistency	N₆₀ (N-Value) (Blows per foot)
Very Loose	0 to 4	Very Soft	<2
Loose	5 to 10	Soft	2 - 4
Medium Dense	11 to 30	Medium	5 - 8
Dense	31 to 50	Stiff	9 - 15
Very Dense	51 to 80	Very Stiff	16 - 30
Extremely Dense	Over 81	Hard	> 30
		Undrained Shear Strength (kips/ft²)	
		< 0.25	< 0.25 or less
		> 0.25	> 0.25 to 0.50
		> 0.50	> 0.50 to 1.0
		> 1.0	> 1.0 to 2.0
		> 2.0	> 2.0 to 4.0
		> 4.0	> 4.0 or greater

Standard Penetration 'N-Value' = Blows per foot of a 140-pound hammer falling 30 inches on a 2-inch O.D. split barrel sampler, except where noted. N₆₀ values as reported on boring logs represent raw N-values corrected for hammer efficiency only.

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BORING B1

PAGE 1 OF 1

BORING DEPTH: 15 FEET

PROJECT NAME: Burdick Street Improvements

PROJECT NUMBER: 093008.00

CLIENT: Hurley & Stewart

PROJECT LOCATION: Kalamazoo, Michigan

DATE STARTED: 7/23/24

COMPLETED: 7/23/24

BORING METHOD: Hollow-stem Augers

DRILLER: CT

RIG NO.: 281 CME 45B-Truck

LOGGED BY: TAG

CHECKED BY: AJR

ELEVATION (FEET)	DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE/NO. INTERVAL	RECOVERY LENGTH (INCHES)	SPT BLOWS PER SIX INCHES	HAMMER EFFICIENCY: 83% DATE: 2/8/2024 N ₆₀ - O	DRY DENSITY (pcf) - ■	MOISTURE & ATTERBERG LIMITS (%)	REMARKS
								90 100 110 120	PL MC LL	
786.8	0.2		3 Inches of ASPHALT PAVEMENT							
786.2	0.8		6 Inches of PORTLAND CEMENT CONCRETE							
783.5	3.5		FILL- Fine to Medium CLAYEY SAND with Gravel- Brown- Moist- Loose (SC)	SB1	18	3	10			Cobbles encountered from 3.5 feet to 15 feet below the existing ground surface. Driller reported driving a rock at Sample SB3.
				SB2	4	2	7			
			FILL- Fine to Coarse SAND with Silt and Gravel- Brown- Moist- Loose (SP-SM)	SB3	4	2	69+			
				SB4	18	12	42			
				SB5	18	9	39			
				SB6	18	16	37			
778.5	8.5		Fine to Coarse SAND with Gravel- Brown- Moist- Dense (SP)							
772.0	15.0		END OF BORING AT 15.0 FEET.							

GROUNDWATER & BACKFILL INFORMATION	NOTES: 1. The indicated stratification lines are approximate. The in-situ transitions between materials may be gradual. 2. The colors depicted on the symbolic profile are solely for visualization purposes and do not necessarily represent the in-situ colors encountered. 3. Surface capped with asphalt cold patch after backfilling the borehole.
GROUNDWATER WAS NOT ENCOUNTERED	
BACKFILL METHOD: Auger Cuttings	

12/15/24 12:05:42 PM



BORING B2

PAGE 1 OF 1

BORING DEPTH: 15 FEET

PROJECT NAME: Burdick Street Improvements

PROJECT NUMBER: 093008.00

CLIENT: Hurley & Stewart

PROJECT LOCATION: Kalamazoo, Michigan

DATE STARTED: 7/23/24

COMPLETED: 7/23/24

BORING METHOD: Hollow-stem Augers

DRILLER: CT

RIG NO.: 281 CME 45B-Truck

LOGGED BY: TAG

CHECKED BY: AJR

ELEVATION (FEET)	DEPTH (FEET)	SYMBOLIC PROFILE	STATION: 45+15 ELEVATION: 782± FT	PROFILE DESCRIPTION	SAMPLE TYPE/NO. INTERVAL	RECOVERY LENGTH (INCHES)	SPT BLOWS PER SIX INCHES	HAMMER EFFICIENCY: 83% DATE: 2/8/2024 N ₆₀ - O	DRY DENSITY (pcf) - ■	MOISTURE & ATTERBERG LIMITS (%)	▼ HAND PENE. ■ TORVANE SHEAR ○ UNC. COMP. □ VANE SHEAR (PK) × VANE SHEAR (REM) ◆ TRIAXIAL (UU) SHEAR STRENGTH (KSF)	REMARKS
									90 100 110 120	PL MC LL		
781.7	0.3			3 Inches of TOPSOIL								
780	3.5			FILL- Fine to Medium CLAYEY SAND- Brown- Moist- Very Loose (SC)	SB1	18	3	4				
778.5	5			FILL- Fine to Medium SAND with Silt and Gravel- Brown- Moist- Medium Dense (SP-SM)	SB2	18	3	11				
776.0	6.0			Fine to Coarse SAND with Gravel- Brown- Moist- Medium Dense (SP)	SB3	18	4	19				
775					SB4	18	7	21				
771.0	11.0			Fine CLAYEY SAND- Brown- Moist- Medium Dense (SC)	SB5	18	4	15				
770	13.5			Fine SAND- Brown- Moist- Loose (SP)	SB6	18	2	6				
767.0	15.0			END OF BORING AT 15.0 FEET.			2					
765												
760												
755												
30												

GROUNDWATER & BACKFILL INFORMATION	NOTES: 1. The indicated stratification lines are approximate. The in-situ transitions between materials may be gradual. 2. The colors depicted on the symbolic profile are solely for visualization purposes and do not necessarily represent the in-situ colors encountered.
GROUNDWATER WAS NOT ENCOUNTERED	
BACKFILL METHOD: Auger Cuttings	

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BORING B3

PAGE 1 OF 1

BORING DEPTH: 15 FEET

PROJECT NAME: Burdick Street Improvements

PROJECT NUMBER: 093008.00

CLIENT: Hurley & Stewart

PROJECT LOCATION: Kalamazoo, Michigan

DATE STARTED: 7/22/24

COMPLETED: 7/22/24

BORING METHOD: Hollow-stem Augers

DRILLER: CT

RIG NO.: 281 CME 45B-Truck

LOGGED BY: TAG

CHECKED BY: AJR

ELEVATION (FEET)	DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE/NO. INTERVAL	RECOVERY LENGTH (INCHES)	SPT BLOWS PER SIX INCHES	HAMMER EFFICIENCY: 83% DATE: 2/8/2024 N ₆₀ - O	DRY DENSITY (pcf) - ■	MOISTURE & ATTERBERG LIMITS (%)	▼ HAND PENE. ■ TORVANE SHEAR ○ UNC. COMP. □ VANE SHEAR (PK) × VANE SHEAR (REM) ◆ TRIAXIAL (UU) SHEAR STRENGTH (KSF)	REMARKS
								90 100 110 120	PL MC LL		
775	0		STATION: 35+94 ELEVATION: 776± FT 3 Inches of ASPHALT PAVEMENT 6 Inches of PORTLAND CEMENT CONCRETE FILL- SAND and GRAVEL	SB1	18	2					
	5		FILL- Fine to Medium CLAYEY SAND with Gravel- Brown- Moist- Very Loose to Loose (SC)	SB2	18	2					
	770			SB3	0	4					Driller reported driving a rock at Sample SB3. Therefore, there was no recovery at Sample SB3.
	10		Fine to Medium SAND- Brown- Moist- Loose (SP)	SB4	18	5					
	765		Fine to Medium SAND with Silt- Brown- Moist- Loose (SP-SM)	SB5	18	3					
	15		Fine to Coarse SAND with Gravel- Brown- Moist- Medium Dense (SP)	SB6	18	3					
	15		END OF BORING AT 15.0 FEET.								

GROUNDWATER & BACKFILL INFORMATION
GROUNDWATER WAS NOT ENCOUNTERED
BACKFILL METHOD: Auger Cuttings

NOTES: 1. The indicated stratification lines are approximate. The in-situ transitions between materials may be gradual.
 2. The colors depicted on the symbolic profile are solely for visualization purposes and do not necessarily represent the in-situ colors encountered.
 3. Surface capped with asphalt cold patch after backfilling the borehole.

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BORING B4

PAGE 1 OF 1

BORING DEPTH: 10 FEET

PROJECT NAME: Burdick Street Improvements

PROJECT NUMBER: 093008.00

CLIENT: Hurley & Stewart

PROJECT LOCATION: Kalamazoo, Michigan

DATE STARTED: 7/22/24

COMPLETED: 7/22/24

BORING METHOD: Hollow-stem Augers

DRILLER: CT

RIG NO.: 281 CME 45B-Truck

LOGGED BY: TAG

CHECKED BY: AJR

ELEVATION (FEET)	DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE/NO. INTERVAL	RECOVERY LENGTH (INCHES)	SPT BLOWS PER SIX INCHES	HAMMER EFFICIENCY: 83% DATE: 2/8/2024 N ₆₀ - O	DRY DENSITY (pcf) - ■	MOISTURE & ATTERBERG LIMITS (%)	▼ HAND PENE. ■ TORVANE SHEAR ○ UNC. COMP. □ VANE SHEAR (PK) × VANE SHEAR (REM) ◆ TRIAXIAL (UU) SHEAR STRENGTH (KSF)	REMARKS
								90 100 110 120			
772.7	0.3		3 Inches of ASPHALT PAVEMENT								
772.3	0.7		4 Inches of BRICK								
772.0	1.0		4 Inches of FILL- SAND and GRAVEL	SB1	18	15					
770.0	3.0		FILL- Fine to Medium SAND- Brown- Moist- Dense (SP)	SB2	18	5					
			Fine to Coarse SAND with Gravel- Brown- Moist- Dense to Medium Dense (SP)	SB3	18	4					
765				SB4	8	7					
763.0	10.0			END OF BORING AT 10.0 FEET.							

GROUNDWATER & BACKFILL INFORMATION
GROUNDWATER WAS NOT ENCOUNTERED
BACKFILL METHOD: Auger Cuttings

NOTES: 1. The indicated stratification lines are approximate. The in-situ transitions between materials may be gradual.
 2. The colors depicted on the symbolic profile are solely for visualization purposes and do not necessarily represent the in-situ colors encountered.
 3. Surface capped with asphalt cold patch after backfilling the borehole.

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BORING B5

PAGE 1 OF 2

BORING DEPTH: 37.5 FEET

PROJECT NAME: Burdick Street Improvements

PROJECT NUMBER: 093008.00

CLIENT: Hurley & Stewart

PROJECT LOCATION: Kalamazoo, Michigan

DATE STARTED: 7/22/24

COMPLETED: 7/22/24

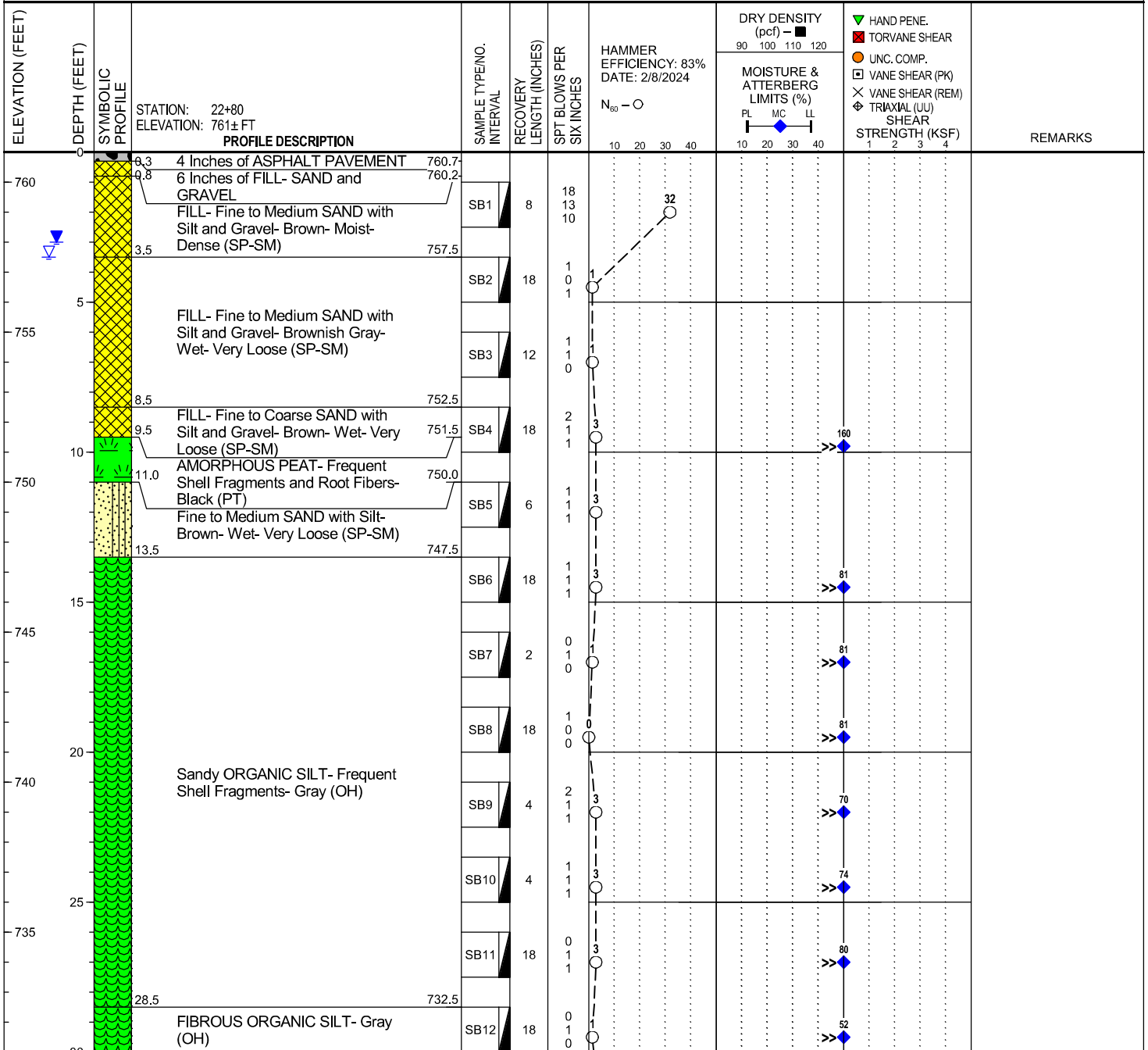
BORING METHOD: Hollow-stem Augers

DRILLER: CT

RIG NO.: 281 CME 45B-Truck

LOGGED BY: TAG

CHECKED BY: AJR



GROUNDWATER & BACKFILL INFORMATION		
	DEPTH (FT)	ELEV (FT)
▽ DURING BORING:	3.5	757.5
▽ AT END OF BORING:	3.0	758.0
CAVE-IN OF BOREHOLE AT:	15.0	746.0
BACKFILL METHOD:	Note 3	

- NOTES: 1. The indicated stratification lines are approximate. The in-situ transitions between materials may be gradual.
 2. The colors depicted on the symbolic profile are solely for visualization purposes and do not necessarily represent the in-situ colors encountered.
 3. Above the cave-in depth, the borehole was backfilled with cement-bentonite grout to 3 feet below the ground surface and auger cuttings from 3 feet to just below the ground surface.
 4. Surface capped with asphalt cold patch after backfilling the borehole.

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BORING B6

PAGE 1 OF 1

BORING DEPTH: 30 FEET

PROJECT NAME: Burdick Street Improvements

PROJECT NUMBER: 093008.00

CLIENT: Hurley & Stewart

PROJECT LOCATION: Kalamazoo, Michigan

DATE STARTED: 7/22/24

COMPLETED: 7/22/24

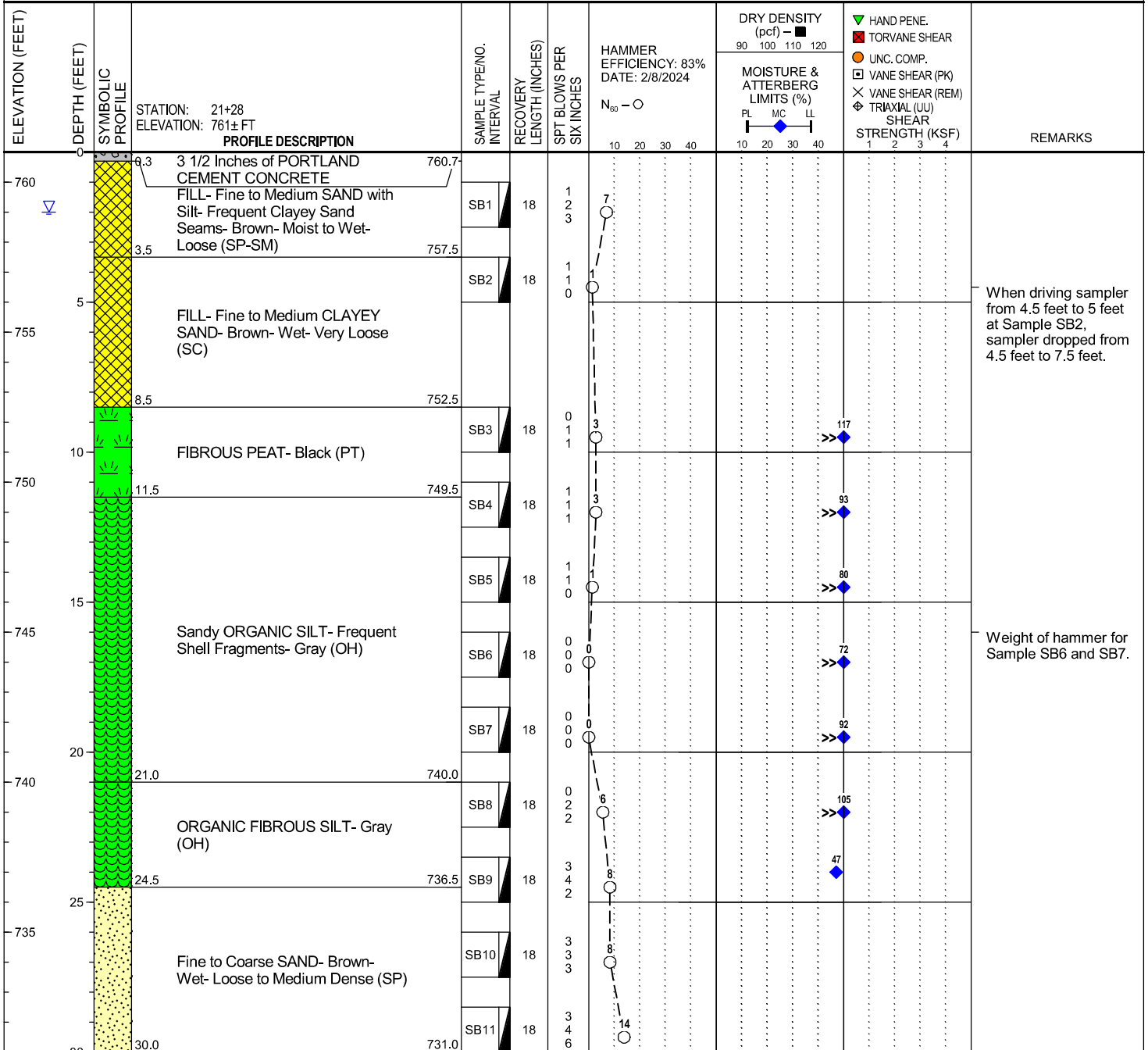
BORING METHOD: Hollow-stem Augers

DRILLER: AK

RIG NO.: 281 CME 45B-Truck

LOGGED BY: TAG

CHECKED BY: AJR



END OF BORING AT 30.0 FEET.

GROUNDWATER & BACKFILL INFORMATION

	DEPTH (FT)	ELEV (FT)
▽ DURING BORING:	2.0	759.0
▽ AT END OF BORING:	Note 3	
BACKFILL METHOD:	Note 3	

- NOTES:
- The indicated stratification lines are approximate. The in-situ transitions between materials may be gradual.
 - The colors depicted on the symbolic profile are solely for visualization purposes and do not necessarily represent the in-situ colors encountered.
 - The borehole was backfilled by tremie method with bentonite and cement grout to 5 feet below the ground surface and auger cuttings to the just below the ground surface. Therefore, an accurate groundwater level measurement was not obtained after completion of drilling activities.
 - Surface capped with Quikrete after backfilling the borehole.

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BORING B7

PAGE 1 OF 1

BORING DEPTH: 10 FEET

PROJECT NAME: Burdick Street Improvements

PROJECT NUMBER: 093008.00

CLIENT: Hurley & Stewart

PROJECT LOCATION: Kalamazoo, Michigan

DATE STARTED: 7/22/24

COMPLETED: 7/22/24

BORING METHOD: Hollow-stem Augers

DRILLER: AK

RIG NO.: 281 CME 45B-Truck

LOGGED BY: TAG

CHECKED BY: AJR

ELEVATION (FEET)	DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE/NO. INTERVAL	RECOVERY LENGTH (INCHES)	SPT BLOWS PER SIX INCHES	HAMMER EFFICIENCY: 83% DATE: 2/8/2024 $N_{60} - O$	DRY DENSITY (pcf) - ■	MOISTURE & ATTERBERG LIMITS (%)	▼ HAND PENE. ■ TORVANE SHEAR ○ UNC. COMP. □ VANE SHEAR (PK) × VANE SHEAR (REM) ⊕ TRIAXIAL (UU) SHEAR STRENGTH (KSF)	REMARKS
								90 100 110 120			
	0		STATION: 16+04 ELEVATION: 764± FT								
	0.7		8 Inches of ASPHALT PAVEMENT								
	1.1		FILL- SAND and GRAVEL								
	3.5		FILL- Fine to Medium SAND with Silt- Frequent Clayey Sand Seams- Brown- Moist- Medium Dense (SP-SM)	SB1	18	5 7 11	25				
760	5		Fine to Medium SAND with Silt- Brown- Moist- Loose to Very Loose (SP-SM)	SB2	18	3 3 3	8				
	8.5		Fine to Coarse SAND with Silt and Gravel- Brown- Wet- Medium Dense (SP-SM)	SB3	18	1 1 2	4				
755	10.0		END OF BORING AT 10.0 FEET.	SB4	18	2 3 6	12				
750	15										
745	20										
740	25										
735	30										

GROUNDWATER & BACKFILL INFORMATION		
	DEPTH (FT)	ELEV (FT)
▽ DURING BORING:	8.5	755.5
▽ AT END OF BORING:	Note 3	
CAVE-IN OF BOREHOLE AT:	8.0	756.0
BACKFILL METHOD:	Auger Cuttings	

NOTES: 1. The indicated stratification lines are approximate. The in-situ transitions between materials may be gradual.
 2. The colors depicted on the symbolic profile are solely for visualization purposes and do not necessarily represent the in-situ colors encountered.
 3. Groundwater was not observed above borehole cave-in depth upon auger removal.
 4. Surface capped with asphalt cold patch after backfilling the borehole.

12/15/24 12:05:49 PM



BORING B8

PAGE 1 OF 1

BORING DEPTH: 2 FEET

PROJECT NAME: Burdick Street Improvements

PROJECT NUMBER: 093008.00

CLIENT: Hurley & Stewart

PROJECT LOCATION: Kalamazoo, Michigan

DATE STARTED: 7/22/24

COMPLETED: 7/22/24

BORING METHOD: Hollow-stem Augers

DRILLER: AK

RIG NO.: 281 CME 45B-Truck

LOGGED BY: TAG

CHECKED BY: AJR

ELEVATION (FEET)	DEPTH (FEET)	SYMBOLIC PROFILE	STATION: 11+81 ELEVATION: 767± FT	PROFILE DESCRIPTION	SAMPLE TYPE/NO. INTERVAL	RECOVERY LENGTH (INCHES)	HAMMER EFFICIENCY: 83% DATE: 2/8/2024 N ₆₀ - O	DRY DENSITY (pcf) - ■	MOISTURE & ATTERBERG LIMITS (%)	▼ HAND PENE. ■ TORVANE SHEAR ○ UNC. COMP. □ VANE SHEAR (PK) × VANE SHEAR (REM) ◆ TRIAXIAL (UU) SHEAR STRENGTH (KSF)	REMARKS	
								90 100 110 120				PL MC LL
0	0.5			6 Inches of ASPHALT PAVEMENT	766.5							
765	2.0			PORTLAND CEMENT CONCRETE	765.0							
				END OF BORING AT 2.0 FEET.								Boring was terminated at a depth of 2 feet below the ground surface.
5												
760												
10												
755												
15												
750												
20												
745												
25												
740												
30												

GROUNDWATER & BACKFILL INFORMATION
GROUNDWATER WAS NOT ENCOUNTERED
BACKFILL METHOD: Note 3

NOTES: 1. The indicated stratification lines are approximate. The in-situ transitions between materials may be gradual.
 2. The colors depicted on the symbolic profile are solely for visualization purposes and do not necessarily represent the in-situ colors encountered.
 3. Surface capped with asphalt cold patch after backfilling the borehole.

APPENDIX B
IMPORTANT INFORMATION ABOUT THIS GEOTECHNICAL-ENGINEERING REPORT
GENERAL COMMENTS
LABORATORY TESTING PROCEDURES

Important Information about This Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, you can benefit from a lowered exposure to problems associated with subsurface conditions at project sites and development of them that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed herein, contact your GBA-member geotechnical engineer. Active engagement in GBA exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Understand the Geotechnical-Engineering Services Provided for this Report

Geotechnical-engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical-engineering services is typically a geotechnical-engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical-engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

Geotechnical-Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical-engineering study conducted for a given civil engineer

will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client.

Likewise, geotechnical-engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical-engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. *Read and refer to the report in full.*

You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept*

responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.

Most of the “Findings” Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site’s subsurface using various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

This Report’s Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are not final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals’ misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals’ plans and specifications; and
- be available whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note*

conspicuously that you’ve included the material for information purposes only. To avoid misunderstanding, you may also want to note that “informational purposes” means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled “limitations,” many of these provisions indicate where geotechnical engineers’ responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a “phase-one” or “phase-two” environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer’s services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, *proper implementation of the geotechnical engineer’s recommendations will not of itself be sufficient to prevent moisture infiltration.* **Confront the risk of moisture infiltration** by including building-envelope or mold specialists on the design team. **Geotechnical engineers are not building-envelope or mold specialists.**



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GENERAL COMMENTS

BASIS OF GEOTECHNICAL REPORT

This report has been prepared in accordance with generally accepted geotechnical engineering practices to assist in the design and/or evaluation of this project. If the project plans, design criteria, and/or other project information referenced in this report and utilized by SME to prepare our recommendations are changed, the conclusions and recommendations contained in this report are not considered valid unless the changes are reviewed, and the conclusions and recommendations of this report are modified or approved in writing.

The discussions and recommendations contained in this report are based on the available project information, described in this report, and the geotechnical data obtained from the field exploration at the locations indicated in the report. Variations in soil and groundwater conditions commonly occur between or away from sampling locations. The nature and extent of the variations may not become evident until the time of construction. If significant variations are observed during construction, SME must be contacted to reevaluate the recommendations of this report.

In the process of obtaining and testing samples and preparing this report, procedures are followed that represent reasonable and accepted practice in the field of geotechnical engineering. Specifically, field logs are prepared during the field exploration that describe field occurrences, sampling locations, and other information. Samples obtained in the field are frequently subjected to additional testing and reclassification in the laboratory and differences may exist between the field logs and the report logs.

The engineer preparing the report reviews the field logs, laboratory classifications, and test data and then prepares the report logs. Our recommendations are based on the contents of the report logs and the information contained therein.

REVIEW OF DESIGN DETAILS, PLANS, AND SPECIFICATIONS

Retain SME to review the design details, project plans, and specifications to verify those documents are consistent with the recommendations contained in this report.

REVIEW OF REPORT INFORMATION WITH PROJECT TEAM

Implementation of our recommendations may affect the design, construction, and performance of the proposed improvements, along with the potential inherent risks involved with the proposed construction. The client and key members of the design team, including SME, should discuss the issues covered in this report so the issues are understood and applied in a manner consistent with the owner's budget, tolerance of risk, and expectations for performance and maintenance.

FIELD VERIFICATION OF GEOTECHNICAL CONDITIONS

SME needs to be retained to continue our services through construction so we may observe and evaluate the actual subsurface conditions relative to the recommendations made in this report, and so we can verify the recommendations of this report are properly implemented during construction. This may avoid misinterpretation of our recommendations by other parties and will allow us to review and modify our recommendations if variations in the site subsurface conditions are encountered.

PROJECT INFORMATION FOR CONTRACTOR

This report and any future addenda or other reports regarding this site needs to be made available to prospective contractors prior to submitting their proposals for their information only and to supply them with facts relative to the subsurface evaluation and laboratory test results. If the selected contractor encounters subsurface conditions during construction, which differ from those presented in this report, the contractor needs to promptly describe the nature and extent of the differing conditions in writing and SME needs to be notified so we can verify those conditions. The construction contract needs to include provisions for dealing with differing conditions, and contingency funds for potential problems during earthwork and foundation construction. We would be pleased to assist with the development of contract provisions based on our experience.

The contractor needs to be prepared to handle environmental conditions encountered at this site, which may affect the excavation, removal, or disposal of soil; dewatering of excavations; and health and safety of workers. Any Environmental Assessment reports prepared for this site need to be made available for review by bidders and the successful contractor.

THIRD PARTY RELIANCE/REUSE OF THIS REPORT

This report has been prepared solely for the use of our Client for the project specifically described in this report. This report cannot be relied upon by other parties not involved in the project, unless specifically allowed by SME in writing. SME also is not responsible for the interpretation by other parties of the geotechnical data and the recommendations provided herein.

LABORATORY TESTING PROCEDURES

VISUAL ENGINEERING CLASSIFICATION

Visual classification was performed on recovered samples. The appended General Notes and Unified Soil Classification System (USCS) sheets include a brief summary of the general method used visually classify the soil and assign an appropriate USCS group symbol. The estimated group symbol, according to the USCS, is shown in parentheses following the textural description of the various strata on the boring logs appended to this report. The soil descriptions developed from visual classifications are sometimes modified to reflect the results of laboratory testing.

MOISTURE CONTENT

Moisture content tests were performed by weighing samples from the field at their in-situ moisture condition. These samples were then dried at a constant temperature (approximately 110° C) overnight in an oven. After drying, the samples were weighed to determine the dry weight of the sample and the weight of the water that was expelled during drying. The moisture content of the specimen is expressed as a percent and is the weight of the water compared to the dry weight of the specimen.

HAND PENETROMETER TESTS

In the hand penetrometer test, the unconfined compressive strength of a cohesive soil sample is estimated by measuring the resistance of the sample to the penetration of a small calibrated, spring-loaded cylinder. The maximum capacity of the penetrometer is 4.5 tons per square-foot (tsf). Theoretically, the undrained shear strength of the cohesive sample is one-half the unconfined compressive strength. The undrained shear strength (based on the hand penetrometer test) presented on the boring logs is reported in units of kips per square-foot (ksf).

TORVANE SHEAR TESTS

In the Torvane test, the shear strength of a low strength, cohesive soil sample is estimated by measuring the resistance of the sample to a torque applied through vanes inserted into the sample. The undrained shear strength of the samples is measured from the maximum torque required to shear the sample and is reported in units of kips per square-foot (ksf).

LOSS-ON-IGNITION (ORGANIC CONTENT) TESTS

Loss-on-ignition (LOI) tests are conducted by first weighing the sample and then heating the sample to dry the moisture from the sample (in the same manner as determining the moisture content of the soil). The sample is then re-weighed to determine the dry weight and then heated for 4 hours in a muffle furnace at a high temperature (approximately 440° C). After cooling, the sample is re-weighed to calculate the amount of ash remaining, which in turn is used to determine the amount of organic matter burned from the original dry sample. The organic matter content of the specimen is expressed as a percent compared to the dry weight of the sample.

ATTERBERG LIMITS TESTS

Atterberg limits tests consist of two components. The plastic limit of a cohesive sample is determined by rolling the sample into a thread and the plastic limit is the moisture content where a 1/8-inch thread begins to crumble. The liquid limit is determined by placing a 1/2-inch thick soil pat into the liquid limits cup and using a grooving tool to divide the soil pat in half. The cup is then tapped on the base of the liquid limits device using a crank handle. The number of drops of the cup to close the gap formed by the grooving tool 1/2 inch is recorded along with the corresponding moisture content of the sample. This procedure is repeated several times at different moisture contents and a graph of moisture content and the corresponding number of blows is plotted. The liquid limit is defined as the moisture content at a nominal 25 drops of the cup. From this test, the plasticity index can be determined by subtracting the plastic limit from the liquid limit.



*Passionate People Building
and Revitalizing our World*

