BAY MILLS INDIAN COMMUNITY
"*GNOOZHEKAANING*" PLACE OF THE PIKE

BAY MILLS TRIBAL ADMINSTRATION
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Brimley, Michigan 49715

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REQUEST FOR QUOTES AND PROPOSALS

Phase II Debris Removal and Stream Corridor Cleanup
Plantation Road, Brimley, Michigan

The Bay Mills Indian Community (BMIC), in partnership with Hiawatha National Forest (HNF), is soliciting quotes and proposals from experienced environmental remediation, excavation, and demolition contractors to conduct cleanup activities at the Superior Township Dump located on Hiawatha National Forest lands near Plantation Road in Superior Township, Michigan.

This project represents the next phase of a multi-year cleanup effort to remove legacy waste and debris from a former unregulated dump site located within a ravine and stream corridor that ultimately drains into Bay Mills Indian Community Trust Lands. Funding in the amount of $740,000 has been awarded for the clean up of tires, debris and other material for Phase 2 of this project.

The selected contractor shall provide all labor, supervision, equipment, materials, temporary erosion controls, transportation, recycling, disposal, documentation, and project management necessary to complete the cleanup activities identified in this RFQPP.

Background
The Former Superior Township Dump operated from approximately 1940 through 1974 as an unregulated disposal area. The site encompasses approximately ten acres of U.S. Forest Service property and is currently listed by the State of Michigan as a Part 201 (contaminated) Facility (Facility ID #17000160).

The site is situated adjacent to a small stream. Historic dumping occurred on upland areas, within the ravine, over steep streambanks, and directly in the stream corridor. Debris documented at the site includes:

- Automobiles and vehicle components
- Appliances
- Scrap metal
- Tires
- Glass
- Construction debris
- Household refuse
- Buried mixed waste deposits

A Remedial Investigation and Feasibility Study (attached) completed in 2025 documented extensive exposed and buried debris throughout the site and identified physical hazards, groundwater contamination concerns, and ongoing erosion of the debris-containing streambank.

Previous Cleanup Activities
During summer 2026, BMIC completed substantial cleanup activities which included:

- Removal of 3,318.79 tons of mixed waste and debris.

- Removal of 272 tons of contaminated soil, debris, and Japanese knotweed.
- Recycling of 103,850 pounds of scrap metal.
- Removal and disposal of 92 tires.
- Construction of access roads and staging areas.
- Invasive species treatment and removal.

Cleanup revealed that buried materials extended much deeper into the ravine than originally anticipated. Additional debris remains embedded in the streambank, ravine slope, and portions of the stream channel.

Project Objectives
The primary objectives of this phase are to:
- Continue removal of exposed and buried debris along the ravine and stream corridor.
- Remove remaining scrap metal, tires, and waste materials.
- Reduce direct-contact hazards.
- Remove debris contributing to erosion and physical obstruction of the stream corridor.
- Stabilize disturbed areas throughout construction.

Scope of Work
The selected contractor shall provide all services necessary to complete the cleanup effort, including but not limited to the following:

Task 1 – Mobilization and Site Preparation
- Attend pre-construction meetings.
- Coordinate activities with BMIC and USFS representatives.
- Mobilize personnel and equipment.
- Review available site reports and mapping.
- Maintain site access roads and staging area throughout the project.

Task 2 – Debris Removal
The contractor shall:
- Remove visible debris from the stream corridor, ravine, slopes, and adjacent areas.
- Remove exposed and buried vehicles, appliances, scrap metal, tires, and refuse.
- Utilize excavation methods appropriate for steep and sensitive terrain.
- Separate recyclable metals from other waste materials where practical.

Materials shall be managed as follows:
Scrap Metal: Transport to an approved recycling facility.
Tires: Transport to a licensed tire recycling or disposal facility.
Mixed Refuse: Transport to an approved landfill.

Task 3 – Stream Protection and Sediment Control
The contractor shall install and maintain erosion and sediment control measures which may include:
- Silt fencing.
- Turbidity curtains.

- Sediment barriers.
- Debris catchment systems.
- Other best management practices necessary to prevent migration of sediments or debris downstream.

Protection measures shall remain functional and be maintained throughout project operations.

Task 4 – Streambank Stabilization

As debris is removed, disturbed soils shall be stabilized throughout project operations. Stabilization measures may include:

- Temporary seeding.
- Erosion control blankets.
- Mulching.
- Other approved Best Management Practices.

Completion of final restoration is not part of this contract but work areas shall be left stable and protected from erosion.

Task 5 – Material Documentation

Contractor shall provide documentation or work with project manager to complete:

- Daily field reports.
- Photographic documentation.
- Weight tickets/Landfill receipts.
- Tire disposal receipts.
- Scrap metal recycling receipts.
- Equipment logs.

Task 6 – Site Restoration and Demobilization

Upon completion:

- Remove temporary construction materials.
- Remove temporary waste containers.
- Restore staging areas.
- Regrade disturbed access areas.
- Address construction-related ruts or depressions.
- Leave access roads in serviceable condition.
- Close access to the site through natural barrier such as tree roots/stumps across road.

Health and Safety Requirements

The contractor shall:

- Follow BMIC's site-specific Health and Safety Plan.
- Develop and follow a Spill Prevention and Response Plan.
- Maintain first aid kits, spill kits, and fire extinguishers onsite.
- Comply with all applicable MIOSHA regulations.
- Conduct daily safety briefings as necessary.

At least one individual present during excavation activities shall maintain:

- Current 40-Hour HAZWOPER Certification.

- Current HAZWOPER Refresher Training.

Davis Bacon/Prevailing Wage Requirements
This project is federally funded and subject to Davis-Bacon and Related Act requirements. Contractors shall:

- Pay prevailing wages (at time of contract execution, the current posted prevailing wage for Chippewa County will determine the wage rate): https://sam.gov/wage-determinations
- Participate in job site labor interviews.
- Submit weekly payroll reports (WH-347).
- Submit weekly pay stubs.
- Maintain all payroll documentation required by the U.S. Department of Labor.
- Ensure subcontractor compliance, if applicable
- Additional details:
    - https://www.epa.gov/brownfields/davis-bacon-act-and-brownfields
    - https://www.epa.gov/system/files/documents/2024-04/davis-bacon-fact-sheet.pdf

Best Management Practices
Although no state permits are anticipated because work occurs on federal land, contractors shall comply with:

- EGLE Nonpoint Source Best Management Practices Manual https://www.michigan.gov/egle/about/organization/water-resources/nonpoint-source/bmp-manual-and-design-references
- Michigan Forestry Best Management Practices for Soil and Water Quality: https://www.michigan.gov/egle/-/media/Project/Websites/dnr/Documents/FRD/Mgt/IC4011_SustainablePracticesForestLand.pdf?rev=4be8786b254d4d5ebcb0233de6f99833&hash=0034747A207C623FF9D43D2746CB04D
- Applicable USFS requirements.

Insurance
Contractor shall obtain and maintain insurance coverages as identified by BMIC contract requirements *(sample contract with exhibits available upon request)*, including:

- Workers Compensation and Employers Liability
- Commercial General Liability
- Commercial Automobile Liability
- Contractor's Pollution Liability

Certificate of Insurance for coverages must be provided before commencement of work.

Mandatory Site Visit
Due to the location and unique character of the dump site, a pre-bid meeting at the site visit is mandatory. This is scheduled for **Wednesday, December 2 at 2pm EST.** Please confirm participation for the pre-bid meeting with the Environmental Coordinator: Jennifer Satchell, jmsatchell@baymills.org, (906) 248-8655. The meeting location is 5463 South Nbiish Road, Brimley, MI 49715 near the water tower. Nbiish Rd is off Plantation Rd, Brimley, at the top of the hill.

Anticipated Schedule

Milestone	Date
RFQP Issued	November 13, 2026
Mandatory Site Visit	December 2, 2026
Proposals Due	December 11, 2026 @ Noon
Evaluation and Selection (Contingent on follow-up questions or interviews if needed)	December 17, 2026
Contract Award	January/February 2027
Mobilization (weather dependent)	Spring 2027
Field Operations	April-November 2027
Final Completion	**November 1, 2027**

Submission Requirements
Proposals shall include:
1. Cover Letter
- Briefly describing interest and understanding of the project.

2. Firm Qualifications
- Years in business.
- Relevant cleanup experience.
- Federal project experience.
- Tribal project experience.

3. Relevant Project Experience
Provide descriptions of similar projects completed within the last ten years involving:
- Landfill remediation.
- Dump cleanup.
- Stream-adjacent excavation.
- Environmental restoration support.

4. Methodology
Describe:
- Proposed sequence of work.
- Excavation methods.
- Debris removal approach.
- Stream protection measures.
- Soil stabilization methods.
- Equipment to be used.
- Waste handling procedures.

5. Schedule
Provide anticipated timeline and duration.

6. Cost Proposal
Include:
- Mobilization
- Labor
- Equipment
- Hauling
- Disposal
- Temporary erosion controls
- Project management
- Unit pricing if applicable

7. Native American Preference (Optional)
Provide documentation demonstrating qualification as a Native American-owned enterprise, with at least 51% active ownership by a member of a federally recognized Native American Tribe.

Proposal Submission
Proposals shall be submitted electronically in PDF format to:

Jennifer Satchell, Environmental Coordinator
Bay Mills Indian Community
Email: jmsatchell@baymills.org

Or hardcopies can be dropped off by the deadline at:
Ogimaag Gamig – Tribal Administration Building
12140 W. Lakeshore Drive
Brimley, MI 49715

Deadline
Friday, December 11, 2026, 12:00 PM (Noon) EST
Late submissions will not be considered.

Questions regarding this RFP should be directed to:
Jennifer Satchell
Environmental Coordinator
Bay Mills Indian Community
Email: jmsatchell@baymills.org
Phone: (906) 248-8655

Evaluation Criteria

	Score Received: 1-5	Weight	Weighted Scores
Qualifications/Relevant Experience: Describe qualifications and experience with environmental clean-up activities		25%	
Methods: How will this project be executed? What equipment will be used?		25%	
Schedule: Explain the project timeline from start to completion		20%	
Cost		25%	
Native American Preference		5%	
Total		100%	

Ratings:	
Clearly Outstanding	5
Well Qualified	4
Average	3
Weak	2
Unsatisfactory	1
Insufficient Response	0

Compensation

The quote should provide a cost for all work associated with the services. The final cost of services may be negotiated, prior to award of the contract, or as a result of additional quantities of work provided. Payment will be provided after satisfactory completion of the work as determined by the BMIC Project Manager.

Reserved Rights

BMIC and HNF reserve the right to:

- Reject any or all proposals.
- Request clarification or additional information including a follow up interview.
- Negotiate scope and pricing.
- Waive informalities.
- Cancel or modify the solicitation at any time.
- Award to the proposal deemed most advantageous to BMIC and HNF.

Attachment

- Photos
- Report from 2026 Clean Up
- Feasibility Study (includes maps, figures & tables)

Photos

Example of debris to be addressed in 2027









SUPERIOR TOWNSHIP DUMP

CLEANUP PROJECT

Summary Report of Summer 2026 Clean Up Activities

Prepared by:

Jennifer Satchell

Environmental Coordinator

Bay Mills Indian Community

EXECUTIVE SUMMARY

This report summarizes the cleanup activities conducted at the former Superior Township Dump by Bay Mills Indian Community (BMIC) in partnership with the U.S. Forest Service (USFS). Grant funding from Minneapolis Foundation Thriving Communities Grantmakers program (TCGM), and the Bureau of Indian Affairs Great Lakes Restoration Initiative (GLRI) supported these efforts. The project aimed to remove legacy waste along a ravine and stream corridor, reduce non-point source pollution, and prepare the site for future riparian and hydrologic restoration.

Major accomplishments this reporting period include access road and staging area development, large-scale excavation of waste materials, treatment and removal of invasive Japanese knotweed, recycling of scrap metal, tire removal, and sustained interagency coordination. Substantial progress was achieved toward long-term ecosystem recovery goals.

PROJECT BACKGROUND

The former Superior Township Dump operated from approximately 1940–1974 and contains mixed waste such as household debris, appliances, vehicles, construction waste, and extensive buried materials within a ravine adjacent to a tributary flowing into the St. Mary's River. Environmental assessments and a feasibility study documented debris on the streambank, within the ravine, and dispersed across approximately ten acres of forested federal land. Cleanup was necessary to reduce contaminant loading to groundwater and surface water, restore riparian function, and mitigate erosion and habitat degradation.

WORK COMPLETED (FIELD OPERATIONS)

Excavation and Debris Removal

- 3,318.79 tons of mixed materials excavated and transported to landfill.
- 272 tons of soil, debris, and Japanese knotweed excavated and landfilled (removal included two feet of root-zone soil to prevent regrowth).
- 103,850 pounds of scrap metal removed and recycled through Reid's Scrap Metal.
- 92 tires removed as taken to Mark's Tire in Brimley.
- Removal activities revealed that landfill material extended significantly deeper into the bank than anticipated, requiring excavation back to native soil along the ravine.

- Additional hazards encountered included buried vehicles, burned waste layers, mixed glass and metal debris, and wet soil near the stream channel.

Japanese Knotweed Management

- A knotweed patch co-located with dump debris was excavated and removed, along with approximately two feet of underlying soil.
- Removal was coordinated with Cooperative Invasive Species Management Area (CISMA) and USFS biologists.

Site Access and Infrastructure

- TCGM-funded tree clearing and access road and staging area developments enabled safe operation of heavy equipment.

FUNDING UTILIZATION

Minneapolis Foundation – Thriving Communities Grantmakers (TCGM)

$350,000 expended
Deliverables included:

- Tree clearing and grubbing
- Gravel for construction of access road and staging area
- Excavation labor and heavy equipment operations
- Waste hauling and landfill tipping fees

Bureau of Indian Affairs – Great Lakes Restoration Initiative (GLRI)

$498,696.36 expended
Deliverables included:

- Excavation labor and heavy equipment operations
- Waste hauling and landfill tipping fees
- Invasive species removal and debris disposal
- Project management
- Agency coordination

CHALLENGES ENCOUNTERED

1. **Deeper and more extensive buried waste than predicted**
   Excavation revealed waste extending far into the bank and as deep as 6–10 feet in some locations, significantly increasing hauling requirements.
2. **Mixed soil and waste material**
   Frequent mixing of waste with soil reduced the ability to separate recyclable materials and increased landfill volume.
3. **Knotweed contamination within dump debris**
   Required extraction and specialized disposal, increasing time spent in the area.
4. **Streambank and hydrology constraints**
   Several debris items remain near or within the stream channel, requiring specialized excavation methods in future phases. Hydrologic study components (monitoring wells, sampling) remain pending for next stage funding.
5. **Budget limitations**
   High waste and soil volumes led to increased disposal costs, requiring funding adjustments and postponement of some tasks to subsequent funding cycles.

PROJECT OUTCOMES

- Substantial removal of waste along approximately 250 feet of ravine bank, returning portions of the site to native soil and preparing the area for future slope regrading and restoration actions.
- Reduction of non-point source pollution risk by removing debris that formerly contributed contaminants to groundwater and surface water.
- Progress toward stable riparian and upland conditions, with future potential for stream rehabilitation and habitat enhancement.

NEXT STEPS AND RECOMMENDATIONS

1. **Secure additional funding (USFS Stewardship, NAMP, BIA GLRI)**
   Needed to finish excavation along the remaining ravine length, complete streambed debris removal, and conduct hydrological monitoring.
2. **Complete debris removal in lower ravine and stream channel**
   Requires excavation with consideration given to precipitation events, possible temporary dewatering strategies, mixing wet and dry materials for landfill acceptance, and use of timber mats.

3. **Implement final 3:1 slope grading and vegetation stabilization**
   Completion will require additional tree clearing and debris removal toward the access road as surveyed.
4. **Conduct hydrogeologic study and monitoring**
   Includes installation and sampling of monitoring wells, PFAS analysis, and updated site characterization consistent with feasibility study recommendations.
5. **Long-term restoration planning**
   Once excavation concludes:
   a. Reconnect floodplain functions
   b. Restore native vegetation
   c. Rehabilitate stream morphology
   d. Address any remaining contamination based on regulatory guidance

PHOTO DOCUMENTATION














KOBELCO





REMEDIAL INVESTIGATION AND FEASIBILITY STUDY

FORMER SUPERIOR TOWNSHIP DUMP
PLANTATION ROAD, BRIMLEY, MICHIGAN

Prepared for

Bay Mills Indian Community

United States Forest Service

Prepared by

Edward Radecki
Mackinac Environmental Technology Coop, Inc.
St. Ignace, Michigan
MET Project No.: M23-4099

SEPTEMBER 03, 2025

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Attachment #4: Laboratory Analytical Data Reports

LIST OF ABBREVIATIONS

Amsl	above mean sea level
Bgs	below ground surface
COC	chain-of-custody
EPA	United States Environmental Protection Agency
GIS	Geographic Information Systems
gpm	gallons per minute
GPS	Global Positioning System
LUST	Leaking Underground Storage Tank
MCL	Maximum Contaminant Level
mg/L	milligrams per liter
MS/MSD	Matrix Spike/ Matrix Spike Duplicate
µg/L	micrograms per liter
PAHs	polyaromatic hydrocarbons
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
SM	Standard Method
USGS	United States Geological Survey

EXECUTIVE SUMMARY

The Remedial Investigation (RI) presented in this report is a continuation of the effort begun in 1993 to characterize the nature and extent of contamination associated with the former Superior Township Dump (the Site). This document includes a risk assessment to evaluate risk to human health and the environment associated with the open dump and a conceptual cleanup plan to be used for developing a Request For Proposals (RFP) for site feasibility study for appropriate closure method of the Site.

The Site is comprised of a 10-acre (approximate) abandoned open dump on United States Forest Service (USFS) land. The Site is located along the south side of Plantation Road approximately one-mile west of Lakeshore Drive in Superior Township, Michigan. The dump area is situated along the edge of a ravine with a small creek that flows easterly for approximately 1.2 miles into Lake Superior.

The Site operated as an unregulated dump from 1940 to 1974. The garbage/debris is visible at surface, on the ravine bank and scattered within the creek channel. The original access road is intact and provides access off of Plantation Road. The road loops around, running parallel to the top of a ravine for approximately 200-feet (reference Figure 2 – Site Plan on page 5).

The Site is characterized as a riverine system. A riverine system is a network of streams and wetlands that share a common drainage; in this instance the creek that runs along the southern boundary of the Site, at the bottom of a 30-foot deep ravine. The garbage/debris was dumped onto the riverine systems upper area (surface and buried in discrete excavations), over the ravine bank and onto the creek itself.

The majority of the dump area is located adjacent to the ravine (in “Area A”) and consists of buried and unburied heterogeneous garbage/debris from surface to depths ranging from approximately two to six-feet bgs. The garbage/debris is visible at the surface (in the “low” elevation areas) and not visible (buried under sand/soil in “high” elevation areas) of the undulating surface topography. Observed garbage/debris includes, but is not limited to, appliances, automobile body/parts, metal scraps, plastics, glass, tires and cans (reference Figure 5 – Garbage/Debris Areas on page 23).

The garbage/debris is underlain by native fine silty sand that provides enough confinement for a shallow perched saturated zone. This upper area is seasonally inundated with water that is displayed as intermittent surface ponds and shallow perched groundwater.

The Hiawatha National Forest (HNF) had initially contracted with Barr Engineering Co. to test ground and surface water from the site from 1999-2001. The HNF studies included the installation five monitoring wells followed by four sampling events. Groundwater sampling identified concentrations of metals exceeding Part 201 generic residential and nonresidential cleanup criteria (GRCC) for Drinking Water Protection (DWP) and Groundwater Surface Water Interface Protection (GSI). Based on those findings, the Site was listed as a Part 201 facility (ID: 17000160), an area of known contamination. In addition, it was determined that the dump is not abandoned properly according to standards set by 40 CFR Section 257.3, effective October 15, 1979, with respect to physical hazard and floodplain/surface water exposure requirements.

In fall 2023 MET was contracted by the Bay Mills Indian Community (BMIC) under a HNF grant to conduct an RI/FS in accordance with the scope of work described in the October 09, 2023 document titled, "Request for Qualifications and Proposal (RFQP) Professional Environmental Services for the Former Superior Township Dump Clean-Up Project".

This Site is of concern to the BMIC community because it poses a significant physical hazard from the exposed garbage/debris that includes rusty metal and broken glass. In addition, to the physical contact concerns, outflow into the creek (groundwater, perched water and surface run-off) is contaminated with heavy metals and PFOAs. In addition, the creek crosses into BMIC property approximately 1,400-feet east of the Site were in encounters several wetland areas and is observed as ponds before the Lake Superior outflow (approximately 1.2-miles east of the Site).

In total, 32 groundwater water samples have been collected from the Site. This includes 21 samples from the partially confined saturated zone encountered at approximately 37-feet bgs (static water at approximately 15 to 30-feet bgs) and eleven from the shallow perched zone encountered from surface to approximately five-feet bgs. Investigations identified heavy metals and PFOS in groundwater at concentrations exceeding Natural Resources and Protection Act, 1994, PA 451 Part 201 Environmental Remediation generic residential and nonresidential cleanup criteria (GRCC) for Drinking Water Protection (DWP) and Groundwater Surface Water Interface Protection (GSI). The groundwater (and perched water) are flowing towards the creek.

Soil (surrounding and underlying the garbage/debris) was visually assessed for physical evidence of contamination (i.e. odor, discoloration) and scanned with a Photo Ionization Detector (PID). The qualitative analysis did not identify obvious visual evidence of contamination (PID did not detect vapors in any of the soil samples or test pits). Four soil samples were collected during installation of MW-1, MW-2, MW-3 and MW-4 (vadose zone above the water table; under the perched water). Selenium in MW-4 at 24-feet bgs, is the only metal was detected above groundwater/surface water interface criteria.

In total, 13 surface water samples have been collected from the Site. This includes five upstream, four mid-stream and four downstream. Mercury, aluminum, barium, iron, lead, manganese, magnesium, chromium and zinc were reported at concentrations above the method detection limit in at least one sample. There was no discernible difference between the three locations.

Cleanup activities are recommended to ensure that the existing contamination and garbage/debris on the Site does not cause unacceptable risks to humans or the environment.

Report Structure: This Report includes two parts; Remedial Investigation and a Feasibility Study. Each part is organized as follows:

<u>Part 1 Remedial Investigation (RI)</u>

- Section 1.0 Introduction: This section provides a summary of the study area, a brief background of Site use and RI objectives.

- Section 2.0 Program Summary: This section presents a summary of the data collection methods used to prepare the RI including compiling data from past investigations, publicly available sources, collecting groundwater level and water quality data. This section also includes a summary of the quality assurance and quality control (QA/QC) procedures outlined in the QAPP, and a description of activities that deviated from the workplan.

- Section 3.0 Environmental Setting: This section describes the physical environment, geologic/hydrogeologic interpretations and the creek.

- Section 4.0 Nature and Extent of Contamination: This section presents the results of physical garbage/debris assessments and analytical data interpretations for soil, groundwater and creek water. This section also includes a list of COCs.

- Section 5.0 Contaminate Fate and Transport: This section presents interpretations concerning the migration of COCs from the garbage/Debris into and through soil and groundwater.

- Section 6.0 Risk Assessment: This section evaluates the human and environmental risks associated with the COCs and garbage/Debris.

- Section 7.0 Conceptual Site Model: This section presents the updated conceptual understanding of the hydrogeologic system, including aquifer properties, garbage/debris distribution, groundwater levels, direction of flow and receptors.

- Section 8.0 Additional Investigation to Address Data Gaps: The section also provides a work plan to address remaining data gaps that should be addressed prior to the design of the preferred cleanup plan.

Part 2 Feasibility Study (FS)

- Section 9.0 Introduction: This section provides a summary of the relevant exposure pathways that will guide the Site cleanup and FS objectives.

- Section 10.0 Cleanup Options: This section presents six options for cleanup of the Site.

Remaining sections include Section 11 References, and Section 12 Closing and Signature.

Figures: All figures are presented with the document text and duplicated in the “Figures” section at the end of the report.

Tables: Tables that are not included in the document text are included in the “Tables” section at the end of the report.

PART 1 – REMEDIAL INVESTIGATION

1.0 INTRODUCTION

Part 1 of the following document was prepared by Mackinac Environmental Technology Co-op, Inc. (MET) to provide the Bay Mills Indian Community (BMIC) and Hiawatha National Forest (HNF) with a Remedial Investigation (RI) of the former Superior Township Dump (Site). Figure 1 – Site Location Map depicts the location on the current topographical map.

This Site lies approximately 1,400-feet west of BMIC trust lands. In addition, the creek runs through BMIC Trust lands on its way to Lake Superior. BMIC is working in partnership with HNF through the Tribal Forest Protection Act (TFPA) to address the Site and develop remedial alternatives. In 2023, the HNF was awarded Great Lakes Restoration Initiative (GLRI) funding to perform assessment and characterization activities of the former Superior Township Dump site through September 30, 2027. Bay Mills Biological Services Department (BM BSD), the primary program manager for this project, is a natural resources management program.

The BMIC project is a part of a continuing effort to assess the nature and extent of impacts to environmental media resulting from decades of unregulated, residential debris/garbage dumping on the Site. The open dump site is not abandoned properly according to standards set by 40 CFR Section 257.3, effective October 15, 1979 and Michigan's Part 115 of the Natural Resources and Environmental Protection Act (Act 451 of 1994), which is the primary law governing solid waste management in the Michigan.

The RI summarized in this report is part of the HNF's on-going project to characterize, clean up and delist the Site. Past Site Investigations by HNF and their consultants found extensive debris/garbage (surface and buried) throughout the Site including elevated levels of metals in groundwater exceeding Part 201 generic residential and nonresidential cleanup criteria (GRCC). Based on those findings, the Site was listed as a Part 201 facility (ID: 17000160), an area of known contamination in May 1999.

BMIC is a federally recognized Native American Tribe that is located in the rural eastern Upper Peninsula of Michigan on the shores of Lake Superior. The people of Bay Mills are Ojibwa (or Chippewa) and they have resided in this area for hundreds of years. BMIC was granted a federal Corporate Charter pursuant to Section 16 of the Indian Reorganization Act on June 18, 1934. BMIC cares for over 3,000 acres of Trust and Fee land in Chippewa County, most of it near Waishkey Bay and Brimley, Michigan.

1.1 Study Area

The Site is comprised of a 10-acre (approximate) abandoned open dump on United States Forest Service (USFS) land. It covers a portion of the 3,440-acre (approximately) Parcel #: 001-131-002-00. The Site is situated in the N 1/2 of the NW ¼ of Section 36, T47N R3W in Superior Township, Chippewa County, Michigan.

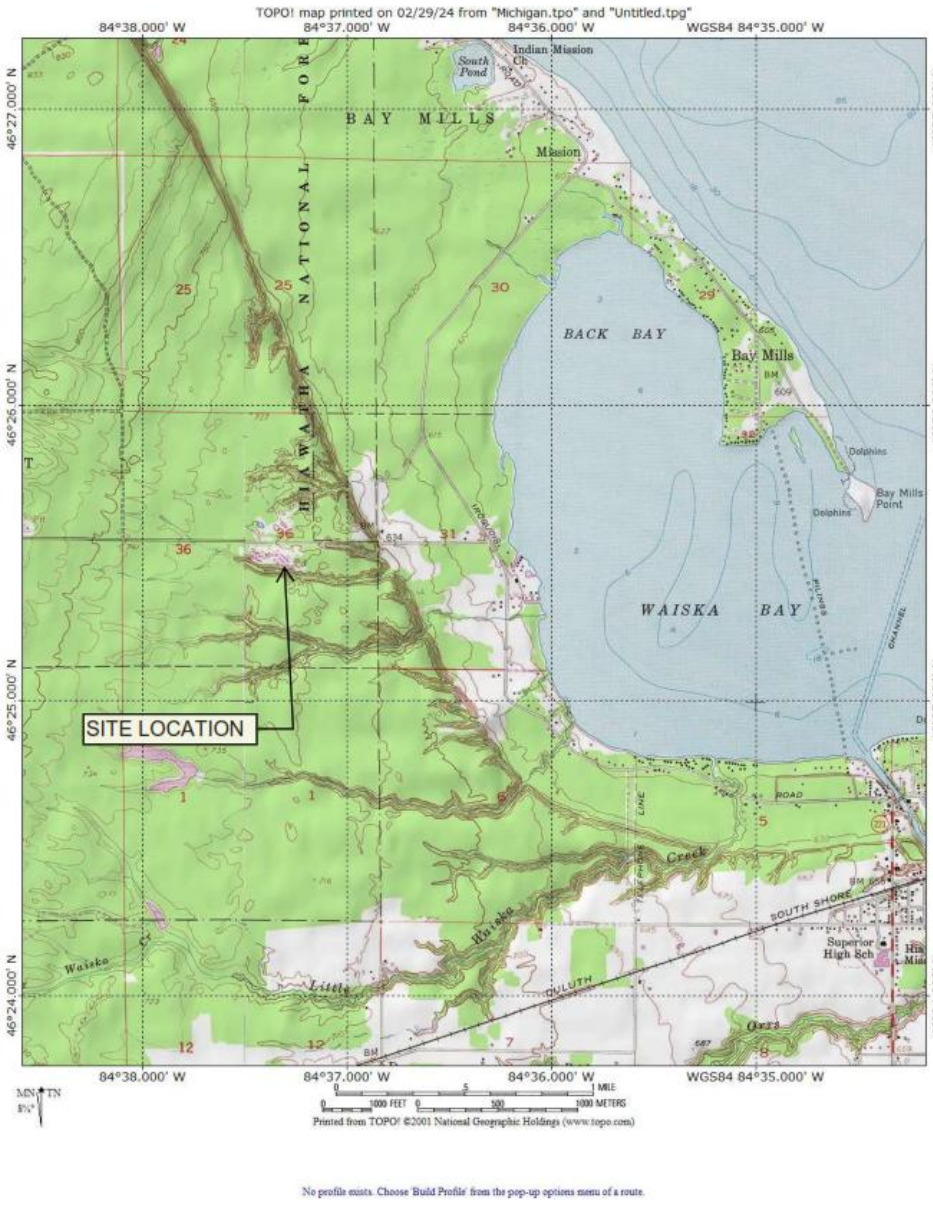
The Site is located along the south side of Plantation Road approximately one-mile west of Lakeshore Drive in Superior Township, Michigan. The dump area is situated along the edge of a ravine with a small creek that flows easterly for approximately 1.2 miles into Lake Superior.

GPS Location: The geographic coordinate position for the Site (Mercator Projection – WGS84 Datum):

- Latitude: 46.4291040°
- Longitude: -84.6245990 °

Figure 1 – Site Location Map depicts the location on the current topographical map.

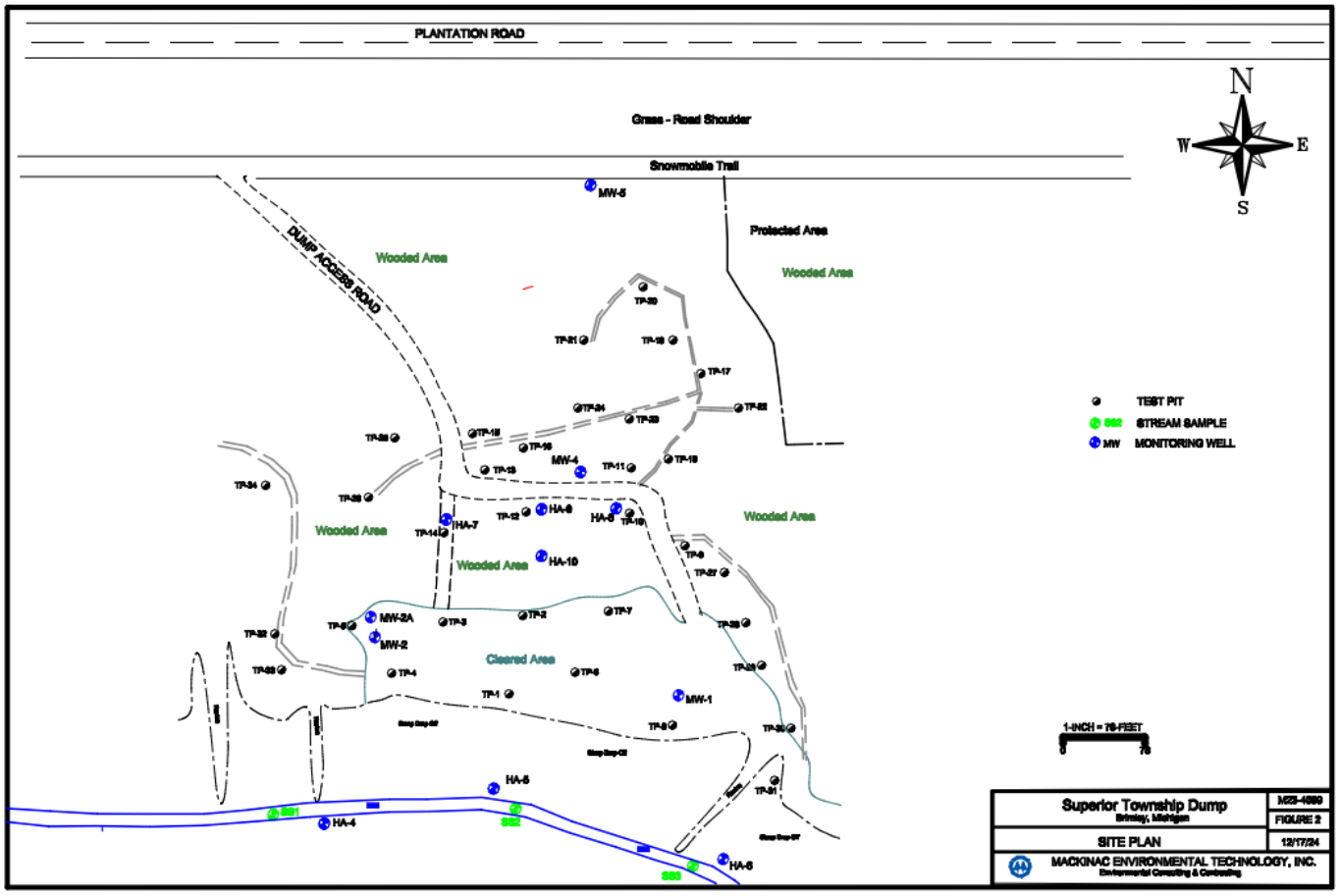
Figure 1 – Site Location Map



No profile exists. Choose 'Build Profile' from the pop-up options menu of a route.

Figure 2 – Site Plan depicts the Site Layout.

Figure 2 - Site Plan



1.2 Site Background

The Site operated as an unregulated dump from 1940 to 1974. The garbage/debris is visible at surface, on the ravine bank and scattered within the creek channel. Historical records indicate that residents entered the area from a gravel road off of Plantation Road. The road looped around, running parallel to the top of the ravine for approximately 200-feet. Local residents reportedly dump motorized vehicles, storage tanks, and other household debris. The unregulated dump was not abandoned properly according to standards set by federal and state regulations, with respect to physical hazard and floodplain/surface water exposure requirements.

Additional Historical Information - Interview With Elders: On July 11, 2024, Ms. Jennifer Satchell (BMIC Environmental Coordinator) interviewed several tribal Elders who had direct knowledge of the unregulated dump. The summary of the interview is as follows.

There were two dumps. One was the dump we are working on. The other dump was down the road to the east and on the north side of the road and is on USFS land. Folks talked about both dumps. Seven people shared memories of Superior Twp dump.

- *No staff were onsite to manage what was disposed of there.*
- *People did not remember trenches to put trash into but they do remember trash and debris were piled up and then every once in a while it would get pushed over the edge.*
- *There were memories of the dump being burned periodically.*
- *The dump was used by people from all over the area, including Sault Ste. Marie.*
- *The dump was THE place to go for tribe members on Friday and Saturday nights. People would back their vehicles up to the dump to watch the bears.*
- *It served as a "convenience store" for tribal citizens, many of whom were very poor.*
  - *Several people mentioned finding clothes at the dump and repurposing them. One woman shared that she learned to sew because they would find clothes at the dump that needed to be altered to fit family members.*
  - *Another story is that a mother of a large family at Bay Mills threw a bunch of clothes away at the dump. The grandmother of that same family found out and went to the dump, found the clothes, repaired them all and gave them back to the family.*
  - *People would pull out bikes and other treasures and use parts they found at the dump to repair bikes, cobble together a working bike and create/repair other items.*
  - *There was a story of several brothers who knew how to weld and were frequently pulling things from the dump and repairing or repurposing what they found.*
- *Overall people seemed to have rather fond memories of the dump.*

The Site is currently vacant but accessible from Plantation Road on a two-track road. The Site is surrounded by the following properties:

- **North**: The area north of the Site, beyond Plantation Road, is mostly undeveloped woodland; except for the BMIC Public Works facility and the Plantation Road Housing development (located west of the public works property).

- **East**: Undeveloped USFS forest land followed by BMIC land (Bay Mills Conservation Department offices, Wild Bluff Golf Course and wetlands).

- **South**: The creek followed by undeveloped USFS forest land.

- **West**: Undeveloped USFS forest land.

1.3 Remedial Investigation/Feasibility Study Objectives

The objectives of the RI are to collect data to improve the conceptual understanding of the garbage/debris including type, distribution and leachate transport into groundwater and surface water. The interpretations can be used to support the comparative evaluation of cleanup alternatives to address the garbage/debris and associated chemicals of concern (COC).

- Provide the data and background necessary to perform a comparative analysis of potential cleanup alternatives in the FS.

- Use existing data supplemented with newly collected data to improve the conceptual understanding of contaminant distribution and transport.

- Focus data collection on areas known to be impacted by contaminants and where existing data can be built upon to develop a better understanding of the existing hydraulic system.

- Collect supplemental data from existing wells that are suitable for testing and sampling based on screen lengths, water quality impacts, access, and available infrastructure to meet testing requirements.

2.0 PROGRAM SUMMARY

2.1 RI Scope of Services

MET was contracted by BMIC under that USFS grant to conduct an RI/FS in accordance with the scope of work described in the October 09, 2023 document titled, "Request for Qualifications and Proposal (RFQP) Professional Environmental Services for the Former Superior Township Dump Clean-Up Project". The Scope of Services include:

1. **Phase 1 Environmental Assessment (Phase 1 ESA):** The Phase 1 ESA, which was completed on June 05, 2024, was conducted in accordance with the American Society for Testing and Materials (ASTM) Standard Practice for Environmental Site Assessments **(ASTM Designation E 1527-21)**.

   - Regulatory File Review: Review of EGLE and EDR records identified the Site as a Part 201 facility (ID: 17000160), an area of known contamination. Available records indicate that the USFS conducted a preliminary study that included the installation five monitoring wells. Four sampling events were completed to evaluate soil and groundwater conditions from the Site's historic use as a dump. Soil and groundwater sampling identified elevated levels of VOCs and metals exceeding Part 201 generic residential and nonresidential cleanup criteria (GRCC) for Drinking Water Protection (DWP) and Groundwater Surface Water Interface Protection (GSI). The likely source is from discarded garbage/debris (i.e. automobiles, tanks, and other regulated debris); however, during the time of operation no regulations were in place.

   - Historical Summary and Land Use: Available historical information indicates that the Site had consisted mostly of an undeveloped woodland. The Superior Township dump operated between 1940 through 1974. The dump was unregulated and residents would dump motorized vehicles, storage tanks, and other household debris. The Site has since remained undeveloped land.

   - Site Reconnaissance: MET conducted a walk-through of the Site on February 27, 2024 for visual evidence of unpermitted dumping, chemical spills, storage tanks or other potential sources of environmental concern. MET observed multiple piles of debris ranging from plastic buckets to automobiles throughout the Site, during the inspection. The origin and contents of the piles are from the unregulated dump which operated between 1940 and 1974.

   - Summary of Recognized Environmental Conditions (RECs): The Site is listed as a Part 201 facility (ID: 17000160), an area of known contamination. Available records indicate that four sampling events were completed to evaluate soil and groundwater conditions from the Site's historic use as a dump. Soil and groundwater sampling identified elevated levels of VOCs and metals exceeding Part 201 generic residential and nonresidential cleanup criteria (GRCC) for Drinking Water Protection (DWP) and Groundwater Surface Water Interface Protection (GSI). Visible evidence of discarded debris (cars, tanks, appliances, etc.) was observed throughout the Site.

2. **Phase 2 Environmental Site Assessment (Phase 2).** The Phase 2 was conducted to develop an improved understanding of the vertical and lateral distribution of garbage/debris along with the distribution, behavior, and migration of heavy metals in shallow and deep groundwater, and the hydrologic interaction of the aquifer system and surface water. Soil borings and Monitoring wells were conducted and sampled in areas known to be impacted by contaminants and where existing data could be built upon to develop a better understanding of the relationship between debris/garbage and contaminants in soil and groundwater. Test pits were conducted to visually identify the garbage/debris. Figure 2 – Site Plan depicts surface features, test pits and monitoring wells. The work included:

   - July 01 and July 02, 2024 – Soil Borings: A stainless-steel hand auger was utilized to complete six soil boring/monitoring wells. HA-4, HA-5 and HA-6 were conducted along the creek bank to assess groundwater quality that discharges into the creek; HA-7, HA-8 and HA-9 were conducted in the north of the main dump area (Area A) to assess the perched water that is in contact with garbage.

     - Soil samples (continuous from surface to termination depth – the water table) physically observed for obvious physical evidence of contamination (odor and discoloration) and scanned with a Mini-REA 2000 photo ionization detector (PID) for volatile organic compounds (VOCs) using the headspace method.

     - Monitoring wells were installed in each boring. The wells are constructed with two-inch PVC well screen and riser. The well screen is set to bisect the shallow saturated zone. The wells are finished above ground (PVC Riser at two-feet).

   - July 09, 2024 – Groundwater Sampling: Each well was opened and monitored prior to sampling (includes the three existing monitoring wells - MW-1R, MW-2 and MW-2A). The monitoring included depth to water measurements from the wells top-of-casing (TOC) to the water table using an interface probe.

     - After monitoring, the nine wells were stabilized and sampled. Stabilization was conducted using the low-flow method which consists of a low-flow peristaltic pump and Hanna HI9829-01041 water quality meter with a flow-through chamber. Water is pumped from the well until parameters (temp, conductivity, pH) are stable. The samples were preserved by EPA guidelines and immediately transferred to a temperature-controlled cooler. The representative samples were prepared, documented on a chain-of-custody and shipped (overnight) on ice to ALS Environmental for analysis.

   - November 06, 2024: A trailer-mounted geoprobe drill rig was utilized to conduct two soil borings (MW-4 and MW-5) to a depth of approximately 38-feet below ground surface (bgs). Soil samples (continuous from surface to termination depth) were:

     - Physically observed soil for obvious physical evidence of contamination (odor and discoloration).

     - Documented: Lithology, observed conditions, PID results, depth and any other pertinent observation were recorded in a field book.

Monitoring wells (MW-4 and MW-5) were installed in each soil boring. The wells are constructed with two-inch diameter PVC casing and five-foot PVC well screens. The wells screens are set to bisect a fine grained saturated sand layer located approximately 34 to 35-feet bgs. The wells are finished approximately three-feet above ground surface; a protective steel casing was installed over the riser.

- Following installation, the two wells were developed by hand bailing approximately 15-gallons of water from each well. The hand bailing did not result in a visually significant turbidity reduction. The bailed water was a "soupy" brown.

- MET installed an additional shallow monitoring well (HA-10) with a hand auger. The well was conducted to assess the shallow saturated zone due to the absence of surface water and seasonally dry conditions.

- November 07, 2024: MET conducted additional well development to remove fine grained sediment from the new wells (initial development did not result in significant turbidity reduction; this additional development also did not have a significant impact). While on-site, MET measured the depth to groundwater from the top-of-casing in all monitoring wells.

- November 14, 2024: MET conducted a top-of-casing (TOC) elevation survey and attempted to conduct the groundwater sampling event; the "soupy" water clogged the submersible pump and the groundwater sampling event was canceled. The groundwater sampling was postponed to allow the sediment in the wells to "settle out".

- December 17, 2024: MET conducted a limited groundwater sampling event from MW-1R, MW-4 and MW-5. The sample collection was conducted using PFAS protocol (certified PFAS free pump/tubing, PFAS free clothing, etc.), to limit potential cross-contamination. The three wells were opened and monitored prior to sampling. The monitoring included depth to water measurements from the wells top-of-casing (TOC) to the water table using an interface probe.

  - After monitoring, the three wells were stabilized and sampled (turbidity levels remained high with visual discoloration). Stabilization was conducted using the low-flow method which consists of a low-flow peristaltic pump and Hanna HI9829-01041 water quality meter with a flow-through chamber. Water is pumped from the well until parameters (temp, conductivity, pH) are stable. The samples were collected in appropriate jars, preserved by EPA guidelines and immediately transferred to a temperature-controlled cooler.

  - The three representative groundwater samples, one field blank and one duplicate were documented on a chain-of-custody and shipped (overnight) on ice to ALS Environmental for analysis.

  - While on-site, MET measured the depth to groundwater from the top-of-casing in each of the other monitoring wells.

3. **Site Study To Characterize Waste Type.** The study was conducted to locate and document the lateral and vertical distribution of garbage/debris including a characterization of the type of garbage /debris. Test pits were conducted throughout the Site for direct visual observation. The work

included:

- April 2024: MET walked the Site and marked areas for clearing. Tree and shrub clearing was conducted by BMIC.

- May 14, 2024: MET directed and documented the completion of 15 Test Pits. The test pits commenced at the creek bank (center of the assumed dump area), and move north, south and west until debris is no longer encountered. The excavator was provided by BMIC. MET marked additional areas for clearing (Areas B and C).

- June 03, 2024: MET directed and documented the completion of 19 Test Pits. The test pits commenced at the boundary of the main dump area, move north, south and west until debris is no longer encountered. The excavator was provided by BMIC.

- June 04, 2024: Each test pit was located with a GPS for inclusion on the Site Plan.

4. **Stream Delineation.** The study was conducted to identify watershed boundaries, the streams headwaters, it's length, where it flows, what it flows through, what flows into it and were it discharges. The work included review of available resources (topographical maps, USDA soil surveys, aerial photographs and USDA wetland maps), a visual reconnaissance of the creek and surface water sampling. The work included:

   - July 09, 2024 - Surface Water Sampling: Surface water grab samples were collected upstream (US), mid-stream (MS) and downstream (DS).

   - Three samples were prepared, documented on a chain-of-custody and shipped (overnight) on ice to ALS Environmental for analysis.

2.2 Other Studies

This project is a part of a continuing effort conducted between 1993 and 2024, to assess the nature and extent of impacts to environmental media resulting from decades of unregulated, residential refuse/garbage dumping on the Site. Investigation of the Site found extensive garbage (surface and buried) including elevated concentrations of metals in groundwater at concentrations exceeding Part 201 generic residential and nonresidential cleanup criteria (GRCC) for Drinking Water Protection (DWP), Direct Contact (DC), and Groundwater Surface Water Interface Protection (GSI).

The USFS had contracted with Barr Engineering Co. to test ground and surface water from the site from 1999-2001. The USFS studies included the installation five monitoring wells followed by four sampling events. Groundwater sampling identified concentrations of metals exceeding Part 201 generic residential and nonresidential cleanup criteria (GRCC) for Drinking Water Protection (DWP) and Groundwater Surface Water Interface Protection (GSI). Based on those findings, the Site was listed as a Part 201 facility (ID: 17000160), an area of known contamination. All available data has been

incorporated in this RI report. The following USFS documents were provided for review (all of the documents were prepared by Barr Engineering Company on behalf of USFS).

- February 1999: Part 3 – Groundwater Sampling at the Superior Township Dump.
- February 2000: Supplementary Investigation Superior Township Dump.
- July 2000: Site Evaluation at the Superior Township Dump.
- December 2000: Site Evaluation at the Superior Township Dump.
- June 2001: Additional Sampling at the Superior Township Dump.
- June 15 2001: Screening Level Human Health and Ecological Risk Assessment for the Superior Township Dump Site in the Hiawatha National Forest.
- December 2002: Additional Sampling at the Superior Township Dump.

2.3 Summary of Applicable Site Data and Data Quality Objectives

In total, approximately 32 groundwater water samples, four soil samples and 13 surface water samples have been collected from the Site. Th e groundwater samples include 21 samples from the partially confined saturated zone encountered at approximately 37-feet bgs (static water at approximately 15 to 30-feet bgs) and eleven from the shallow perched zone encountered from surface to approximately five-feet bgs.

2.3.1 MET Samples

MET's groundwater samples and field blanks were documented on a chain-of-custody and shipped (overnight) on ice to ALS Environmental (a State of Michigan certified laboratory) for quantitative analysis of target compounds by approved USEPA methods. This included:

- Total Metals by ICP-MS SW6020B/Mercury by CVAA SW7470A.
- PNAs: SW 8270 E
- VOCs: SW 8260 D
- PFAs: EPA Method 537 Modified (one event, limited to three monitoring wells).

MET's surface water samples were prepared, documented on a chain-of-custody and shipped (overnight) on ice to ALS Environmental for analysis of target compounds by approved USEPA methods. This included:

- Total Metals by ICP-MS SW6020B/Mercury by CVAA SW7470A.
- VOCs: SW 8260 D
- PNAs: SW 8270 E
- Ammonia-nitrogen, nitrate/nitrite, phosphorus, chloride and BOD.

MET's soil sample was prepared, documented on a chain-of-custody and shipped (overnight) on ice to ALS Environmental for analysis of target compounds by approved USEPA methods. This included:

- Total Metals by ICP-MS SW6020B/Mercury by CVAA SW7470A.
- PFAS by EPA 537 Modified.

A review of the QC data was conducted to assess the integrity of the sample collection procedures and the validity of the analytical results. Field and laboratory QC practices were detailed in the Sampling and Analysis Plans (SOPs) and MET's QAPP.

Laboratory QC review included reviewing sample holding time, sample temperature and results for method blanks. Samples were analyzed according to the analytical methodology previously transmitted in the "Work Order Acknowledgement". Methodologies are also documented in the "Analytical Result" section for each sample. Quality control results are listed in the "QC Report" section.

Sample association for the reported quality control is located at the end of each batch summary. If applicable, results are appropriately qualified in the Analytical Result and QC Report sections. The "Qualifiers" section documents the various qualifiers, units, and acronyms utilized in reporting.

Sample Receipt and Holding Times

Each laboratory report includes a "Sample Receipt Checklist" document that depicts the date of receipt, status of custody seals, container integrity, preservation, and temperature compliance. As depicted in the documents all holding times and temperatures were met. In addition, the laboratory review and check list determined that the sample preparation and shipping procedures were appropriate and did not adversely affect the quality of analytical data.

Method Blanks

Each laboratory report includes a Case Narrative describing method blank interpretations. With the following exceptions, all sample analyses achieved analytical criteria. None of the exceptions are considered significant and did not significantly adversely affect the quality of analytical data or conclusions/interpretations that are based on the data.

The laboratory reported some concentrations in the Method Blank at concentrations greater than the quantitation limit. Based on sample results, the laboratory concluded no qualification was necessary with the following exceptions:

- 12/17/2024 Event:
  - Silver - Batch 251745, Method SW6020B, Sample MW-4 (24120581-02B): The reporting limits are elevated due to internal standard failure in the undiluted run for these analytes.

- 07/09/24 Event (Surface Water):
  - Aluminum - Batch 244067, Method SW6020B, Sample MBLK-244067: The concentration in the Method Blank was greater than the quantitation limit. Positive results in the batch may be biased high for this analyte.

- 07/09/2024 Event:
  - PNAs - Batch 243539, Method SW8270E, Sample HA-8 (24070451-03B): One or more surrogate recoveries were below the lower control limits. Sample results may be biased low.
  - PNAs - Batch 243539, Method SW8270E, Sample HA-9 (24070451-04B): One or more surrogate recoveries were below the lower control limits. Sample results may be biased low.

- PFAS - 12/17/2024 Event:
  - PFDoS - Batch 251810, Method E537 Mod, Sample LCSD-251810: The LCSD recovery was below the lower control limit. The sample results may be biased low for this analyte.
  - PFDoS, 13C2-PFHxDA - Batch 251810, Method E537 Mod, Sample LCSD-251810: The RPD between the LCS and LCSD was outside of the control limit. The sample results should be considered estimated for this analyte.

Copies of MET's laboratory analytical reports are included in ***Attachment #4***.

Field Conditions

Metal samples collected by MET were not field filtered and represent total metal concentrations. MW-4 and MW-5 were installed on November 26, 2024. Despite significant well development (hand bailing over two days and low-flow sampling) the water remained a cloudy brown with turbidity levels in excess of 1,000 ntu. Elevated total metals in the samples may be attributed to the elevated turbidity and not actual groundwater conditions. MET collected a "duplicate" sample from MW-4. The initial sample was collected with no purging after the well sat undisturbed for 48-hours ("pre stabilization sample"). The second sample was collected using the low-flow method (sample collected after stabilization purging was complete. A significant metal reduction was observed in the "pre-stabilization" sample. This reduction is attributed to turbidity.

MW-4 Soil

A typo on the laboratory analytical report mistakenly depicted metal results as mg/L. The mg/L is a typo; results were reported as mg/KG.

2.3.2 Barr Engineering Company Samples

Barr Engineering Company samples were shipped to TriMatrix Laboratories, Inc. Analytical methodology was not described in the provided documents. QC interpretations are included in the reports.

- Total and dissolved Metals.
- PCBs
- Pesticides
- PNAs
- VOCs

2.3.3 Conclusions of the QC Review

Due to the project requirement of reporting all compounds below the laboratory's QL and requirement of meeting Target Detection Levels as outlined in the March 2016 EGLE guidance document, all analysis performed by the laboratory were completed using the most sensitive equipment and the lowest level methods available. The project data quality objectives were met by the sample collection and analysis activities with the exception of total metals in MW-4 and MW-5. Elevated total metals in the samples may be elevated due to elevated turbidity and not actual groundwater conditions. All other data is determined acceptable with the above mentioned qualifications.

2.4 Assessment of Applicability of Part 201 Generic Criteria

The Site consists of vacant woodland with a small creek running along its south boundary. Future land use is recreational. Subsequently, generic non-residential cleanup criteria (GNRCC) were utilized to evaluate the Site and will be utilized for future access.

Part 201 (324.20101(1)(ii)) defines "non-residential" as a category of land use for parcels of property or portions of parcels of property that is not residential. This category of land use may include, but is not limited to, any of the following:

(i) Industrial, commercial, retail, office, and service uses.
(ii) Recreational properties that are not contiguous to residential property.
(iii) Hotels, hospitals, and campgrounds.
(iv) Natural areas such as woodlands, brushlands, grasslands, and wetlands.

Part 201, Environmental Remediation, of the NREPA, and the associated Administrative Rules regulate most Sites of environmental contamination in Michigan. The Part 201 Administrative Rules establish the generic cleanup criteria to evaluate potential risks for individual hazardous substances associated with various exposure pathways; however, development of the generic criteria are based on assumptions that are not applicable for all Sites.

3.0 ENVIRONMENTAL SETTING

3.1 Physical Environment

The following descriptions of the physical setting of the Site and immediate vicinity were compiled by MET through review of publications from the U.S. Department of Agriculture – Soil Conservation Service, the University of Michigan, State of Michigan and current USGS 7.5 Quad Topographical Map. References are included in Section 11.0.

Topography: Topography varies across the Site with multiple elevated mounds throughout and a ridge with a steep slope towards the ravine. The highest surface elevation of approximately 770 feet above mean sea level is encountered near the center of the Site with a decline to the east (690 feet msl near ravine). The reviewed USGS 7.5 Quad Topographical Map (1980) depicts regional topography with an eastern decline towards Lake Superior, which is located approximately 4,800 feet east of the Site.

Regional Geology: The University of Michigan, Department of Geological Sciences "Quaternary Geology of Northern Michigan" map (Farrand and Bell et. al.) indicates that surficial deposits near the Site are comprised of thin to discontinuous glacial till over bedrock. The till color, grain size and lithology vary with the nature of the underlying rock. The material may include areas of outwash or lacustrine, as well as organic deposits.

Soil Survey: The USDA Natural Resource Conservation Service, Web Soil Survey, identified one major surficial soil type throughout the Site. A copy of the USDA Soil Report is included in ***Attachment #1.***

Map Unit Symbol	Map Unit Name	Approx. Acres in AOI	Percent of AOI
86A	Ingalls-Halfaday complex, 0 to 3 percent slopes	10	100

This soil is characterized as sandy glaciofluvial deposits over stratified loamy lacustrine deposits. The typical profile is as follows:

- 0 to 1 inches: slightly decomposed plant material
- 1 to 3 inches: muck
- 3 to 10 inches: loamy sand
- 10 to 17 inches: loamy sand
- 17 to 23 inches: sand
- 23 to 43 inches: loamy fine sand
- 43 to 80 inches: stratified loamy fine sand to silt loam

3.2 Geological/Hydrogeological Interpretations

Perched groundwater was encountered at a depths ranging from zero to four-feet bgs (seasonal influence from precipitation). A silty sand and clayey sand was encountered beneath the perched water. This sediment included heterogeneous saturated layers and some clays. A second saturated zone was interpreted in a clayey silt and fine silty sand located at approximately 25-feet bgs. The following table

depicts the measurements. As depicted on Table 1, the presence of perched water (and surface pools) is seasonal.

FORMER SUPERIOR TOWNSHIP DUMP ***TABLE 1- WATER TABLE ELEVATION MONITORING DATA***
M23-4099

October 1999 to July 2024

Location	TOC Elev.	BOS Elev.	Well Length	Screen Length	10/2/99 DTW	10/2/99 DTP	10/2/99 WTE	6/4/00 DTW	6/4/00 DTP	6/4/00 WTE	5/2/01 DTW	5/2/01 DTP	5/2/01 WTE
Deep Wells													
MW-1	730.61	66.00	34.00	10'	31.36								
MW-1R	730.61	59.52	41.00	10'				30.01		700.60	29.73		700.88
MW-2	730.93	69.30	29.80	10'	22.50		708.43	21.02		709.91	21.66		709.27
MW-3		71.51	31.00	10'	24.51			23.13			24.47		
MW-4	734.00		40.00	5'									
MW-5	736.06		40.00	5'									
Shallow Wells													
MW-2A	730.26	86.03	12.60	5'	7.66		722.60	5.31		724.95	4.42		725.84
HA-4*	696.95			2.5'									
HA-5*	695.06			2.5'									
HA-6*	692.70			2.5'									
HA-7*	731.71			2.5'									
HA-8*	732.42			2.5'									
HA-9*	732.33			2.5'									
HA-10*	731.16												

Location	TOC Elev.	BOS Elev.	Well Length	Screen Length	7/9/24 DTW	7/9/24 DTP	7/9/24 WTE	12/17/24 DTW	12/17/24 DTP	12/17/24 WTE			
Deep Wells													
MW-1	730.61	66.00	34.00	10'									
MW-1R	730.61	59.52	41.00	10'	27.48		703.13	30.23		700.38			
MW-2	730.93	69.30	29.80	10'	18.45		712.48	20.26		710.67			
MW-3		71.51	31.00	10'									
MW-4	734.00		40.00	5'				23.30		710.70			
MW-5	736.06		40.00	5'				14.71		721.35			
Shallow Wells													
MW-2A	730.26	86.03	12.60	5'	3.95		726.31	6.75		723.51			
HA-4*	696.95			2.5'	3.28		693.67						
HA-5*	695.06			2.5'	2.85		692.21						
HA-6*	692.70			2.5'	1.60		691.10	1.70		691.00			
HA-7*	731.71			2.5'	1.56		730.15	Dry					
HA-8*	732.42			2.5'	1.98		730.44	Dry					
HA-9*	732.33			2.5'	2.10		730.23	Dry					
HA-10*	731.16												

*Estimated elevation based on surface elevation - Measured with Trimble GPS

3.2.1 Shallow Geological/Hydrogeological Interpretations

The Site is located in an area classified as a "Class R-4SBC[1] Riverine System". The riverine system is a network of streams and wetlands that share a common drainage; in this instance the creek that runs along the southern boundary of the Site that discharges into Lake Superior (located approximately 1.2 miles east of the Site). The garbage/debris was dumped onto the riverine system surface (ponds and buried in discrete excavations), terminating on the underlying fine silty sand. The garbage/debris is seasonally inundated with water (seasonal surface ponds and shallow perched groundwater). The fine silty sand appears to act as a confining area, restricting vertical penetration of perched and pooled water.

[1]National Wetlands Inventory (https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/)

System Riverine (R): The Riverine System includes all wetlands and deepwater habitats contained within a channel. A channel is an open conduit either naturally or artificially created which periodically or continuously contains moving water, or which forms a connecting link between two bodies of standing water.

Subsystem Intermittent (4): This Subsystem includes channels that contain flowing water only part of the year. When the water is not flowing, it may remain in isolated pools or surface water may be absent.

Class Streambed (SB): Includes all wetlands contained within the Intermittent Subsystem of the Riverine System.

Water Regime Seasonally Flooded (C): Surface water is present for extended periods especially early in the growing season, but is absent by the end of the growing season in most years. The water table after flooding ceases is variable, extending from saturated to the surface to a water table well below the ground surface.

Shallow monitoring wells (MW-2R, HA-7, HA-8, HA-9 and HA-10) are set in the upper six-feet and represent the seasonal surface drainage ravines and small ponds.

	July 09, 2025 Seasonal Conditions - TP-14/HA-7 area.
	July 09, 2025 Seasonal Conditions - TP-14.

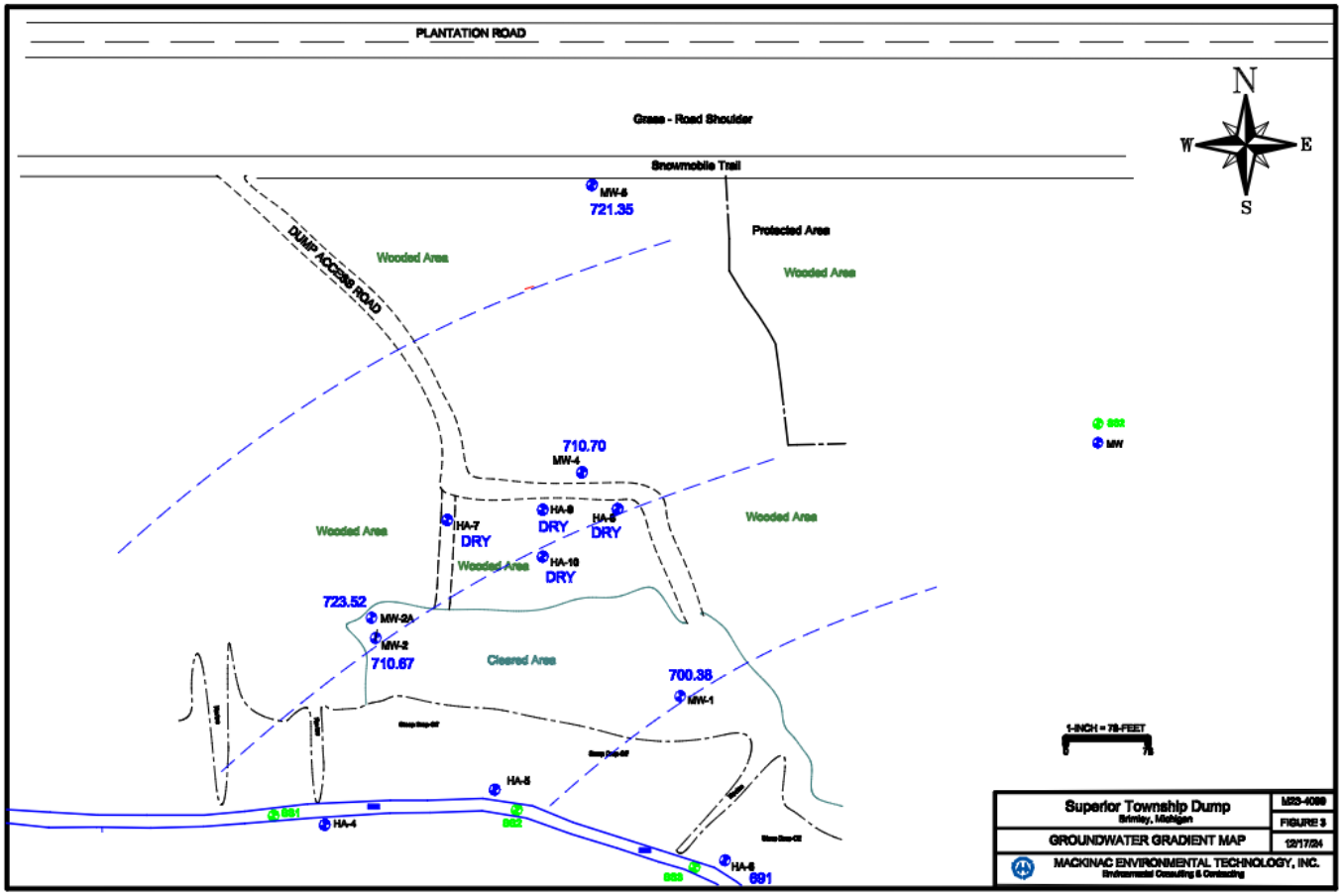
3.2.2 Site Lithology "Deep" Hydrogeological Interpretations

Four monitoring wells (MW-1R, MW-2, MW-4 and MW-5) were completed to depths of approximately 35 to 40-feet bgs. Soil borings encountered fine grained sediment from approximately five-feet bgs to termination depth (40-feet bgs +/-). The sediment ranges from a fine silty sand to a clayey silt with varying amounts of water. The wetter layers are "soupy". Well screens were set to bisect a saturated fine silty sand that was encountered at a depth of approximately 34 to 35-feet bgs. Soil Boring/Monitoring Well Logs are included in ***Attachment #2.***

	MW#4. The fine sediment ranges from fine silty sand to clayey silt with intermittent wet areas. Cores are situated right to left – top to bottom. Tubes are situated vertically - top to bottom.

Water table elevation monitoring encountered groundwater in the four wells (12/17/24) at depths ranging from 14 to 30-feet bgs (see Table 1 – Water Table Elevation Form). Figure 3 – Groundwater Gradient Map depicts the water table elevations and gradient. The measurements depict a groundwater gradient towards the southeast.

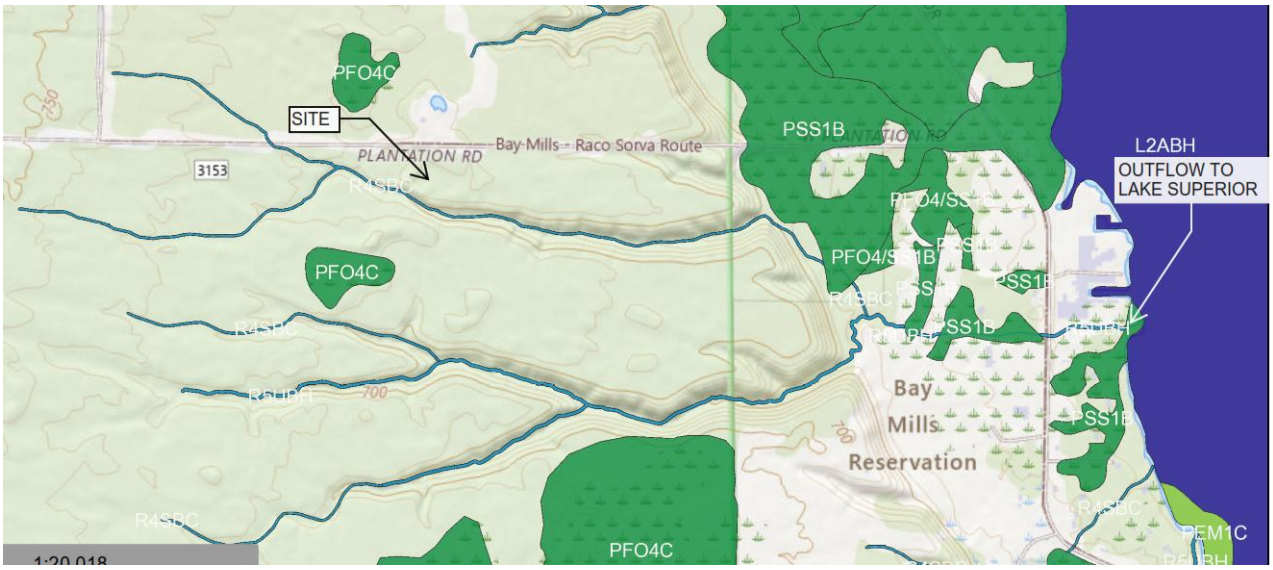
Figure 3 – Groundwater Gradient Map



3.3 Creek Interpretation

The Site is a mixture of mostly old growth vegetation and a Class R-4SBC[1] riverine system. The riverine system is a network of streams and wetlands that share a common drainage conduit into Lake Superior. Seasonal surface drainage ravines and small ponds are observed throughout the undisturbed portion of the Site and surrounding area. The main riverine system conduit that receives the surface waters runs along the south side of the Site and consists of a small creek running at the base of a steep, 25-foot bank. The creek's outflow is into Lake Superior, located approximately 1.2 miles east of the Site. Creek information is summarized below.

Figure 4 – The Creek



Records indicate that the creek once held native brook trout with quality invertebrate and amphibian habitat. However, because the creek and adjacent hillside were used as a dump site for many years, the stream has degraded to a point that it is now unsuitable habitat for most species.

Increased precipitation, more high-streamflow days in winter and spring, and more frequent heavy precipitation events are of great concern for this Site. Debris from the dump site is already exposed and chronological pictures show that more debris is being uncovered as time passes. These precipitation events are anticipated to expose more debris. Also of concern are sources of material and contaminants currently buried in the bank which could be released through erosion, and further impact soil, groundwater and surface water. This in turn would impact aquatic life in the stream, and the fisheries and wild rice beds that are downstream in Waiska Bay.

4.0 NATURE AND EXTENT OF CONTAMINATION

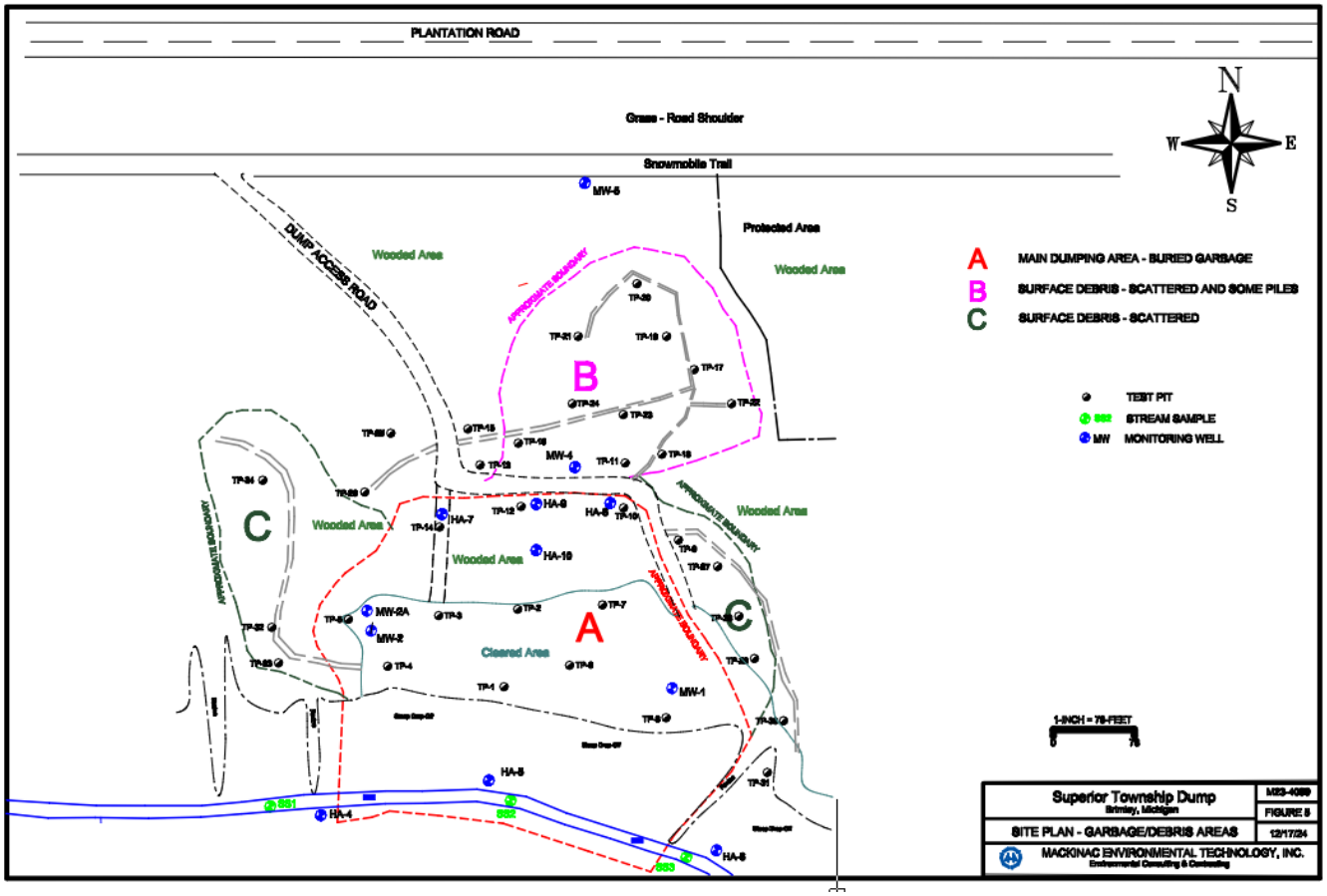
4.1 Garbage/Debris

The primary concern with the Site is the past use as an unlicensed dump site and the current presence of garbage and debris. Environmental concerns include the garbage/debris along with potential leachate that may be associated with the garbage/debris. The initial effort included locating the lateral and vertical extent of the garbage and debris. This was accomplished with test pits. MET utilized the test pit observations to organize the Site under three areas:

- Area A: This area represents the Main Dump. It is characterized by surface debris and buried debris/garbage.
- Area B: This area is located west and east along the main dump access road. It is characterized by scattered surface debris located throughout.
- Area C: This area is located east and west of Area A. It is characterized by discrete, scattered surface debris.

The following figure depicts the layout of the Site and test pit locations.

Figure 5 – Garbage/Debris Location Map



In general, Test Pits in Area A encountered buried and unburied heterogeneous garbage/debris from surface to depths ranging from approximately two to six-feet below ground surface (bgs). The garbage/debris is visible at the surface (in the “low” elevation areas) and not visible (buried under sand/soil in “high” elevation areas) of the undulating surface topography. Observed garbage/debris includes, but is not limited to, appliances, automobile body/parts, metal scraps, plastics, glass, tires and cans.

The garbage/debris underlain by the native, fine silty sand and inundated with water (seasonal surface ponds and shallow perched groundwater). Areas B and C are characterized by discrete surface debris including, but not limited to, small appliances, automobile body/parts, metal scraps, plastics, glass and cans. Photographic documentation of the Test Pit observations are included in ***Attachment #3*** and summarized on the following table.

Table 2: Test Pit Summary - 05/14/2024 & 06/03/2024

Test Pit #	Test Pit Depth	Perched Water[1]	*Garbage/Debris*			Comments
			Surface	Buried	Approximate thickness	
AREA A – MAIN DUMP AREA • Approximately 3 acres. • Wooded area exhibits swales with standing water & garbage/debris (surface and buried). • Cleared area is flat with buried & surface debris. • Debris (metal and tires) is located on the steep slope leading to the stream and on the stream bed.						
1	8’	No	Yes	Yes	6.5’	At the edge of the bank
2	6’	Yes	Yes	Yes	6’	In the cleared area
3	4’	No	No	No	0	Test pit located on probable dump access road
4	8’	No	Yes	Yes	6’	At the edge of the bank
5	4’	Yes	Yes	Yes	4’	Near MW-2
6	6’	Yes	Yes	Yes	6’	Middle of cleared area
7	5’	Yes	Yes	Yes	5’	In the cleared area
8	10’	No	Yes	Yes	10’	At the edge of the bank
10	3’	Yes	Yes	Yes	3’+	Ridge between swales
12	3’	Yes	Yes	Yes	3’+	Ridge between swales
14	2’	Yes	Yes	Yes	2’+	In a swale
The presence of water in the test pit limited observation of termination depth soils and vertical extent of debris/garbage’						
AREA B • Approximately 1 acre. • Wooded area with discrete areas of debris (glass and metal) - widespread. • Discrete surface water ponds, test pits terminated before encountering water.						
18	2’	No	Yes	No	--	Scattered debris - minimal
22	2’	No	Yes	No	--	“Protected Area” with standing water beyond.
17	2’	No	Yes	No	--	Drum and metal debris
19	2’	No	Yes	No	--	Scattered debris - minimal
20	2’	No	Yes	No	--	metal debris - piles
21	2’	No	Yes	No	--	Scattered debris - minimal
23	2’	No	Yes	No	--	metal debris - piles
24	2’	No	Yes	No	--	metal debris - piles
AREA C – EAST • Minor, scattered surface debris. • Approximately 0.4 acres.						
9	2’	No	No	No	--	
27	2’	No	Yes	No	--	Scattered debris - minimal
28	2’	No	No	No	--	
29	2’	No	No	No	--	
30	2’	No	No	No	--	
31	2’	No	No	No	--	Adjacent to the ravine
AREA C – WEST • Minor, scattered surface debris. • Approximately 0.5 acres.						
32	2’	No	No	No	--	
33	2’	No	No	No	--	
34	1’	No	Yes	No	--	Metal debris
OTHER						
11	4’	No	No	No	--	Debris/Garbage was not observed in these areas
13	4’	No	No	No	--	
15	2’	No	No	No	--	
16	2’	No	No	No	--	
25	2’	No	No	No	--	
26	2’	No	No	No	--	

4.2 Groundwater Interpretations

In total, 32 groundwater water samples have been collected from the Site. This includes 21 samples from the partially confined saturated zone encountered at approximately 37-feet bgs (static water at approximately 15 to 30-feet bgs) and eleven from the shallow perched zone encountered from surface to approximately five-feet bgs. All groundwater sample results (MET and Barr) were compiled in a single table and are compared to Part 201 generic residential and nonresidential cleanup criteria (GRCC) (EGLE, October 2023).

- VOCs – All Wells: VOC compounds were reported as below method detection limits or generic Part 201 criteria.

- PNAs: PNA compounds were reported as below method detection limits or generic Part 201 criteria.

- Metals – Deep Wells:
  - GSI Criteria Exceedances: Mercury, Arsenic, Silver, Vanadium.
  - Drinking Water Protection Criteria Exceedances: Aluminum, Iron, Lead, Manganese, Chromium, Cobalt, Nickle, Vanadium.

  Note: Metals, including Barium, Cadmium, & Selenium, were reported at elevated concentrations in MW-4 and MW-5; the elevated metal concentrations are attributed to turbidity.

- Metals – Perched Water Wells:
  - GSI Criteria Exceedances: Mercury, Arsenic, Silver.
  - Drinking Water Protection Criteria exceedances: Aluminum, Arsenic, Iron, Lead, Manganese, Cadmium, Nickle.

- PFAS – MW-1R: PFOA and PFOS were reported at concentrations exceeding EGLE Drinking Water/Groundwater levels and USEPA Enforceable Maximum Contaminant levels.

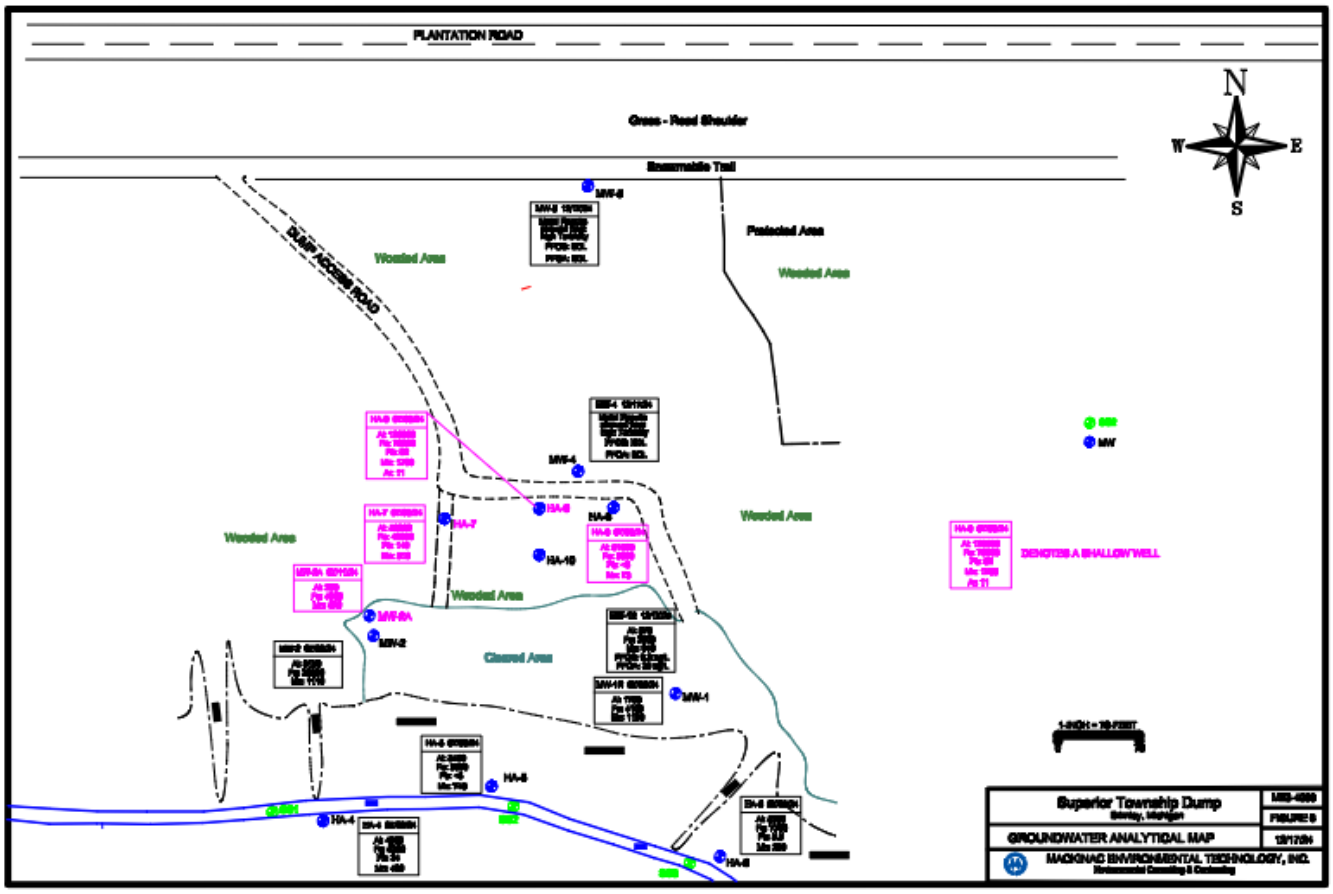
Attachments:

- Figure 6 - Groundwater Analytical Data Map depicts the locations and results of the groundwater samples.

- Table 3 – Summary of Groundwater Analytical Data (***see Tables***) depicts results with a comparison to Part 201 GRCC (EGLE, October 2023). A copy of MET's groundwater laboratory analytical reports are included in ***Attachment #4***.

Note: Analytical data from an October 1993 sampling event was referenced in the February 1999 report, "Part 3 – Groundwater Sampling at the Superior Township Dump". However, based on the absence of the laboratory report, documentation of sampling method and analytical methodology, results are not included in this document.

Figure 6 - Groundwater Analytical Map



4.3 Soil Interpretations

4.3.1 Shallow Conditions

Soil (surrounding and underlying the garbage/debris) was visually assessed for physical evidence of contamination (i.e. odor, discoloration) and scanned with a Photo Ionization Detector (PID). The PID scanning included measuring the headspace above bagged samples. The PID did not detect vapors in any of the soil samples or test pits. Subsequently, MET did not submit any soil samples to the laboratory for quantitative analysis.

4.3.2 Conditions Under the Garbage/Debris

In total, four soil samples have been collected from the Site. This includes soil samples collected during installation of MW-1, MW-2, MW-3 and MW-4. All soil sample results are summarized on Table 4 – Summary of Soil Analytical Data (***see Tables***) and are compared to Part 201 generic residential and nonresidential cleanup criteria (GRCC) (EGLE, October 2023).

As depicted on the table, Selenium in MW-4 at 24-feet bgs, is the only metal was detected above groundwater/surface water interface criteria. A copy of the laboratory analytical report (MET samples only) is included in ***Attachment #4***.

4.4 Creek Water

In total, 13 surface water samples have been collected from the Site. This includes five upstream, four mid-stream and four downstream, All surface sample total metal results were compiled in a single table and are compared to generic Rule 57 Surface Water Quality Values (EGLE, October 2023). Table 5 – Summary of Creek Water Analytical Data (***see Tables***) depicts the detected metals. A copy of the laboratory analytical report (MET samples only) is included in ***Attachment #4***.

- VOCs – Analysis for VOCs was conducted on 09/29/1999 and 07/09/2024 – All VOC compounds were reported as below method detection limits.

- PNAs: Analysis for SVOCs was conducted on 07/09/2024 – All SVOC compounds were reported as below method detection limits.

- Metals: Mercury, aluminum, barium, iron, lead, manganese, magnesium, chromium and zinc were reported at concentrations above the method detection limit in at least one sample. As depicted on the table:

  - Mercury was detected at concentrations exceeding “Human Health – Noncancer” and “Wildlife” values in upstream SW-9 and SW10), midstream (SW-8) and downstream (SW-7) samples collected on 05/02/2001. There was no discernible difference between the three locations.

  - Other metals: No discernible difference between the three locations. Criteria calculations for other metals is on-going pending receipt of hardness analytical data.

- Other parameters: The following parameters were tested for to determine if any other adverse discharges to the creek are occurring from potential upstream or midstream sources.

  - Sodium, Calcium, Ammonia as nitrogen. No discernible difference between the three locations.

  - BOD, phosphorus, chloride, nitrogen nitrate, nitrogen nitrite and nitrogen nitrite-nitrate. All results were reported as BDL.

Current data and interpretations do not reveal an impact to the creek water.

4.5 Chemicals of Concern

The chemical abstract service (CAS) numbers for each Chemical of Concern (COC), maximum concentration found on the Site, date of sample and the affected media are listed in Table 6. Only compounds exceeding a Part 201 GRCC are listed.

Table 6 – Chemicals of Concern

COC	CAS #	Highest Concentration	Sample Location	Sample Date	GRCC Exceedances & Criteria
Groundwater		***Results ug/L***			***Criteria ug/L***
Mercury (Total)	Varies	0.136	MW-2A	7/11/24	GSI (0.0013)
Aluminum	7429905	120,000	HA-9	07/09/24	DW (50)
Arsenic	7440382	11	HA-9	07/09/24	GSI (10), DW (10)
Iron	7439896	78,000	HA-9	07/09/24	DW (300)
Lead	7439921	140	HA-7	07/11/24	DW (4)
Manganese	7439965	3470	MW-2A	05/02/01	DW (50)
Cadmium	7440439	5.3	MW-2A	05/02/01	DW (5)
Chromium	16065831	271	MW-3	05/02/01	DW (100)
Cobalt	7440484	79	MW-3	05/02/01	DW (40)
Nickle	7440020	690	MW-3	05/02/01	DW (100)
Silver	7440224	0.7	MW-2	05/02/01	GSI (0.2)
Vanadium	7440622	210	MW-3	05/02/01	DW (4.5), GSI (27)
		Results ng/L			***Criteria ng/L***
PFOA	335671	39 ng/L	MW-1R	12/17/04	USEPA MAX (4), EGLE, DW & GW (8)
PFOS	1763231	9.2 ng/L	MW-1R	12/17/04	USEPA MAX (4)
Creek Water		***Results ug/L***			***Criteria ug/L***
Mercury (Total)	Varies	0.005	SW-9 & SW-10	05/02/01	DW-Noncancer (0.0018) & Wildlife (0.0013)
Soil		***Results ug/kg***			***Criteria ug/Kg***
Selenium	7782492	720	MW-4	12/17/24	GSI (400)

GW – groundwater, DW – drinking water, GSI - groundwater/surface water interface protection,
USEPA EMCL – Enforceable Maximum Concentration Level
EGLE DW/GW – Drinking Water/Ground Water Levels

5.0 CONTAMINATE FATE AND TRANSPORT

The nature and extent of contamination identified by the RI are discussed in Section 4.0. A conceptual site model (CSM - see Section 7.0) was developed based on the data obtained during the RI. The CSM presents a simplified depiction of conditions at the Site with respect to the primary and secondary contaminant sources, migration pathways, and important chemical and physical processes.

The process of evaluating fate and transport mechanisms requires assumptions based on professional judgment. This judgment is especially important when information such as the type and quantity of the contaminants is not known (i.e. heterogeneous garbage/debris). As previously discussed, the current conditions of the Site are markedly different from the physical conditions that characterized the Site prior to when it was utilized as a dump. The garbage/debris has been graded and buried with potential preferential flow pathways toward the ravine and creek. Native vegetation now covers most of the Site with recent clearing and access along a two-track road that exposed surface garbage/debris. These changes have modified the migration pathways and rates.

5.1 Potential Contamination Routes

In general, numerous potential migration routes exist at the Site. Such migration routes include, but are not limited to, groundwater, perched surface water, overland migration of dissolved or adsorbed contaminants and atmospheric migration via particulates from exposed garbage/debris. As a result of the nature and extent of contamination at the Site and various sites specific conditions, the potential migration routes of contaminants at the Site fall into the following categories:

- Vertical and horizontal migration through the unsaturated and saturated zones.
- Surface transport of shallow soil contaminants via surface runoff and perched water migration.
- Particulate transport in a prevailing downwind direction.

5.2 Contaminant Persistence

Several transformation processes are believed to affect the persistence of organic and inorganic chemicals in the environment. The primary processes affecting contaminant persistence in the environment include the following:

- Abiotic transformation and degradation processes such as hydrolysis, photolysis, and oxidation/reduction reactions.

- Biological transformation and degradation processes.

Transformation and degradation processes are discussed below for classes of organic and inorganic compounds detected at the Site.

5.2.1 Inorganic Metals

Both abiotic and biotic processes may affect the speciation of metals in soil or groundwater. Although speciation may affect metal mobility, it will not affect metal persistence. Metals will remain in the environment in one form or another.

5.2.2 Organic Compounds

PFAS are synthetic organic compounds characterized by their carbon-fluorine bonds, which make them highly resistant to degradation. They are characterized by having chains of linked carbon and fluorine atoms, with at least one fully fluorinated carbon atom (where all hydrogen atoms have been replaced by fluorine atoms). The strong carbon-fluorine bond makes PFAS highly resistant to degradation, both in the environment and when used. The two PFAS that were encountered In the Site's groundwater, PFOS (perfluorooctane sulfonate) and PFOA (perfluorooctanoic acid) are sometimes referred to as "forever chemicals".

5.3 Contaminant Migration Processes

This section describes the processes that govern migration of contaminants through soil and groundwater. Fundamental processes that affect the migration of pollutants through soil and groundwater include adsorption, volatilization, dissolution/precipitation, advection/dispersion, and diffusion. These processes are as follows:

5.3.1 Adsorption

The migration of the COCs through the subsurface is greatly affected by the extent to which they are released from the garbage/debris (leachate). Metals and PFAS that leach out of the garbage/debris will be subject to adsorption into the surrounding sand, dissolution into the perched saturated zone and secondary adsorption into the underlying silty sand.

The potential for adsorption of chemical constituents into soil is typically expressed as Kd, the soil-water partition coefficient of the constituent. This term represents the ratio of the change in concentration of the contaminant on the soil to the change in concentration of the contaminant in groundwater. The partition coefficient is not constant for every soil type. In general a higher Kd value indicates a stronger affinity for the soil, meaning the substance is less likely to move through the soil. The following are some general Kd estimates for sand and silty sand.

- Sand: Values typically range from 1 to 10 liters/kilogram (L/kg) or milliliters/gram (ml/g), depending on the specific substance and sand characteristics.
- Silty Sand: Values typically range from 0.5 to 5 L/kg.

5.3.2 Volatilization

Volatilization is the movement of a constituent from the liquid or solid phase to the gas phase. The potential for volatilization of a compound is typically expressed as either vapor pressure of the compound or as the Henry's law constant. Larger Henry's law constants indicate a greater tendency to escape the water phase and enter soil pore spaces or the atmosphere. Volatilization is of primary significance in instances where environmental interfaces such as surface soil/air and surface water/air are important, rather than in evaluation of groundwater and subsurface soils.

In general, the metals encountered in the Site's groundwater are not considered volatile (Part 201 GRCC, EGLE, October 2023 – metals criteria listed as "Not likely to Volatilize) with the exception of mercury. However, potential airborne concerns for other metals may be created from combustion of metal containing garbage/debris.

Some PFAS, particularly those with small non-fluorinated structures or alcohols, are more volatile than others. PFOA and PFOS, the two compounds that were detected in the Site's exhibit relatively low volatility, however, they can adsorb onto particulate matter and undergo atmospheric transportation and deposition.

5.3.3 Dissolution

The rate at which a chemical is leached from the garbage/debris by infiltrating precipitation (and groundwater) is proportional to its water solubility. More soluble chemicals are expected to enter water much more readily and rapidly than less soluble chemicals.

Metal solubility, or the ability of a metal compound to dissolve in water, is generally governed by solubility rules, with some compounds being soluble while others are not. Solubility depends on the specific compound and its interaction with water, as well as factors like pH. In most instances the metals detected in the Site's groundwater were not all introduced in their base metal state. They were most likely introduces as a material that contained a metal (i.e. a metal ion). Factors affecting the solubility of metals include pH, the acidity or alkalinity of the solution (i.e. precipitation influx and groundwater), temperature (increases with temperature for most compounds), presence of other ions, complexation (metal ions can form complexes with other molecules or ions, which can increase or decrease their solubility), lattice energy (strength of the ionic bonds in the compound affects how easily it dissolves). In general, metal solubility is summarized as follows:

- Alkali metal salts (Group 1) and ammonium salts (NH_4^+) are generally soluble.
- Nitrates (NO_3^-) are always soluble.
- Halides (chlorides, bromides, iodides) are generally soluble, except for those with silver (Ag), lead (Pb), and mercury(I) (Hg_2) ions.
- Sulfates (SO_4) are generally soluble, except for those with barium (Ba), lead (Pb), calcium (Ca), and silver (Ag) ions.

- Carbonates (CO3), phosphates (PO4), and sulfides (S) are generally insoluble, except for those with alkali metals and ammonium.

- Hydroxides (OH) are generally insoluble, except for those with alkali metals and barium.

The perched samples were taken from locations where garbage/debris are saturated with water at least part of the time and where water can become stagnant at least some of the time. These soil conditions would tend to create reducing redox conditions; evaporating water will concentrate metals, and may have resulted in the precipitation of metals from the garbage/debris.

PFAS are generally water-soluble, which contributes to their mobility and persistence in the environment, and they can be found in various environmental media. This water solubility, coupled with their resistance to breakdown, makes PFAS environmentally mobile and persistent, allowing them to travel through different environmental compartments like water, soil, and even air. While specific solubility values can vary depending on the specific PFAS compound and environmental conditions, the solubility for the detected PFOAs compounds are as follows:

- PFOA: 9.5 x 10^3 mg/L at 25°C.
- PFOS: 570 mg/L at 25°C.

The solubility of PFAS can be affected by factors like temperature, pH, and the presence of other chemicals or salts in the water.

5.3.4 Advection and Dispersion

Advection describes mass transport due simply to the flow of the water in which the mass is located. The direction and rate of transport coincide with those of groundwater. But dissolved compounds are subject to sorption and attenuation by the solid surfaces that the water contacts, resulting in a solute velocity that is less than the water velocity. As discussed previously, the amount of retardation will be equal to the retardation factor, R.

Dispersion is a process of fluid mixing that causes a zone of mixing to develop between a fluid of one composition that is adjacent to, or being displaced by, a fluid of another composition. Dispersion creates a zone of mixing between displacing fluid and the fluid being displaced. Also, dispersion spreads some of the mass beyond the region it would occupy due to advection alone. There is a spreading both in longitudinal and transverse directions. Transverse dispersion will reduce concentrations everywhere behind the advective front while longitudinal dispersion will only do so at the frontal portions of a plume.

5.3.5 Diffusion

Diffusion is the movement of a compound from a region of high concentration to a region of low concentration, through water or air. Diffusion in some limited way may move metals in groundwater from areas of high concentration to areas of lower concentrations.

6.0 RISK ASSESSMENT

The interpretations in this sections are limited to the COCs as described in Section 4.5. This includes metals and PFOAs.

6.1 Human and Environmental Exposure Pathways That Are, or May Become, Complete

A complete exposure pathway requires (1) a source of contamination, (2) contaminated media, (3) exposure point, (4) exposure route, and (5) a receptor population. An exposure pathway is considered complete if there is evidence that all five of these elements are, have been, or will be present at the Site. If an element is missing, the pathway is incomplete and is not considered an exposure threat.

Completed subsurface investigations have identified metals and PFAS in Site groundwater at levels exceeding a Part 201 generic nonresidential cleanup criteria (GNRCC) for:

- Drinking Water Protection (DWP) Criteria.
- Groundwater Surface Water Interface (GSI) criteria.
- The garbage and debris presents a physical contact hazard for cuts, tripping and falling (only applicable for solids – no direct contact criteria for groundwater or creek water).

Volatilization to Indoor Air and Ambient Air – Volatilization to Ambient Air Inhalation (VSIC): These exposure pathways relates to the inhalation of hazardous vapors to indoor air (vapor intrusion) and outdoor air from debris, soil, perched water or surface water, etc. No detectable concentrations of the COCs were identified at the Site in excess of the generic Part 201 GRCC for Indoor air Inhalation or outdoor air Inhalation, including Mercury. In addition, PFOA and PFOS, the two compounds that were detected in the Site's exhibit relatively low volatility, These exposure pathways are considered incomplete and are not addressed further.

6.2 Groundwater Exposure

Perched groundwater was encountered at a depths ranging from zero to four-feet bgs (seasonal influence from precipitation). A silty sand and clayey sand was encountered beneath the perched water. This sediment included heterogeneous saturated layers and some clays. A second saturated zone was interpreted in a clayey silt and fine silty sand located at approximately 25-feet bgs. Metals and PFAS were detected in groundwater samples at concentrations exceeding generic Part 201 criteria and/or EPA criteria (PFAS).

1. **Drinking Water Protection (Exposure Risk – Low):** This relevant exposure pathway relates to the COCs in groundwater, resulting in direct or indirect ingestion of the impacted groundwater. Multiple samples exceeded the generic Part 201 non-residential drinking water criteria.

   No potable or non-potable wells (other than monitoring wells) are located at the Site. In addition, the Site and surrounding area are undeveloped with the exception of the BMIC Public Works facility and the Plantation Road Housing development (located west of the public works property) on the north

side of Plantation Road. Both developments are located "up gradient" of the Site and are serviced by a municipal water system. Although the drinking water pathway is not likely given the current condition of the Site, the future installation of Site wells, may present an unacceptable risk to potential receptors. Subsequently, this exposure pathway remains complete.

2. **GSI (Exposure Risk – High):** Advection/Dispersion of metals and PFAS in perched water and groundwater. This relevant exposure pathway relates to the potential for COC in groundwater to discharge into the creek. Multiple samples exceeded the groundwater/surface GSI protection criteria. Subsequently, this exposure pathway remains complete.

6.3 Soil Exposure (Including Garbage/Debris)

One metal, selenium, was detected in soil at a concentration that exceeds state wide background and a generic Part 201 criteria. However, this interpretation is limited based on minimal soil data and the heterogeneous garbage and debris. In addition, metals and PFAS are assumed present in some of the garbage/debris; the compounds may become exposed from natural erosion or groundwork.

1. **Drinking Water Protection (Exposure Risk – Low):** This exposure pathway relates to COCs in soil, resulting in direct or indirect leaching to groundwater. Current soil data does not identify a COC at a concentration exceeding generic Part 201 nonresidential drinking water criteria. However, this interpretation is based on limited soil data. Continued leaching of precipitation through the garbage/debris may affect this interpretation.

   No potable or non-potable wells (other than monitoring wells) are located at the Site. In addition, the Site and surrounding area are undeveloped with the exception of the BMIC Public Works facility and the Plantation Road Housing development (located west of the public works property) on the north side of Plantation Road. Both developments are located "up gradient" of the Site and are serviced by a municipal water system. Although the drinking water pathway is not likely given the current condition of the Site, the future installation of Site wells, may present an unacceptable risk to potential receptors. However, this interpretation is based on limited soil data. Continued leaching of precipitation trough the garbage/debris may affect this interpretation. This exposure pathway remains complete due to the limited soil data and contact of debris/garbage with groundwater and creek water.

2. **GSI (Exposure Risk – High):** Dissolution of metals and PFAS into soil and groundwater. This relevant exposure pathway relates to the potential for COC in soil to leach into groundwater or creek water. One metal, selenium, was detected in soil at a concentration that exceeds state wide background and GSI criteria. However, this interpretation is based on limited soil data. Continued leaching of precipitation through the garbage/debris may affect this interpretation. This exposure pathway remains complete due to the limited soil data and contact of debris/garbage with groundwater and creek water.

3. **Direct Contact (Exposure Risk – High):** This relevant exposure pathway relates to the incidental dermal contact with garbage and debris. The debris includes broken glass, sharp metal, uneven

ground, ground cavities. This exposure pathway remains complete. In addition, the heterogeneous garbage and debris poses other potential concerns with COCs.

6.4 Creek Water

1. **Drinking Water Protection (Exposure Risk – Low):** This relevant exposure pathway relates to the COCs in creek water, resulting in direct or indirect ingestion of the impacted creek water. Mercury was detected at a concentration that exceeds the Rule 57 Surface Water Quality Value for Drinking Water Noncancer.

   The creek crosses into BMIC property approximately 1,400-feet east of the Site. The creek encounters several wetland areas and is observed as ponds before the Lake Superior outflow (approximately 1.2-miles east of the Site). Although the drinking water pathway is not likely given the current condition of the Site, access to creek water is not restricted and may present an unacceptable risk to potential receptors. Subsequently, this exposure pathway remains complete.

7.0 CONCEPTUAL SITE MODEL

The Site operated as an unregulated dump from 1940 to 1974. The garbage/debris is visible at surface, on the ravine bank and scattered within the creek channel. The original access road is intact and provides access off of Plantation Road. The road loops around, running parallel to the top of a ravine for approximately 200-feet.

The Site is characterized as a riverine system. A riverine system is a network of streams and wetlands that share a common drainage; in this instance the creek that runs along the southern boundary of the Site, at the bottom of a 30-foot deep ravine. The garbage/debris was dumped onto the riverine systems upper area (surface and buried in discrete excavations), over the ravine bank and onto the creek itself.

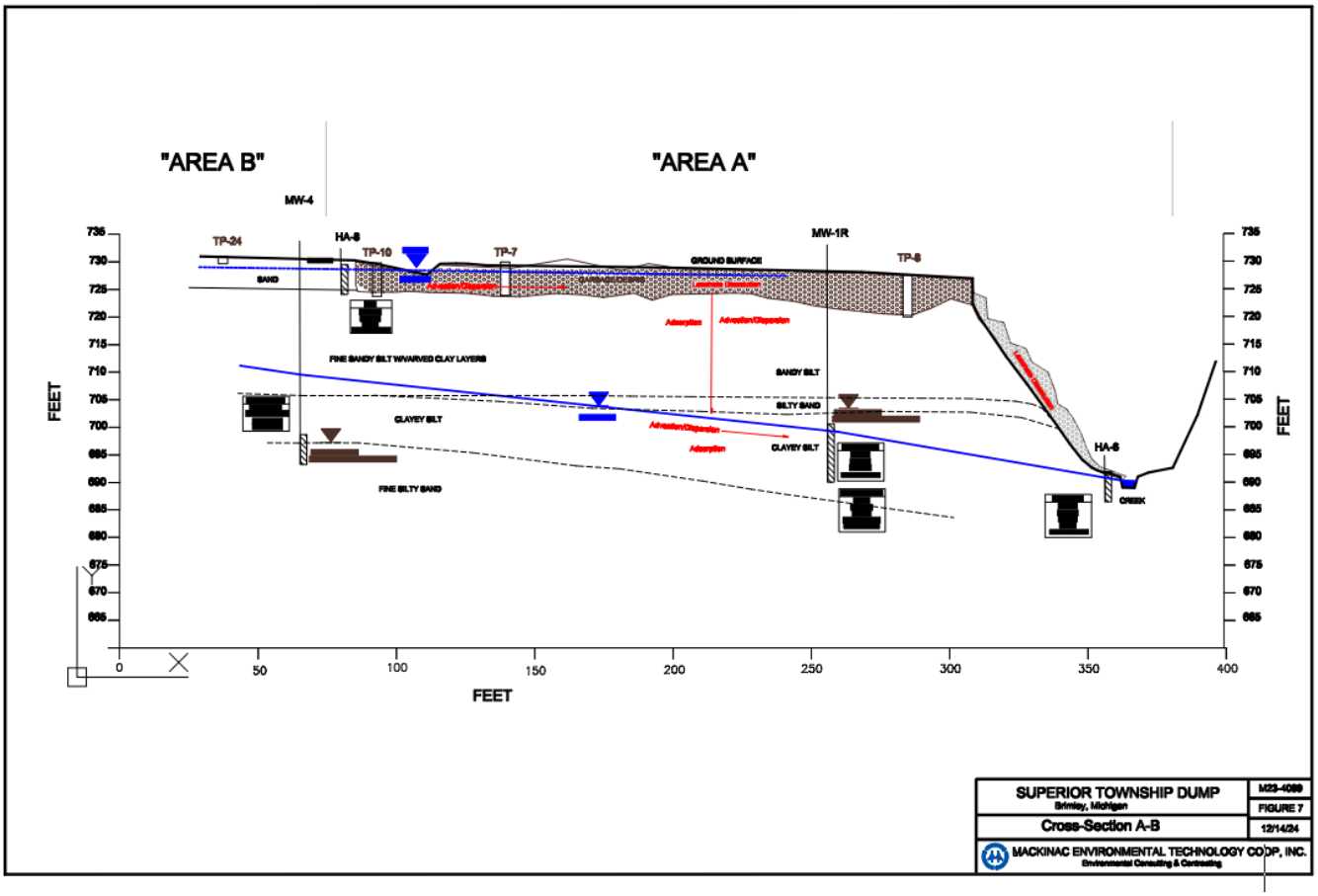
The majority of the dump area is located adjacent to the ravine (in “Area A”) and consists of buried and unburied heterogeneous garbage/debris from surface to depths ranging from approximately two to six-feet bgs. The garbage/debris is visible at the surface (in the “low” elevation areas) and not visible (buried under sand/soil in “high” elevation areas) of the undulating surface topography. Observed garbage/debris includes, but is not limited to, appliances, automobile body/parts, metal scraps, plastics, glass, tires and cans.

The garbage/debris is underlain by native fine silty sand that appears to act as a confining area. Subsequently, the upper area is seasonally inundated with water (intermittent seasonal surface ponds and shallow perched groundwater).

- Dissolution of metals and PFAS from the garbage/debris (i.e. leachate) into soil and groundwater.
- Adsorption of contaminated leachate into soil.
- Advection/dispersion of metals and PFAS in perched water and groundwater that my discharge into the creek.

Figure 7 - Cross-Section A-B in depicts a visual scenario of the garbage/debris, surface topography and saturated zones.

Figure 7 - Cross-Section A-B



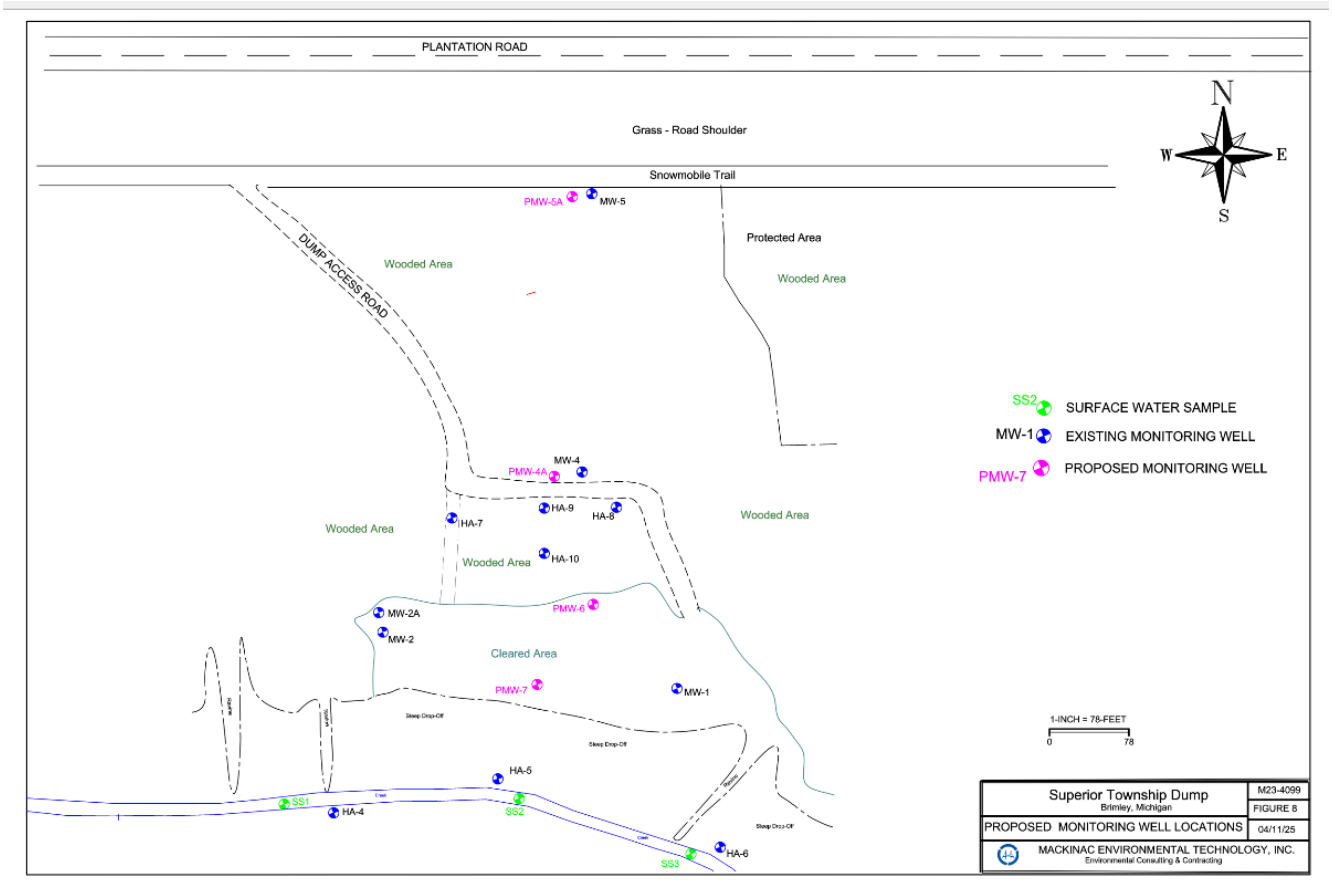
8.0 ADDITIONAL INVESTIGATION TO ADDRESS DATA GAPS

This pre-remedial activity is intended to provide additional information for groundwater flow and contamination (PFAS and metals).

Task #1: Groundwater/Hydrogeological Study

1. Monitoring well installation with drilling subcontractor. Utilize a truck-mounted auger rig to conduct four soil borings. The auger rig is recommended to enable a larger auger with better control of well screen filter pack and bentonite sealing. The monitoring wells will be positioned within the subsurface so as to bisect the water table that is currently defined as the static water level in the existing monitoring wells. The monitoring wells will be constructed of 2-inch diameter PVC 0.07 slot pre-packed screens and associated riser to the surface. The annular space above the pre-packed screen will be sealed with hydrated bentonite chips to surface. The wells will stand approximately 2-feet above ground surface and will be encased in steel, high-visibility, stick-up well covers equipped with a security lock.

Figure 8 – Proposed Monitoring Well Location Map



2. Groundwater Sampling. The sampling event will consist of the collection of groundwater samples via the low-flow sampling method derived from USEPA Region 1 EQASOP-GW Low-Flow SOP

Revision #4. MET anticipates that samples will be collected from all existing monitoring wells during the sampling event.

3. Laboratory Analysis. Recommended analysis includes 6020B & 7470A – Total Metals and 537 MOD - PFAS.

Task #2: Landfill Disposal Evaluation

The detection of PFAS in groundwater presents a concern with disposal of the garbage/debris; PFAS contaminated material is treated as a hazardous waste.

1. Correspondence with GFL Environmental (GFL) pertaining to acceptance of materials and material characterization analytical requirements.

2. Collect waste samples for analysis of PFAS and metals (anticipated disposal characterization requirements).

3. If acceptable, continue with GFL for disposal of debris.

4. If unacceptable due to PFAS, commence disposal correspondence with US Ecology - Wayne Disposal for disposal of debris in their Belleview, Michigan hazardous waste landfill.

The on-going feasibility study will include correspondence with the landfill personnel and EGLE to determine the applicable disposal location and feasibility for off-site disposal.

PART 2 – FEASIBILITY STUDY

9.0 INTRODUCTION

The open dump site is not abandoned properly according to standards set by 40 CFR Section 257.3, effective October 15, 1979, with respect to physical hazard and floodplain/surface water exposure requirements. Superior Township Dump is also listed as a Part 201 Facility, Facility ID #17000160 per EGLE. In its current condition the Site poses risk to both humans (drinking water, direct contact) and nature (surface water quality and wildlife). Cleanup activities are recommended to protect the following relevant pathways:

1. Drinking Water Protection (Metals and PFAS in Groundwater): This relevant exposure pathway relates to the COCs in groundwater, resulting in direct or indirect ingestion of the impacted groundwater.

2. GSI (Discharge of metals and PFAS into the Creek): This relevant exposure pathway relates to the potential for COC in groundwater to discharge into the creek. The creek crosses into BMIC property approximately 1,400-feet east of the Site. The creek encounters several wetland areas and is observed as ponds before the Lake Superior outflow (approximately 1.2-miles east of the Site). Although the drinking water pathway is not likely given the current condition of the Site, access to creek water is not restricted and may present an unacceptable risk to potential receptors. Subsequently, this exposure pathway remains complete.

3. Direct Contact (Contact with Garbage/Debris): This relevant exposure pathway relates to the incidental dermal contact with garbage and debris. The debris includes broken glass, sharp metal, uneven ground, ground cavities. This exposure pathway remains complete. In addition, the heterogeneous garbage and debris poses other potential concerns with COCs.

The objectives of the RI are to collect data to improve the conceptual understanding of the garbage/debris including type, distribution and leachate transport into groundwater and surface water. The interpretations can be used to support the comparative evaluation of cleanup alternatives to address the garbage/debris and associated chemicals of concern (COC).

9.1 Feasibility Study Objectives

The objectives of the FS is to identify cleanup options and rate the effectiveness of achieving cleanup goals associated with unacceptable exposure to garbage/debris and the associated COCs.

1. Identify and screen general cleanup approaches that can be used to prevent or clean up garbage/debris and COCs that enter groundwater and/or creek water.

2. Identify and screen general approaches that can prevent the spread or release of COCs into groundwater and creek water.

3. Evaluate and rank the potential implementation project alternatives based on objective performance criteria and anticipated costs.

This Feasibility Study (FS) assess six options to address Site conditions. The options increase in complexity and cost, and are summarized on the following table.

Table 7 - Cleanup Options Being Considered

Option	Description	Addressed Receptor[1]				
		Drinking Water	GSI	Direct Contact	Creek	Estimated Cost
1	Do nothing. The garbage/debris would remain as is.	0	0	0	0	$0
2	Installation of a security fence and restrictive covenant.	1 (on-site only)	0	1 (on-site only)	0	$50,000
3	Remove recyclables in the creek and ravine.	0	2	1	2	$150,000
4	Option #3 plus excavation of buried garbage/debris from the Creek and Ravine	1	2	2	3	$300,000[2]
5	Option #4 plus Leave Upper Area Garbage/Debris In Place and Cap With Sediment and a Synthetic Liner[3].	4	4	4	5	$700,000[2]
6	Option #4 plus Excavation and Off-Site Disposal of Garbage/Debris	5	5	5	5	
	6a - Disposal at a Type 2 Sanitary Landfill					$2,500,000
	6b – Disposal at a Hazardous Waste Landfill					$6,700,000

[1]0 to 5: 0 = no benefit to 5 = highest benefit

[2]Cost will be affected by landfill acceptance and/or capping costs.

[3]Liner design will be developed in conjunction with Part 201 requirements and closure objectives.

10.0 CLEANUP OPTIONS

The following subsections provide corrective action alternatives to satisfy future land use under Section 324.20118 Response activity; remedial action; purposes; selection or approval; conditions of Part 201 of the NREPA Act 451 of 1994.

10.1 Site Preparation

The following effort is required regardless of the selected cleanup.

1. Project Management. This includes Project commencement, landfill correspondence and sampling, reporting, field supervision.

2. Clear & Grub: 1.5 acres

3. Improve access drive for access to ravine bank (800-feet from Plantation Road to the target area). The access drive must support 30-yard dump truck/trailers and excavators.

4. Sediment Control:
   - Install approximately 450-feet silt fencing along the creek bank (bottom of ravine).
   - Install silt boom in creek to protect the creek during cleanup.

5. Construct an access "road" to the creek. The creek is situated approximately 38-feet below the upper ground surface. The anticipated pathway is through the east ravine area. The access should have a mid-point staging area(s) and enable access to the creek with an excavator (outfitted with a grappler) and a means to transport removed materials to the surface grade.

10.2 Cleanup Options

Option #1: Do Nothing

This option would maintain current conditions. There would be no protections or limitations on contaminant migration or exposure.

Option #2: Security Fencing and Restrictive Covenant

All garbage/debris would stay the same.

1. A chain-linked security fence would be installed around Area A. The fence would terminate at the creek on the east and west boundaries of visible garbage/debris. Signage along the fence, including at the creek, would warn the public of interior conditions.

2. A Restrictive Covenant could would be placed over the Site to discourage or prohibit the future installation of a potable water well on the Site. This may be obsolete since the Site is located on HNF property and future development is unlikely.

3. Groundwater cleanup would rely on natural attenuation. This would have no impact on the natural attenuation process with the presence of the Source Soil/Gargage/Debris.

This option offers the following:

- Direct Contact – This would have some benefit to the Direct Contact pathway by providing a physical barrier for access to the garbage/debris.

- Drinking Water exposure pathways. The restrictive covenant would ensure that the underlying aquifer(s), located under the Site are not accesses for a potable water. Groundwater cleanup would rely on natural attenuation. The continued presence of Source Soil/Gargage/Debris would limit success.

- GSI/Creek: No protection.

Option #3: Remove Surface Garbage/Debris in the Creek and Ravine

Visible garbage/debris in the creek and along the ravine bank consists of metal (appliances, cars, etc.) and tires. The target area consists of approximately 15,000 square-feet of surface area. The quantity of the debris is estimated at approximately 2,000 to 2,500 cubic yards. This material will be removed and recycled.

1. Utilize an excavator outfitted with a grappler to retrieve exposed debris on the creek bank and ravine. The removal will commence at the top of the ravine. Debris will be separated from soil/garbage (as needed) and loaded into a transport truck/trailer for transportation off Site and recycling.

2. Once accessible debris is removed from the upper portion. Move to the creek area and continue removal with the excavator outfitted with a grappler. This may require several staging areas for transport to the upper grade.

3. Groundwater cleanup would rely on natural attenuation. This would have minimal impact on the natural attenuation process with the presence of the Source Soil/Gargage/Debris.

This option offers the following:

- Direct Contact – This has limited benefit for the direct contact pathway (limited to the creek and ravine). It does not address the exposed garbage/debris in the upper area.

- Drinking Water exposure pathways. This option does not offer any protection to the drinking water pathway; the leaching of COCs would continue without control.

- GSI: Some minor benefit would be realized by the removal of garbage/debris that is in direct contact with the creek. However, buried garbage/debris would remain and would continue to leach the COCs into the saturated zone.

- Creek: This would result in a benefit by removing garbage/debris in direct contact with the creek and removing the physical obstructions from the creek.

<u>Option #4</u>: Remove Exposed Garbage/Debris in the Upland Area and Excavate Buried Garbage/Debris in the Creek and Ravine

This option includes Option #3 plus the following action.

1. Excavate soil/garbage from the upper ground surface (400-feet by 20-feet by an average six-feet deep) along the top of the ravine. This will be conducted as a "Source Soil/Garbage/Debris" excavation to remove the garbage and provide additional vertical access to the ravine bank. The estimated quantity is 1,800 cubic yards. This material will be placed in cleared area along the south side of the access road. The material will be staged for transport/disposal at a landfill or remain and be capped.

2. An excavator, operating from the top of the ravine will "reach down" to remove buried debris and garbage from the ravine bank (assume 500 cubic yards).

3. Additional removal will be conducted from the creek area as needed.

4. Once complete, stabilize the ravine bank with geotextile and plant native plants.

5. Access along the creek may cause damage to the creek and may require creek restoration.

6. Cleanup of Areas B & C
   - Shallow excavation of exposed debris. The majority of the observed debris is glass and metals.
   - The estimated quantity is ~50 cubic yards.
   - PFAS was not detected in groundwater (MW-4 and MW-5).
   - Place the material in the Receiving Area or haul to a landfill.

7. Groundwater cleanup would rely on natural attenuation. This would be partially enhanced with the removal of some Source Soil/Gargage/Debris.

This option offers the following:

- Direct Contact – This has a benefit for the direct contact pathway by removing a significant portion of exposed garbage/debris throughout the Site.

- Drinking Water Exposure Pathway. This option provides a limited benefit to the drinking water pathway by the Source Soil/Gargage/Debris removal from the creek, ravine and upper are adjacent to the ravine. It will eliminate some precipitation leaching from the garbage/debris.

- GSI: This option provides a limited benefit to the GSI pathway by the Source Soil/Gargage/Debris removal from the creek, ravine and upper are adjacent to the ravine. It will eliminate some precipitation leaching from the garbage/debris.

- Creek: This would result in near complete restoration of the creek along with some control of leachate into the saturated zone and surface runoff into the creek.

Option #5: Leave Upper Area Garbage/Debris In Place and Cap With Sediment and a Synthetic Liner.

This option includes Option #4 plus the following action.

1. Establish a 33,000 square-foot area between the current cleared area and the access road (north portion of Area A) to receive all garbage and debris (Receiving Area).

2. Excavate garbage/debris from the remainer of Area A. Estimated at 8,200 cubic yards.

3. Place the excavated material plus the 2,200 cubic yards removed from the creek and ravine (total of approximately 10,400 cubic yards), on top of this area. The resultant mound would extend approximately eight-feet above ground surface.

4. Cap the area with a synthetic liner and sediment.

5. Install monitoring wells through and downgradient to monitor leachate and groundwater under the stockpile.

6. Groundwater cleanup would rely on natural attenuation. This would be enhanced with the absence of the Source Soil/Gargage/Debris.

This option offers the following:

- Direct Contact – This option provides a benefit to the direct contact pathway. All Source Soil/Garbage/Debris would be relocated to the upper area and capped.

- Drinking Water Exposure Pathway. This option provides a benefit to the drinking water pathway by the Source Soil/Garbage/Debris excavation and capping (control precipitation leaching from the garbage/debris).

- GSI: This option provides a benefit to the GSI pathway by the Source Soil/Garbage/Debris excavation (throughout the creek, ravine and upper area adjacent to the ravine) and capping (control precipitation leaching from the garbage/debris).

- Creek: This would result in near complete restoration of the creek along with control of leachate into the saturated zone and surface runoff into the creek.

Option #6: Excavation and Off-Site Disposal of Garbage/Debris.

This option consists of Option #5 plus:

1. Excavate all accessible Source Soil/Garbage/Debris from the Site.

2. If warranted, control perched water with dewatering.

3. Haul all Source Soil/Garbage/Debris to landfill.

4. Groundwater cleanup would rely on natural attenuation. This would be enhanced with the absence of the Source Soil/Gargage/Debris.

This option offers the following:

- Direct Contact – This option provides a high positive benefit to the direct contact pathway. All Source Soil/Garbage/Debris would be removed from the Site and disposed at a landfill.

- Drinking Water Exposure Pathway. This option provides a benefit to the drinking water pathway by the Source Soil/Garbage/Debris excavation.

- GSI: This option provides a high benefit to the GSI pathway by the Source Soil/Garbage/Debris excavation (throughout the creek, ravine and upper area adjacent to the ravine).

- Creek: This would result in near complete restoration of the creek along with control of leachate into the saturated zone and surface runoff into the creek.

Transportation and disposal of the Soil/Garbage/Debris as non-hazardous in GFL's Dafter landfill may not be possible due to the presence of PFAS in the underlying groundwater and potentially in the Soil/Garbage/Debris. Transportation and disposal as hazardous waste (due to PFAS) at the US Ecology Wayne Disposal's Belleview may be required if off-site disposal is desired.

6a - Haul and Transport to GFL Dafter – if sampling can "validate" that PFAS is not present in the garbage/debris.

Haul the Source Soil/Garbage/Debris to a Type 2 Sanitary Landfill (i.e. GFL Dafter).
- The estimated quantity of garbage/debris is approximately 18,000 cubic yards.
- Assume 0.4 tons/cubic yard of garbage/debris (limited soil) or 7,200 tons.
- Assume landfill disposal at $110/ton.

6b - Haul and Transport at Wayne Disposal – if PFAS is identified or cannot be ruled out due to groundwater detections.

Haul the garbage/debris to a Hazardous Waste Landfill (i.e. Wayne Disposal).
- The estimated quantity of garbage/debris is approximately 18,000 cubic yards.
- Assume 0.4 tons/cubic yard of garbage/debris (limited soil) or 7,200 tons.
- Assume landfill disposal at $400/ton.
- 10-hour round trip per 40-yard transport (675 round trips).

11.0 REFERENCES

Geological References:

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Kelly, R.W., Bedrock of Michigan; State of Michigan Department of Natural Resources, Division of Geology; 1977. (Map and information compiled from Geological Survey and publications and manuscripts, 1968).

U.S Department of Agriculture. Natural Resource Conservation Service, Web Soil Survey. WebSite: websoilsurvey.nrcs.usda.gov

U.S. Fish & Wildlife Service. National Wetlands Inventory. WebSite: fws.gov/wetlands

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jmsatchell@baymills.org

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edrnet.com

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Sault Ste. Marie, Michigan 49783
906.635.1581
www.eup-planning.org

Michigan Department of Environment, Great Lakes and Energy
michigan.gov/egle

Bay Mills Township Assessor's Office
Kathy Loup, MCAO, Assessor
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Brimley, Michigan 49715
906.440.1159
kloup714@gmail.com

Chippewa County Health Department
508 Ashmun St., Suite 120

Sault Ste. Marie, Michigan 49783
906.635.1566
contact@chippewahd.com

Documentation/Sources:

Barr Engineering Company. Part 3: Groundwater sampling at Superior Township Dump, Contract No. 53-569R-7-01111. Dated February 1999.

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Michigan Department of Environment, Great Lakes and Energy - RRD. Cleanup Criteria Requirements for Response Activity (Formerly the Part 201 Generic Cleanup Criteria and Screening Levels). Updated October 2023. Available online at https://www.michigan.gov/egle/about/organization/remediation-and-redevelopment/remediation-and-investigation/cleanup-criteria

12.0 CLOSING AND SIGNATURE

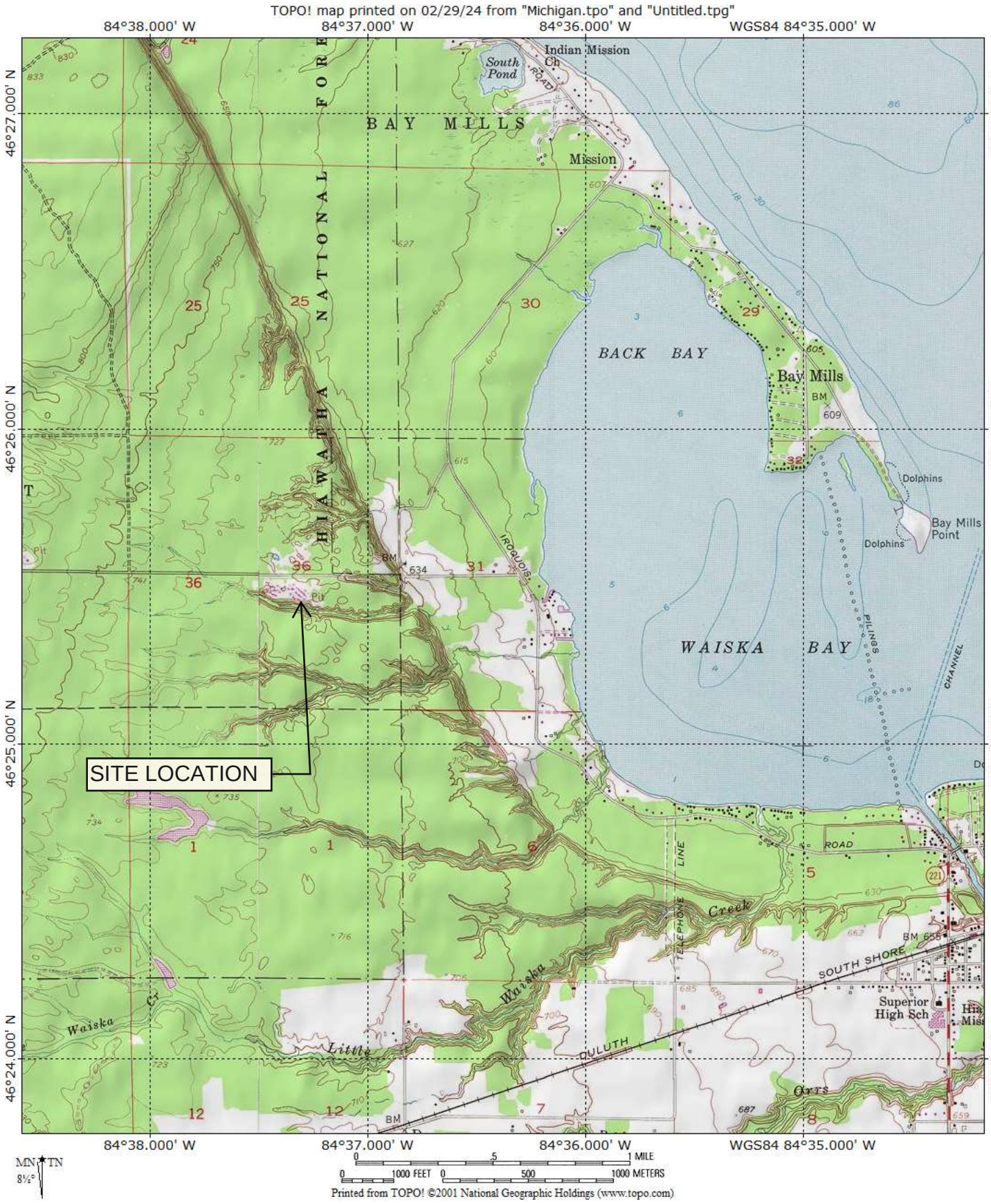
Please contact me if you have any questions.

Sincerely,
Mackinac Environmental Technology, Inc.

Edward Radecki, CPG Date
Senior Project Manager
231.622.3229

FIGURES

FIGURE 1 - SITE LOCATION MAP



No profile exists. Choose 'Build Profile' from the pop-up options menu of a route.

FIGURE 2 - SITE PLAN

PLANTATION ROAD

N

W E

S

Grass - Road Shoulder

Snowmobile Trail

MW-5

DUMP ACCESS ROAD

Wooded Area

Protected Area

Wooded Area

TP-20

TP-21

TP-19

TP-17

TP-24

TP-22

TP-23

TP-25

TP-15

TP-16

MW-4

TP-11

TP-18

TP-13

TP-34

TP-26

HA-9

TP-12

HA-8

TP-10

Wooded Area

HA-7

TP-14

Wooded Area

HA-10

Wooded Area

TP-9

TP-27

TP-5

MW-2A

TP-3

TP-2

TP-7

TP-28

TP-32

MW-2

Cleared Area

TP-33

TP-4

TP-6

TP-29

TP-1

MW-1

Ravine

Ravine

Steep Drop-Off

TP-8

TP-30

Steep Drop-Off

HA-5

TP-31

Ravine

SS1

Creek

HA-4

SS2

Creek

Steep Drop-Off

HA-6

SS3

TEST PIT

SS2 STREAM SAMPLE

MW MONITORING WELL

1-INCH = 78-FEET

0 78

Superior Township Dump Brimley, Michigan	M23-4099
	FIGURE 2
SITE PLAN	12/17/24
MACKINAC ENVIRONMENTAL TECHNOLOGY, INC. Environmental Consulting & Contracting	

FIGURE 3 - GROUNDWATER GRADIENT MAP

PLANTATION ROAD

N
W E
S

Grass - Road Shoulder

Snowmobile Trail

MW-5
721.35

DUMP ACCESS ROAD

Wooded Area

Protected Area

Wooded Area

710.70
MW-4

HA-9
DRY

HA-8
DRY

HA-7
DRY

HA-10
DRY

Wooded Area

Wooded Area

Wooded Area

723.52
MW-2A

MW-2
710.67

Cleared Area

700.38
MW-1

Ravine

Ravine

Steep Drop-Off

Steep Drop-Off

Ravine

Steep Drop-Off

HA-5

SS1

Creek

HA-4

SS2

Creek

HA-6
691

SS3

SS2
MW

1-INCH = 78-FEET
0 78

Superior Township Dump Brimley, Michigan	M23-4099
	FIGURE 3
GROUNDWATER GRADIENT MAP	12/17/24
MACKINAC ENVIRONMENTAL TECHNOLOGY, INC. Environmental Consulting & Contracting	

FIGURE 4 – THE CREEK

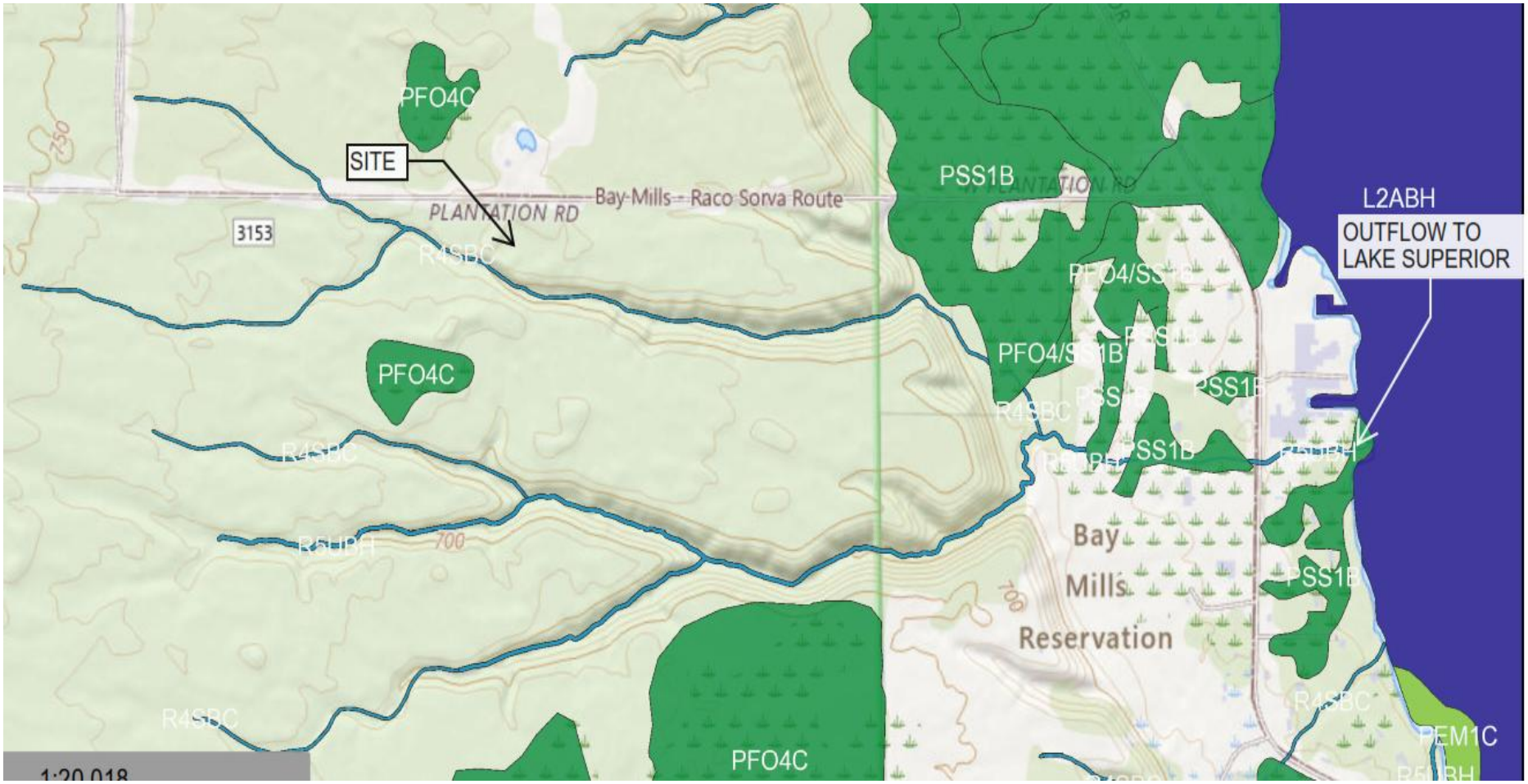
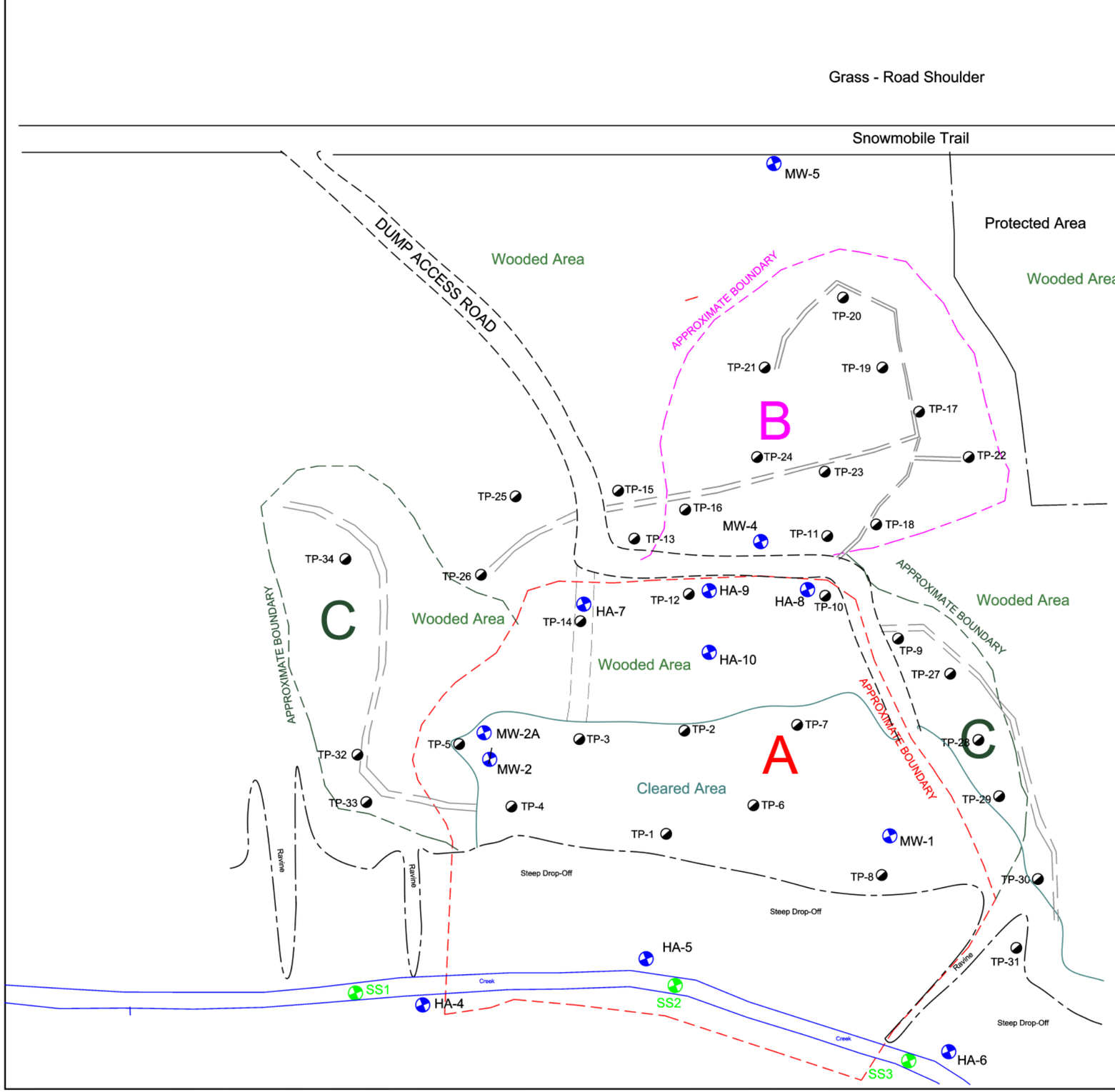


FIGURE 5 - SITE PLAN - GARBAGE/DEBRIS AREAS



A MAIN DUMPING AREA - BURIED GARBAGE

B SURFACE DEBRIS - SCATTERED AND SOME PILES

C SURFACE DEBRIS - SCATTERED

TEST PIT

SS2 STREAM SAMPLE

MW MONITORING WELL

1-INCH = 78-FEET

0 78

Superior Township Dump Brimley, Michigan	M23-4099
	FIGURE 5
SITE PLAN - GARBAGE/DEBRIS AREAS	12/17/24
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FIGURE 6 - GROUNDWATER ANALYTICAL MAP

PLANTATION ROAD

Grass - Road Shoulder

Snowmobile Trail

DUMP ACCESS ROAD

Wooded Area

Protected Area

Wooded Area

Wooded Area

Wooded Area

Wooded Area

Cleared Area

Steep Drop-Off

Steep Drop-Off

Steep Drop-Off

Ravine

Ravine

Ravine

Creek

Creek

MW-5

MW-5 12/17/24
Metal Results skewed from high Turbidity
PFOS: BDL
PFOA: BDL

MW-4

MW-4 12/17/24
Metal Results skewed from high Turbidity
PFOS: BDL
PFOA: BDL

HA-9

HA-9 07/09/24
Al: 120000
Fe: 78000
Pb: 82
Mn: 1700
Ar: 11

HA-8

HA-8 07/09/24
Al: 61009
Fe: 3900
Pb: <5
Mn: 73

HA-7

HA-7 07/09/24
Al: 59000
Fe: 42000
Pb: 140
Mn: 510

HA-10

MW-2A

MW-2A 07/11/24
Al: 290
Fe: 4900
Mn: 520

MW-2

MW-2 07/09/24
Al: 8150
Fe: 36300
Mn: 1110

MW-1

MW-1R 12/17/24
Al: 870
Fe: 3000
Mn: 940
PFOS: 9.2 ng/L
PFOA: 39 ng/L

MW-1R 07/09/24
Al: 1700
Fe: 4100
Mn: 1100

HA-5

HA-5 07/09/24
Al: 3400
Fe: 3800
Pb: <5
Mn: 740

HA-6

HA-6 07/09/24
Al: 5300
Fe: 7700
Pb: 5.5
Mn: 260

HA-4

HA-4 07/09/24
Al: 4900
Fe: 5300
Pb: 34
Mn: 430

SS1

SS2

SS3

SS2

MW

HA-9 07/09/24
Al: 120000
Fe: 78000
Pb: 82
Mn: 1700
Ar: 11

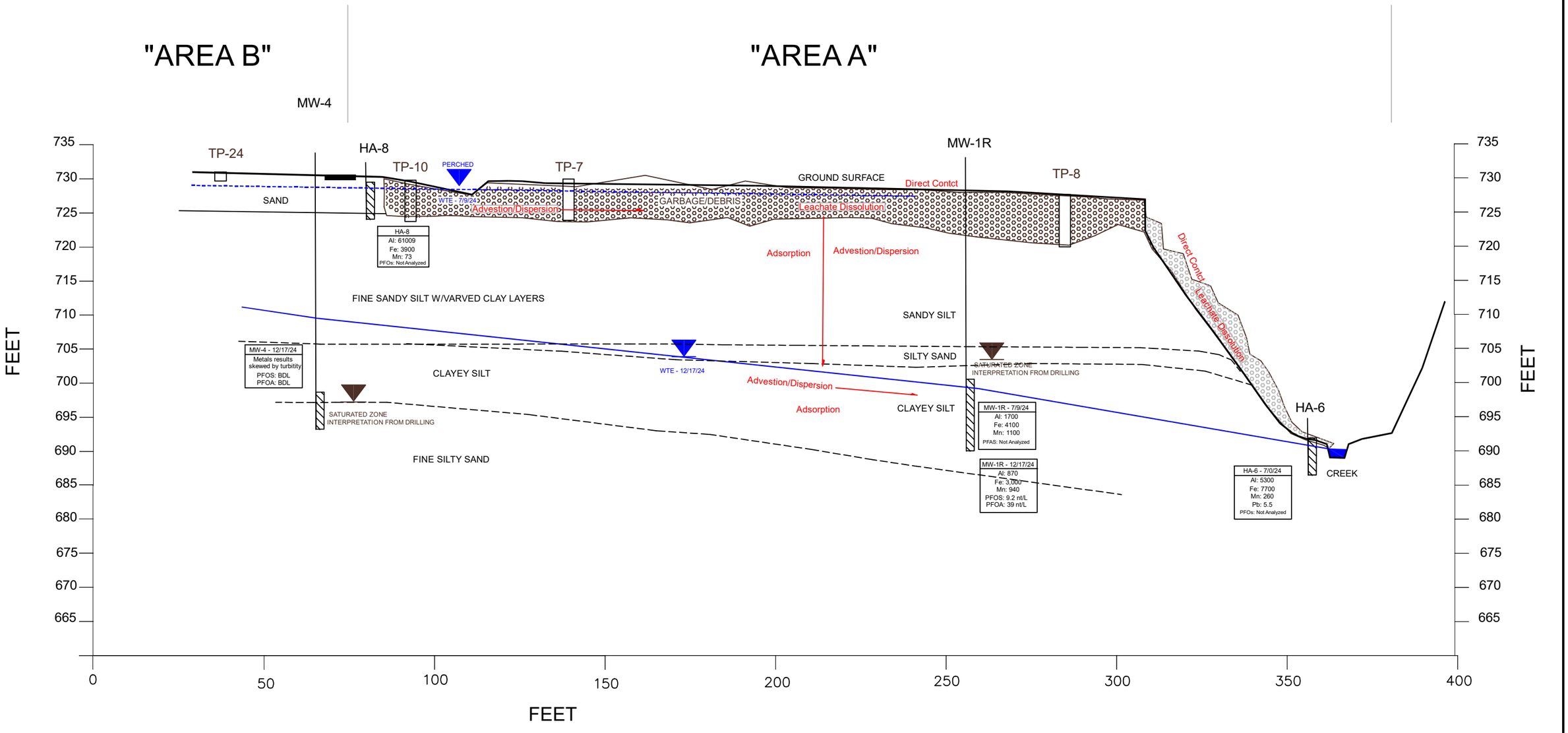
DENOTES A SHALLOW WELL

1-INCH = 78-FEET

0 78

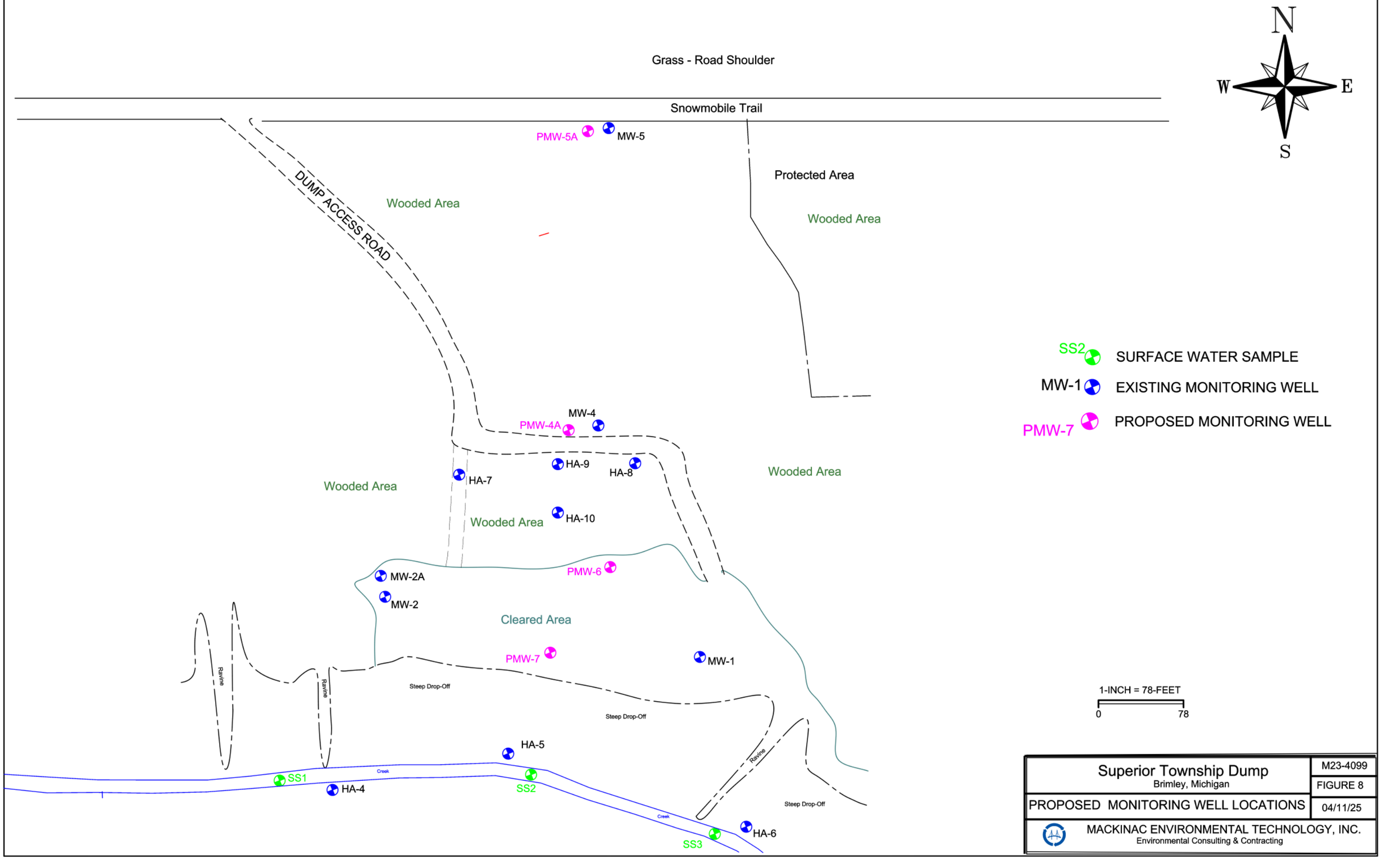
Superior Township Dump Brimley, Michigan	M23-4099
GROUNDWATER ANALYTICAL MAP	FIGURE 6
MACKINAC ENVIRONMENTAL TECHNOLOGY, INC. Environmental Consulting & Contracting	12/17/24

FIGURE 7 - CROSS-SECTION A-B



SUPERIOR TOWNSHIP DUMP Brimley, Michigan	M23-4099
	FIGURE 7
Cross-Section A-B	12/14/24
MACKINAC ENVIRONMENTAL TECHNOLOGY COOP, INC. Environmental Consulting & Contracting	

FIGURE 8 - PROPOSED MONITORING WELL LOCATION MAP



Superior Township Dump Brimley, Michigan	M23-4099
	FIGURE 8
PROPOSED MONITORING WELL LOCATIONS	04/11/25
MACKINAC ENVIRONMENTAL TECHNOLOGY, INC. Environmental Consulting & Contracting	

TABLES

FORMER SUPERIOR TOWNSHIP DUMP ***TABLE 1- WATER TABLE ELEVATION MONITORING DATA***
M23-4099

October 1999 to July 2024

Location	TOC Elev.	BOS Elev.	Well Length	Screen Length	10/2/99			6/4/00			5/2/01		
					DTW	DTP	WTE	DTW	DTP	WTE	DTW	DTP	WTE
Deep Wells													
MW-1	730.61	66.00	34.00	10'	31.36								
MW-1R	730.61	59.52	41.00	10'				30.01		700.60	29.73		700.88
MW-2	730.93	69.30	29.80	10'	22.50		708.43	21.02		709.91	21.66		709.27
MW-3		71.51	31.00	10'	24.51			23.13			24.47		
MW-4	734.00		40.00	5'									
MW-5	736.06		40.00	5'									
Shallow Wells													
MW-2A	730.26	86.03	12.60	5'	7.66		722.60	5.31		724.95	4.42		725.84
HA-4*	696.95			2.5'									
HA-5*	695.06			2.5'									
HA-6*	692.70			2.5'									
HA-7*	731.71			2.5'									
HA-8*	732.42			2.5'									
HA-9*	732.33			2.5'									
HA-10*	731.16												

Location	TOC Elev.	BOS Elev.	Well Length	Screen Length	7/9/24			12/17/24					
					DTW	DTP	WTE	DTW	DTP	WTE			
Deep Wells													
MW-1	730.61	66.00	34.00	10'									
MW-1R	730.61	59.52	41.00	10'	27.48		703.13	30.23		700.38			
MW-2	730.93	69.30	29.80	10'	18.45		712.48	20.26		710.67			
MW-3		71.51	31.00	10'									
MW-4	734.00		40.00	5'				23.30		710.70			
MW-5	736.06		40.00	5'				14.71		721.35			
Shallow Wells													
MW-2A	730.26	86.03	12.60	5'	3.95		726.31	6.75		723.51			
HA-4*	696.95			2.5'	3.28		693.67						
HA-5*	695.06			2.5'	2.85		692.21						
HA-6*	692.70			2.5'	1.60		691.10	1.70		691.00			
HA-7*	731.71			2.5'	1.56		730.15	Dry					
HA-8*	732.42			2.5'	1.98		730.44	Dry					
HA-9*	732.33			2.5'	2.10		730.23	Dry					
HA-10*	731.16												

*Estimated elevation based on surface elevation - Measured with Trimble GPS

Table 2: Test Pit Summary - 05/14/2024 & 06/03/2024

Test Pit #	Test Pit Depth	Perched Water[1]	*Garbage/Debris*			Comments
			Surface	Buried	Approximate thickness	
AREA A – MAIN DUMP AREA • Approximately 3 acres. • Wooded area exhibits swales with standing water & garbage/debris (surface and buried). • Cleared area is flat with buried & surface debris. • Debris (metal and tires) is located on the steep slope leading to the stream and on the stream bed.						
1	8’	No	Yes	Yes	6.5’	At the edge of the bank
2	6’	Yes	Yes	Yes	6’	In the cleared area
3	4’	No	No	No	0	Test pit located on probable dump access road
4	8’	No	Yes	Yes	6’	At the edge of the bank
5	4’	Yes	Yes	Yes	4’	Near MW-2
6	6’	Yes	Yes	Yes	6’	Middle of cleared area
7	5’	Yes	Yes	Yes	5’	In the cleared area
8	10’	No	Yes	Yes	10’	At the edge of the bank
10	3’	Yes	Yes	Yes	3’+	Ridge between swales
12	3’	Yes	Yes	Yes	3’+	Ridge between swales
14	2’	Yes	Yes	Yes	2’+	In a swale
The presence of water in the test pit limited observation of termination depth soils and vertical extent of debris/garbage’						
AREA B • Approximately 1 acre. • Wooded area with discrete areas of debris (glass and metal) - widespread. • Discrete surface water ponds, test pits terminated before encountering water.						
18	2’	No	Yes	No	--	Scattered debris - minimal
22	2’	No	Yes	No	--	“Protected Area” with standing water beyond.
17	2’	No	Yes	No	--	Drum and metal debris
19	2’	No	Yes	No	--	Scattered debris - minimal
20	2’	No	Yes	No	--	metal debris - piles
21	2’	No	Yes	No	--	Scattered debris - minimal
23	2’	No	Yes	No	--	metal debris - piles
24	2’	No	Yes	No	--	metal debris - piles
AREA C – EAST • Minor, scattered surface debris. • Approximately 0.4 acres.						
9	2’	No	No	No	--	
27	2’	No	Yes	No	--	Scattered debris - minimal
28	2’	No	No	No	--	
29	2’	No	No	No	--	
30	2’	No	No	No	--	
31	2’	No	No	No	--	Adjacent to the ravine
AREA C – WEST • Minor, scattered surface debris. • Approximately 0.5 acres.						
32	2’	No	No	No	--	
33	2’	No	No	No	--	
34	1’	No	Yes	No	--	Metal debris
OTHER						
11	4’	No	No	No	--	Debris/Garbage was not observed in these areas
13	4’	No	No	No	--	
15	2’	No	No	No	--	
16	2’	No	No	No	--	
25	2’	No	No	No	--	
26	2’	No	No	No	--	

Table #3A: Summary of Groundwater Analytical Data

FORMER SUPERIOR TOWNSHIP DUMP
Hiawatha National Forest, Plantation Road, Brimley, Michigan
MET Project #: M23-4099
26-Jul-24

Location	Date	TOTAL METALS															Water Table Elevation
		Mercury (Total) (BZ)	Aluminum	Arsenic	Barium (B)	Iron	Lead (B)	Manganese	Cadmium	Chromium	Cobalt	Copper	Nickle	Selenium	Silver	Vanadium	Zinc	
DEEP MONITORING WELLS																		
	CAS E#	Varies	7429905	7440382	7440393	7439896	7439921	7439965	7440439	16065831	7440484	7440508	7440020	7782492	7440224	7440622	7440666	
MW-1R	12/17/2024	<0.20	**870**	<5	320	**3,000**	<5	**940**	<2	<5	<5	NA	<5	<5	<5	<5	NA	700.38
	7/9/2024	<0.2	**1700**	<5	260	**4100**	<5	**1100**	NA	NA	NA	NA	NA	NA	NA	NA	NA	703.13
Blind Dup MW-9	7/9/2024	<0.2	**1400**	<5	240	**3900**	<5	**1100**	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	5/2/2001	**0.064**	**25100**	7.6	570	**28200**	**13**	**1400**	0.2	94	**56**	40	**190**	3.3	2.8	**73**	46	700.88
	6/3/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	700.6
MW-1	10/2/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	699.25
	7/27/1998	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
MW-2	7/9/2024	<0.2	<50	<5	120	**7500**	<5	**480**	NA	NA	NA	NA	NA	NA	NA	NA	NA	712.48
	5/2/2001	0.0009	**8150**	8.1	460	**36300**	**10**	**1110**	0.5	**243**	**53**	70	**510**	1.9	**0.7**	**29**	20	709.27
	6/3/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	709.91
	10/21/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	708.43
	7/27/1998	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
MW-3	5/2/2001	**0.023**	**64000**	14	580	**67000**	**30**	**2230**	0.5	**271**	**79**	93	**690**	10	**0.3**	**210**	150	
	6/3/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	10/21/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	7/27/1998	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
MW-4	12/17/2024	<0.2	*2,600,000*	*570*	*36000*	*2,400,000*	*1,400*	*72,000*	*<20*	*5,400*	*1,600*	*NA*	*4,000*	*720*	*<500*	*5,400*	*NA*	710.7
MW-4 Pre-stabilization	12/17/2024	<0.2	*1,200,000*	*200*	*19,000*	*900,000*	*870*	*35,000*	*<20*	*1,500*	*520*	*NA*	*1,100*	*210*	*<50*	*2,900*	*NA*	
MW-5	12/17/2024	<0.2	*660,000*	*150*	*7,200*	*470,000*	*280*	*17,000*	*<20*	*750*	*280*	*NA*	*560*	*140*	*<50*	*1,500*	*NA*	721.35
TRIP BLANKS	7/9/2024	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	12/17/2024	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Res - Drinking Water Protection		2A	**50 V**	10A	2,000 A	**300 E**	**4 (L)**	**50(E).**	5.0 A	**100 A**	**40**	1000 (e)	**100 (a)**	50 (A)	34	**4.5**	2400	
Non-Res - Drinking Water Protection		2A	**50 V**	10A	2,000 A	**300 E**	**4 (L)**	**50(E).**	5.0 A	**100 A**	100	1000 (e)	**100 (a)**	50 (a)	98	**62**	5000 (e)	
Groundwater/Surface Water (GSI)		**0.0013**	NA	10	G	NA	GX	(G,X)	(G,X)	(G,X)	100	(G)	G	5	**0.2 (M); 0.6**	**27**	G	
Res - Volatilization to Indoor Air		56 S	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	
Non-Res - Volatilization to Indoor Air		56 S	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	
Flamability and Explosivity		ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	

NA = Total metal concentration were not analyzed. Pre-2024 samples were analyzed for dissolved metals

Note: MW-4 and MW-5 exhibited elevated turbidity including visual discoloration; concentrations of total metals that were analyzed using ICP-MS appear skewed high due to the elevated turbidity.

Table #3A: Summary of Groundwater Analytical Data

FORMER SUPERIOR TOWNSHIP DUMP
Hiawatha National Forest, Plantation Road, Brimley, Michigan
MET Project #: M23-4099
26-Jul-24

Location	Date	TOTAL METALS																Water Table Elevation
		Mercury (Total) (BZ)	Aluminum	*Arsenic*	*Barium (B)*	Iron	*Lead (B)*	*Manganese*	*Cadmium*	*Chromium*	*Cobalt*	*Copper*	*Nickle*	*Selenium*	*Silver*	*Vanadium*	*Zinc*	
SHALLOW MONITORING WELLS																		
CAS #		Varies	7429905	7440382	7440393	7439896	7439921	7439965	7440439	16065831	7440484	7440508	7440020	7782492	7440224	7440622	7440666	
MW-2A	7/11/2024	<0.2	290	<5	<10	4,900	<5	520	NA	NA	NA	NA	NA	NA	NA	NA	NA	726.31
	5/2/2001	0.136	110	0.4	200	14700	8.8	3740	5.3	1	37	84	130	<1	0.4	<10	1310	725.84
	6/3/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	724.95
	10/2/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	722.6
HA-6	7/9/2024	<0.2	5300	<5	120	7700	5.5	260	NA	NA	NA	NA	NA	NA	NA	NA	NA	691.1
HA-4	7/9/2024	<0.2	4,900	<5	<100	5,300	34	430	NA	NA	NA	NA	NA	NA	NA	NA	NA	693.67
HA-5	7/9/2024	<0.2	3400	<5	120	3800	<5	740	NA	NA	NA	NA	NA	NA	NA	NA	NA	692.21
HA-7	7/11/2024	<0.2	59,000	6	310	42000	140	510	NA	NA	NA	NA	NA	NA	NA	NA	NA	730.15
HA-8	7/9/2024	<0.2	61009	<5	<100	3900	<5	73	NA	NA	NA	NA	NA	NA	NA	NA	NA	730.44
HA-9	7/9/2024	<0.2	120000	11	900	78000	82	1700	NA	NA	NA	NA	NA	NA	NA	NA	NA	730.23
TRIP BLANK	7/9/2024	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Res - Drinking Water Protection		2A	50 V	10A	2,000 A	300 E	4 (L)	50(E).	5.0 A	100 A	40	1000 (e)	100 (a)	50 (A)	34	4.5	2400	
Non-Res - Drinking Water Protection		2A	50 V	10A	2,000 A	300 E	4 (L)	50(E).	5.0 A	100 A	100	(G)	100 (a)	50 (a)	98	62	5000 (e)	
Groundwater/Surface Water (GSI)		0.0013	NA	10	G	NA	GX	(G,X)	(G,X)	(G,X)	100	NLV	G	5	0.2 (M); 0.6	27	G	
Res - Volatilization to Indoor Air		56 S	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	
Non-Res - Volatilization to Indoor Air		56 S	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NA	NLV	NLV	NLV	NLV	NLV	
Flamability and Explosivity		ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	

NA = Total metal concentration were not analyzed. Pre-2024 samples were analyzed for dissolved metals

KEY TO SUMMARY TABLE

BOLD RED Exceeds a Part 201 generic criteria

Results are compared to Residential Part 201 Tier 1 Risk-Based Screening Levels (RBSLs)

ID = Inadequate data to develop RBSL.

NLV = Not Likely to volatilize

A = Criterion is the State of Michigan drinking water standard established pursuant to section 5 of 1976 PA 399, MCL 325.1005.

B = Background, as defined in R 299.1(b), may be substituted if higher than the calculated cleanup criterion. Background levels may be less than criteria for some inorganic compounds.

D = Calculated criterion exceeds 100 percent; hence it is reduced to 100 percent or 1.0E+9 parts per billion (ppb).

G = Groundwater surface water interface (GSI) criterion depends on the pH or water hardness, or both, of the receiving surface water. The final chronic value (FCV) for the protection of aquatic life shall be calculated based on the pH or hardness the receiving surface water. A generic value using hardness of 100mg/L is listed in the table.

H = Valence-specific chromium data (Cr III and Cr VI) shall be compared to the corresponding valence-specific cleanup criteria. If both Cr III and Cr VI are present in groundwater, the total concentration of both cannot exceed the drinking water criterion of 100 ug/L. If analytical data are provided for total chromium only, they shall be compared to the cleanup criteria for Cr VI. Cr III soil cleanup criterion for protection of drinking water can only be used at sites where groundwater is prevented from being used as a public water supply, currently and in the future, through an approved land or resource use restriction.

(I) = Hazardous substance may exhibit the characteristic of ignitability as defined in 40 C.F.R. §261.21 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at the DEQ, 525 West Allegan Street, Lansing, Michigan.

L = Criteria for lead are derived using a biologically based model, as allowed for under Section 20120a(9) of the NREPA and are not calculated using the algorithms and assumptions specified in pathway-specific rules. The generic residential drinking water criterion of 4 ug/L is linked to the generic residential soil direct contact criterion of 400 mg/kg.

S = Criterion defaults to the hazardous substance-specific water solubility limit.

X = The GSI RBSL shown is not protective for surface water that is used as a drinking water source. For a groundwater discharge to the Great Lakes and their connecting waters or discharges in close proximity to a water supply inlet in inland surface waters, the generic GSI criterion shall be the surface water human drinking water value (HDV) listed in the table in this footnote, except for those HDV indicated with an asterisk. For HDV with an asterisk, the generic GSI criterion shall be the lowest of the HDV, the WV, and the calculated FCV. See formulas in footnote (G). Soil protection criteria based on the HDV shall be as listed in the table in this footnote, except for those values with an asterisk. Soil GSI protection criteria for compounds with an asterisk shall be the greater of 20 times the GSI criterion of the GSI soil-water partition values using the GSI criteria developed with the procedure described in this footnote.

(Z) Mercury is typically measured as total mercury. The generic cleanup criteria, however, are based on data for different species of mercury. Specifically, data for elemental mercury, chemical abstract service (CAS) number 7439976, serve as the basis for the soil volatilization to indoor air criteria, groundwater volatilization to indoor air, and soil inhalation criteria. Data for methyl mercury, CAS number 22967926, serve as the basis for the GSI criterion; and data for mercuric chloride, CAS number 7487947, serve as the basis for the drinking water, groundwater contact, soil direct contact, and the groundwater protection criteria. Comparison to criteria shall be based on species-specific analytical data only if sufficient facility characterization has been conducted to rule out the presence of other species of mercury.

Table #3B: Summary of Groundwater Analytical Data

FORMER SUPERIOR TOWNSHIP DUMP
Hiawatha National Forest, Plantation Road, Brimley, Michigan
MET Project #: M23-4099

7-Jan-25

Location	Date	PFAS (PART PER TRILLION)			Pesticides	PCBs	SVOCs	VOCs		Water Table Elevation
		PFOS	PFOA	PFBA				*Other VOCs*	Bromochloromethane	
DEEP WELLS										
MW-1R	12/17/2024	9.2	39	12	NA	NA	NA	NA	NA	700.38
	7/9/2024				NA	NA	BDL	BDL	<1	703.13
Blind Dup MW-9	7/9/2024				NA	NA	BDL	BDL	<1	
	5/2/2001				NA	NA	NA	NA	NA	700.88
	6/3/2000				NA	NA	NA	NA	NA	700.6
MW-1	10/2/1999				BDL	BDL	BDL	BDL	NA	699.25
	7/27/1998				BDL	BDL	BDL	BDL	NA	
MW-2	7/9/2024				NA	NA	BDL	BDL	<1	712.48
	5/2/2001				NA	NA	NA	NA	NA	709.27
	6/3/2000				NA	NA	NA	NA	NA	709.91
	10/2/1999				BDL	BDL	BDL	BDL	NA	708.43
	7/27/1998				BDL	BDL	BDL	BDL	NA	
MW-3	5/2/2001				NA	NA	NA	NA	NA	
	6/3/2000				NA	NA	NA	NA	NA	
	10/2/1999				BDL	BDL	BDL	BDL	NA	
	7/27/1998				BDL	BDL	BDL	BDL	NA	
MW-4	12/17/2024	<1	<1	<1	NA	NA	NA	NA	NA	710.7
MW-5	12/17/2024	<1	<1	<1	NA	NA	NA	NA	NA	721.35
TRIP BLANK	12/17/2024	<1	<1	<1	NA	NA	NA	NA	NA	
	7/9/2024				BDL	BDL	BDL	BDL	<1	
CAS #					*Varies*	*Varies*	*Varies*	*Varies*	*74975*	
Res - Drinking Water Protection					*Varies*	*Varies*	*Varies*	*Varies*	*No Citeria*	
Non-Res - Drinking Water Protection					*Varies*	*Varies*	*Varies*	*Varies*	*No Citeria*	
Groundwater/Surface Water (GSI)					*Varies*	*Varies*	*Varies*	*Varies*	*No Citeria*	
Res - Volatilization to Indoor Air					*Varies*	*Varies*	*Varies*	*Varies*	*No Citeria*	
Non-Res - Volatilization to Indoor Air					*Varies*	*Varies*	*Varies*	*Varies*	*No Citeria*	
Flamability and Explosivity					*Varies*	*Varies*	*Varies*	*Varies*	*No Citeria*	
PFAS										
EGLE - DRINKING WATER & GROUNDWATER		16	8	NA						
USEPA - MAXIMUM CONCENTRATION LEVEL		4	4	NA						

Varies = VOCs & SVOCs - Detection limits vary by compound.

Table #3B: Summary of Groundwater Analytical Data

FORMER SUPERIOR TOWNSHIP DUMP
Hiawatha National Forest, Plantation Road, Brimley, Michigan
MET Project #: M23-4099

7-Jan-25

Location	Date	PFAS (PART PER TRILLION)			Pesticides	PCBs	SVOCs	VOCs		Water Table Elevation
		NT/I	PFOA	PFBA				*Other VOCs*	Bromochloromethane	
SHALLOW WELLS										
MW-2A	7/11/2024				NA	NA	BDL	BDL	2.5	726.31
	5/2/2001				NA	NA	NA	NA	NA	725.84
	6/3/2000				NA	NA	NA	NA	NA	724.95
	10/2/1999				BDL	BDL	BDL	BDL	NA	722.6
HA-6	7/9/2024				NA	NA	BDL	BDL	<1	691
HA-4	7/9/2024				NA	NA	BDL	BDL	<1	693.67
HA-5	7/9/2024				NA	NA	BDL	BDL	<1	692.21
HA-7	7/11/2024				NA	NA	BDL	BDL	<1	730.15
HA-8	7/9/2024				NA	NA	BDL	BDL	<1	730.44
HA-9	7/9/2024				NA	NA	BDL	BDL	<1	730.23
TRIP BLANK	7/9/2024				NA	NA	BDL	BDL	<1	
CAS #					*Varies*	*Varies*	*Varies*	*Varies*	*74975*	
Res - Drinking Water Protection					*Varies*	*Varies*	*Varies*	*Varies*	*No Citeria*	
Non-Res - Drinking Water Protection					*Varies*	*Varies*	*Varies*	*Varies*	*No Citeria*	
Groundwater/Surface Water (GSI)					*Varies*	*Varies*	*Varies*	*Varies*	*No Citeria*	
Res - Volatilization to Indoor Air					*Varies*	*Varies*	*Varies*	*Varies*	*No Citeria*	
Non-Res - Volatilization to Indoor Air					*Varies*	*Varies*	*Varies*	*Varies*	*No Citeria*	
Flamability and Explosivity					*Varies*	*Varies*	*Varies*	*Varies*	*No Citeria*	
PFAS										
EGLE - DRINKING WATER & GROUNDWATER		16	8	NA						
USEPA - MAXIMUM CONCENTRATION LEVEL		4	4	NA						

Varies = VOCs & SVOCs - Detection limits vary by compound.

KEY TO SUMMARY TABLE

BOLD RED Exceeds a Part 201 generic criteria OR usepa Regulatory Limt (PFAS)

Results are compared to Residential Part 201 Tier 1 Risk-Based Screening Levels (RBSLs)

ID = Inadequate data to develop RBSL.

NLV = Not Likely to volatilize

A = Criterion is the State of Michigan drinking water standard established pursuant to section 5 of 1976 PA 399, MCL 325.1005.

B = Background, as defined in R 299.1(b), may be substituted if higher than the calculated cleanup criterion. Background levels may be less than criteria for some inorganic compounds.

D = Calculated criterion exceeds 100 percent; hence it is reduced to 100 percent or 1.0E+9 parts per billion (ppb).

G = Groundwater surface water interface (GSI) criterion depends on the pH or water hardness, or both, of the receiving surface water. The final chronic value (FCV) for the protection of aquatic life shall be calculated based on the pH or hardness the receiving surface water. A generic value using hardness of 100mg/L is listed in the table.

H = Valence-specific chromium data (Cr III and Cr VI) shall be compared to the corresponding valence-specific cleanup criteria. If both Cr III and Cr VI are present in groundwater, the total concentration of both cannot exceed the drinking water criterion of 100 ug/L. If analytical data are provided for total chromium only, they shall be compared to the cleanup criteria for Cr VI. Cr III soil cleanup criterion for protection of drinking water can only be used at sites where groundwater is prevented from being used as a public water supply, currently and in the future, through an approved land or resource use restriction.

(I) = Hazardous substance may exhibit the characteristic of ignitability as defined in 40 C.F.R. §261.21 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at the DEQ, 525 West Allegan Street, Lansing, Michigan.

L = Criteria for lead are derived using a biologically based model, as allowed for under Section 20120a(9) of the NREPA and are not calculated using the algorithms and assumptions specified in pathway-specific rules. The generic residential drinking water criterion of 4 ug/L is linked to the generic residential soil direct contact criterion of 400 mg/kg.

S = Criterion defaults to the hazardous substance-specific water solubility limit.

X = The GSI RBSL shown is not protective for surface water that is used as a drinking water source. For a groundwater discharge to the Great Lakes and their connecting waters or discharges in close proximity to a water supply inlet in inland surface waters, the generic GSI criterion shall be the surface water human drinking water value (HDV) listed in the table in this footnote, except for those HDV indicated with an asterisk. For HDV with an asterisk, the generic GSI criterion shall be the lowest of the HDV, the WV, and the calculated FCV. See formulas in footnote (G). Soil protection criteria based on the HDV shall be as listed in the table in this footnote, except for those values with an asterisk. Soil GSI protection criteria based on the HDV shall be as listed in the table in this footnote, except for those values with an asterisk. Soil GSI protection criteria for compounds with an asterisk shall be the greater of 20 times the GSI criterion of the GSI soil-water partition values using the GSI criteria developed with the procedure described in this footnote.

(Z) Mercury is typically measured as total mercury. The generic cleanup criteria, however, are based on data for different species of mercury. Specifically, data for elemental mercury, chemical abstract service (CAS) number 7439976, serve as the basis for the soil volatilization to indoor air criteria, groundwater volatilization to indoor air, and soil inhalation criteria. Data for methyl mercury, CAS number 22967926, serve as the basis for the GSI criterion; and data for mercuric chloride, CAS number 7487947, serve as the basis for the drinking water, groundwater contact, soil direct contact, and the groundwater protection criteria. Comparison to criteria shall be based on species-specific analytical data only if sufficient facility characterization has been conducted to rule out the presence of other species of mercury.

FORMER SUPERIOR TOWNSHIP DUMP
Hiawatha National Forest, Plantation Road, Brimley, Michigan
MET Project #: M23-4099
26-Jul-24

Table #4: Summary of Soil Analytical Data

Location	Date	Depth	TOTAL METALS													
			Mercury (Total) (BZ)	Aluminum (B)	Arsenic	Barium (B)	Iron (B)	Lead (B)	Manganese (B)	Chromium (BH)	Cobalt	Copper (B)	Nickle (B)	Selenium (B)	Vanadium	Zinc (B)
SB01-17-19/MW-1	10/19/1993	Not listed		3,520			5,510	1.7	115	8		8			13.1	12
SB02-17-19/MW-2	10/19/1993	Not listed		3,830			6,740	1.9	130	9.4		9.1			14.3	13.7
SB03-17-19/MW-3	10/19/1993	Not listed		3,020			1.5	3,380	46.8	5						6
MW-4	12/17/2024		<0.2	2,600,000	570	36,000	2,400,000	1,400	72,000	5,400	1,600		4,000	720	5,400	
CAS #			**Varies**	**7429905**	**7440382**	**7440393**	**7439896**	**7439921**	**7439965**	**16065831**	**7440484**	**7440508**	**7440020**	**7782492**	**7440622**	**7440666**
State Wide Background			130	6.90E+06	5,800	75,000	1.20E+07	21,000	4.40E+05	18,000	6,800	32,000	20,000	410	NA	47,000
Res - Drinking Water Protection			1,700	1,000	4,600	1.30E+06	6,000	7.00E+05	1,000	1.00E+09	2,000	5.80E+06	1.00E+05	4,000	9.90E+05	5.00E+06
Non-Res - Drinking Water Protection			1,700	1,000	4,600	1.30E+06	6,000	7.00E+05	1,000	1.00E+09	800	5.80E+06	1.00E+05	4,000	72,000	2.40E+06
Groundwater/Surface Water (GSI)			1.2	NA	4,600	G	NA	G,X	G,X	G,X	2,000	G	G	400	4.30E+05	G
Volatilization to Indoor Air			89,000	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV
Infinite Source Volatilization to outdoor Air			62,000	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV	NLV
Particulate Soil Inhalation			8.80E+06	ID	9.10E+05	1.50E+08	ID	4.40E+07	1.50E+06	1.50E+08	5.90E+06	5.90E+07	1.60E+07	5.90E+07	ID	ID
Direct Contact			5.80E+06	3.7E+8 (DD)	37,000	1.30E+08	5.80E+08	9.0E+5 (DD)	9.00E+07	1.0E+9 (D)	9.00E+06	7.30E+07	1.50E+08	9.60E+06	5.5E+6 (DD)	6.30E+08

NA = Total metal concentration were not analyzed. Pre-2024 samples were analyzed for dissolved metals

Note: Analytical data from 10/19/1993 was provided on a table. Sample collection depth, analytical methods and lab reports were not provided. In addition, the report text stated that the three soil samples were analyzed for VOCs, SVOCs, PCBs, pesticides and metals - only detected compounds weer included on the table. Results were depicted as ug/kg.

KEY TO SUMMARY TABLE

BOLD RED	Exceeds a Part 201 generic criteria

Results are compared to Residential Part 201 Tier 1 Risk-Based Screening Levels (RBSLs)

ID = Inadequate data to develop RBSL.

NLV = Not Likely to volatilize

A = Criterion is the State of Michigan drinking water standard established pursuant to section 5 of 1976 PA 399, MCL 325.1005.

B = Background, as defined in R 299.1(b), may be substituted if higher than the calculated cleanup criterion. Background levels may be less than criteria for some inorganic compounds.

D = Calculated criterion exceeds 100 percent; hence it is reduced to 100 percent or 1.0E+9 parts per billion (ppb).

G = Groundwater surface water interface (GSI) criterion depends on the pH or water hardness, or both, of the receiving surface water. The final chronic value (FCV) for the protection of aquatic life shall be calculated based on the pH or hardness the receiving surface water. A generic value using hardness of 100mg/L is listed in the table.

H = Valence-specific chromium data (Cr III and Cr VI) shall be compared to the corresponding valence-specific cleanup criteria. If both Cr III and Cr VI are present in groundwater, the total concentration of both cannot exceed the drinking water criterion of 100 ug/L. If analytical data are provided for total chromium only, they shall be compared to the cleanup criteria for Cr VI. Cr III soil cleanup criterion for protection of drinking water can only be used at sites where groundwater is prevented from being used as a public water supply, currently and in the future, through an approved land or resource use restriction.

(I) = Hazardous substance may exhibit the characteristic of ignitability as defined in 40 C.F.R. §261.21 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at the DEQ, 525 West Allegan Street, Lansing, Michigan.

L = Criteria for lead are derived using a biologically based model, as allowed for under Section 20120a(9) of the NREPA and are not calculated using the algorithms and assumptions specified in pathway-specific rules. The generic residential drinking water criterion of 4 ug/L is linked to the generic residential soil direct contact criterion of 400 mg/kg.

S = Criterion defaults to the hazardous substance-specific water solubility limit.

X = The GSI RBSL shown is not protective for surface water that is used as a drinking water source. For a groundwater discharge to the Great Lakes and their connecting waters or discharges in close proximity to a water supply inlet in inland surface waters, the generic GSI criterion shall be the surface water human drinking water value (HDV) listed in the table in this footnote, except for those HDV indicated with an asterisk. For HDV with an asterisk, the generic GSI criterion shall be the lowest of the HDV, the WV, and the calculated FCV. See formulas in footnote (G). Soil protection criteria based on the HDV shall be as listed in the table in this footnote, except for those values with an asterisk. Soil GSI protection criteria based on the HDV shall be as listed in the table in this footnote, except for those values with an asterisk. Soil GSI protection criteria for compounds with an asterisk shall be the greater of 20 times the GSI criterion of the GSI soil-water partition values using the GSI criteria developed with the procedure described in this footnote.

(Z) Mercury is typically measured as total mercury. The generic cleanup criteria, however, are based on data for different species of mercury. Specifically, data for elemental mercury, chemical abstract service (CAS) number 7439976, serve as the basis for the soil volatilization to indoor air criteria, groundwater volatilization to indoor air, and soil inhalation criteria. Data for methyl mercury, CAS number 22967926, serve as the basis for the GSI criterion; and data for mercuric chloride, CAS number 7487947, serve as the basis for the drinking water, groundwater contact, soil direct contact, and the groundwater protection criteria. Comparison to criteria shall be based on species-specific analytical data only if sufficient facility characterization has been conducted to rule out the presence of other species of mercury.

Table 5 - Creek Analytical Data Summary

FORMER SUPERIOR TOWNSHIP DUMP
Hiawatha National Forest, Plantation Road, Brimley, Michigan
MET Project #: M23-4099
26-Jul-24

Location	Date	TOTAL METALS										
		Mercury (Total) (BZ)	Aluminum	*Barium (B)*	Iron	*Lead (B)*	*Manganese*	*Zinc*	*Total Chromium*	*Magnesium*	*Sodium*	*Calcium*
Upstream												
Upstream	7/9/2024	<0.2	730	<100	2100	<5	81	Not Analyzed				
SW-9	5/2/2001	**0.005**	380	22	310	<1	59	9J	0.4j	1200	1200	4100
SW-10	5/2/2001	**0.005**	460	23	230	0.2j	48	<10	0.5j	990	850	3500
SW-6	6/3/2000	<0.2	220	36	1900	0.4j	140	59b	0.7j	4800	2600	15,000
SW-3	9/29/1999	<0.2	210	41	2050	<0.1	140	<20	0.9j	6700	2300	21,000
Midstream												
Midstream (MS)	7/9/2024	<0.2	590	<100	2000	<5	78	Not Analyzed				
SW-8	5/2/2001	**0.004**	310	23	360	0.2j	58	<10	0.4j	1800	1400	6900
SW-5	6/3/2000	<0.2	190	40	1730	<0.3j	170	47b	0.4j	7200	3100	24000
SW-1	9/29/1999	<0.2	1200	69	4220	1.6	280	16j	1.7	10000	3700	34000
Downstream												
Downstream	7/9/2024	<0.2	550	<100	1900	<5	77	Not Analyzed				
SW-7	5/2/2001	**0.004**	320	24	390	0.3j	60	21	0.4j	2000	1800	7300
SW-4	6/3/2000	<0.2	340	47	2150	<0.8j	210	25	0.7j	8100	3400	26000
SW-2	9/29/1999	<0.2	640	68	2610	<0.8j	180	33	1.2	11000	3400	35000
CAS #		7439976*	7429905	7440393	7439896	7439921	7439965	7440666	7440473	7439954	17341252	
Human Health Values												
Drinking Water - Nocancer		**0.0018**	NC	5800	NC	14	1300	3300	120	NC	NC	NC
Non-DW - Nocancer		**0.0018**	NC	470000	NC	190	59000	16000	9400	NC	NC	NC
Drinking Water - Cancer		NA	NC	NA	NC	NA	NA	NA	NA	NC	NC	NC
Non-DW -Cancer		NA	NC	NA	NC	NA	NA	NA	NA	NC	NC	NC
Non-Human												
Wildlife Value		**0.0013**	NC	NA	NC	NA	NA	NA	NA	NC	NC	NC
Aquatic												
Final Cronic Value		0.77	NC	[1]Note	NC	[1]Note	[1]Note	[1]Note	[1]Note	NC	NC	NC
Aquatic Maximum		1.4[D]	NC	[1]Note	NC	[1]Note	[1]Note	[1]Note	[1]Note	NC	NC	NC
Final Acute Value		2.8[D]	NC	[1]Note	NC	[1]Note	[1]Note	[1]Note	[1]Note	NC	NC	NC

KEY TO SUMMARY TABLE

BOLD RED = EXCEEDS A RULE 57 VALUE

Rresults are compared to "Rule 57 Surface Water Quality Values" - October 12, 2023
All results in ug/L - Total Concentrations (unless otherwise noted).
* CAS number for Mercury varies
D = Value expressed as dissolved
[1]Note: Hardness dependent - calculations are on-going and pending reciept of hardness analysis (04/01/2025)
NC = No criteria
NA = Not Applicable
BDL = Below Method Detection Limit
ID = Insufficient data to derive value

Semi-Volatile Compounds (PNAs): Analyzed on 07/09/2024 - all BDL
Volatile Organic Compounds (VOCs): Analyzed on 07/09/2024 & 09/29/1999 - all BDL
Pesticides: Analyzed on 09/29/1999 - all BDL

Table 6 – Chemicals of Concern

COC	CAS #	Highest Concentration	Sample Location	Sample Date	GRCC Exceedances & Criteria
Groundwater		***Results ug/L***			***Criteria ug/L***
Mercury (Total)	Varies	0.136	MW-2A	7/11/24	GSI (0.0013)
Aluminum	7429905	120,000	HA-9	07/09/24	DW (50)
Arsenic	7440382	11	HA-9	07/09/24	GSI (10), DW (10)
Iron	7439896	78,000	HA-9	07/09/24	DW (300)
Lead	7439921	140	HA-7	07/11/24	DW (4)
Manganese	7439965	3470	MW-2A	05/02/01	DW (50)
Cadmium	7440439	5.3	MW-2A	05/02/01	DW (5)
Chromium	16065831	271	MW-3	05/02/01	DW (100)
Cobalt	7440484	79	MW-3	05/02/01	DW (40)
Nickle	7440020	690	MW-3	05/02/01	DW (100)
Silver	7440224	0.7	MW-2	05/02/01	GSI (0.2)
Vanadium	7440622	210	MW-3	05/02/01	DW (4.5), GSI (27)
		Results ng/L			***Criteria ng/L***
PFOA	335671	39 ng/L	MW-1R	12/17/04	USEPA MAX (4), EGLE, DW & GW (8)
PFOS	1763231	9.2 ng/L	MW-1R	12/17/04	USEPA MAX (4)
Creek Water		***Results ug/L***			***Criteria ug/L***
Mercury (Total)	Varies	0.005	SW-9 & SW-10	05/02/01	DW-Noncancer (0.0018) & Wildlife (0.0013)
Soil		***Results ug/kg***			***Criteria ug/Kg***
Selenium	7782492	720	MW-4	12/17/24	GSI (400)

GW – groundwater, DW – drinking water, GSI - groundwater/surface water interface protection,
USEPA EMCL – Enforceable Maximum Concentration Level
EGLE DW/GW – Drinking Water/Ground Water Levels

Table 7 - Cleanup Options Being Considered

Option	Description	Addressed Receptor[1]				
		Drinking Water	GSI	Direct Contact	Creek	Estimated Cost
1	Do nothing. The garbage/debris would remain as is.	0	0	0	0	$0
2	Installation of a security fence and restrictive covenant.	1 (on-site only)	0	1 (on-site only)	0	$50,000
3	Remove recyclables in the creek and ravine.	0	2	1	2	$150,000
4	Option #3 plus excavation of buried garbage/debris from the Creek and Ravine	1	2	2	3	$300,000[2]
5	Option #4 plus Leave Upper Area Garbage/Debris In Place and Cap With Sediment and a Synthetic Liner[3].	4	4	4	5	$700,000[2]
6	Option #4 plus Excavation and Off-Site Disposal of Garbage/Debris	5	5	5	5	
	6a - Disposal at a Type 2 Sanitary Landfill					$2,500,000
	6b – Disposal at a Hazardous Waste Landfill					$6,700,000

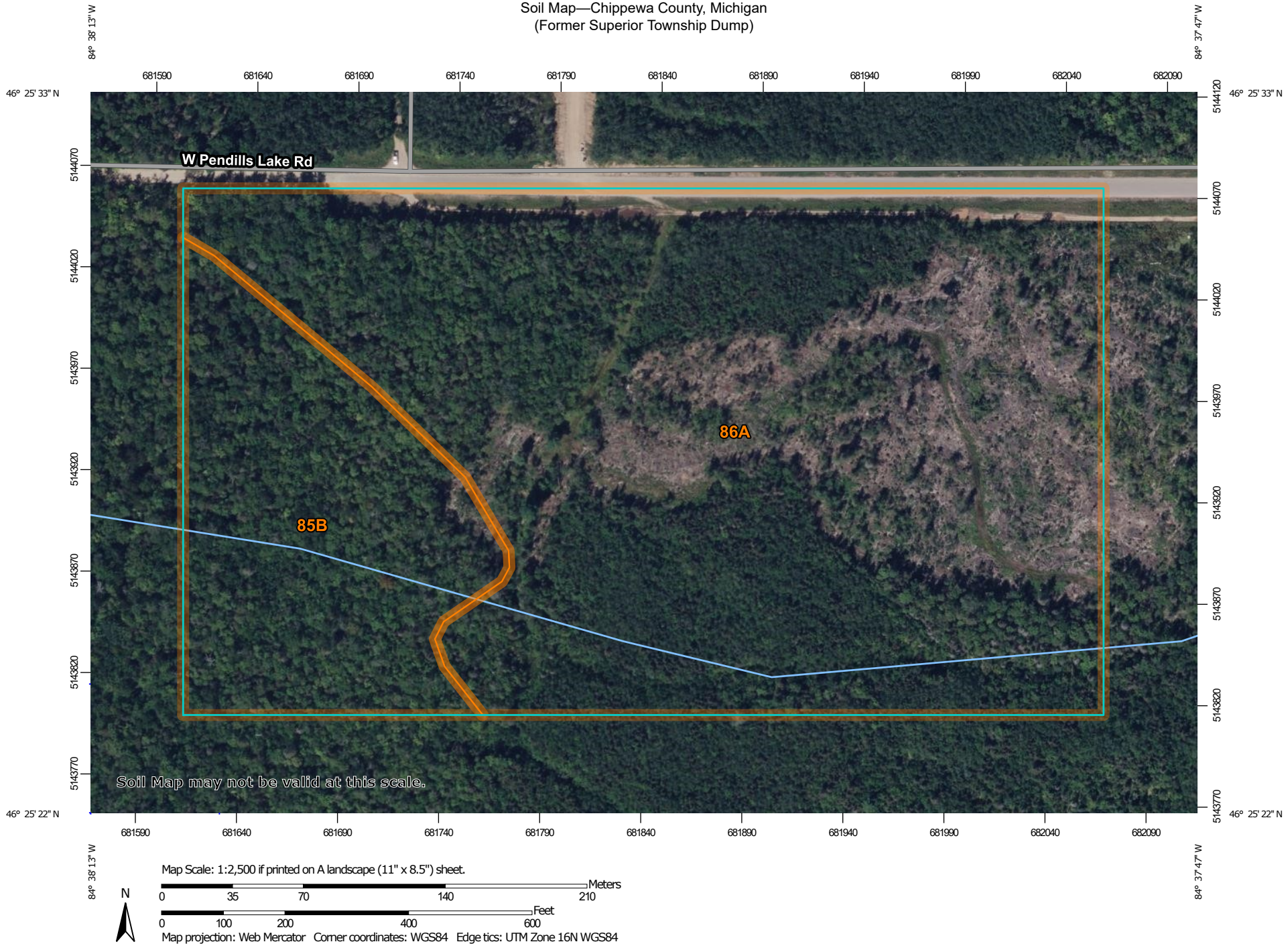
[1]0 to 5: 0 = no benefit to 5 = highest benefit

[2]Cost will be affected by landfill acceptance and/or capping costs.

[3]Liner design will be developed in conjunction with Part 201 requirements and closure objectives.

ATTACHMENTS

Soil Map—Chippewa County, Michigan
(Former Superior Township Dump)



Map Scale: 1:2,500 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 35 70 140 210

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Chippewa County, Michigan
Survey Area Data: Version 18, Aug 26, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 12, 2020—Aug 14, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
85B	Kalkaska-Ocqueoc complex, 0 to 6 percent slopes	6.4	21.7%
86A	Ingalls-Halfaday complex, 0 to 3 percent slopes	23.0	78.3%
Totals for Area of Interest		**29.3**	**100.0%**

IT CORPORATION

VISUAL CLASSIFICATION OF SOILS

Boring Number
BM MW-01

Project Name: USFS-Bay Mills	**Project No.:** 302879.06.03
Coordinates: N/A E/A	**Elevation:** N/A ft. MSL
Drill Rig/Method: Mobile B-57/4.25" ID HSA	**Date Started:** 10-19-93
Sampling Method: 2" O.D. X 24" Split Spoon	**Date Completed:** 10-20-93
Drilling Firm/Crew: WTD/M. Mueller, K. Krowlow	**GWL (ATD):** 25.5 ft. / 10-19-93
Engineer/Geologist: J. Curtis	**Checked By:** JT

DEPTH (feet)	SAMPLE NUMBER	PID (ppm)	BLOWS/FT.	RECOVERY (inches)	USCS SYMBOL	DESCRIPTION	WELL PROFILE	REMARKS
0						Grass at surface	6" Protective Casing	
						SILTY SAND; dk. brown, landfill materials present (glass, plastic and metal)	2" PVC riser extends 30" above grade	Start Time: 0725
2.5	01	0	6,9	6	I		Cement/bentonite grout	
			16,31			SILT; lt. brown w/ some mottling, v. soft, moist		
5	02	0	6,22	3				
7.5	03	0	7,41	3		Metal shards present		
					ml	SILT; brown, m.stiff, sl. moist		
10	04	0	6,36	14				
12.5	05	0	27,47	18			Bentonite	
			22,47					
15	06	0		48				

NOTES: Drill rig mounted on an all terrain vehicle. Monitor well construction materials: 2" stainless steel (S.S.), 0.010" slot screen, PVC riser, Filter pack: Red Flint #30 silica sand, Fine sand: Badger Mining BB#7, Cement: Leforge Type 1 Regular Portland & Medusa Type 1A, Grout mix: 1 bg. Leforg (94 lbs/bg), 2 bgs. Medusa (94 lbs./bg), 1/4 bg. bentonite powder and 18 gals. water. Master lock #2121. GWL (ATD) implies ground water level at time of drilling.

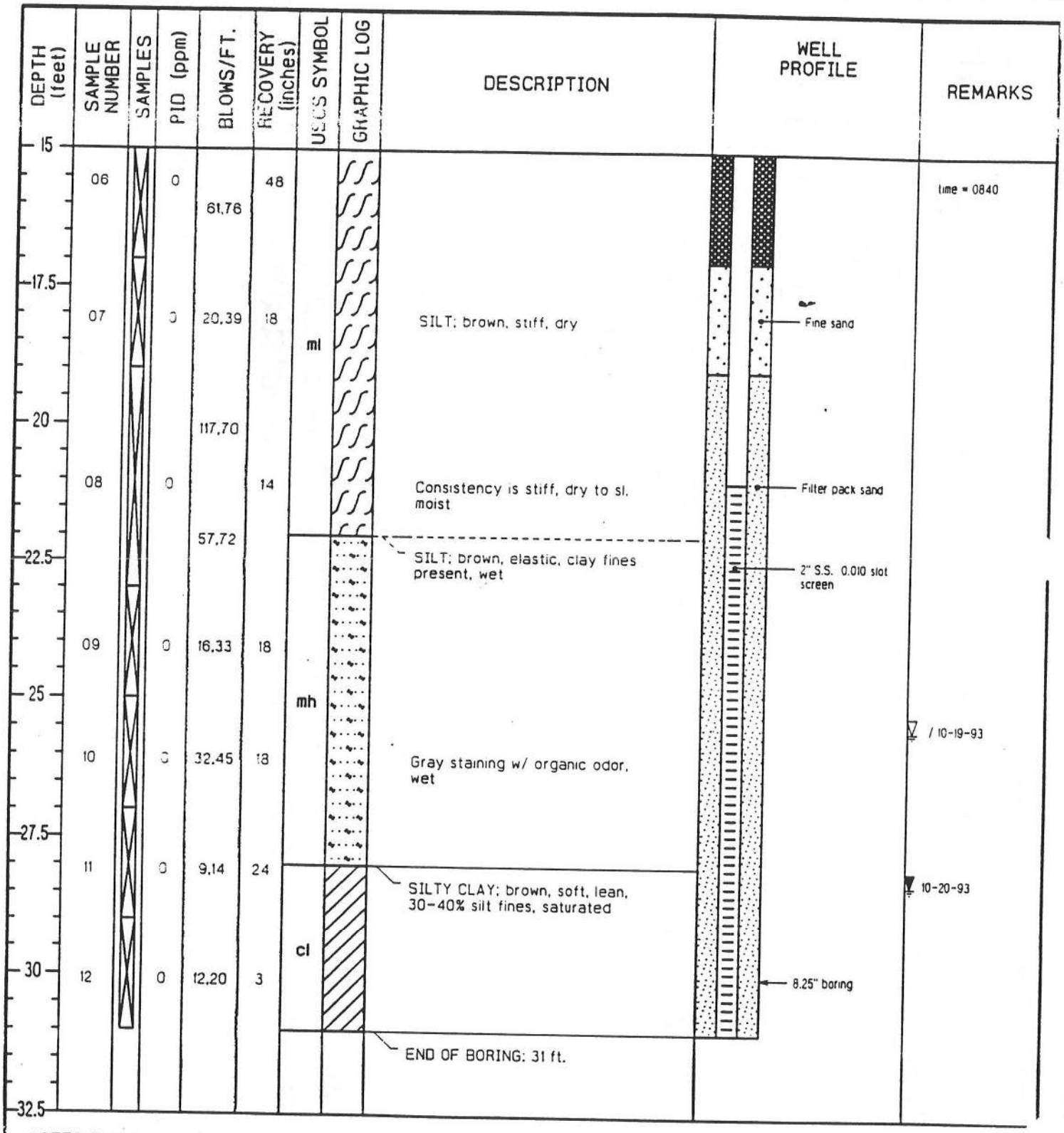
IT CORPORATION

VISUAL CLASSIFICATION OF SOILS

Boring Number
BM MW-01

Project Name: *USFS-Bay Mills*

Project No.: *302879.06.03*



NOTES: Drill rig mounted on an all terrain vehicle. Monitor well construction materials: 2" stainless steel (S.S.), 0.010" slot screen, PVC riser, Filter pack: Red Flint #30 silica sand, Fine sand: Badger Mining BB#7, Cement: Leforge Type I Regular Portland & Medusa Type 1A, Grout mix: 1 bg. Leforg (94 lbs/bg), 2 bgs. Medusa (94 lbs./bg), 1/4 bg. bentonite powder and 18 gals. water. Master lock #2121. GWL (ATD) implies ground water level at time of drilling.

IT CORPORATION

VISUAL CLASSIFICATION OF SOILS

Boring Number
BM MW-02

Project Name: USFS-Bay Mills	**Project No.:** 302879.06.03
Coordinates: NN/A EN/A	**Elevation:** N/A ft. MSL
Drill Rig/Method: Mobile B-57/4.25" ID HSA	**Date Started:** 10-21-93
Sampling Method: 2" O.D. X 24" Split Spoon	**Date Completed:** 10-21-93
Drilling Firm/Crew: WTD/M. Mueller, K. Krowlow	**GWL (ATD):** 11.0 ft. / 10-20-93
Engineer/Geologist: J. Curtis	**Checked By:**

DEPTH (feet)	SAMPLE NUMBER	SAMPLES	PID (ppm)	BLOWS/FT.	RECOVERY (inches)	USCS SYMBOL	GRAPHIC LOG	DESCRIPTION	WELL PROFILE	REMARKS
0									6" Protective Casing	Start Time: 1700
									2" PVC riser	
2.5	01		0	9,10 11,17	37	sp		SAND: red-brown, loose, f.-m. grain, lenses of v.f. and coarse grained sand also present Wet at 3.0 ft.	Grout	
5	02		0	8,8	18			SAND: tan, loose, f. grain, wet		
7.5				2,3						
10	03		0	4,6	42	cl		CLAY w/ Silt: brown, soft-m. stiff, lean, 20% silt fines, saturated	Bentonite	▽ / 10-20-93
12.5	04		0	5,6	6					
15	05		0	11,18	12	mh		CLAYEY SILT: brown, soft, elastic, 40% clay, saturated		

NOTES: Drill rig mounted on an all terrain vehicle. Monitor well construction materials: Screen: 2" S.S. 0.010" slot. Riser: 2" PVC Sch 40, Filter pack: Red Flint #30 silica sand, Fine sand: Badger Mining Corp. BB#7, Cement : Leforge Type I Regular Portland & Medusa Type 1A, Grout mix: 1 bg. Leforge (94 lbs/bg), 2 bags Medusa (94 lb/bg), 1/4 bg bentonite powder and 18 gals. water. Master Lock #2121. GWL (ATD) implies ground water level at time of drilling.

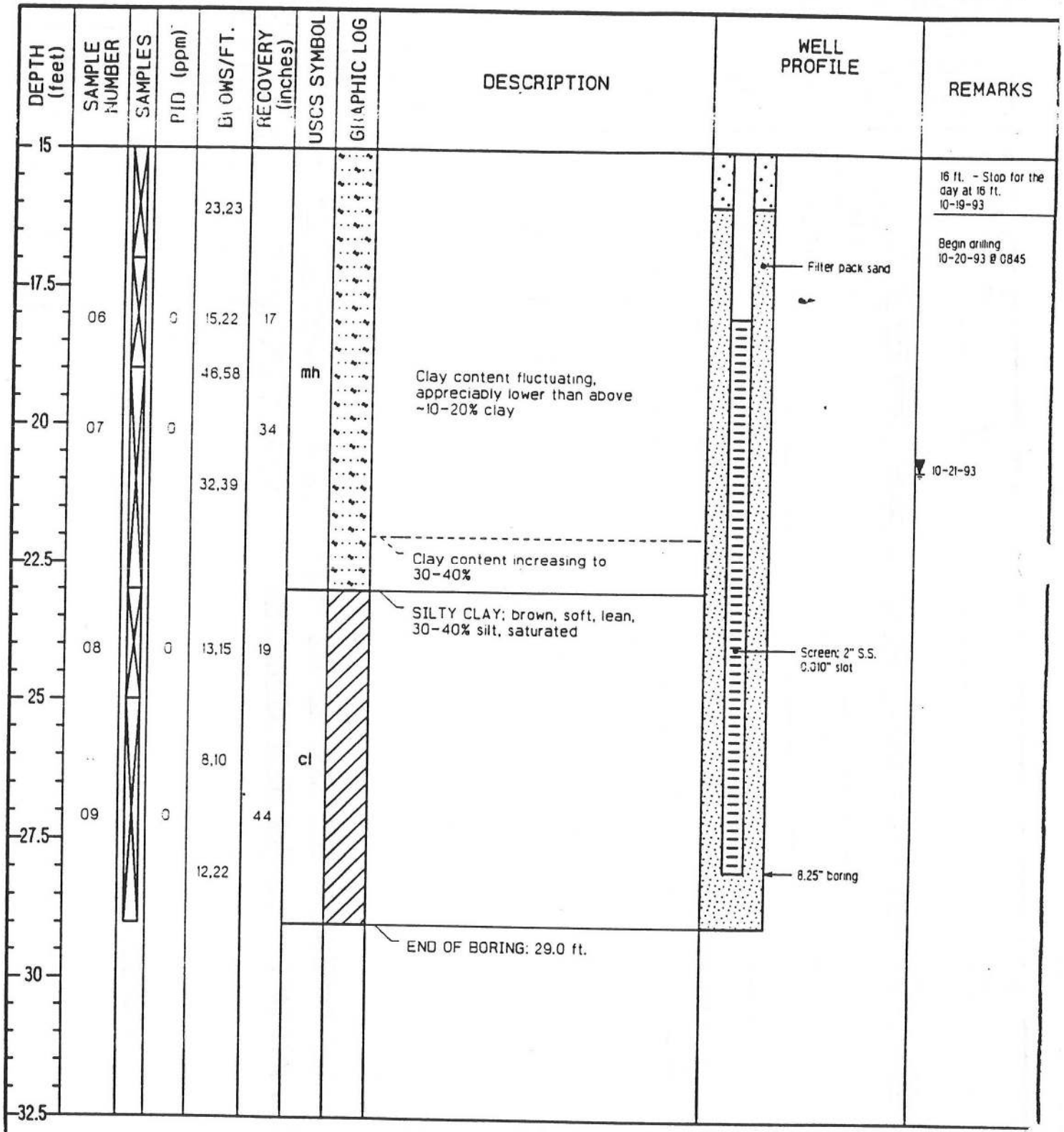
IT CORPORATION

VISUAL CLASSIFICATION OF SOILS

Boring Number
BM MW-02

Project Name: USFS-Bay Mills

Project No.: 302879.06.03



NOTES: Drill rig mounted on an all terrain vehicle. Monitor well construction materials; Screen: 2" S.S. 0.010" slot, Riser: 2" PVC Sch 40, Filter pack: Red Flint #30 silica sand, Fine sand: Badger Mining Corp. BB#7, Cement : Leforge Type I Regular Portland & Medusa Type IA, Grout mix: 1 bg. Leforge (94 lbs/bg), 2 bags Medusa (94 lb/bg), 1/4 bg bentonite powder and 18 gals. water. Master Lock #2121. GWL (ATD) implies ground water level at time of drilling.

IT CORPORATION

VISUAL CLASSIFICATION OF SOILS

Boring Number
BM MW-03

Project Name: USFS-Bay Mills	**Project No.:** 302879.06.03
Coordinates: NN/A EN/A	**Elevation:** N/A ft. MSL
Drill Rig/Method: Mobile B-57/4.25" ID HSA	**Date Started:** 10-21-93
Sampling Method: 2" O.D. X 24" Split Spoon	**Date Completed:** 10-21-93
Drilling Firm/Crew: WTD/M. Mueller, K. Krowlow	**GWL (ATD):** 11.0 ft. / 10-21-93
Engineer/Geologist: J. Curtis	**Checked By:**

DEPTH (feet)	SAMPLE NUMBER	PID (ppm)	BLOWS/FT.	RECOVERY (inches)	USCS SYMBOL	DESCRIPTION
0					sp	SAND: brown, f. , poorly graded, wet
			13,24			
2.5	01	0		15	mh	SILT: brown, soft, elastic, 2-4 cm clay layers, varved, wet
			23,38			
5	02	0	13,15	23		Varves stop, Silt w/ 20% clay, elastic, wet
7.5			14,31		cl	SILTY CLAY: brown, varved, soft, flexible
	03	0		28		
10			56,78			
12.5	04	0	25,52	22	mh	CLAYEY SILT: brown, soft, plastic w/high clay content, wet
			25,44			
15	05	0		31		

WELL PROFILE: 6" Protective Casing; 2" PVC riser; Grout; Bentonite; / 10-21-93

REMARKS: Start Time: 1021

NOTES: Drill rig mounted on an all terrain vehicle. Monitor well construction materials: Screen: 2" S.S. 0.010" slot, Riser: 2" PVC Sch 40, Filter pack: Red Flint #30 silica sand, Fine sand: Badger Mining Corp. BB#7, Cement : Leforge Type I Regular Portland & Medusa Type 1A, Grout mix: 1 bg. Leforge (94 lbs/bg), 2 bags Medusa (94 lb/bg), 1/4 bg bentonite powder and 18 gals. water. Master Lock #2121. GWL (ATD) implies ground water level at time of drilling.

IT CORPORATION

VISUAL CLASSIFICATION OF SOILS

Boring Number
BM MW-03

Project Name: *USFS-Bay Mills*

Project No.: *302879.06.03*

DEPTH (feet)	SAMPLE NUMBER	SAMPLES	PID (ppm)	BLOWS/FT.	RECOVERY (inches)	USCS SYMBOL	GRAPHIC LOG	DESCRIPTION	WELL PROFILE	REMARKS
15	05		0	25,44 58,49	31	mh			Fine sand 2" PVC riser	
17.5						cl		SILTY CLAY; lean clay w/ high silt content		
	06		0	2,12	24			CLAYEY SILT; brown, soft, elastic, clay varies from 10-40%, wet	Filter pack sand	
20				25,30						
	07		0	25,30	26					10-21-93
22.5				47,51		mh				
	08		0	11,25	24				Screen: 2" S.S. 0.010" slot	
25										
				30.8						
	09		0		44	cl		SILTY CLAY; lean clay w/ high silt content. Wet		
27.5				4,22		mh		CLAYEY SILT; brown, soft, elastic	8.25" boring	End time: 14:5
30								END OF BORING: 30 ft.		
32.5										

NOTES: Drill rig mounted on an all terrain vehicle. Monitor well construction materials: Screen: 2" S.S. 0.010" slot, Riser: 2" PVC Sch 40, Filter pack: Red Flint #30 silica sand, Fine sand: Badger Mining Corp. BB#7, Cement : Leforge Type I Regular Portland & Medusa Type 1A, Grout mix: 1 bg. Leforge (94 lbs/bg), 2 bags Medusa (94 lb/bg), 1/4 bg bentonite powder and 18 gals. water. Master Lock #2121. GWL (ATD) implies ground water level at time of drilling.

Barr Engineering Company | **Ref. Boring # MW1R** | **Well # MW1R**

Project: USFS Superior

Project Number:	2221016JCG300	**Total Drilled Depth:**	42 feet
Boring Location:	Superior Township Dump	**Ground Surface Elevation (ft):**	
Drilling Contractor:	American Engineering and Testing	**Depth to Groundwater (ft):**	29.5 feet bgs
Drilling Method:	Hollow Stem Auger	**Riser Elevation:**	
Driller:	Mike Daringer	**Date Started:**	6/1/00
Geologist:	Jerry Mullin	**Date Completed:**	6/1/00
		Unique #:	

p:\22\21\016\logs\MW1R.dat

Depth (ft. bgs)	Sample Type\ Recovery (ft)	Blow Count	Odor\Sheen	Headspace (ppm)	Moisture/W.L.	Gravel/Sand/Fines	ASTM	Lithologic Unit	Material Descriptions and Remarks	Well Construction	Elevation
4	SS-01	1 1 2 4	No/No	0.5	Moist		ML		SANDY SILT: Yellowish to reddish brown to dark reddish gray, sandy silt. Sand is fine grained. Unit is soft, compact, friable.		
10	SS-02	2 4 5 5	No/No	0.7	Moist		ML				
14	SS-03	6 13 12 12	No/No	0.7	Moist		ML				
20	SS-04	6 10 10 14	No/No	0.6	Moist		ML				
26	SS-05	10 17 17 15	No/No	0.7	Moist-Wet		SM/SP		SILTY SAND: Poorly-graded, reddish gray, silty fine grained, quartz-rich sand.		
30	SS-06	WH 1 1 1	No/No	0.7	Moist-Wet		ML/MH		CLAYEY SILT: Reddish gray clayey silt. Sticky, tight. Laminar bedding/varves from 35-36.5 ft. At same depth, the unit is loose and slightly soupy. Becomes less soupy with depth.		
	SS-07	WH 1 1	No/No	0.9	Saturated		ML/MH				

p:\22\6\logs\MW1R.dat

Barr Engineering Company

Ref. Boring # MW1R

Well # MW1R

Depth (ft. bgs)	Sample Type\ Recovery (ft.)	Blow Count	Odor\Sheen	Headspace (ppm)	Moisture\W.L.	Estimated % of Gravel\Sand\Fine	ASTM	Lithologic Unit	Material Descriptions and Remarks	Well Construction	Elevation
32											-32
34											-34
36	SS-08	WH WH 1 1	No/No	--	Saturated		ML/MH				-36
38											-38
40	SS-09	WH WH 2 3	No/No	--	Saturated						-40
42											-42
44											-44

Monitoring well is constructed of a 2-inch diameter stainless steel riser flush-threaded to a 2-inch diameter, 10-foot long stainless steel screen.

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: 12-00205 LOG OF BORING NO. MW-2A (p. 1 of 1)

PROJECT: SUPERIOR TOWNSHIP DUMP; BRIMLEY, MICHIGAN

DEPTH IN FEET	SURFACE ELEVATION: ____ MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC. IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-200
	Fill, silty sand, black, moist, very loose										
1	Silty sand, brown, fine grained, moist, very loose (SM) A little garbage @ 2.0'		4	M	SS	14					
2											
3			3	M	SS	8					
4											
5			2	~~W~~	SS	22					
6	Silty clay with sand, gray, waterbearing to moist, very soft to medium (CL-ML)										
7											
8			WR	W	SS	24					
9											
10			WR	W	SS	12					
11											
12											
13			6	M	SS	20					
14											
	END OF BORING @ 14.5'										

DEPTH: DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-14.5' 4.25" HSA	9-28-99	10:00	6.5'	4.5'	6.5'	None	5.1'	
BORING COMPLETED: 9/28/99								
CC: JS CA: MD Rig: 27								

4/90

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY DIVISION
P.O. BOX 30028, LANSING, MICHIGAN 48909

RECORD OF WELL DRILLING OR DEEPENING

USE APPROPRIATE BLOCKS. FOR ITEMS NOT LISTED SUBMIT ATTACHMENTS.

REQUIRED BY AUTHORITY OF:
☐ ACT 61, P.A. 1939, AS AMENDED. (Submit 2 copies within 30 days completion.)
☐ ACT 315, P.A. 1969, AS AMENDED. (Submit 2 copies within 60 days of completion.)

NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT IN FINES AND/OR IMPRISONMENT.

PERMIT NO./DEEPENING PERMIT NO.	TYPE OF WELL (after completion): Monitoring
FIELD/FACILITY NAME: MW-2A 12-00205	
WELL NAME & NUMBER: MW-2A 12-00205	
SURFACE LOCATION: ¼ of ¼ of ¼ Section T R	
NAME AND ADDRESS OF OWNER: Superior Township Dump, Bay Mills, Michigan	TOWNSHIP / COUNTY: Superior
	FOOTAGES: NORTH/SOUTH Ft. from Line and EAST/WEST Ft. from Line of ¼ Sec.
NAME AND ADDRESS OF DRILLING CONTRACTOR: American Engineering Testing, Inc., 4203 Schofield Avenue, Suite 1, Schofield, WI 54476	SUBSURFACE LOCATION (if directionally drilled): ¼ of ¼ of ¼ Section T R
	TOWNSHIP / COUNTY
DATE DRILLING BEGAN: 9-28-99 / DATE DRILL. COMPLETED: 9-29-99 / DATE WELL COMPLETED: 9-29-99	FOOTAGES: NORTH/SOUTH Ft. from Line and EAST/WEST Ft. from Line of ¼ Sec.
TOTAL DEPTH OF WELL: Driller Log / FORMATION AT T.D. / PROD. FORMATION(S)	FEET DRILLED — CABLE TOOLS: From To / FEET DRILLED — ROTARY TOOLS: From 0.0 To 14.5
DATE OF FIRST INJECTION / INJECTED FORMATION / SOLUTION FORMATION	ELEVATIONS: K.B. ft. R.F. ft. R.T ft. Grd. ft.

CASING, CASING LINERS AND CEMENTING, OPERATING STRINGS

SIZE	WHERE SET	CEMENT	FT. PULLED
2"	9.0	2.0 to surface	

PERFORATIONS

DATE	NUMBER HOLES	INTERVAL PERFORATED	OPEN YES	OPEN NO

GROSS PAY INTERVALS

FORMATION	OIL OR GAS	FROM	TO

ALL OTHER OIL AND GAS SHOWS OBSERVED OR LOGGED

FORMATION	OIL OR GAS	DEPTH	WHERE OBSERVED (X): Samples	Odor	Pits	Mud Line	Gas Log	Fill Up

STIMULATION BY ACID OR FRACTURING

DATE	INTERVAL TREATED	MATERIALS AND AMOUNT USED

WATER FILL UP (F.U.) OR LOST CIRCULATION (L.C.) (X)

FORMATION	F.U.	L.C.	DEPTH	AMOUNT

MECHANICAL LOGS, LIST EACH TYPE RUN

DEPTH CORRECTION

DEVIATION SURVEY

PLUGGED BACK

BRAND	(X)	LOG TYPES	LOGGED INTERVALS	DEPTH	CORRECTION	RUN AT	DEGREES	YES	NO	DEPTH
Schlumberger										
Birdwell										
OTHER										

PRODUCTION TEST DATA

OIL Bbls/day	GRAVITY — °API	COND. Bbls/day	GAS — MCF/day	WATER — Bbls/day	H_2S — Grains/100 cu. ft.	B.H.P. AND DEPTH

I AM RESPONSIBLE FOR THIS REPORT. THE INFORMATION IS COMPLETE AND CORRECT.

DATE	NAME AND TITLE (PRINT)	SIGNATURE
10-5-99	Michael Daninger, Crewchief	Michael Daninger

NOTICE: REPORT COMPLETE SAMPLE AND FORMATION RECORD, CORING RECORD AND DRILL STEM TEST INFORMATION ON REVERSE SIDE.

PR 7200-5
Rev. 8/85

State of Wisconsin
Department of Natural Resources

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 7-98

Facility/Project Name: Superior Town Dump	Local Grid Location of Well ☐N. ☐S. _____ ft. ☐E. ☐W. _____ ft.	Well Name: MW-2A 12-00205
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☐ Lat. ° ' " Long. ° ' " or	Wis. Unique Well No. / DNR Well ID
Facility ID	St. Plane _____ ft. N, _____ ft. E. S/C/N	Date Well Installed: 9 / 29 / 99 (m m d d y y y y)
Type of Well: Well Code 11 /	Section Location of Waste/Source: _____ 1/4 of _____ 1/4 of Sec. _____, T. _____ N, R. _____ ☐E ☐W	Well Installed By: Name (first, last) and Firm: Michael Daninger, American Engineering Testin
Distance from Waste/Source _____ ft. / Enf. Stds. Apply ☐	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	Gov. Lot Number

A. Protective pipe, top elevation _____ ft. MSL

B. Well casing, top elevation _____ ft. MSL

C. Land surface elevation _____ ft. MSL

D. Surface seal, bottom _____ ft. MSL or _____ ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☒ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☐

13. Sieve analysis performed? ☐ Yes ☒ No

14. Drilling method used: Rotary ☐ 50 Hollow Stem Auger ☒ 41 Other ☐ _____

15. Drilling fluid used: Water ☐ 02 Air ☐ 01 Drilling Mud ☐ 03 None ☒ 99

16. Drilling additives used? ☐ Yes ☒ No

Describe _____

17. Source of water (attach analysis, if required):

_____

E. Bentonite seal, top _____ ft. MSL or 00 ft.

F. Fine sand, top _____ ft. MSL or 20 ft.

G. Filter pack, top _____ ft. MSL or 30 ft.

H. Screen joint, top _____ ft. MSL or 40 ft.

I. Well bottom _____ ft. MSL or 90 ft.

J. Filter pack, bottom _____ ft MSL or 145 ft.

K. Borehole, bottom _____ ft MSL or 145 ft.

L. Borehole, diameter 8.0 in.

M. O.D. well casing 2.37 in.

N. I.D. well casing 2.02 in.

1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 4.0 in.
b. Length: 6.0 ft.
c. Material: Steel ☒ 04 Other ☐ _____
d. Additional protection? ☐ Yes ☒ No
If yes, describe: _____

3. Surface seal: Bentonite ☐ 30 Concrete ☒ 01 Other ☐ _____

4. Material between well casing and protective pipe: Bentonite ☐ 30 Other ☐ _____

5. Annular space seal: a. Granular/Chipped Bentonite ☐ 33
b. _____ Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight ..... Bentonite slurry ☐ 31
d. 5 % Bentonite ..... Bentonite-cement grout ☒ 50
e. _____ Ft^3 volume added for any of the above
f. How installed: Tremie ☐ _____ Tremie pumped ☒ 02 Gravity ☐ 08

6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐1/4 in. ☐3/8 in. ☐1/2 in. Bentonite chips ☐ 32
c. _____ Other ☐ _____

7. Fine sand material: Manufacturer, product name & mesh size
a. American Material #45-55
b. Volume added 75 lbs

8. Filter pack material: Manufacturer, product name & mesh size
a. American Material # 30
b. Volume added 175 lbs

9. Well casing: Flush threaded PVC schedule 40 ☐ 23 Flush threaded PVC schedule 80 ☐ 24 Other ☒ Stainless Steel

10. Screen material: Stainless Steel
a. Screen type: Factory cut ☒ 11 Continuous slot ☐ 01 Other ☐ _____
b. Manufacturer Johnson
c. Slot size: 0.010 in.
d. Slotted length: 5.0 ft.

11. Backfill material (below filter pack): None ☒ 14 Other ☐ _____

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: Michael Daninger Firm: American Engineering Testing, Inc.

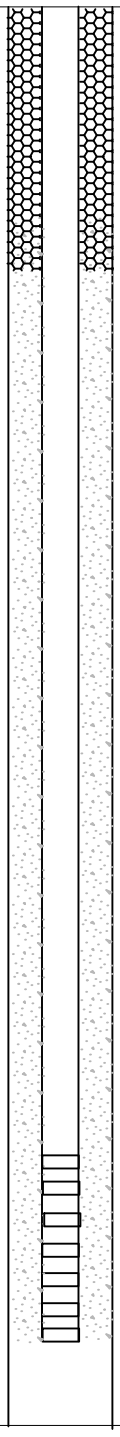
Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

MW-4

Former Superior Township Dump — Brimley, MI

Project Number:	M23-4099	Drilling Co:	Mackinac Environmental Technology
Logged By:	Ed Radecki	TOC Elevation: 734'	Ground Elevation: ~731'
Date Drilled:	11/6/2024	Boring Depth:	37'
Borehole Diameter:	6" HSA - Geoprobe	Saturation Depth:	34'

Depth (FT)	Sample	PID (ppm)	Blow Count	ASTM	Graphic Log	Subsurface Lithology
0–4		0		SP		Sand
4–14						Fine silty sand, with varved clay layers, moist to wet
14–24		0		ML		
24–34		0		ML/MH		Clayey silt, moist to wet, varved
34–38		0		ML		Fine silty sand, wet



2-INCH PVC RISER WITH 5-FOOT PVC, 0.007 SLOT SCREEN
FINISHED ~3-FEET ABOVE GROUND WITH A STEEL STICKUP

Casing = 35'
Screen = 5'

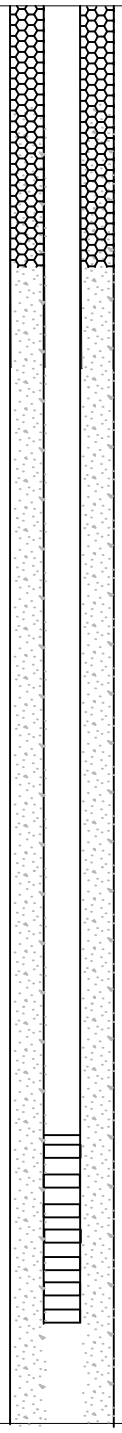
MACKINAC ENVIRONMENTAL TECHNOLOGY, INC.
Environmental Consulting & Contracting

MW-5

Former Superior Township Dump — Brimley, MI

Project Number:	M23-4099	Drilling Co:	Mackinac Environmental Technology
Logged By:	Ed Radecki	TOC Elevation:	736.06' Ground Elevation: ~733'
Date Drilled:	11/6/2024	Boring Depth:	40'
Borehole Diameter:	6" HSA - Geoprobe	Saturation Depth:	33'

Depth (FT)	Sample	PID (ppm)	Blow Count	ASTM	Graphic Log	Subsurface Lithology
0–8		0		SP		Fine sand, varved, brown
8–20		0		SM/SP		Sandy silt, with some clayey sand layers, moist, brown
20–26		0		ML		Fine silty sand, slightly moldable, w/thin saturated varved layers
26–34		0		ML/MH		Clayey silt slightly moldable
34–40		0		ML		Fine silty sand, saturated



2-INCH PVC RISER WITH 5-FOOT PVC, 0.007 SLOT SCREEN
FINISHED ~3-FEET ABOVE GROUND WITH A STEEL STICKUP

Casing = 35'
Screen = 5'

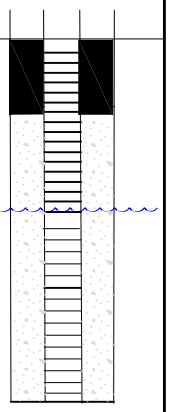
MACKINAC ENVIRONMENTAL TECHNOLOGY, INC.
Environmental Consulting & Contracting

HA-4

Former Superior Township Dump — Brimley, MI

Project Number:	M23-4099	Drilling Co:	Mackinac Environmental Technology
Logged By:	J. Reynolds	TOC Elevation: 696.95'	Ground Elevation:
Date Drilled:	7/9/2024	Boring Depth:	5'
Borehole Diameter:	2.5"	Saturation Depth:	1.5-3'

Depth (FT)	Sample	PID (ppm)	Blow Count	Comments	Graphic Log	Subsurface Lithology	Well Diagram
0						Topsoil	
1						Coarse Sand & Gravel	
2							
3						Medium to Coarse Tan Sand	
4				SATURATED			
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							



Completion Notes: Stick-up well

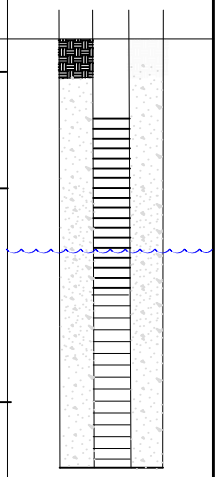
Casing = 1'
Screen = 5'

HA-5

Former Superior Township Dump — Brimley, MI

Project Number:	M23-4099	Drilling Co:	Mackinac Environmental Technology
Logged By:	J. Reynolds	TOC Elevation: 695.06'	Ground Elevation:
Date Drilled:	7/9/2024	Boring Depth:	5'
Borehole Diameter:	2.5"	Saturation Depth:	1.5-3'

Depth (FT)	Sample	PID (ppm)	Blow Count	Comments	Graphic Log	Subsurface Lithology	Well Diagram
0–20				SATURATED		Topsoil; Coarse Sand & Gravel; Medium to Coarse Tan Sand	



Completion Notes: Stick-up well

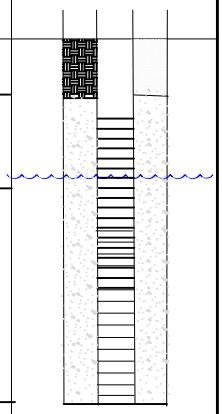
Casing = 1'
Screen = 5'

HA-6

Former Superior Township Dump — Brimley, MI

Project Number:	M23-4099	Drilling Co:	Mackinac Environmental Technology
Logged By:	J. Reynolds	TOC Elevation: 692.70'	Ground Elevation:
Date Drilled:	7/9/2024	Boring Depth:	5'
Borehole Diameter:	2.5"	Saturation Depth:	1.5-3'

Depth (FT)	Sample	PID (ppm)	Blow Count	Comments	Graphic Log	Subsurface Lithology	Well Diagram
0–1						Topsoil	
1–2						Coarse Sand & Gravel	
2–5				SATURATED		Medium to Coarse Tan Sand	



Completion Notes: Stick-up well

Casing = 1'
Screen = 5'

HA-7

Former Superior Township Dump — Brimley, MI

Project Number:	M23-4099	Drilling Co:	Mackinac Environmental Technology
Logged By:	J. Reynolds	TOC Elevation: 731.71'	Ground Elevation:
Date Drilled:	7/9/2024	Boring Depth:	5'
Borehole Diameter:	2.5"	Saturation Depth:	1.5-3'

Depth (FT)	Sample	PID (ppm)	Blow Count	Comments	Graphic Log	Subsurface Lithology	Well Diagram
0						Topsoil	
1						Coarse Sand & Gravel	
2							
3						Medium to Coarse Tan Sand	
4				SATURATED			
5						Clay	
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

Completion Notes: Stick-up well

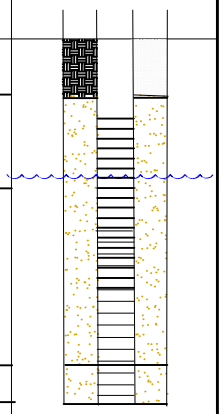
Casing = 1'
Screen = 5'

HA-8

Former Superior Township Dump — Brimley, MI

Project Number:	M23-4099	Drilling Co:	Mackinac Environmental Technology
Logged By:	J. Reynolds	TOC Elevation: 732.42'	Ground Elevation:
Date Drilled:	7/9/2024	Boring Depth:	5'
Borehole Diameter:	2.5"	Saturation Depth:	1.5-3'

Depth (FT)	Sample	PID (ppm)	Blow Count	Comments	Graphic Log	Subsurface Lithology	Well Diagram
0–1						Topsoil	
1–2						Coarse Sand & Gravel	
2–4				SATURATED		Medium to Coarse Tan Sand	
4–5						Clay	



Completion Notes: Stick-up well

Casing = 1'
Screen = 5'

HA-9

Former Superior Township Dump Brimley, MI

Project Number:	M23-4099	Drilling Co:	Mackinac Environmental Technology
Logged By:	J. Reynolds	TOC Elevation: 732.33'	Ground Elevation:
Date Drilled:	7/9/2024	Boring Depth:	5'
Borehole Diameter:	2.5"	Saturation Depth:	1.5-3'

Depth (FT)	Sample	PID (ppm)	Blow Count	Comments	Graphic Log	Subsurface Lithology	Well Diagram
0						Topsoil	
1						Coarse Sand & Gravel	
2				SATURATED			
3						Medium to Coarse Tan Sand	
4							
5						Clay	
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

Completion Notes: Stick-up well

Casing = 1'
Screen = 5'

PHOTOGRAPHIC DOCUMENTATION	
FORMER SUPERIOR TOWNSHIP DUMP	
Photographs taken by Edward Radecki on May 15, 2024 & June 03, 2024	M23-4099

AREA A



1. Looking southeast across Area A - from the edge of the cleared area to Test Pit #1.

- The creek is located beyond the excavator.
- Area A is characterized as buried garbage (cars, wheels, car parts, glass, plastic, metal,) from near surface to depths ranging from two to 10-feet below ground surface (bgs).

PHOTOGRAPHIC DOCUMENTATION	
FORMER SUPERIOR TOWNSHIP DUMP	
Photographs taken by Edward Radecki on May 15, 2024 & June 03, 2024	M23-4099

AREA A – January 2024



2. Surface Debris (Vicinity of MW-1)

PHOTOGRAPHIC DOCUMENTATION	
FORMER SUPERIOR TOWNSHIP DUMP	
Photographs taken by Edward Radecki on May 15, 2024 & June 03, 2024	M23-4099

AREA A – January 2024



3. Surface Debris in the creek.

- TP-1, TP-4 and TP-8 are at the top of the slope (right hand side).
- The debris was observed along the steep bank and surrounding the creek.

PHOTOGRAPHIC DOCUMENTATION	
FORMER SUPERIOR TOWNSHIP DUMP	
Photographs taken by Edward Radecki on May 15, 2024 & June 03, 2024	M23-4099

AREA A



4. Test Pit #1

- Location: Middle of clearing – North edge of the steep bank.
- Garbage was encountered from near surface to 6.5-feet bgs.
- Surface to 6.5': Garbage and debris (car parts, plastic, glass & metal debris)
- 6.5' to 8': Native soil – Black, organic soil
- 8' - EOP: Brown/orange sand to clay
- Water was not observed.

PHOTOGRAPHIC DOCUMENTATION	
FORMER SUPERIOR TOWNSHIP DUMP	
Photographs taken by Edward Radecki on May 15, 2024 & June 03, 2024	M23-4099

AREA A



5. Test Pit #2

- Location: Middle of clearing – At the north edge.
- Surface to 6': Garbage and debris (plastics, glass, tires & metal debris)
- 6' to 8': Clay
- Water was running into the excavation (water restricted visual observation of the test pit base).

PHOTOGRAPHIC DOCUMENTATION	
FORMER SUPERIOR TOWNSHIP DUMP	
Photographs taken by Edward Radecki on May 15, 2024 & June 03, 2024	M23-4099

AREA A



6. Test Pit #3

- Location: Middle of clearing – At the north edge – on a former access drive.
- Surface to 4' – soil, silty sand (old access road?)
- Garbage/debris was not observed
- Water was not encountered.

PHOTOGRAPHIC DOCUMENTATION	
FORMER SUPERIOR TOWNSHIP DUMP	
Photographs taken by Edward Radecki on May 15, 2024 & June 03, 2024	M23-4099

AREA A



7. Test Pit #4

- Location: Southwest side of clearing – North edge of the steep bank.
- Surface to 6': Garbage (plastic, glass & metal debris)
- 6' to 8': Sandy silt, clayey.
- Water was not encountered.

PHOTOGRAPHIC DOCUMENTATION	
FORMER SUPERIOR TOWNSHIP DUMP	
Photographs taken by Edward Radecki on May 15, 2024 & June 03, 2024	M23-4099

AREA A



8. Test Pit #5

- Location: West side of clearing and MW-2.
- Surface to 4': Garbage (plastic, glass & metal debris) in a sandy silt.
- Water was running into the excavation (water restricted visual observation of the test pit base).

PHOTOGRAPHIC DOCUMENTATION	
FORMER SUPERIOR TOWNSHIP DUMP	
Photographs taken by Edward Radecki on May 15, 2024 & June 03, 2024	M23-4099

AREA A



9. Test Pit #6

- Location: Middle of clearing (east side).
- Surface to 6' +/-: Garbage (plastic, glass & metal debris) in a sandy silt.
- Water was running into the excavation (water restricted visual observation of the test pit base).

PHOTOGRAPHIC DOCUMENTATION	
FORMER SUPERIOR TOWNSHIP DUMP	
Photographs taken by Edward Radecki on May 15, 2024 & June 03, 2024	M23-4099

AREA A



10. Test Pit #7

- Location: Northeast corner of clearing.
- Surface to 5' +/-: Garbage (plastic, glass & metal debris) in a sandy silt.
- Water was running into the excavation (water restricted visual observation of the test pit base).

PHOTOGRAPHIC DOCUMENTATION	
FORMER SUPERIOR TOWNSHIP DUMP	
Photographs taken by Edward Radecki on May 15, 2024 & June 03, 2024	M23-4099

AREA A



11. Test Pit #8

- Location: Southeast side of clearing – South of MW-1A on the north edge of the steep bank.
- Surface to 10': Garbage (plastic, glass & metal debris) in a silty sand.
- 10'': Sandy silt, clayey.
- Water was not observed.

PHOTOGRAPHIC DOCUMENTATION	
FORMER SUPERIOR TOWNSHIP DUMP	
Photographs taken by Edward Radecki on May 15, 2024 & June 03, 2024	M23-4099

AREA A



12. Test Pit #10

- Location: Northeast corner of clearing.
- Surface to 3' +/-: Garbage (plastic, glass & metal debris) in a sandy silt.
- Water was running into the excavation (water restricted visual observation of the test pit base).

PHOTOGRAPHIC DOCUMENTATION	
FORMER SUPERIOR TOWNSHIP DUMP	
Photographs taken by Edward Radecki on May 15, 2024 & June 03, 2024	M23-4099

AREA A



13. Test Pit #12:

- Location: South side of access road – North boundary of Area A.
- Surface to 3' +/-: Garbage (plastic, glass & metal debris) in a sandy silt.
- Water was running into the excavation (water restricted visual observation of the test pit base).

PHOTOGRAPHIC DOCUMENTATION	
FORMER SUPERIOR TOWNSHIP DUMP	
Photographs taken by Edward Radecki on May 15, 2024 & June 03, 2024	M23-4099

REA A



14. Test Pit #14

- Location: North end of Area A in wooded area.
- Surface to 3' +/-: Garbage (plastic, glass & metal debris) in a sandy silt.
- Surface water (water restricted visual observation of the test pit base).

PHOTOGRAPHIC DOCUMENTATION	
FORMER SUPERIOR TOWNSHIP DUMP	
Photographs taken by Edward Radecki on May 15, 2024 & June 03, 2024	M23-4099

AREA B



15. Area B – TP#11

- Looking at Test Pit #11: North side of the access road. The path through the wooded area was constructed in June 2024 for access of the back hoe.
- This area is characterized with discrete surface debris. Test pits did not reveal buried debris.

PHOTOGRAPHIC DOCUMENTATION	
FORMER SUPERIOR TOWNSHIP DUMP	
Photographs taken by Edward Radecki on May 15, 2024 & June 03, 2024	M23-4099

AREA B



16. Test Pit #18

- Location: North side of the access road, east of TP-11.
- Scattered surface debris.

PHOTOGRAPHIC DOCUMENTATION	
FORMER SUPERIOR TOWNSHIP DUMP	
Photographs taken by Edward Radecki on May 15, 2024 & June 03, 2024	M23-4099

AREA B



17. Test Pit #17

- Location: East side of Area B
- Surface to 3' - Fine silty sand, no water.
- Scattered surface debris including a wood burning stove.

PHOTOGRAPHIC DOCUMENTATION	
FORMER SUPERIOR TOWNSHIP DUMP	
Photographs taken by Edward Radecki on May 15, 2024 & June 03, 2024	M23-4099

AREA B



18. Test Pit #22

- Location: East side of Area B
- Surface to 2' - Fine silty sand, no water.
- Scattered surface debris.

PHOTOGRAPHIC DOCUMENTATION	
FORMER SUPERIOR TOWNSHIP DUMP	
Photographs taken by Edward Radecki on May 15, 2024 & June 03, 2024	M23-4099

AREA B



19. East of Test Pit #22

- The “protected area” – Note the stripped flagging.
- Standing water.
- Some scattered debris (discrete).

PHOTOGRAPHIC DOCUMENTATION	
FORMER SUPERIOR TOWNSHIP DUMP	
Photographs taken by Edward Radecki on May 15, 2024 & June 03, 2024	M23-4099

AREA B



20. Test Pit #20

- Example of metal and glass debris in the area.
- Standing surface water in low areas.

PHOTOGRAPHIC DOCUMENTATION	
FORMER SUPERIOR TOWNSHIP DUMP	
Photographs taken by Edward Radecki on May 15, 2024 & June 03, 2024	M23-4099

AREA B



21. Test Pit #23.

- Example of metal and glass debris in the area.

PHOTOGRAPHIC DOCUMENTATION	
FORMER SUPERIOR TOWNSHIP DUMP	
Photographs taken by Edward Radecki on May 15, 2024 & June 03, 2024	M23-4099

AREA C – WEST



22. Vicinity of TP-33.

- Note the ravine.
- Small, discrete areas of scattered surface debris.

PHOTOGRAPHIC DOCUMENTATION	
FORMER SUPERIOR TOWNSHIP DUMP	
Photographs taken by Edward Radecki on May 15, 2024 & June 03, 2024	M23-4099

AREA C - WEST



23. TP-34

- Example of scattered metal and glass debris in the area.

PHOTOGRAPHIC DOCUMENTATION	
FORMER SUPERIOR TOWNSHIP DUMP	
Photographs taken by Edward Radecki on May 15, 2024 & June 03, 2024	M23-4099

AREA C - WEST



24. West of "West C".

- Discrete surface water bodies are located throughout this area.
- Debris was not observed in the standing water

25-Jul-2024

Ed Radecki
Mackinac Environmental Technology, Inc.
4 Pennsylvania Plz.
Petoskey, MI 49770

Re: **Superior Township Dump** Work Order: **24070392**

Dear Ed,

ALS Environmental received 3 samples on 10-Jul-2024 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 33.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Alex J. Csaszar

Alex J. Csaszar
Project Manager

ALS Group, USA

Date: 25-Jul-24

Client: Mackinac Environmental Technology, Inc.
Project: Superior Township Dump
Work Order: **24070392**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
24070392-01	Midstream (MS)	Water		7/9/2024 10:50	7/10/2024 09:30	☐
24070392-02	Upstream	Water		7/9/2024 11:05	7/10/2024 09:30	☐
24070392-03	Downstream	Water		7/9/2024 10:35	7/10/2024 09:30	☐

Client:	Mackinac Environmental Technology, Inc.
Project:	Superior Township Dump
Work Order:	24070392

Case Narrative

The attached "Sample Receipt Checklist" documents the date of receipt, status of custody seals, container integrity, preservation, and temperature compliance.

Samples were analyzed according to the analytical methodology previously transmitted in the "Work Order Acknowledgement". Methodologies are also documented in the "Analytical Result" section for each sample. Quality control results are listed in the "QC Report" section. A copy of the laboratory's scope of accreditation is available upon request.

Sample association for the reported quality control is located at the end of each batch summary. If applicable, results are appropriately qualified in the Analytical Result and QC Report sections. The "Qualifiers" section documents the various qualifiers, units, and acronyms utilized in reporting.

Any flags on MS/MSD samples not addressed in this narrative are unrelated to samples in this report.

With the following exceptions, all sample analyses achieved analytical criteria.

Metals:

Batch 244067, Method SW6020B, Sample Midstream (MS) (24070392-01C): The concentration in the Method Blank was greater than the quantitation limit. The sample result was greater than 10x the concentration in the Method Blank; therefore, no qualification is necessary for this analyte: Al

Batch 244067, Method SW6020B, Sample Upstream (24070392-02C): The concentration in the Method Blank was greater than the quantitation limit. The sample result was greater than 10x the concentration in the Method Blank; therefore, no qualification is necessary for this analyte: Al

Batch 244067, Method SW6020B, Sample Downstream (24070392-03C): The concentration in the Method Blank was greater than the quantitation limit. The sample result was greater than 10x the concentration in the Method Blank; therefore, no qualification is necessary for this analyte: Al

Batch 244067, Method SW6020B, Sample MBLK-244067: The concentration in the Method Blank was greater than the quantitation limit. Positive results in the batch may be biased high for this analyte: Al

Client:	Mackinac Environmental Technology, Inc.
Project:	Superior Township Dump
WorkOrder:	**24070392**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Analyte accreditation is not offered
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

Units Reported	Description
µg/L	Micrograms per Liter
mg NH3-N/L	Milligrams Ammonia-Nitrogen per Liter
mg/L	Milligrams per Liter

ALS Group, USA

Date: *25-Jul-24*

Client:	Mackinac Environmental Technology, Inc.	**Client Sample ID:**	Midstream (MS)
Work Order:	24070392	**Collection Date:**	7/9/2024 10:50:00 AM
Project:	Superior Township Dump		
Lab ID:	24070392-01	**Matrix:**	WATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7470A**		Prep Date: **7/18/2024**		Analyst: **KSC**
Mercury	ND	0.00020	0.00020		mg/L	1	7/19/2024
METALS BY ICP-MS			**SW6020B**		Prep Date: **7/24/2024**		Analyst: **STP**
Aluminum	**0.59**	**0.050**	**0.050**	B	**mg/L**	1	7/25/2024
Arsenic	ND	0.0050	0.0050		mg/L	1	7/24/2024
Barium	ND	0.10	0.10		mg/L	1	7/25/2024
Iron	**2.0**	**0.20**	**0.20**		**mg/L**	1	7/24/2024
Lead	ND	0.0050	0.0030		mg/L	1	7/24/2024
Manganese	**0.078**	**0.050**	**0.050**		**mg/L**	1	7/24/2024
POLYNUCLEAR AROMATIC HYDROCARBONS (SIM)			**SW8270E**		Prep Date: **7/11/2024**		Analyst: **TVB**
2-Chloronaphthalene	ND	5.0	5.0		µg/L	1	7/11/2024
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	7/11/2024
Acenaphthene	ND	5.0	5.0		µg/L	1	7/11/2024
Acenaphthylene	ND	5.0	5.0		µg/L	1	7/11/2024
Anthracene	ND	5.0	5.0		µg/L	1	7/11/2024
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	7/11/2024
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	7/11/2024
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	7/11/2024
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	7/11/2024
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	7/11/2024
Chrysene	ND	1.0	1.0		µg/L	1	7/11/2024
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	7/11/2024
Fluoranthene	ND	1.0	1.0		µg/L	1	7/11/2024
Fluorene	ND	5.0	5.0		µg/L	1	7/11/2024
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	7/11/2024
Naphthalene	ND	5.0	5.0		µg/L	1	7/11/2024
Phenanthrene	ND	2.0	2.0		µg/L	1	7/11/2024
Pyrene	ND	5.0	5.0		µg/L	1	7/11/2024
Surr: 2-Fluorobiphenyl	*94.8*	*62-135*			*%REC*	1	7/11/2024
Surr: 4-Terphenyl-d14	*56.7*	*48-133*			*%REC*	1	7/11/2024
Surr: Nitrobenzene-d5	*45.1*	*21-57*			*%REC*	1	7/11/2024
VOLATILE ORGANIC COMPOUNDS			**SW8260D**				Analyst: **JGV**
1,1,1,2-Tetrachloroethane	ND	1.0	1.0		µg/L	1	7/16/2024
1,1,1-Trichloroethane	ND	1.0	1.0		µg/L	1	7/16/2024
1,1,2,2-Tetrachloroethane	ND	1.0	1.0		µg/L	1	7/16/2024
1,1,2-Trichloroethane	ND	1.0	1.0		µg/L	1	7/16/2024
1,1,2-Trichlorotrifluoroethane	ND	1.0	1.0		µg/L	1	7/16/2024
1,1-Dichloroethane	ND	1.0	1.0		µg/L	1	7/16/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Jul-24*

Client:	Mackinac Environmental Technology, Inc.	**Client Sample ID:**	Midstream (MS)
Work Order:	24070392	**Collection Date:**	7/9/2024 10:50:00 AM
Project:	Superior Township Dump		
Lab ID:	24070392-01	**Matrix:**	WATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	1.0	1.0		µg/L	1	7/16/2024
1,2,3-Trichloropropane	ND	1.0	1.0		µg/L	1	7/16/2024
1,2,4-Trichlorobenzene	ND	5.0	5.0		µg/L	1	7/16/2024
1,2,4-Trimethylbenzene	ND	1.0	1.0		µg/L	1	7/16/2024
1,2-Dibromo-3-chloropropane	ND	1.0	0.20		µg/L	1	7/16/2024
1,2-Dibromoethane	ND	1.0	0.050		µg/L	1	7/16/2024
1,2-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/16/2024
1,2-Dichloroethane	ND	1.0	1.0		µg/L	1	7/16/2024
1,2-Dichloropropane	ND	1.0	1.0		µg/L	1	7/16/2024
1,3,5-Trimethylbenzene	ND	1.0	1.0		µg/L	1	7/16/2024
1,3-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/16/2024
1,4-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/16/2024
2-Butanone	ND	25	25		µg/L	1	7/16/2024
2-Hexanone	ND	50	50		µg/L	1	7/16/2024
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	7/16/2024
4-Methyl-2-pentanone	ND	50	50		µg/L	1	7/16/2024
Acetone	ND	50	50		µg/L	1	7/16/2024
Acrylonitrile	ND	2.0	2.0		µg/L	1	7/16/2024
Benzene	ND	1.0	1.0		µg/L	1	7/16/2024
Bromochloromethane	ND	1.0	1.0		µg/L	1	7/16/2024
Bromodichloromethane	ND	1.0	1.0		µg/L	1	7/16/2024
Bromoform	ND	1.0	1.0		µg/L	1	7/16/2024
Bromomethane	ND	5.0	5.0		µg/L	1	7/16/2024
Carbon disulfide	ND	5.0	5.0		µg/L	1	7/16/2024
Carbon tetrachloride	ND	1.0	1.0		µg/L	1	7/16/2024
Chlorobenzene	ND	1.0	1.0		µg/L	1	7/16/2024
Chloroethane	ND	5.0	5.0		µg/L	1	7/16/2024
Chloroform	ND	1.0	1.0		µg/L	1	7/16/2024
Chloromethane	ND	5.0	5.0		µg/L	1	7/16/2024
cis-1,2-Dichloroethene	ND	1.0	1.0		µg/L	1	7/16/2024
cis-1,3-Dichloropropene	ND	1.0	1.0		µg/L	1	7/16/2024
Dibromochloromethane	ND	5.0	5.0		µg/L	1	7/16/2024
Dibromomethane	ND	5.0	5.0		µg/L	1	7/16/2024
Dichlorodifluoromethane	ND	5.0	5.0		µg/L	1	7/16/2024
Diethyl ether	ND	10	10		µg/L	1	7/16/2024
Ethylbenzene	ND	1.0	1.0		µg/L	1	7/16/2024
Hexachloroethane	ND	5.0	5.0		µg/L	1	7/16/2024
Isopropylbenzene	ND	5.0	5.0		µg/L	1	7/16/2024
m,p-Xylene	ND	2.0	2.0		µg/L	1	7/16/2024
Methyl iodide	ND	5.0	1.0		µg/L	1	7/16/2024
Methyl tert-butyl ether	ND	5.0	5.0		µg/L	1	7/16/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Mackinac Environmental Technology, Inc. **Client Sample ID:** Midstream (MS)
Work Order: 24070392 **Collection Date:** 7/9/2024 10:50:00 AM
Project: Superior Township Dump
Lab ID: 24070392-01 **Matrix:** WATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Methylene chloride	ND	5.0	5.0		µg/L	1	7/16/2024
Naphthalene	ND	5.0	5.0		µg/L	1	7/16/2024
n-Propylbenzene	ND	1.0	1.0		µg/L	1	7/16/2024
o-Xylene	ND	1.0	1.0		µg/L	1	7/16/2024
Styrene	ND	1.0	1.0		µg/L	1	7/16/2024
Tetrachloroethene	ND	1.0	1.0		µg/L	1	7/16/2024
Toluene	ND	1.0	1.0		µg/L	1	7/16/2024
trans-1,2-Dichloroethene	ND	1.0	1.0		µg/L	1	7/16/2024
trans-1,3-Dichloropropene	ND	1.0	1.0		µg/L	1	7/16/2024
trans-1,4-Dichloro-2-butene	ND	2.0	1.0		µg/L	1	7/16/2024
Trichloroethene	ND	1.0	1.0		µg/L	1	7/16/2024
Trichlorofluoromethane	ND	1.0	1.0		µg/L	1	7/16/2024
Vinyl acetate	ND	100	100		µg/L	1	7/16/2024
Vinyl chloride	ND	1.0	1.0		µg/L	1	7/16/2024
Xylenes, Total	ND	3.0	3.0		µg/L	1	7/16/2024
Surr: 1,2-Dichloroethane-d4	*105*	*80-120*			*%REC*	1	7/16/2024
Surr: 4-Bromofluorobenzene	*99.6*	*80-120*			*%REC*	1	7/16/2024
Surr: Dibromofluoromethane	*101*	*80-120*			*%REC*	1	7/16/2024
Surr: Toluene-d8	*99.2*	*80-120*			*%REC*	1	7/16/2024
BIOCHEMICAL OXYGEN DEMAND			**A5210B-16**		Prep Date: **7/10/2024**		Analyst: **RZM**
Biochemical Oxygen Demand	ND	3.00	0		mg/L	1	7/15/2024
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**				Analyst: **JGV**
Chloride	ND	10.0	10.0		mg/L	1	7/10/2024
Nitrogen, Nitrate	ND	0.100	0.100		mg/L	1	7/10/2024
Nitrogen, Nitrite	ND	0.100	0.100		mg/L	1	7/10/2024
Nitrogen, Nitrate-Nitrite	ND	0.100	0		mg/L	1	7/10/2024
AMMONIA AS NITROGEN			**A4500-NH3 G-11**				Analyst: **EE**
Ammonia as Nitrogen	**0.068**	**0.025**	**0.025**		**mg NH3-N/L**	1	7/16/2024
PHOSPHORUS, TOTAL			**E365.1 R2.0**				Analyst: **EE**
Phosphorus, Total	ND	0.050	0.010		mg/L	1	7/17/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Mackinac Environmental Technology, Inc. **Client Sample ID:** Upstream
Work Order: 24070392 **Collection Date:** 7/9/2024 11:05:00 AM
Project: Superior Township Dump
Lab ID: 24070392-02 **Matrix:** WATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7470A**		Prep Date: **7/18/2024**		Analyst: **KSC**
Mercury	ND	0.00020	0.00020		mg/L	1	7/19/2024
METALS BY ICP-MS			**SW6020B**		Prep Date: **7/24/2024**		Analyst: **STP**
Aluminum	**0.73**	**0.050**	**0.050**	B	**mg/L**	1	7/25/2024
Arsenic	ND	0.0050	0.0050		mg/L	1	7/24/2024
Barium	ND	0.10	0.10		mg/L	1	7/25/2024
Iron	**2.1**	**0.20**	**0.20**		**mg/L**	1	7/24/2024
Lead	ND	0.0050	0.0030		mg/L	1	7/24/2024
Manganese	**0.081**	**0.050**	**0.050**		**mg/L**	1	7/24/2024
POLYNUCLEAR AROMATIC HYDROCARBONS (SIM)			**SW8270E**		Prep Date: **7/11/2024**		Analyst: **TVB**
2-Chloronaphthalene	ND	5.0	5.0		µg/L	1	7/11/2024
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	7/11/2024
Acenaphthene	ND	5.0	5.0		µg/L	1	7/11/2024
Acenaphthylene	ND	5.0	5.0		µg/L	1	7/11/2024
Anthracene	ND	5.0	5.0		µg/L	1	7/11/2024
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	7/11/2024
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	7/11/2024
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	7/11/2024
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	7/11/2024
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	7/11/2024
Chrysene	ND	1.0	1.0		µg/L	1	7/11/2024
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	7/11/2024
Fluoranthene	ND	1.0	1.0		µg/L	1	7/11/2024
Fluorene	ND	5.0	5.0		µg/L	1	7/11/2024
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	7/11/2024
Naphthalene	ND	5.0	5.0		µg/L	1	7/11/2024
Phenanthrene	ND	2.0	2.0		µg/L	1	7/11/2024
Pyrene	ND	5.0	5.0		µg/L	1	7/11/2024
Surr: 2-Fluorobiphenyl	*100*	*62-135*			*%REC*	1	7/11/2024
Surr: 4-Terphenyl-d14	*61.1*	*48-133*			*%REC*	1	7/11/2024
Surr: Nitrobenzene-d5	*40.4*	*21-57*			*%REC*	1	7/11/2024
VOLATILE ORGANIC COMPOUNDS			**SW8260D**				Analyst: **JGV**
1,1,1,2-Tetrachloroethane	ND	1.0	1.0		µg/L	1	7/16/2024
1,1,1-Trichloroethane	ND	1.0	1.0		µg/L	1	7/16/2024
1,1,2,2-Tetrachloroethane	ND	1.0	1.0		µg/L	1	7/16/2024
1,1,2-Trichloroethane	ND	1.0	1.0		µg/L	1	7/16/2024
1,1,2-Trichlorotrifluoroethane	ND	1.0	1.0		µg/L	1	7/16/2024
1,1-Dichloroethane	ND	1.0	1.0		µg/L	1	7/16/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Mackinac Environmental Technology, Inc. **Client Sample ID:** Upstream
Work Order: 24070392 **Collection Date:** 7/9/2024 11:05:00 AM
Project: Superior Township Dump
Lab ID: 24070392-02 **Matrix:** WATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	1.0	1.0		µg/L	1	7/16/2024
1,2,3-Trichloropropane	ND	1.0	1.0		µg/L	1	7/16/2024
1,2,4-Trichlorobenzene	ND	5.0	5.0		µg/L	1	7/16/2024
1,2,4-Trimethylbenzene	ND	1.0	1.0		µg/L	1	7/16/2024
1,2-Dibromo-3-chloropropane	ND	1.0	0.20		µg/L	1	7/16/2024
1,2-Dibromoethane	ND	1.0	0.050		µg/L	1	7/16/2024
1,2-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/16/2024
1,2-Dichloroethane	ND	1.0	1.0		µg/L	1	7/16/2024
1,2-Dichloropropane	ND	1.0	1.0		µg/L	1	7/16/2024
1,3,5-Trimethylbenzene	ND	1.0	1.0		µg/L	1	7/16/2024
1,3-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/16/2024
1,4-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/16/2024
2-Butanone	ND	25	25		µg/L	1	7/16/2024
2-Hexanone	ND	50	50		µg/L	1	7/16/2024
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	7/16/2024
4-Methyl-2-pentanone	ND	50	50		µg/L	1	7/16/2024
Acetone	ND	50	50		µg/L	1	7/16/2024
Acrylonitrile	ND	2.0	2.0		µg/L	1	7/16/2024
Benzene	ND	1.0	1.0		µg/L	1	7/16/2024
Bromochloromethane	ND	1.0	1.0		µg/L	1	7/16/2024
Bromodichloromethane	ND	1.0	1.0		µg/L	1	7/16/2024
Bromoform	ND	1.0	1.0		µg/L	1	7/16/2024
Bromomethane	ND	5.0	5.0		µg/L	1	7/16/2024
Carbon disulfide	ND	5.0	5.0		µg/L	1	7/16/2024
Carbon tetrachloride	ND	1.0	1.0		µg/L	1	7/16/2024
Chlorobenzene	ND	1.0	1.0		µg/L	1	7/16/2024
Chloroethane	ND	5.0	5.0		µg/L	1	7/16/2024
Chloroform	ND	1.0	1.0		µg/L	1	7/16/2024
Chloromethane	ND	5.0	5.0		µg/L	1	7/16/2024
cis-1,2-Dichloroethene	ND	1.0	1.0		µg/L	1	7/16/2024
cis-1,3-Dichloropropene	ND	1.0	1.0		µg/L	1	7/16/2024
Dibromochloromethane	ND	5.0	5.0		µg/L	1	7/16/2024
Dibromomethane	ND	5.0	5.0		µg/L	1	7/16/2024
Dichlorodifluoromethane	ND	5.0	5.0		µg/L	1	7/16/2024
Diethyl ether	ND	10	10		µg/L	1	7/16/2024
Ethylbenzene	ND	1.0	1.0		µg/L	1	7/16/2024
Hexachloroethane	ND	5.0	5.0		µg/L	1	7/16/2024
Isopropylbenzene	ND	5.0	5.0		µg/L	1	7/16/2024
m,p-Xylene	ND	2.0	2.0		µg/L	1	7/16/2024
Methyl iodide	ND	5.0	1.0		µg/L	1	7/16/2024
Methyl tert-butyl ether	ND	5.0	5.0		µg/L	1	7/16/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Mackinac Environmental Technology, Inc. **Client Sample ID:** Upstream
Work Order: 24070392 **Collection Date:** 7/9/2024 11:05:00 AM
Project: Superior Township Dump
Lab ID: 24070392-02 **Matrix:** WATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Methylene chloride	ND	5.0	5.0		µg/L	1	7/16/2024
Naphthalene	ND	5.0	5.0		µg/L	1	7/16/2024
n-Propylbenzene	ND	1.0	1.0		µg/L	1	7/16/2024
o-Xylene	ND	1.0	1.0		µg/L	1	7/16/2024
Styrene	ND	1.0	1.0		µg/L	1	7/16/2024
Tetrachloroethene	ND	1.0	1.0		µg/L	1	7/16/2024
Toluene	ND	1.0	1.0		µg/L	1	7/16/2024
trans-1,2-Dichloroethene	ND	1.0	1.0		µg/L	1	7/16/2024
trans-1,3-Dichloropropene	ND	1.0	1.0		µg/L	1	7/16/2024
trans-1,4-Dichloro-2-butene	ND	2.0	1.0		µg/L	1	7/16/2024
Trichloroethene	ND	1.0	1.0		µg/L	1	7/16/2024
Trichlorofluoromethane	ND	1.0	1.0		µg/L	1	7/16/2024
Vinyl acetate	ND	100	100		µg/L	1	7/16/2024
Vinyl chloride	ND	1.0	1.0		µg/L	1	7/16/2024
Xylenes, Total	ND	3.0	3.0		µg/L	1	7/16/2024
Surr: 1,2-Dichloroethane-d4	*103*	*80-120*			*%REC*	1	7/16/2024
Surr: 4-Bromofluorobenzene	*95.5*	*80-120*			*%REC*	1	7/16/2024
Surr: Dibromofluoromethane	*102*	*80-120*			*%REC*	1	7/16/2024
Surr: Toluene-d8	*97.6*	*80-120*			*%REC*	1	7/16/2024
BIOCHEMICAL OXYGEN DEMAND			**A5210B-16**		Prep Date: **7/10/2024**		Analyst: **RZM**
Biochemical Oxygen Demand	ND	3.00	0		mg/L	1	7/15/2024
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**				Analyst: **JGV**
Chloride	ND	10.0	10.0		mg/L	1	7/10/2024
Nitrogen, Nitrate	ND	0.100	0.100		mg/L	1	7/10/2024
Nitrogen, Nitrite	ND	0.100	0.100		mg/L	1	7/10/2024
Nitrogen, Nitrate-Nitrite	ND	0.100	0		mg/L	1	7/10/2024
AMMONIA AS NITROGEN			**A4500-NH3 G-11**				Analyst: **EE**
Ammonia as Nitrogen	**0.066**	**0.025**	**0.025**		**mg NH3-N/L**	1	7/16/2024
PHOSPHORUS, TOTAL			**E365.1 R2.0**				Analyst: **EE**
Phosphorus, Total	ND	0.050	0.010		mg/L	1	7/17/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	Mackinac Environmental Technology, Inc.	**Client Sample ID:**	Downstream
Work Order:	24070392	**Collection Date:**	7/9/2024 10:35:00 AM
Project:	Superior Township Dump		
Lab ID:	24070392-03	**Matrix:**	WATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7470A**		Prep Date: **7/18/2024**		Analyst: **KSC**
Mercury	ND	0.00020	0.00020		mg/L	1	7/19/2024
METALS BY ICP-MS			**SW6020B**		Prep Date: **7/24/2024**		Analyst: **STP**
Aluminum	**0.55**	**0.050**	**0.050**	B	**mg/L**	1	7/25/2024
Arsenic	ND	0.0050	0.0050		mg/L	1	7/24/2024
Barium	ND	0.10	0.10		mg/L	1	7/25/2024
Iron	**1.9**	**0.20**	**0.20**		**mg/L**	1	7/24/2024
Lead	ND	0.0050	0.0030		mg/L	1	7/24/2024
Manganese	**0.077**	**0.050**	**0.050**		**mg/L**	1	7/24/2024
POLYNUCLEAR AROMATIC HYDROCARBONS (SIM)			**SW8270E**		Prep Date: **7/11/2024**		Analyst: **TVB**
2-Chloronaphthalene	ND	5.0	5.0		µg/L	1	7/11/2024
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	7/11/2024
Acenaphthene	ND	5.0	5.0		µg/L	1	7/11/2024
Acenaphthylene	ND	5.0	5.0		µg/L	1	7/11/2024
Anthracene	ND	5.0	5.0		µg/L	1	7/11/2024
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	7/11/2024
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	7/11/2024
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	7/11/2024
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	7/11/2024
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	7/11/2024
Chrysene	ND	1.0	1.0		µg/L	1	7/11/2024
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	7/11/2024
Fluoranthene	ND	1.0	1.0		µg/L	1	7/11/2024
Fluorene	ND	5.0	5.0		µg/L	1	7/11/2024
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	7/11/2024
Naphthalene	ND	5.0	5.0		µg/L	1	7/11/2024
Phenanthrene	ND	2.0	2.0		µg/L	1	7/11/2024
Pyrene	ND	5.0	5.0		µg/L	1	7/11/2024
Surr: 2-Fluorobiphenyl	*113*	*62-135*			*%REC*	1	7/11/2024
Surr: 4-Terphenyl-d14	*58.1*	*48-133*			*%REC*	1	7/11/2024
Surr: Nitrobenzene-d5	*43.2*	*21-57*			*%REC*	1	7/11/2024
VOLATILE ORGANIC COMPOUNDS			**SW8260D**				Analyst: **JGV**
1,1,1,2-Tetrachloroethane	ND	1.0	1.0		µg/L	1	7/16/2024
1,1,1-Trichloroethane	ND	1.0	1.0		µg/L	1	7/16/2024
1,1,2,2-Tetrachloroethane	ND	1.0	1.0		µg/L	1	7/16/2024
1,1,2-Trichloroethane	ND	1.0	1.0		µg/L	1	7/16/2024
1,1,2-Trichlorotrifluoroethane	ND	1.0	1.0		µg/L	1	7/16/2024
1,1-Dichloroethane	ND	1.0	1.0		µg/L	1	7/16/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Mackinac Environmental Technology, Inc. **Client Sample ID:** Downstream
Work Order: 24070392 **Collection Date:** 7/9/2024 10:35:00 AM
Project: Superior Township Dump
Lab ID: 24070392-03 **Matrix:** WATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	1.0	1.0		µg/L	1	7/16/2024
1,2,3-Trichloropropane	ND	1.0	1.0		µg/L	1	7/16/2024
1,2,4-Trichlorobenzene	ND	5.0	5.0		µg/L	1	7/16/2024
1,2,4-Trimethylbenzene	ND	1.0	1.0		µg/L	1	7/16/2024
1,2-Dibromo-3-chloropropane	ND	1.0	0.20		µg/L	1	7/16/2024
1,2-Dibromoethane	ND	1.0	0.050		µg/L	1	7/16/2024
1,2-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/16/2024
1,2-Dichloroethane	ND	1.0	1.0		µg/L	1	7/16/2024
1,2-Dichloropropane	ND	1.0	1.0		µg/L	1	7/16/2024
1,3,5-Trimethylbenzene	ND	1.0	1.0		µg/L	1	7/16/2024
1,3-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/16/2024
1,4-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/16/2024
2-Butanone	ND	25	25		µg/L	1	7/16/2024
2-Hexanone	ND	50	50		µg/L	1	7/16/2024
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	7/16/2024
4-Methyl-2-pentanone	ND	50	50		µg/L	1	7/16/2024
Acetone	ND	50	50		µg/L	1	7/16/2024
Acrylonitrile	ND	2.0	2.0		µg/L	1	7/16/2024
Benzene	ND	1.0	1.0		µg/L	1	7/16/2024
Bromochloromethane	ND	1.0	1.0		µg/L	1	7/16/2024
Bromodichloromethane	ND	1.0	1.0		µg/L	1	7/16/2024
Bromoform	ND	1.0	1.0		µg/L	1	7/16/2024
Bromomethane	ND	5.0	5.0		µg/L	1	7/16/2024
Carbon disulfide	ND	5.0	5.0		µg/L	1	7/16/2024
Carbon tetrachloride	ND	1.0	1.0		µg/L	1	7/16/2024
Chlorobenzene	ND	1.0	1.0		µg/L	1	7/16/2024
Chloroethane	ND	5.0	5.0		µg/L	1	7/16/2024
Chloroform	ND	1.0	1.0		µg/L	1	7/16/2024
Chloromethane	ND	5.0	5.0		µg/L	1	7/16/2024
cis-1,2-Dichloroethene	ND	1.0	1.0		µg/L	1	7/16/2024
cis-1,3-Dichloropropene	ND	1.0	1.0		µg/L	1	7/16/2024
Dibromochloromethane	ND	5.0	5.0		µg/L	1	7/16/2024
Dibromomethane	ND	5.0	5.0		µg/L	1	7/16/2024
Dichlorodifluoromethane	ND	5.0	5.0		µg/L	1	7/16/2024
Diethyl ether	ND	10	10		µg/L	1	7/16/2024
Ethylbenzene	ND	1.0	1.0		µg/L	1	7/16/2024
Hexachloroethane	ND	5.0	5.0		µg/L	1	7/16/2024
Isopropylbenzene	ND	5.0	5.0		µg/L	1	7/16/2024
m,p-Xylene	ND	2.0	2.0		µg/L	1	7/16/2024
Methyl iodide	ND	5.0	1.0		µg/L	1	7/16/2024
Methyl tert-butyl ether	ND	5.0	5.0		µg/L	1	7/16/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Mackinac Environmental Technology, Inc. **Client Sample ID:** Downstream
Work Order: 24070392 **Collection Date:** 7/9/2024 10:35:00 AM
Project: Superior Township Dump
Lab ID: 24070392-03 **Matrix:** WATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Methylene chloride	ND	5.0	5.0		µg/L	1	7/16/2024
Naphthalene	ND	5.0	5.0		µg/L	1	7/16/2024
n-Propylbenzene	ND	1.0	1.0		µg/L	1	7/16/2024
o-Xylene	ND	1.0	1.0		µg/L	1	7/16/2024
Styrene	ND	1.0	1.0		µg/L	1	7/16/2024
Tetrachloroethene	ND	1.0	1.0		µg/L	1	7/16/2024
Toluene	ND	1.0	1.0		µg/L	1	7/16/2024
trans-1,2-Dichloroethene	ND	1.0	1.0		µg/L	1	7/16/2024
trans-1,3-Dichloropropene	ND	1.0	1.0		µg/L	1	7/16/2024
trans-1,4-Dichloro-2-butene	ND	2.0	1.0		µg/L	1	7/16/2024
Trichloroethene	ND	1.0	1.0		µg/L	1	7/16/2024
Trichlorofluoromethane	ND	1.0	1.0		µg/L	1	7/16/2024
Vinyl acetate	ND	100	100		µg/L	1	7/16/2024
Vinyl chloride	ND	1.0	1.0		µg/L	1	7/16/2024
Xylenes, Total	ND	3.0	3.0		µg/L	1	7/16/2024
Surr: 1,2-Dichloroethane-d4	*97.7*	*80-120*			*%REC*	1	7/16/2024
Surr: 4-Bromofluorobenzene	*99.1*	*80-120*			*%REC*	1	7/16/2024
Surr: Dibromofluoromethane	*98.0*	*80-120*			*%REC*	1	7/16/2024
Surr: Toluene-d8	*102*	*80-120*			*%REC*	1	7/16/2024
BIOCHEMICAL OXYGEN DEMAND			**A5210B-16**		Prep Date: **7/10/2024**		Analyst: **RZM**
Biochemical Oxygen Demand	ND	3.00	0		mg/L	1	7/15/2024
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**				Analyst: **JGV**
Chloride	ND	10.0	10.0		mg/L	1	7/10/2024
Nitrogen, Nitrate	ND	0.100	0.100		mg/L	1	7/10/2024
Nitrogen, Nitrite	ND	0.100	0.100		mg/L	1	7/10/2024
Nitrogen, Nitrate-Nitrite	ND	0.100	0		mg/L	1	7/10/2024
AMMONIA AS NITROGEN			**A4500-NH3 G-11**				Analyst: **EE**
Ammonia as Nitrogen	**0.065**	**0.025**	**0.025**		**mg NH3-N/L**	1	7/16/2024
PHOSPHORUS, TOTAL			**E365.1 R2.0**				Analyst: **EE**
Phosphorus, Total	ND	0.050	0.010		mg/L	1	7/17/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Batch ID: **243793** Instrument ID **HG5** Method: **SW7470A**

MBLK	Sample ID: **MBLK-243793-243793**			Units: **mg/L**			Analysis Date: **7/19/2024 02:48 PM**			
Client ID:	Run ID: **HG5_240719A**			SeqNo: **10967318**			Prep Date: **7/18/2024**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.00020								

LCS	Sample ID: **LCS-243793-243793**			Units: **mg/L**			Analysis Date: **7/19/2024 02:50 PM**			
Client ID:	Run ID: **HG5_240719A**			SeqNo: **10967319**			Prep Date: **7/18/2024**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.0021	0.00020	0.002	0	105	80-120	0			

MS	Sample ID: **24070411-01CMS**			Units: **mg/L**			Analysis Date: **7/19/2024 03:06 PM**			
Client ID:	Run ID: **HG5_240719A**			SeqNo: **10967328**			Prep Date: **7/18/2024**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.001725	0.00020	0.002	-0.0000555	89	75-125	0			

MSD	Sample ID: **24070411-01CMSD**			Units: **mg/L**			Analysis Date: **7/19/2024 03:08 PM**			
Client ID:	Run ID: **HG5_240719A**			SeqNo: **10967329**			Prep Date: **7/18/2024**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.001695	0.00020	0.002	-0.0000555	87.5	75-125	0.001725	1.75	20	

The following samples were analyzed in this batch: 24070392-01C 24070392-02C 24070392-03C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Mackinac Environmental Technology, Inc.
Work Order: 24070392
Project: Superior Township Dump

QC BATCH REPORT

Batch ID: **244067** Instrument ID **ICPMS3** Method: **SW6020B**

MBLK Sample ID: **MBLK-244067-244067** Units: **mg/L** Analysis Date: **7/24/2024 05:32 PM**
Client ID: Run ID: **ICPMS3_240724A** SeqNo: **10980802** Prep Date: **7/24/2024** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.0050								
Barium	ND	0.0050								
Iron	0.06558	0.080								J
Lead	ND	0.0050								
Manganese	0.003254	0.0050								J

LCS Sample ID: **LCS-244067-244067** Units: **mg/L** Analysis Date: **7/24/2024 05:34 PM**
Client ID: Run ID: **ICPMS3_240724A** SeqNo: **10980804** Prep Date: **7/24/2024** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09891	0.010	0.1	0	98.9	80-120	0			B
Arsenic	0.09468	0.0050	0.1	0	94.7	80-120	0			
Barium	0.0965	0.0050	0.1	0	96.5	80-120	0			
Iron	9.501	0.080	10	0	95	80-120	0			
Lead	0.09427	0.0050	0.1	0	94.3	80-120	0			
Manganese	0.09471	0.0050	0.1	0	94.7	80-120	0			

MS Sample ID: **24070411-03CMS** Units: **mg/L** Analysis Date: **7/24/2024 05:49 PM**
Client ID: Run ID: **ICPMS3_240724A** SeqNo: **10980829** Prep Date: **7/24/2024** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1037	0.010	0.1	0.007483	96.2	75-125	0			B
Arsenic	0.09398	0.0050	0.1	0.0007238	93.3	75-125	0			
Barium	0.3821	0.0050	0.1	0.2951	87	75-125	0			
Iron	9.923	0.080	10	0.6668	92.6	75-125	0			
Lead	0.09435	0.0050	0.1	0.0001694	94.2	75-125	0			
Manganese	0.4736	0.0050	0.1	0.3985	75.1	75-125	0			

MSD Sample ID: **24070411-03CMSD** Units: **mg/L** Analysis Date: **7/24/2024 05:51 PM**
Client ID: Run ID: **ICPMS3_240724A** SeqNo: **10980831** Prep Date: **7/24/2024** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1102	0.010	0.1	0.007483	103	75-125	0.1037	6.05	20	B
Arsenic	0.09533	0.0050	0.1	0.0007238	94.6	75-125	0.09398	1.43	20	
Barium	0.3833	0.0050	0.1	0.2951	88.2	75-125	0.3821	0.314	20	
Iron	10.03	0.080	10	0.6668	93.7	75-125	9.923	1.1	20	
Lead	0.09599	0.0050	0.1	0.0001694	95.8	75-125	0.09435	1.73	20	
Manganese	0.4793	0.0050	0.1	0.3985	80.8	75-125	0.4736	1.2	20	

The following samples were analyzed in this batch: 24070392-01C 24070392-02C 24070392-03C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **243409** Instrument ID **SVMS6** Method: **SW8270E**

MBLK Sample ID: **SBLKW1-243409-243409** Units: **µg/L** Analysis Date: **7/11/2024 03:03 PM**

Client ID: Run ID: **SVMS6_240711A** SeqNo: **10950529** Prep Date: **7/11/2024** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Chloronaphthalene	ND	0.17								
2-Methylnaphthalene	ND	0.17								
Acenaphthene	ND	0.17								
Acenaphthylene	ND	0.17								
Anthracene	ND	0.17								
Benzo(a)anthracene	ND	0.17								
Benzo(a)pyrene	ND	0.17								
Benzo(b)fluoranthene	ND	0.17								
Benzo(g,h,i)perylene	ND	0.17								
Benzo(k)fluoranthene	ND	0.17								
Chrysene	ND	0.17								
Dibenzo(a,h)anthracene	ND	0.17								
Fluoranthene	ND	0.17								
Fluorene	ND	0.17								
Indeno(1,2,3-cd)pyrene	ND	0.17								
Naphthalene	ND	0.17								
Phenanthrene	ND	0.17								
Pyrene	ND	0.17								
Surr: 2-Fluorobiphenyl	*7.264*	0	*8.34*	0	*87.1*	*62-135*	0			
Surr: 4-Terphenyl-d14	*4.612*	0	*8.34*	0	*55.3*	*48-133*	0			
Surr: Nitrobenzene-d5	*3.448*	0	*8.34*	0	*41.3*	*21-57*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **243409** Instrument ID **SVMS6** Method: **SW8270E**

LCS	Sample ID: **SLCSW1-243409-243409**				Units: **µg/L**			Analysis Date: **7/11/2024 04:07 PM**			
Client ID:		Run ID: **SVMS6_240711A**			SeqNo: **10950531**			Prep Date: **7/11/2024**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Chloronaphthalene	8.191	0.17	8.34	0	98.2	51-147	0			
2-Methylnaphthalene	8.88	0.17	8.34	0	106	44-138	0			
Acenaphthene	8.51	0.17	8.34	0	102	69-133	0			
Acenaphthylene	8.192	0.17	8.34	0	98.2	64-130	0			
Anthracene	9.111	0.17	8.34	0	109	75-135	0			
Benzo(a)anthracene	7.573	0.17	8.34	0	90.8	69-138	0			
Benzo(a)pyrene	7.419	0.17	8.34	0	89	68-140	0			
Benzo(b)fluoranthene	6.652	0.17	8.34	0	79.8	64-137	0			
Benzo(g,h,i)perylene	6.888	0.17	8.34	0	82.6	58-141	0			
Benzo(k)fluoranthene	6.864	0.17	8.34	0	82.3	66-141	0			
Chrysene	7.485	0.17	8.34	0	89.7	72-146	0			
Dibenzo(a,h)anthracene	7.322	0.17	8.34	0	87.8	59-138	0			
Fluoranthene	8.974	0.17	8.34	0	108	70-137	0			
Fluorene	8.791	0.17	8.34	0	105	71-133	0			
Indeno(1,2,3-cd)pyrene	7.739	0.17	8.34	0	92.8	60-143	0			
Naphthalene	8.242	0.17	8.34	0	98.8	49-134	0			
Phenanthrene	8.756	0.17	8.34	0	105	77-132	0			
Pyrene	7.24	0.17	8.34	0	86.8	60-144	0			
Surr: 2-Fluorobiphenyl	*9.25*	0	*8.34*	0	*111*	*62-135*	0			
Surr: 4-Terphenyl-d14	*5.976*	0	*8.34*	0	*71.7*	*48-133*	0			
Surr: Nitrobenzene-d5	*4.078*	0	*8.34*	0	*48.9*	*21-57*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **243409** Instrument ID **SVMS6** Method: **SW8270E**

LCSD Sample ID: **SLCSDW1-243409-243409** Units: **µg/L** Analysis Date: **7/11/2024 04:23 PM**

Client ID: Run ID: **SVMS6_240711A** SeqNo: **10950532** Prep Date: **7/11/2024** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Chloronaphthalene	9.042	0.17	8.34	0	108	51-147	8.191	9.88	30	
2-Methylnaphthalene	10.04	0.17	8.34	0	120	44-138	8.88	12.3	30	
Acenaphthene	9.429	0.17	8.34	0	113	69-133	8.51	10.2	30	
Acenaphthylene	8.888	0.17	8.34	0	107	64-130	8.192	8.16	30	
Anthracene	9.924	0.17	8.34	0	119	75-135	9.111	8.54	30	
Benzo(a)anthracene	8.678	0.17	8.34	0	104	69-138	7.573	13.6	30	
Benzo(a)pyrene	7.981	0.17	8.34	0	95.7	68-140	7.419	7.29	30	
Benzo(b)fluoranthene	7.246	0.17	8.34	0	86.9	64-137	6.652	8.54	30	
Benzo(g,h,i)perylene	7.539	0.17	8.34	0	90.4	58-141	6.888	9.03	30	
Benzo(k)fluoranthene	7.473	0.17	8.34	0	89.6	66-141	6.864	8.49	30	
Chrysene	8.786	0.17	8.34	0	105	72-146	7.485	16	30	
Dibenzo(a,h)anthracene	7.972	0.17	8.34	0	95.6	59-138	7.322	8.49	30	
Fluoranthene	9.763	0.17	8.34	0	117	70-137	8.974	8.42	30	
Fluorene	9.481	0.17	8.34	0	114	71-133	8.791	7.55	30	
Indeno(1,2,3-cd)pyrene	8.561	0.17	8.34	0	103	60-143	7.739	10.1	30	
Naphthalene	9.166	0.17	8.34	0	110	49-134	8.242	10.6	30	
Phenanthrene	9.568	0.17	8.34	0	115	77-132	8.756	8.85	30	
Pyrene	8.318	0.17	8.34	0	99.7	60-144	7.24	13.9	30	
Surr: 2-Fluorobiphenyl	*9.193*	0	*8.34*	0	*110*	*62-135*	9.25	*0.609*	*30*	
Surr: 4-Terphenyl-d14	*6.71*	0	*8.34*	0	*80.5*	*48-133*	5.976	*11.6*	*30*	
Surr: Nitrobenzene-d5	*4.308*	0	*8.34*	0	*51.7*	*21-57*	4.078	*5.48*	*30*	

The following samples were analyzed in this batch: 24070392-01B 24070392-02B 24070392-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R407981a** Instrument ID **VMS8** Method: **SW8260D**

MBLK Sample ID: **8V-BLKW1-240716-R407981a** Units: **µg/L** Analysis Date: **7/16/2024 02:10 PM**

Client ID: Run ID: **VMS8_240716A** SeqNo: **10959128** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
1,1,2-Trichlorotrifluoroethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2,3-Trichloropropane	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	1.0								
1,2-Dibromoethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,2-Dichloroethane	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
2-Butanone	ND	5.0								
2-Hexanone	ND	5.0								
2-Methylnaphthalene	ND	5.0								
4-Methyl-2-pentanone	ND	1.0								
Acetone	ND	10								
Acrylonitrile	ND	1.0								
Benzene	ND	1.0								
Bromochloromethane	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	1.0								
Carbon disulfide	ND	1.0								
Carbon tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	1.0								
Chloroform	ND	1.0								
Chloromethane	ND	1.0								
cis-1,2-Dichloroethene	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
Diethyl ether	ND	1.0								
Ethylbenzene	ND	1.0								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R407981a** Instrument ID **VMS8** Method: **SW8260D**

Hexachloroethane	ND	1.0					
Isopropylbenzene	ND	1.0					
m,p-Xylene	ND	2.0					
Methyl iodide	ND	5.0					
Methyl tert-butyl ether	ND	1.0					
Methylene chloride	ND	5.0					
Naphthalene	ND	5.0					
n-Propylbenzene	ND	1.0					
o-Xylene	ND	1.0					
Styrene	ND	1.0					
Tetrachloroethene	ND	1.0					
Toluene	ND	1.0					
trans-1,2-Dichloroethene	ND	1.0					
trans-1,3-Dichloropropene	ND	1.0					
trans-1,4-Dichloro-2-butene	ND	2.0					
Trichloroethene	ND	1.0					
Trichlorofluoromethane	ND	1.0					
Vinyl acetate	ND	5.0					
Vinyl chloride	ND	1.0					
Xylenes, Total	ND	3.0					
Surr: 1,2-Dichloroethane-d4	*20.51*	0	*20*	0	*103*	*80-120*	0
Surr: 4-Bromofluorobenzene	*19.74*	0	*20*	0	*98.7*	*80-120*	0
Surr: Dibromofluoromethane	*20.34*	0	*20*	0	*102*	*80-120*	0
Surr: Toluene-d8	*20.02*	0	*20*	0	*100*	*80-120*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R407981a** Instrument ID **VMS8** Method: **SW8260D**

LCS Sample ID: **8V-LCSW1-240716-R407981a** Units: **µg/L** Analysis Date: **7/16/2024 01:14 PM**

Client ID: Run ID: **VMS8_240716A** SeqNo: **10959126** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	16.31	1.0	20	0	81.6	72-119	0			
1,1,1-Trichloroethane	16.42	1.0	20	0	82.1	75-119	0			
1,1,2,2-Tetrachloroethane	17.16	1.0	20	0	85.8	80-123	0			
1,1,2-Trichloroethane	17.01	1.0	20	0	85	83-118	0			
1,1,2-Trichlorotrifluoroethane	16.62	1.0	20	0	83.1	64-133	0			
1,1-Dichloroethane	17.67	1.0	20	0	88.4	73-122	0			
1,1-Dichloroethene	18.08	1.0	20	0	90.4	66-131	0			
1,2,3-Trichloropropane	16.41	1.0	20	0	82	78-119	0			
1,2,4-Trichlorobenzene	18.74	1.0	20	0	93.7	73-127	0			
1,2,4-Trimethylbenzene	16.53	1.0	20	0	82.6	74-118	0			
1,2-Dibromo-3-chloropropane	16.98	1.0	20	0	84.9	52-141	0			
1,2-Dibromoethane	19.54	1.0	20	0	97.7	60-159	0			
1,2-Dichlorobenzene	18.21	1.0	20	0	91	80-119	0			
1,2-Dichloroethane	17.41	1.0	20	0	87	78-121	0			
1,2-Dichloropropane	18.09	1.0	20	0	90.4	78-120	0			
1,3,5-Trimethylbenzene	17.24	1.0	20	0	86.2	76-120	0			
1,3-Dichlorobenzene	18.31	1.0	20	0	91.6	80-120	0			
1,4-Dichlorobenzene	18.11	1.0	20	0	90.6	81-119	0			
2-Butanone	14.97	5.0	20	0	74.8	69-147	0			
2-Hexanone	16.1	5.0	20	0	80.5	67-140	0			
2-Methylnaphthalene	17.87	5.0	20	0	89.4	50-150	0			
4-Methyl-2-pentanone	16.17	1.0	20	0	80.8	68-199	0			
Acetone	15.43	10	20	0	77.2	70-166	0			
Acrylonitrile	16.04	1.0	20	0	80.2	70-133	0			
Benzene	17.07	1.0	20	0	85.4	78-120	0			
Bromochloromethane	18.75	1.0	20	0	93.8	70-125	0			
Bromodichloromethane	17.43	1.0	20	0	87.2	73-126	0			
Bromoform	14.45	1.0	20	0	72.2	60-124	0			
Bromomethane	10.48	1.0	20	0	52.4	20-183	0			
Carbon disulfide	18.48	1.0	20	0	92.4	67-159	0			
Carbon tetrachloride	16.22	1.0	20	0	81.1	69-124	0			
Chlorobenzene	17.34	1.0	20	0	86.7	80-118	0			
Chloroethane	15.19	1.0	20	0	76	35-136	0			
Chloroform	18.22	1.0	20	0	91.1	75-119	0			
Chloromethane	12.46	1.0	20	0	62.3	26-117	0			
cis-1,2-Dichloroethene	18.04	1.0	20	0	90.2	75-123	0			
cis-1,3-Dichloropropene	18.23	1.0	20	0	91.2	69-120	0			
Dibromochloromethane	17.06	1.0	20	0	85.3	63-117	0			
Dibromomethane	18.25	1.0	20	0	91.2	78-120	0			
Dichlorodifluoromethane	11.76	1.0	20	0	58.8	36-133	0			
Diethyl ether	18.49	1.0	20	0	92.4	57-163	0			
Ethylbenzene	16.97	1.0	20	0	84.8	76-116	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R407981a** Instrument ID **VMS8** Method: **SW8260D**

Hexachloroethane	17.73	1.0	20	0	88.6	60-130	0
Isopropylbenzene	17.36	1.0	20	0	86.8	77-118	0
m,p-Xylene	34.04	2.0	40	0	85.1	76-119	0
Methyl iodide	24.09	5.0	20	0	120	10-200	0
Methyl tert-butyl ether	18.05	1.0	20	0	90.2	77-137	0
Methylene chloride	18.66	5.0	20	0	93.3	68-125	0
Naphthalene	16.82	5.0	20	0	84.1	56-142	0
n-Propylbenzene	16.9	1.0	20	0	84.5	74-118	0
o-Xylene	16.99	1.0	20	0	85	77-116	0
Styrene	17.5	1.0	20	0	87.5	76-123	0
Tetrachloroethene	18.01	1.0	20	0	90	80-124	0
Toluene	16.73	1.0	20	0	83.6	78-116	0
trans-1,2-Dichloroethene	17.89	1.0	20	0	89.4	73-124	0
trans-1,3-Dichloropropene	17.61	1.0	20	0	88	67-118	0
trans-1,4-Dichloro-2-butene	13.57	2.0	20	0	67.8	58-118	0
Trichloroethene	16.49	1.0	20	0	82.4	75-122	0
Trichlorofluoromethane	15.17	1.0	20	0	75.8	52-115	0
Vinyl chloride	14.05	1.0	20	0	70.2	49-122	0
Xylenes, Total	51.03	3.0	60	0	85	77-119	0
Surr: 1,2-Dichloroethane-d4	*20.53*	0	*20*	0	*103*	*80-120*	0
Surr: 4-Bromofluorobenzene	*19.36*	0	*20*	0	*96.8*	*80-120*	0
Surr: Dibromofluoromethane	*20.43*	0	*20*	0	*102*	*80-120*	0
Surr: Toluene-d8	*19.98*	0	*20*	0	*99.9*	*80-120*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R407981a** Instrument ID **VMS8** Method: **SW8260D**

MS Sample ID: **HN2404092-003 MS** Units: **µg/L** Analysis Date: **7/16/2024 09:12 PM**

Client ID: Run ID: **VMS8_240716A** SeqNo: **10959150** Prep Date: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	96.35	5.0	100	0	96.4	72-119	0			
1,1,1-Trichloroethane	107.2	5.0	100	0	107	75-119	0			
1,1,2,2-Tetrachloroethane	91.65	5.0	100	0	91.6	80-123	0			
1,1,2-Trichloroethane	101.6	5.0	100	0	102	83-118	0			
1,1,2-Trichlorotrifluoroethane	122	5.0	100	0	122	64-133	0			
1,1-Dichloroethane	109.2	5.0	100	0	109	73-122	0			
1,1-Dichloroethene	123.6	5.0	100	0	124	66-131	0			
1,2,3-Trichloropropane	96.8	5.0	100	0	96.8	78-119	0			
1,2,4-Trichlorobenzene	99.05	5.0	100	0	99	73-127	0			
1,2,4-Trimethylbenzene	96.5	5.0	100	0	96.5	74-118	0			
1,2-Dibromo-3-chloropropane	98.2	5.0	100	0	98.2	52-141	0			
1,2-Dibromoethane	112.2	5.0	100	0	112	60-159	0			
1,2-Dichlorobenzene	101.2	5.0	100	0	101	80-119	0			
1,2-Dichloroethane	104.9	5.0	100	0	105	78-121	0			
1,2-Dichloropropane	106.2	5.0	100	0	106	78-120	0			
1,3,5-Trimethylbenzene	103.2	5.0	100	0	103	76-120	0			
1,3-Dichlorobenzene	102.2	5.0	100	0	102	80-120	0			
1,4-Dichlorobenzene	100.2	5.0	100	0	100	81-119	0			
2-Butanone	104.3	25	100	0	104	69-147	0			
2-Hexanone	95.35	25	100	0	95.4	67-140	0			
2-Methylnaphthalene	96.75	25	100	0	96.8	50-150	0			
4-Methyl-2-pentanone	96.75	5.0	100	0	96.8	68-199	0			
Acetone	669.4	50	100	569.7	99.7	70-166	0			EO
Acrylonitrile	98.05	5.0	100	0	98	70-133	0			
Benzene	110.4	5.0	100	0	110	78-120	0			
Bromochloromethane	110.5	5.0	100	0	110	70-125	0			
Bromodichloromethane	104	5.0	100	0	104	73-126	0			
Bromoform	84.9	5.0	100	0	84.9	60-124	0			
Bromomethane	72.55	5.0	100	0	72.6	20-183	0			
Carbon disulfide	120.1	5.0	100	0	120	67-159	0			
Carbon tetrachloride	112.3	5.0	100	0	112	69-124	0			
Chlorobenzene	101.2	5.0	100	0	101	80-118	0			
Chloroethane	102.6	5.0	100	0	103	35-136	0			
Chloroform	107.4	5.0	100	0	107	75-119	0			
Chloromethane	77.95	5.0	100	0	78	26-117	0			
cis-1,2-Dichloroethene	109.2	5.0	100	0	109	75-123	0			
cis-1,3-Dichloropropene	103.5	5.0	100	0	104	69-120	0			
Dibromochloromethane	91.45	5.0	100	0	91.4	63-117	0			
Dibromomethane	107	5.0	100	0	107	78-120	0			
Dichlorodifluoromethane	90.9	5.0	100	0	90.9	36-133	0			
Diethyl ether	107.2	5.0	100	0	107	57-163	0			
Ethylbenzene	104.5	5.0	100	0	104	76-116	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R407981a** Instrument ID **VMS8** Method: **SW8260D**

Hexachloroethane	104	5.0	100	0	104	60-130	0
Isopropylbenzene	110.8	5.0	100	0	111	77-118	0
m,p-Xylene	205	10	200	0	103	76-119	0
Methyl iodide	161.2	25	100	0	161	10-200	0
Methyl tert-butyl ether	106	5.0	100	0	106	77-137	0
Methylene chloride	111.9	25	100	0	112	68-125	0
Naphthalene	92.65	25	100	0	92.6	56-142	0
n-Propylbenzene	101.6	5.0	100	0	102	74-118	0
o-Xylene	102.7	5.0	100	0	103	77-116	0
Styrene	104.4	5.0	100	0	104	76-123	0
Tetrachloroethene	120.6	5.0	100	0	121	80-124	0
Toluene	102.9	5.0	100	0	103	78-116	0
trans-1,2-Dichloroethene	115.6	5.0	100	0	116	73-124	0
trans-1,3-Dichloropropene	97.6	5.0	100	0	97.6	67-118	0
trans-1,4-Dichloro-2-butene	68.1	10	100	0	68.1	58-118	0
Trichloroethene	108.2	5.0	100	0	108	75-122	0
Trichlorofluoromethane	109	5.0	100	0	109	52-115	0
Vinyl chloride	103.1	5.0	100	0	103	49-122	0
Xylenes, Total	307.8	15	300	0	103	77-119	0
Surr: 1,2-Dichloroethane-d4	*105*	0	*100*	0	*105*	*80-120*	0
Surr: 4-Bromofluorobenzene	*98.4*	0	*100*	0	*98.4*	*80-120*	0
Surr: Dibromofluoromethane	*102.5*	0	*100*	0	*102*	*80-120*	0
Surr: Toluene-d8	*101.5*	0	*100*	0	*102*	*80-120*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R407981a** Instrument ID **VMS8** Method: **SW8260D**

MSD Sample ID: **HN2404092-003 MSD** Units: **µg/L** Analysis Date: **7/16/2024 09:31 PM**

Client ID: Run ID: **VMS8_240716A** SeqNo: **10959151** Prep Date: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	97.45	5.0	100	0	97.4	72-119	96.35	1.14	30	
1,1,1-Trichloroethane	106.6	5.0	100	0	107	75-119	107.2	0.561	30	
1,1,2,2-Tetrachloroethane	93.15	5.0	100	0	93.2	80-123	91.65	1.62	30	
1,1,2-Trichloroethane	104	5.0	100	0	104	83-118	101.6	2.38	30	
1,1,2-Trichlorotrifluoroethane	118.6	5.0	100	0	119	64-133	122	2.78	30	
1,1-Dichloroethane	108.2	5.0	100	0	108	73-122	109.2	0.92	30	
1,1-Dichloroethene	124.4	5.0	100	0	124	66-131	123.6	0.645	30	
1,2,3-Trichloropropane	95.8	5.0	100	0	95.8	78-119	96.8	1.04	30	
1,2,4-Trichlorobenzene	98.75	5.0	100	0	98.8	73-127	99.05	0.303	30	
1,2,4-Trimethylbenzene	99.9	5.0	100	0	99.9	74-118	96.5	3.46	30	
1,2-Dibromo-3-chloropropane	99.75	5.0	100	0	99.8	52-141	98.2	1.57	30	
1,2-Dibromoethane	114.1	5.0	100	0	114	60-159	112.2	1.72	30	
1,2-Dichlorobenzene	99.95	5.0	100	0	100	80-119	101.2	1.24	30	
1,2-Dichloroethane	102.7	5.0	100	0	103	78-121	104.9	2.12	30	
1,2-Dichloropropane	109.1	5.0	100	0	109	78-120	106.2	2.74	30	
1,3,5-Trimethylbenzene	104.5	5.0	100	0	104	76-120	103.2	1.25	30	
1,3-Dichlorobenzene	100.2	5.0	100	0	100	80-120	102.2	1.93	30	
1,4-Dichlorobenzene	100.8	5.0	100	0	101	81-119	100.2	0.597	30	
2-Butanone	102.2	25	100	0	102	69-147	104.3	2.03	30	
2-Hexanone	95.2	25	100	0	95.2	67-140	95.35	0.157	30	
2-Methylnaphthalene	101	25	100	0	101	50-150	96.75	4.25	30	
4-Methyl-2-pentanone	93.45	5.0	100	0	93.4	68-199	96.75	3.47	30	
Acetone	647.6	50	100	569.7	77.9	70-166	669.4	3.3	30	EO
Acrylonitrile	94.5	5.0	100	0	94.5	70-133	98.05	3.69	30	
Benzene	108.2	5.0	100	0	108	78-120	110.4	2.1	30	
Bromochloromethane	110.3	5.0	100	0	110	70-125	110.5	0.181	30	
Bromodichloromethane	102	5.0	100	0	102	73-126	104	1.89	30	
Bromoform	84.6	5.0	100	0	84.6	60-124	84.9	0.354	30	
Bromomethane	79.75	5.0	100	0	79.8	20-183	72.55	9.46	30	
Carbon disulfide	120.6	5.0	100	0	121	67-159	120.1	0.415	30	
Carbon tetrachloride	110.8	5.0	100	0	111	69-124	112.3	1.34	30	
Chlorobenzene	102.4	5.0	100	0	102	80-118	101.2	1.18	30	
Chloroethane	100.9	5.0	100	0	101	35-136	102.6	1.67	30	
Chloroform	107.2	5.0	100	0	107	75-119	107.4	0.186	30	
Chloromethane	75.8	5.0	100	0	75.8	26-117	77.95	2.8	30	
cis-1,2-Dichloroethene	107.6	5.0	100	0	108	75-123	109.2	1.48	30	
cis-1,3-Dichloropropene	100.1	5.0	100	0	100	69-120	103.5	3.34	30	
Dibromochloromethane	91.35	5.0	100	0	91.4	63-117	91.45	0.109	30	
Dibromomethane	103.9	5.0	100	0	104	78-120	107	2.89	30	
Dichlorodifluoromethane	83.4	5.0	100	0	83.4	36-133	90.9	8.61	30	
Diethyl ether	109	5.0	100	0	109	57-163	107.2	1.67	30	
Ethylbenzene	105.3	5.0	100	0	105	76-116	104.5	0.763	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R407981a** Instrument ID **VMS8** Method: **SW8260D**

Hexachloroethane	105.2	5.0	100	0	105	60-130	104	1.2	30	
Isopropylbenzene	111.2	5.0	100	0	111	77-118	110.8	0.36	30	
m,p-Xylene	205.5	10	200	0	103	76-119	205	0.219	30	
Methyl iodide	165.4	25	100	0	165	10-200	161.2	2.51	30	
Methyl tert-butyl ether	101.8	5.0	100	0	102	77-137	106	4.04	30	
Methylene chloride	108.2	25	100	0	108	68-125	111.9	3.41	30	
Naphthalene	94.4	25	100	0	94.4	56-142	92.65	1.87	30	
n-Propylbenzene	103.2	5.0	100	0	103	74-118	101.6	1.56	30	
o-Xylene	101.8	5.0	100	0	102	77-116	102.7	0.88	30	
Styrene	104.1	5.0	100	0	104	76-123	104.4	0.288	30	
Tetrachloroethene	125.4	5.0	100	0	125	80-124	120.6	3.98	30	S
Toluene	104	5.0	100	0	104	78-116	102.9	1.06	30	
trans-1,2-Dichloroethene	114.2	5.0	100	0	114	73-124	115.6	1.31	30	
trans-1,3-Dichloropropene	100.3	5.0	100	0	100	67-118	97.6	2.73	30	
trans-1,4-Dichloro-2-butene	69.1	10	100	0	69.1	58-118	68.1	1.46	30	
Trichloroethene	105.9	5.0	100	0	106	75-122	108.2	2.15	30	
Trichlorofluoromethane	106.6	5.0	100	0	107	52-115	109	2.23	30	
Vinyl chloride	101.5	5.0	100	0	102	49-122	103.1	1.56	30	
Xylenes, Total	307.3	15	300	0	102	77-119	307.8	0.146	30	
Surr: 1,2-Dichloroethane-d4	*102.9*	0	*100*	0	*103*	*80-120*	105	*2.07*	*30*	
Surr: 4-Bromofluorobenzene	*96.55*	0	*100*	0	*96.6*	*80-120*	98.4	*1.9*	*30*	
Surr: Dibromofluoromethane	*100.8*	0	*100*	0	*101*	*80-120*	102.5	*1.62*	*30*	
Surr: Toluene-d8	*101*	0	*100*	0	*101*	*80-120*	101.5	*0.543*	*30*	

The following samples were analyzed in this batch: 24070392-01A 24070392-02A 24070392-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Mackinac Environmental Technology, Inc.
Work Order: 24070392
Project: Superior Township Dump

QC BATCH REPORT

Batch ID: **243378** Instrument ID **LDO** Method: **A5210B-16**

MBLK	Sample ID: **MBLK-243378-243378**				Units: **mg/L**			Analysis Date: **7/15/2024 11:06 AM**			
Client ID:	Run ID: **LDO_240715A**				SeqNo: **10955061**			Prep Date: **7/10/2024**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Biochemical Oxygen Demand	ND	3.0								

LCS	Sample ID: **LCS-243378-243378**				Units: **mg/L**			Analysis Date: **7/15/2024 11:06 AM**			
Client ID:	Run ID: **LDO_240715A**				SeqNo: **10955062**			Prep Date: **7/10/2024**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Biochemical Oxygen Demand	173.9	3.0	198	0	87.8	85-115	0			

DUP	Sample ID: **24070138-10A DUP**				Units: **mg/L**			Analysis Date: **7/15/2024 11:06 AM**			
Client ID:	Run ID: **LDO_240715A**				SeqNo: **10955064**			Prep Date: **7/10/2024**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Biochemical Oxygen Demand	7.64	3.0	0	0	0	0-0	9.89	25.7	20	R

DUP	Sample ID: **24070400-02C DUP**				Units: **mg/L**			Analysis Date: **7/15/2024 11:06 AM**			
Client ID:	Run ID: **LDO_240715A**				SeqNo: **10955078**			Prep Date: **7/10/2024**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Biochemical Oxygen Demand	669.4	3.0	0	0	0	0-0	690.4	3.09	20	

The following samples were analyzed in this batch: 24070392-01H 24070392-02H 24070392-03H

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Mackinac Environmental Technology, Inc.
Work Order: 24070392
Project: Superior Township Dump

QC BATCH REPORT

Batch ID: **R407694B** Instrument ID **IC3** Method: **SW9056A**

MBLK Sample ID: **MBLK-A-R407694B** Units: **mg/L** Analysis Date: **7/10/2024 08:06 PM**
Client ID: Run ID: **IC3_240710A** SeqNo: **10944378** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	ND	1.0								
Nitrogen, Nitrate	ND	0.10								
Nitrogen, Nitrite	ND	0.10								
Nitrogen, Nitrate-Nitrite	ND	0.10								

LCS Sample ID: **LCS-A-R407694B** Units: **mg/L** Analysis Date: **7/10/2024 07:56 PM**
Client ID: Run ID: **IC3_240710A** SeqNo: **10944377** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	9.411	1.0	10	0	94.1	88-110	0			
Nitrogen, Nitrate	2.018	0.10	2	0	101	90-110	0			
Nitrogen, Nitrite	2.017	0.10	2	0	101	89-113	0			
Nitrogen, Nitrate-Nitrite	4.036	0.10	4	0	101	90-110	0			

MS Sample ID: **24070392-01I MS** Units: **mg/L** Analysis Date: **7/10/2024 08:25 PM**
Client ID: **Midstream (MS)** Run ID: **IC3_240710A** SeqNo: **10944380** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	9.913	1.0	10	0.6768	92.4	88-110	0			
Nitrogen, Nitrate	1.956	0.10	2	0	97.8	90-110	0			
Nitrogen, Nitrite	1.952	0.10	2	0	97.6	89-113	0			
Nitrogen, Nitrate-Nitrite	3.907	0.10	4	0	97.7	90-110	0			

MSD Sample ID: **24070392-01I MSD** Units: **mg/L** Analysis Date: **7/10/2024 08:35 PM**
Client ID: **Midstream (MS)** Run ID: **IC3_240710A** SeqNo: **10944381** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	9.865	1.0	10	0.6768	91.9	88-110	9.913	0.49	15	
Nitrogen, Nitrate	1.958	0.10	2	0	97.9	90-110	1.956	0.092	15	
Nitrogen, Nitrite	1.956	0.10	2	0	97.8	89-113	1.952	0.205	15	
Nitrogen, Nitrate-Nitrite	3.913	0.10	4	0	97.8	90-110	3.907	0.148	15	

The following samples were analyzed in this batch: 24070392-01I 24070392-02I 24070392-03I

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Mackinac Environmental Technology, Inc.
Work Order: 24070392
Project: Superior Township Dump

QC BATCH REPORT

Batch ID: **R408020b** Instrument ID **SKALAR2** Method: **A4500-NH3 G-11**

MBLK Sample ID: **MBLK2-R408020b** Units: **mg NH3-N/L** Analysis Date: **7/16/2024 03:15 PM**
Client ID: Run ID: **SKALAR2_240716A** SeqNo: **10958980** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	ND	0.020								

LCS Sample ID: **LCS2-R408020b** Units: **mg NH3-N/L** Analysis Date: **7/16/2024 03:19 PM**
Client ID: Run ID: **SKALAR2_240716A** SeqNo: **10958981** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	1.013	0.020	1	0	101	74-129	0			

MS Sample ID: **24070331-03B MS** Units: **mg NH3-N/L** Analysis Date: **7/16/2024 03:31 PM**
Client ID: Run ID: **SKALAR2_240716A** SeqNo: **10958984** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	1.087	0.020	1	0.0725	101	74-129	0			

MS Sample ID: **24070367-01I MS** Units: **mg NH3-N/L** Analysis Date: **7/16/2024 04:05 PM**
Client ID: Run ID: **SKALAR2_240716A** SeqNo: **10958992** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	1.265	0.020	1	0.1973	107	74-129	0			

MSD Sample ID: **24070331-03B MSD** Units: **mg NH3-N/L** Analysis Date: **7/16/2024 03:36 PM**
Client ID: Run ID: **SKALAR2_240716A** SeqNo: **10958985** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	1.101	0.020	1	0.0725	103	74-129	1.087	1.23	25	

MSD Sample ID: **24070367-01I MSD** Units: **mg NH3-N/L** Analysis Date: **7/16/2024 04:09 PM**
Client ID: Run ID: **SKALAR2_240716A** SeqNo: **10958993** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	1.266	0.020	1	0.1973	107	74-129	1.265	0.0648	25	

The following samples were analyzed in this batch: 24070392-01D 24070392-02D 24070392-03D

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Mackinac Environmental Technology, Inc.
Work Order: 24070392
Project: Superior Township Dump

QC BATCH REPORT

Batch ID: **R408105a** Instrument ID **SKALAR2** Method: **E365.1 R2.0**

MBLK Sample ID: **MBLK1-R408105a** Units: **mg/L** Analysis Date: **7/17/2024 03:03 PM**
Client ID: Run ID: **SKALAR2_240717A** SeqNo: **10962907** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	ND	0.050								

LCS Sample ID: **LCS1-R408105a** Units: **mg/L** Analysis Date: **7/17/2024 03:06 PM**
Client ID: Run ID: **SKALAR2_240717A** SeqNo: **10962908** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	2.606	0.050	2.5	0	104	90-110	0			

MS Sample ID: **24070331-01B MS** Units: **mg/L** Analysis Date: **7/17/2024 03:18 PM**
Client ID: Run ID: **SKALAR2_240717A** SeqNo: **10962911** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	2.569	0.050	2.5	-0.004263	103	90-110	0			

MS Sample ID: **24070138-14B MS** Units: **mg/L** Analysis Date: **7/17/2024 05:00 PM**
Client ID: Run ID: **SKALAR2_240717A** SeqNo: **10962935** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	3.429	0.050	2.5	0.8299	104	90-110	0			

MSD Sample ID: **24070331-01B MSD** Units: **mg/L** Analysis Date: **7/17/2024 03:23 PM**
Client ID: Run ID: **SKALAR2_240717A** SeqNo: **10962912** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	2.537	0.050	2.5	-0.004263	102	90-110	2.569	1.26	20	

MSD Sample ID: **24070138-14B MSD** Units: **mg/L** Analysis Date: **7/17/2024 05:02 PM**
Client ID: Run ID: **SKALAR2_240717A** SeqNo: **10962936** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	3.44	0.050	2.5	0.8299	104	90-110	3.429	0.325	20	

The following samples were analyzed in this batch: 24070392-01D 24070392-02D 24070392-03D

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Simi Valley, CA +1 805 526 7161
Kelso, WA +1 360 577 7222
Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Middletown, PA +1 717 944 5541
Valparaiso, IN +1 219 299 8127
Salt Lake City, UT +1 801 266 7700
South Charleston, WV +1 304 356 3168
Rochester, NY +1 585 288 5380

Chain of Custody Form

Page 1 of 1

COC ID: 065499

ALS Project Manager: | ALS Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	Superior Township Dump (STD)	A	VOCs
Quote #		Project Number	M23-4099	B	PAH
Company Name		Bill To Company	MET	C	Metals (As, Ba, Hg, Al, Mn, Fe, Pb)
Send Report To	Ed Radecki	Invoice Attn	Nikole Noble	D	Ammonia-Nitrate, nitrate/nitrite, phosphorous, chloride
Address		Address	300 Ferry Ln	E	BOD
City/State/Zip		City/State/Zip	Saint Ignace/MI/49781	F	
Phone		Phone		G	
Fax		Fax		H	
e-Mail Address	met@sault.com	e-Mail Address	metesault.com	I	
				J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	Hold
1	Midstream (MS)	7-9-24	1050	Water		11	X	X	X	X	X		
2	Upstream (US)	↓	1105	↓		↓	↓	↓	↓	↓	↓		
3	Downstream (DS)	↓	1035	↓		↓	↓	↓	↓	↓	↓		
4													
5													
6													
7													
8													
9													
10													

24070392

MACKNAC ENVIRONMENTAL TECHNOLOGY Mackenac Environmental Technology, Inc.
Project: Superior Township Dump

Sampler(s) Please Print & Sign: Matt Radsvick

Shipment Method: Fedex

Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☐ 2 BD ☐ 1 BD Other

Relinquished by:	Date:	Time:	Received by:	Notes:
	7-9-24	1500	7-10-24 9:30	Non-MUSTA
Relinquished by:	Date:	Time:	Received by (Laboratory):	
Logged by (Laboratory):	Date: 7-10-24	Time: 11:37	Checked by (Laboratory):	

Cooler ID	Cooler Temp.
4.0c	PF2

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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ALS Group, USA
Holland, Michigan

Sample Receipt Checklist

Client Name: **MACKINAC ENVIRONMENTAL TE** Date/Time Received: **10-Jul-24 09:30**

Work Order: **24070392** Received by: **CMK**

Checklist completed by Caleb Koetje (eSignature) 10-Jul-24 (Date) Reviewed by: Alex J. Csaszar (eSignature) 10-Jul-24 (Date)

Matrices: Water
Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Sample(s) received on ice?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	4.0c	DF2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	7/10/2024 2:09:23 PM		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☑	No ☐	N/A ☐
pH adjusted by:	CMK		

Login Notes: pH Check <2 (Had a nitric acid preserved bottle for Metals testing but no sulfuric acid preserved bottle for Ammonia tests. One was preserved with sulfuric acid)

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

24-Jul-2024

Matt Radsvick
Mackinac Environmental Technology, Inc.
4 Pennsylvania Plz.
Petoskey, MI 49770

Re: **Superior Township Dump M23-4099** Work Order: **24070451**

Dear Matt,

ALS Environmental received 9 samples on 11-Jul-2024 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 72.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Alex J. Csaszar

Alex J. Csaszar
Project Manager

Report of Laboratory Analysis

Certificate No: FL E871106

ALS Group, USA

Date: 24-Jul-24

Client: Mackinac Environmental Technology, Inc.
Project: Superior Township Dump M23-4099
Work Order: **24070451**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
24070451-01	HA-6	Groundwater		7/9/2024 10:56	7/11/2024 09:00	☐
24070451-02	HA-5	Groundwater		7/9/2024 11:40	7/11/2024 09:00	☐
24070451-03	HA-8	Groundwater		7/9/2024 13:28	7/11/2024 09:00	☐
24070451-04	HA-9	Groundwater		7/9/2024 14:30	7/11/2024 09:00	☐
24070451-05	HA-4	Groundwater		7/9/2024 12:02	7/11/2024 09:00	☐
24070451-06	MW-1	Groundwater		7/9/2024 13:25	7/11/2024 09:00	☐
24070451-07	MW-9	Groundwater		7/9/2024 13:25	7/11/2024 09:00	☐
24070451-08	MW-2	Groundwater		7/9/2024 14:25	7/11/2024 09:00	☐
24070451-09	Trip Blank	Water		7/9/2024	7/11/2024 09:00	☐

Client:	Mackinac Environmental Technology, Inc.
Project:	Superior Township Dump M23-4099
Work Order:	24070451

Case Narrative

The attached "Sample Receipt Checklist" documents the date of receipt, status of custody seals, container integrity, preservation, and temperature compliance.

Samples were analyzed according to the analytical methodology previously transmitted in the "Work Order Acknowledgement". Methodologies are also documented in the "Analytical Result" section for each sample. Quality control results are listed in the "QC Report" section. A copy of the laboratory's scope of accreditation is available upon request.

Sample association for the reported quality control is located at the end of each batch summary. If applicable, results are appropriately qualified in the Analytical Result and QC Report sections. The "Qualifiers" section documents the various qualifiers, units, and acronyms utilized in reporting.

Any flags on MS/MSD samples not addressed in this narrative are unrelated to samples in this report.

With the following exceptions, all sample analyses achieved analytical criteria.

Extractable Organics:

Batch 243539, Method SW8270E, Sample HA-8 (24070451-03B): One or more surrogate recoveries were below the lower control limits. The sample results may be biased low.

Batch 243539, Method SW8270E, Sample HA-9 (24070451-04B): One or more surrogate recoveries were below the lower control limits. The sample results may be biased low.

Metals:

Batch 243562, Method SW6020B, Sample 24070451-06CMS: The MS recovery was outside of the control limit; however, the result in the parent sample is greater than 4x the spike amount. No qualification is required for this analyte: Mn

Batch 243562, Method SW6020B, Sample 24070451-06CMS: The MS recovery was outside of the control limit; however, the result in the parent sample is greater than 4x the spike amount. No qualification is required for this analyte: Al

Batch 243562, Method SW6020B, Sample 24070451-06CMSD: The MSD recovery was

outside of the control limit; however, the result in the parent sample is greater than 4x the spike amount. No qualification is required for this analyte: Mn

Batch 243562, Method SW6020B, Sample 24070451-06CMSD: The MSD recovery was outside of the control limit; however, the result in the parent sample is greater than 4x the spike amount. No qualification is required for this analyte: Al

Client:	Mackinac Environmental Technology, Inc.
Project:	Superior Township Dump M23-4099
WorkOrder:	**24070451**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Analyte accreditation is not offered
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

Units Reported	Description
µg/L	Micrograms per Liter
mg/L	Milligrams per Liter

ALS Group, USA

Date: *24-Jul-24*

Client:	Mackinac Environmental Technology, Inc.	**Client Sample ID:**	HA-6
Work Order:	24070451	**Collection Date:**	7/9/2024 10:56:00 AM
Project:	Superior Township Dump M23-4099		
Lab ID:	24070451-01	**Matrix:**	GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7470A**		Prep Date: **7/18/2024**		Analyst: **KSC**
Mercury	ND	0.00020	0.00020		mg/L	1	7/19/2024
METALS BY ICP-MS			**SW6020B**		Prep Date: **7/16/2024**		Analyst: **STP**
Aluminum	**5.3**	**0.10**	**0.050**		**mg/L**	10	7/18/2024
Arsenic	ND	0.0050	0.0050		mg/L	1	7/17/2024
Barium	**0.12**	**0.10**	**0.10**		**mg/L**	1	7/17/2024
Iron	**7.7**	**0.20**	**0.20**		**mg/L**	1	7/17/2024
Lead	**0.0055**	**0.0050**	**0.0030**		**mg/L**	1	7/17/2024
Manganese	**0.26**	**0.050**	**0.050**		**mg/L**	1	7/17/2024
POLYNUCLEAR AROMATIC HYDROCARBONS (SIM)			**SW8270E**		Prep Date: **7/15/2024**		Analyst: **SMT**
2-Chloronaphthalene	ND	5.0	5.0		µg/L	1	7/15/2024
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	7/15/2024
Acenaphthene	ND	5.0	5.0		µg/L	1	7/15/2024
Acenaphthylene	ND	5.0	5.0		µg/L	1	7/15/2024
Anthracene	ND	5.0	5.0		µg/L	1	7/15/2024
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	7/15/2024
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	7/15/2024
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	7/15/2024
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	7/15/2024
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	7/15/2024
Chrysene	ND	1.0	1.0		µg/L	1	7/15/2024
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	7/15/2024
Fluoranthene	ND	1.0	1.0		µg/L	1	7/15/2024
Fluorene	ND	5.0	5.0		µg/L	1	7/15/2024
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	7/15/2024
Naphthalene	ND	5.0	5.0		µg/L	1	7/15/2024
Phenanthrene	ND	2.0	2.0		µg/L	1	7/15/2024
Pyrene	ND	5.0	5.0		µg/L	1	7/15/2024
Surr: 2-Fluorobiphenyl	*108*	*62-135*			*%REC*	1	7/15/2024
Surr: 4-Terphenyl-d14	*72.8*	*48-133*			*%REC*	1	7/15/2024
Surr: Nitrobenzene-d5	*53.3*	*21-57*			*%REC*	1	7/15/2024
VOLATILE ORGANIC COMPOUNDS			**SW8260D**				Analyst: **JGV**
1,1,1,2-Tetrachloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1,1-Trichloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1,2,2-Tetrachloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1,2-Trichloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1,2-Trichlorotrifluoroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1-Dichloroethane	ND	1.0	1.0		µg/L	1	7/13/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	Mackinac Environmental Technology, Inc.	**Client Sample ID:**	HA-6
Work Order:	24070451	**Collection Date:**	7/9/2024 10:56:00 AM
Project:	Superior Township Dump M23-4099		
Lab ID:	24070451-01	**Matrix:**	GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	1.0	1.0		µg/L	1	7/13/2024
1,2,3-Trichloropropane	ND	1.0	1.0		µg/L	1	7/13/2024
1,2,4-Trichlorobenzene	ND	5.0	5.0		µg/L	1	7/13/2024
1,2,4-Trimethylbenzene	ND	1.0	1.0		µg/L	1	7/13/2024
1,2-Dibromo-3-chloropropane	ND	1.0	0.20		µg/L	1	7/13/2024
1,2-Dibromoethane	ND	1.0	0.050		µg/L	1	7/13/2024
1,2-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/13/2024
1,2-Dichloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,2-Dichloropropane	ND	1.0	1.0		µg/L	1	7/13/2024
1,3,5-Trimethylbenzene	ND	1.0	1.0		µg/L	1	7/13/2024
1,3-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/13/2024
1,4-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/13/2024
2-Butanone	ND	25	25		µg/L	1	7/13/2024
2-Hexanone	ND	50	50		µg/L	1	7/13/2024
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	7/13/2024
4-Methyl-2-pentanone	ND	50	50		µg/L	1	7/13/2024
Acetone	ND	50	50		µg/L	1	7/13/2024
Acrylonitrile	ND	2.0	2.0		µg/L	1	7/13/2024
Benzene	ND	1.0	1.0		µg/L	1	7/13/2024
Bromochloromethane	ND	1.0	1.0		µg/L	1	7/13/2024
Bromodichloromethane	ND	1.0	1.0		µg/L	1	7/13/2024
Bromoform	ND	1.0	1.0		µg/L	1	7/13/2024
Bromomethane	ND	5.0	5.0		µg/L	1	7/13/2024
Carbon disulfide	ND	5.0	5.0		µg/L	1	7/13/2024
Carbon tetrachloride	ND	1.0	1.0		µg/L	1	7/13/2024
Chlorobenzene	ND	1.0	1.0		µg/L	1	7/13/2024
Chloroethane	ND	5.0	5.0		µg/L	1	7/13/2024
Chloroform	ND	1.0	1.0		µg/L	1	7/13/2024
Chloromethane	ND	5.0	5.0		µg/L	1	7/13/2024
cis-1,2-Dichloroethene	ND	1.0	1.0		µg/L	1	7/13/2024
cis-1,3-Dichloropropene	ND	1.0	1.0		µg/L	1	7/13/2024
Dibromochloromethane	ND	5.0	5.0		µg/L	1	7/13/2024
Dibromomethane	ND	5.0	5.0		µg/L	1	7/13/2024
Dichlorodifluoromethane	ND	5.0	5.0		µg/L	1	7/13/2024
Diethyl ether	ND	10	10		µg/L	1	7/13/2024
Ethylbenzene	ND	1.0	1.0		µg/L	1	7/13/2024
Hexachloroethane	ND	5.0	5.0		µg/L	1	7/13/2024
Isopropylbenzene	ND	5.0	5.0		µg/L	1	7/13/2024
m,p-Xylene	ND	2.0	2.0		µg/L	1	7/13/2024
Methyl iodide	ND	5.0	1.0		µg/L	1	7/13/2024
Methyl tert-butyl ether	ND	5.0	5.0		µg/L	1	7/13/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Mackinac Environmental Technology, Inc. **Client Sample ID:** HA-6
Work Order: 24070451 **Collection Date:** 7/9/2024 10:56:00 AM
Project: Superior Township Dump M23-4099
Lab ID: 24070451-01 **Matrix:** GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Methylene chloride	ND	5.0	5.0		µg/L	1	7/13/2024
Naphthalene	ND	5.0	5.0		µg/L	1	7/13/2024
n-Propylbenzene	ND	1.0	1.0		µg/L	1	7/13/2024
o-Xylene	ND	1.0	1.0		µg/L	1	7/13/2024
Styrene	ND	1.0	1.0		µg/L	1	7/13/2024
Tetrachloroethene	ND	1.0	1.0		µg/L	1	7/13/2024
Toluene	ND	1.0	1.0		µg/L	1	7/13/2024
trans-1,2-Dichloroethene	ND	1.0	1.0		µg/L	1	7/13/2024
trans-1,3-Dichloropropene	ND	1.0	1.0		µg/L	1	7/13/2024
trans-1,4-Dichloro-2-butene	ND	2.0	1.0		µg/L	1	7/13/2024
Trichloroethene	ND	1.0	1.0		µg/L	1	7/13/2024
Trichlorofluoromethane	ND	1.0	1.0		µg/L	1	7/13/2024
Vinyl acetate	ND	100	100		µg/L	1	7/13/2024
Vinyl chloride	ND	1.0	1.0		µg/L	1	7/13/2024
Xylenes, Total	ND	3.0	3.0		µg/L	1	7/13/2024
Surr: 1,2-Dichloroethane-d4	*102*	*80-120*			*%REC*	1	7/13/2024
Surr: 4-Bromofluorobenzene	*103*	*80-120*			*%REC*	1	7/13/2024
Surr: Dibromofluoromethane	*100*	*80-120*			*%REC*	1	7/13/2024
Surr: Toluene-d8	*102*	*80-120*			*%REC*	1	7/13/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	Mackinac Environmental Technology, Inc.	**Client Sample ID:**	HA-5
Work Order:	24070451	**Collection Date:**	7/9/2024 11:40:00 AM
Project:	Superior Township Dump M23-4099		
Lab ID:	24070451-02	**Matrix:**	GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7470A**		Prep Date: **7/18/2024**		Analyst: **KSC**
Mercury	ND	0.00020	0.00020		mg/L	1	7/19/2024
METALS BY ICP-MS			**SW6020B**		Prep Date: **7/16/2024**		Analyst: **STP**
Aluminum	**3.4**	**0.10**	**0.050**		**mg/L**	10	7/18/2024
Arsenic	ND	0.0050	0.0050		mg/L	1	7/17/2024
Barium	**0.12**	**0.10**	**0.10**		**mg/L**	1	7/17/2024
Iron	**3.8**	**0.20**	**0.20**		**mg/L**	1	7/17/2024
Lead	ND	0.0050	0.0030		mg/L	1	7/17/2024
Manganese	**0.74**	**0.050**	**0.050**		**mg/L**	1	7/17/2024
POLYNUCLEAR AROMATIC HYDROCARBONS (SIM)			**SW8270E**		Prep Date: **7/15/2024**		Analyst: **SMT**
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	7/16/2024
Acenaphthene	ND	5.0	5.0		µg/L	1	7/16/2024
Acenaphthylene	ND	5.0	5.0		µg/L	1	7/16/2024
Anthracene	ND	5.0	5.0		µg/L	1	7/16/2024
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	7/16/2024
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	7/16/2024
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	7/16/2024
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	7/16/2024
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	7/16/2024
Chrysene	ND	1.0	1.0		µg/L	1	7/16/2024
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	7/16/2024
Fluoranthene	ND	1.0	1.0		µg/L	1	7/16/2024
Fluorene	ND	5.0	5.0		µg/L	1	7/16/2024
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	7/16/2024
Naphthalene	ND	5.0	5.0		µg/L	1	7/16/2024
Phenanthrene	ND	2.0	2.0		µg/L	1	7/16/2024
Pyrene	ND	5.0	5.0		µg/L	1	7/16/2024
Surr: 2-Fluorobiphenyl	*108*	*62-135*			*%REC*	1	7/16/2024
Surr: 4-Terphenyl-d14	*78.2*	*48-133*			*%REC*	1	7/16/2024
Surr: Nitrobenzene-d5	*49.5*	*21-57*			*%REC*	1	7/16/2024
VOLATILE ORGANIC COMPOUNDS			**SW8260D**				Analyst: **JGV**
1,1,1,2-Tetrachloroethane	ND	1.0	1.0		µg/L	1	7/16/2024
1,1,1-Trichloroethane	ND	1.0	1.0		µg/L	1	7/16/2024
1,1,2,2-Tetrachloroethane	ND	1.0	1.0		µg/L	1	7/16/2024
1,1,2-Trichloroethane	ND	1.0	1.0		µg/L	1	7/16/2024
1,1,2-Trichlorotrifluoroethane	ND	1.0	1.0		µg/L	1	7/16/2024
1,1-Dichloroethane	ND	1.0	1.0		µg/L	1	7/16/2024
1,1-Dichloroethene	ND	1.0	1.0		µg/L	1	7/16/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	Mackinac Environmental Technology, Inc.	**Client Sample ID:**	HA-5
Work Order:	24070451	**Collection Date:**	7/9/2024 11:40:00 AM
Project:	Superior Township Dump M23-4099		
Lab ID:	24070451-02	**Matrix:**	GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,2,3-Trichloropropane	ND	1.0	1.0		µg/L	1	7/16/2024
1,2,4-Trichlorobenzene	ND	5.0	5.0		µg/L	1	7/16/2024
1,2,4-Trimethylbenzene	ND	1.0	1.0		µg/L	1	7/16/2024
1,2-Dibromo-3-chloropropane	ND	1.0	0.20		µg/L	1	7/16/2024
1,2-Dibromoethane	ND	1.0	0.050		µg/L	1	7/16/2024
1,2-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/16/2024
1,2-Dichloroethane	ND	1.0	1.0		µg/L	1	7/16/2024
1,2-Dichloropropane	ND	1.0	1.0		µg/L	1	7/16/2024
1,3,5-Trimethylbenzene	ND	1.0	1.0		µg/L	1	7/16/2024
1,3-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/16/2024
1,4-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/16/2024
2-Butanone	ND	25	25		µg/L	1	7/16/2024
2-Hexanone	ND	50	50		µg/L	1	7/16/2024
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	7/16/2024
4-Methyl-2-pentanone	ND	50	50		µg/L	1	7/16/2024
Acetone	ND	50	50		µg/L	1	7/16/2024
Acrylonitrile	ND	2.0	2.0		µg/L	1	7/16/2024
Benzene	ND	1.0	1.0		µg/L	1	7/16/2024
Bromochloromethane	ND	1.0	1.0		µg/L	1	7/16/2024
Bromodichloromethane	ND	1.0	1.0		µg/L	1	7/16/2024
Bromoform	ND	1.0	1.0		µg/L	1	7/16/2024
Bromomethane	ND	5.0	5.0		µg/L	1	7/16/2024
Carbon disulfide	ND	5.0	5.0		µg/L	1	7/16/2024
Carbon tetrachloride	ND	1.0	1.0		µg/L	1	7/16/2024
Chlorobenzene	ND	1.0	1.0		µg/L	1	7/16/2024
Chloroethane	ND	5.0	5.0		µg/L	1	7/16/2024
Chloroform	ND	1.0	1.0		µg/L	1	7/16/2024
Chloromethane	ND	5.0	5.0		µg/L	1	7/16/2024
cis-1,2-Dichloroethene	ND	1.0	1.0		µg/L	1	7/16/2024
cis-1,3-Dichloropropene	ND	1.0	1.0		µg/L	1	7/16/2024
Dibromochloromethane	ND	5.0	5.0		µg/L	1	7/16/2024
Dibromomethane	ND	5.0	5.0		µg/L	1	7/16/2024
Dichlorodifluoromethane	ND	5.0	5.0		µg/L	1	7/16/2024
Diethyl ether	ND	10	10		µg/L	1	7/16/2024
Ethylbenzene	ND	1.0	1.0		µg/L	1	7/16/2024
Hexachloroethane	ND	5.0	5.0		µg/L	1	7/16/2024
Isopropylbenzene	ND	5.0	5.0		µg/L	1	7/16/2024
m,p-Xylene	ND	2.0	2.0		µg/L	1	7/16/2024
Methyl iodide	ND	5.0	1.0		µg/L	1	7/16/2024
Methyl tert-butyl ether	ND	5.0	5.0		µg/L	1	7/16/2024
Methylene chloride	ND	5.0	5.0		µg/L	1	7/16/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Mackinac Environmental Technology, Inc. **Client Sample ID:** HA-5
Work Order: 24070451 **Collection Date:** 7/9/2024 11:40:00 AM
Project: Superior Township Dump M23-4099
Lab ID: 24070451-02 **Matrix:** GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Naphthalene	ND	5.0	5.0		µg/L	1	7/16/2024
n-Propylbenzene	ND	1.0	1.0		µg/L	1	7/16/2024
o-Xylene	ND	1.0	1.0		µg/L	1	7/16/2024
Styrene	ND	1.0	1.0		µg/L	1	7/16/2024
Tetrachloroethene	ND	1.0	1.0		µg/L	1	7/16/2024
Toluene	ND	1.0	1.0		µg/L	1	7/16/2024
trans-1,2-Dichloroethene	ND	1.0	1.0		µg/L	1	7/16/2024
trans-1,3-Dichloropropene	ND	1.0	1.0		µg/L	1	7/16/2024
trans-1,4-Dichloro-2-butene	ND	2.0	1.0		µg/L	1	7/16/2024
Trichloroethene	ND	1.0	1.0		µg/L	1	7/16/2024
Trichlorofluoromethane	ND	1.0	1.0		µg/L	1	7/16/2024
Vinyl acetate	ND	100	100		µg/L	1	7/16/2024
Vinyl chloride	ND	1.0	1.0		µg/L	1	7/16/2024
Xylenes, Total	ND	3.0	3.0		µg/L	1	7/16/2024
Surr: 1,2-Dichloroethane-d4	*103*	*80-120*			*%REC*	1	7/16/2024
Surr: 4-Bromofluorobenzene	*98.5*	*80-120*			*%REC*	1	7/16/2024
Surr: Dibromofluoromethane	*102*	*80-120*			*%REC*	1	7/16/2024
Surr: Toluene-d8	*97.8*	*80-120*			*%REC*	1	7/16/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	Mackinac Environmental Technology, Inc.	**Client Sample ID:**	HA-8
Work Order:	24070451	**Collection Date:**	7/9/2024 1:28:00 PM
Project:	Superior Township Dump M23-4099		
Lab ID:	24070451-03	**Matrix:**	GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7470A**		Prep Date: **7/18/2024**		Analyst: **KSC**
Mercury	ND	0.00020	0.00020		mg/L	1	7/19/2024
METALS BY ICP-MS			**SW6020B**		Prep Date: **7/16/2024**		Analyst: **STP**
Aluminum	**6.1**	**0.10**	**0.050**		**mg/L**	10	7/18/2024
Arsenic	ND	0.0050	0.0050		mg/L	1	7/17/2024
Barium	ND	0.10	0.10		mg/L	1	7/17/2024
Iron	**3.9**	**0.20**	**0.20**		**mg/L**	1	7/17/2024
Lead	ND	0.0050	0.0030		mg/L	1	7/17/2024
Manganese	**0.073**	**0.050**	**0.050**		**mg/L**	1	7/17/2024
POLYNUCLEAR AROMATIC HYDROCARBONS (SIM)			**SW8270E**		Prep Date: **7/15/2024**		Analyst: **SMT**
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	7/16/2024
Acenaphthene	ND	5.0	5.0		µg/L	1	7/16/2024
Acenaphthylene	ND	5.0	5.0		µg/L	1	7/16/2024
Anthracene	ND	5.0	5.0		µg/L	1	7/16/2024
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	7/16/2024
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	7/16/2024
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	7/16/2024
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	7/16/2024
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	7/16/2024
Chrysene	ND	1.0	1.0		µg/L	1	7/16/2024
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	7/16/2024
Fluoranthene	ND	1.0	1.0		µg/L	1	7/16/2024
Fluorene	ND	5.0	5.0		µg/L	1	7/16/2024
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	7/16/2024
Naphthalene	ND	5.0	5.0		µg/L	1	7/16/2024
Phenanthrene	ND	2.0	2.0		µg/L	1	7/16/2024
Pyrene	ND	5.0	5.0		µg/L	1	7/16/2024
Surr: 2-Fluorobiphenyl	*64.0*	*62-135*			*%REC*	1	7/16/2024
Surr: 4-Terphenyl-d14	*28.3*	*48-133*		S	*%REC*	1	7/16/2024
Surr: Nitrobenzene-d5	*43.2*	*21-57*			*%REC*	1	7/16/2024
VOLATILE ORGANIC COMPOUNDS			**SW8260D**				Analyst: **JGV**
1,1,1,2-Tetrachloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1,1-Trichloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1,2,2-Tetrachloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1,2-Trichloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1,2-Trichlorotrifluoroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1-Dichloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1-Dichloroethene	ND	1.0	1.0		µg/L	1	7/13/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	Mackinac Environmental Technology, Inc.	**Client Sample ID:**	HA-8
Work Order:	24070451	**Collection Date:**	7/9/2024 1:28:00 PM
Project:	Superior Township Dump M23-4099		
Lab ID:	24070451-03	**Matrix:**	GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,2,3-Trichloropropane	ND	1.0	1.0		µg/L	1	7/13/2024
1,2,4-Trichlorobenzene	ND	5.0	5.0		µg/L	1	7/13/2024
1,2,4-Trimethylbenzene	ND	1.0	1.0		µg/L	1	7/13/2024
1,2-Dibromo-3-chloropropane	ND	1.0	0.20		µg/L	1	7/13/2024
1,2-Dibromoethane	ND	1.0	0.050		µg/L	1	7/13/2024
1,2-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/13/2024
1,2-Dichloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,2-Dichloropropane	ND	1.0	1.0		µg/L	1	7/13/2024
1,3,5-Trimethylbenzene	ND	1.0	1.0		µg/L	1	7/13/2024
1,3-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/13/2024
1,4-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/13/2024
2-Butanone	ND	25	25		µg/L	1	7/13/2024
2-Hexanone	ND	50	50		µg/L	1	7/13/2024
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	7/13/2024
4-Methyl-2-pentanone	ND	50	50		µg/L	1	7/13/2024
Acetone	ND	50	50		µg/L	1	7/13/2024
Acrylonitrile	ND	2.0	2.0		µg/L	1	7/13/2024
Benzene	ND	1.0	1.0		µg/L	1	7/13/2024
Bromochloromethane	ND	1.0	1.0		µg/L	1	7/13/2024
Bromodichloromethane	ND	1.0	1.0		µg/L	1	7/13/2024
Bromoform	ND	1.0	1.0		µg/L	1	7/13/2024
Bromomethane	ND	5.0	5.0		µg/L	1	7/13/2024
Carbon disulfide	ND	5.0	5.0		µg/L	1	7/13/2024
Carbon tetrachloride	ND	1.0	1.0		µg/L	1	7/13/2024
Chlorobenzene	ND	1.0	1.0		µg/L	1	7/13/2024
Chloroethane	ND	5.0	5.0		µg/L	1	7/13/2024
Chloroform	ND	1.0	1.0		µg/L	1	7/13/2024
Chloromethane	ND	5.0	5.0		µg/L	1	7/13/2024
cis-1,2-Dichloroethene	ND	1.0	1.0		µg/L	1	7/13/2024
cis-1,3-Dichloropropene	ND	1.0	1.0		µg/L	1	7/13/2024
Dibromochloromethane	ND	5.0	5.0		µg/L	1	7/13/2024
Dibromomethane	ND	5.0	5.0		µg/L	1	7/13/2024
Dichlorodifluoromethane	ND	5.0	5.0		µg/L	1	7/13/2024
Diethyl ether	ND	10	10		µg/L	1	7/13/2024
Ethylbenzene	ND	1.0	1.0		µg/L	1	7/13/2024
Hexachloroethane	ND	5.0	5.0		µg/L	1	7/13/2024
Isopropylbenzene	ND	5.0	5.0		µg/L	1	7/13/2024
m,p-Xylene	ND	2.0	2.0		µg/L	1	7/13/2024
Methyl iodide	ND	5.0	1.0		µg/L	1	7/13/2024
Methyl tert-butyl ether	ND	5.0	5.0		µg/L	1	7/13/2024
Methylene chloride	ND	5.0	5.0		µg/L	1	7/13/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	Mackinac Environmental Technology, Inc.	**Client Sample ID:**	HA-8
Work Order:	24070451	**Collection Date:**	7/9/2024 1:28:00 PM
Project:	Superior Township Dump M23-4099		
Lab ID:	24070451-03	**Matrix:**	GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Naphthalene	ND	5.0	5.0		µg/L	1	7/13/2024
n-Propylbenzene	ND	1.0	1.0		µg/L	1	7/13/2024
o-Xylene	ND	1.0	1.0		µg/L	1	7/13/2024
Styrene	ND	1.0	1.0		µg/L	1	7/13/2024
Tetrachloroethene	ND	1.0	1.0		µg/L	1	7/13/2024
Toluene	ND	1.0	1.0		µg/L	1	7/13/2024
trans-1,2-Dichloroethene	ND	1.0	1.0		µg/L	1	7/13/2024
trans-1,3-Dichloropropene	ND	1.0	1.0		µg/L	1	7/13/2024
trans-1,4-Dichloro-2-butene	ND	2.0	1.0		µg/L	1	7/13/2024
Trichloroethene	ND	1.0	1.0		µg/L	1	7/13/2024
Trichlorofluoromethane	ND	1.0	1.0		µg/L	1	7/13/2024
Vinyl acetate	ND	100	100		µg/L	1	7/13/2024
Vinyl chloride	ND	1.0	1.0		µg/L	1	7/13/2024
Xylenes, Total	ND	3.0	3.0		µg/L	1	7/13/2024
Surr: 1,2-Dichloroethane-d4	*99.3*	*80-120*			*%REC*	1	7/13/2024
Surr: 4-Bromofluorobenzene	*95.2*	*80-120*			*%REC*	1	7/13/2024
Surr: Dibromofluoromethane	*98.7*	*80-120*			*%REC*	1	7/13/2024
Surr: Toluene-d8	*99.9*	*80-120*			*%REC*	1	7/13/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	Mackinac Environmental Technology, Inc.	**Client Sample ID:**	HA-9
Work Order:	24070451	**Collection Date:**	7/9/2024 2:30:00 PM
Project:	Superior Township Dump M23-4099		
Lab ID:	24070451-04	**Matrix:**	GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7470A**		Prep Date: **7/18/2024**		Analyst: **KSC**
Mercury	ND	0.00020	0.00020		mg/L	1	7/19/2024
METALS BY ICP-MS			**SW6020B**		Prep Date: **7/16/2024**		Analyst: **STP**
Aluminum	**120**	**1.0**	**0.050**		**mg/L**	100	7/22/2024
Arsenic	**0.011**	**0.0050**	**0.0050**		**mg/L**	1	7/17/2024
Barium	**0.90**	**0.10**	**0.10**		**mg/L**	1	7/17/2024
Iron	**78**	**0.20**	**0.20**		**mg/L**	1	7/17/2024
Lead	**0.082**	**0.0050**	**0.0030**		**mg/L**	1	7/17/2024
Manganese	**1.7**	**0.050**	**0.050**		**mg/L**	1	7/17/2024
POLYNUCLEAR AROMATIC HYDROCARBONS (SIM)			**SW8270E**		Prep Date: **7/15/2024**		Analyst: **SMT**
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	7/16/2024
Acenaphthene	ND	5.0	5.0		µg/L	1	7/16/2024
Acenaphthylene	ND	5.0	5.0		µg/L	1	7/16/2024
Anthracene	ND	5.0	5.0		µg/L	1	7/16/2024
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	7/16/2024
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	7/16/2024
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	7/16/2024
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	7/16/2024
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	7/16/2024
Chrysene	ND	1.0	1.0		µg/L	1	7/16/2024
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	7/16/2024
Fluoranthene	ND	1.0	1.0		µg/L	1	7/16/2024
Fluorene	ND	5.0	5.0		µg/L	1	7/16/2024
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	7/16/2024
Naphthalene	ND	5.0	5.0		µg/L	1	7/16/2024
Phenanthrene	ND	2.0	2.0		µg/L	1	7/16/2024
Pyrene	ND	5.0	5.0		µg/L	1	7/16/2024
Surr: 2-Fluorobiphenyl	*97.8*	*62-135*			*%REC*	1	7/16/2024
Surr: 4-Terphenyl-d14	*39.9*	*48-133*		S	*%REC*	1	7/16/2024
Surr: Nitrobenzene-d5	*46.5*	*21-57*			*%REC*	1	7/16/2024
VOLATILE ORGANIC COMPOUNDS			**SW8260D**				Analyst: **JGV**
1,1,1,2-Tetrachloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1,1-Trichloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1,2,2-Tetrachloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1,2-Trichloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1,2-Trichlorotrifluoroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1-Dichloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1-Dichloroethene	ND	1.0	1.0		µg/L	1	7/13/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	Mackinac Environmental Technology, Inc.	**Client Sample ID:**	HA-9
Work Order:	24070451	**Collection Date:**	7/9/2024 2:30:00 PM
Project:	Superior Township Dump M23-4099		
Lab ID:	24070451-04	**Matrix:**	GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,2,3-Trichloropropane	ND	1.0	1.0		µg/L	1	7/13/2024
1,2,4-Trichlorobenzene	ND	5.0	5.0		µg/L	1	7/13/2024
1,2,4-Trimethylbenzene	ND	1.0	1.0		µg/L	1	7/13/2024
1,2-Dibromo-3-chloropropane	ND	1.0	0.20		µg/L	1	7/13/2024
1,2-Dibromoethane	ND	1.0	0.050		µg/L	1	7/13/2024
1,2-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/13/2024
1,2-Dichloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,2-Dichloropropane	ND	1.0	1.0		µg/L	1	7/13/2024
1,3,5-Trimethylbenzene	ND	1.0	1.0		µg/L	1	7/13/2024
1,3-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/13/2024
1,4-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/13/2024
2-Butanone	ND	25	25		µg/L	1	7/13/2024
2-Hexanone	ND	50	50		µg/L	1	7/13/2024
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	7/13/2024
4-Methyl-2-pentanone	ND	50	50		µg/L	1	7/13/2024
Acetone	ND	50	50		µg/L	1	7/13/2024
Acrylonitrile	ND	2.0	2.0		µg/L	1	7/13/2024
Benzene	ND	1.0	1.0		µg/L	1	7/13/2024
Bromochloromethane	ND	1.0	1.0		µg/L	1	7/13/2024
Bromodichloromethane	ND	1.0	1.0		µg/L	1	7/13/2024
Bromoform	ND	1.0	1.0		µg/L	1	7/13/2024
Bromomethane	ND	5.0	5.0		µg/L	1	7/13/2024
Carbon disulfide	ND	5.0	5.0		µg/L	1	7/13/2024
Carbon tetrachloride	ND	1.0	1.0		µg/L	1	7/13/2024
Chlorobenzene	ND	1.0	1.0		µg/L	1	7/13/2024
Chloroethane	ND	5.0	5.0		µg/L	1	7/13/2024
Chloroform	ND	1.0	1.0		µg/L	1	7/13/2024
Chloromethane	ND	5.0	5.0		µg/L	1	7/13/2024
cis-1,2-Dichloroethene	ND	1.0	1.0		µg/L	1	7/13/2024
cis-1,3-Dichloropropene	ND	1.0	1.0		µg/L	1	7/13/2024
Dibromochloromethane	ND	5.0	5.0		µg/L	1	7/13/2024
Dibromomethane	ND	5.0	5.0		µg/L	1	7/13/2024
Dichlorodifluoromethane	ND	5.0	5.0		µg/L	1	7/13/2024
Diethyl ether	ND	10	10		µg/L	1	7/13/2024
Ethylbenzene	ND	1.0	1.0		µg/L	1	7/13/2024
Hexachloroethane	ND	5.0	5.0		µg/L	1	7/13/2024
Isopropylbenzene	ND	5.0	5.0		µg/L	1	7/13/2024
m,p-Xylene	ND	2.0	2.0		µg/L	1	7/13/2024
Methyl iodide	ND	5.0	1.0		µg/L	1	7/13/2024
Methyl tert-butyl ether	ND	5.0	5.0		µg/L	1	7/13/2024
Methylene chloride	ND	5.0	5.0		µg/L	1	7/13/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Mackinac Environmental Technology, Inc. **Client Sample ID:** HA-9
Work Order: 24070451 **Collection Date:** 7/9/2024 2:30:00 PM
Project: Superior Township Dump M23-4099
Lab ID: 24070451-04 **Matrix:** GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Naphthalene	ND	5.0	5.0		µg/L	1	7/13/2024
n-Propylbenzene	ND	1.0	1.0		µg/L	1	7/13/2024
o-Xylene	ND	1.0	1.0		µg/L	1	7/13/2024
Styrene	ND	1.0	1.0		µg/L	1	7/13/2024
Tetrachloroethene	ND	1.0	1.0		µg/L	1	7/13/2024
Toluene	ND	1.0	1.0		µg/L	1	7/13/2024
trans-1,2-Dichloroethene	ND	1.0	1.0		µg/L	1	7/13/2024
trans-1,3-Dichloropropene	ND	1.0	1.0		µg/L	1	7/13/2024
trans-1,4-Dichloro-2-butene	ND	2.0	1.0		µg/L	1	7/13/2024
Trichloroethene	ND	1.0	1.0		µg/L	1	7/13/2024
Trichlorofluoromethane	ND	1.0	1.0		µg/L	1	7/13/2024
Vinyl acetate	ND	100	100		µg/L	1	7/13/2024
Vinyl chloride	ND	1.0	1.0		µg/L	1	7/13/2024
Xylenes, Total	ND	3.0	3.0		µg/L	1	7/13/2024
Surr: 1,2-Dichloroethane-d4	*98.0*	*80-120*			*%REC*	1	7/13/2024
Surr: 4-Bromofluorobenzene	*96.4*	*80-120*			*%REC*	1	7/13/2024
Surr: Dibromofluoromethane	*100*	*80-120*			*%REC*	1	7/13/2024
Surr: Toluene-d8	*101*	*80-120*			*%REC*	1	7/13/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	Mackinac Environmental Technology, Inc.	**Client Sample ID:**	HA-4
Work Order:	24070451	**Collection Date:**	7/9/2024 12:02:00 PM
Project:	Superior Township Dump M23-4099		
Lab ID:	24070451-05	**Matrix:**	GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7470A**		Prep Date: **7/18/2024**		Analyst: **KSC**
Mercury	ND	0.00020	0.00020		mg/L	1	7/19/2024
METALS BY ICP-MS			**SW6020B**		Prep Date: **7/16/2024**		Analyst: **STP**
Aluminum	**4.9**	**0.10**	**0.050**		**mg/L**	10	7/18/2024
Arsenic	ND	0.0050	0.0050		mg/L	1	7/17/2024
Barium	ND	0.10	0.10		mg/L	1	7/17/2024
Iron	**5.3**	**0.20**	**0.20**		**mg/L**	1	7/17/2024
Lead	**0.034**	**0.0050**	**0.0030**		**mg/L**	1	7/17/2024
Manganese	**0.43**	**0.050**	**0.050**		**mg/L**	1	7/17/2024
POLYNUCLEAR AROMATIC HYDROCARBONS (SIM)			**SW8270E**		Prep Date: **7/15/2024**		Analyst: **SMT**
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	7/16/2024
Acenaphthene	ND	5.0	5.0		µg/L	1	7/16/2024
Acenaphthylene	ND	5.0	5.0		µg/L	1	7/16/2024
Anthracene	ND	5.0	5.0		µg/L	1	7/16/2024
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	7/16/2024
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	7/16/2024
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	7/16/2024
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	7/16/2024
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	7/16/2024
Chrysene	ND	1.0	1.0		µg/L	1	7/16/2024
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	7/16/2024
Fluoranthene	ND	1.0	1.0		µg/L	1	7/16/2024
Fluorene	ND	5.0	5.0		µg/L	1	7/16/2024
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	7/16/2024
Naphthalene	ND	5.0	5.0		µg/L	1	7/16/2024
Phenanthrene	ND	2.0	2.0		µg/L	1	7/16/2024
Pyrene	ND	5.0	5.0		µg/L	1	7/16/2024
Surr: 2-Fluorobiphenyl	*101*	*62-135*			*%REC*	1	7/16/2024
Surr: 4-Terphenyl-d14	*66.7*	*48-133*			*%REC*	1	7/16/2024
Surr: Nitrobenzene-d5	*47.0*	*21-57*			*%REC*	1	7/16/2024
VOLATILE ORGANIC COMPOUNDS			**SW8260D**				Analyst: **JGV**
1,1,1,2-Tetrachloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1,1-Trichloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1,2,2-Tetrachloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1,2-Trichloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1,2-Trichlorotrifluoroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1-Dichloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1-Dichloroethene	ND	1.0	1.0		µg/L	1	7/13/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	Mackinac Environmental Technology, Inc.	**Client Sample ID:**	HA-4
Work Order:	24070451	**Collection Date:**	7/9/2024 12:02:00 PM
Project:	Superior Township Dump M23-4099		
Lab ID:	24070451-05	**Matrix:**	GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,2,3-Trichloropropane	ND	1.0	1.0		µg/L	1	7/13/2024
1,2,4-Trichlorobenzene	ND	5.0	5.0		µg/L	1	7/13/2024
1,2,4-Trimethylbenzene	ND	1.0	1.0		µg/L	1	7/13/2024
1,2-Dibromo-3-chloropropane	ND	1.0	0.20		µg/L	1	7/13/2024
1,2-Dibromoethane	ND	1.0	0.050		µg/L	1	7/13/2024
1,2-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/13/2024
1,2-Dichloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,2-Dichloropropane	ND	1.0	1.0		µg/L	1	7/13/2024
1,3,5-Trimethylbenzene	ND	1.0	1.0		µg/L	1	7/13/2024
1,3-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/13/2024
1,4-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/13/2024
2-Butanone	ND	25	25		µg/L	1	7/13/2024
2-Hexanone	ND	50	50		µg/L	1	7/13/2024
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	7/13/2024
4-Methyl-2-pentanone	ND	50	50		µg/L	1	7/13/2024
Acetone	ND	50	50		µg/L	1	7/13/2024
Acrylonitrile	ND	2.0	2.0		µg/L	1	7/13/2024
Benzene	ND	1.0	1.0		µg/L	1	7/13/2024
Bromochloromethane	ND	1.0	1.0		µg/L	1	7/13/2024
Bromodichloromethane	ND	1.0	1.0		µg/L	1	7/13/2024
Bromoform	ND	1.0	1.0		µg/L	1	7/13/2024
Bromomethane	ND	5.0	5.0		µg/L	1	7/13/2024
Carbon disulfide	ND	5.0	5.0		µg/L	1	7/13/2024
Carbon tetrachloride	ND	1.0	1.0		µg/L	1	7/13/2024
Chlorobenzene	ND	1.0	1.0		µg/L	1	7/13/2024
Chloroethane	ND	5.0	5.0		µg/L	1	7/13/2024
Chloroform	ND	1.0	1.0		µg/L	1	7/13/2024
Chloromethane	ND	5.0	5.0		µg/L	1	7/13/2024
cis-1,2-Dichloroethene	ND	1.0	1.0		µg/L	1	7/13/2024
cis-1,3-Dichloropropene	ND	1.0	1.0		µg/L	1	7/13/2024
Dibromochloromethane	ND	5.0	5.0		µg/L	1	7/13/2024
Dibromomethane	ND	5.0	5.0		µg/L	1	7/13/2024
Dichlorodifluoromethane	ND	5.0	5.0		µg/L	1	7/13/2024
Diethyl ether	ND	10	10		µg/L	1	7/13/2024
Ethylbenzene	ND	1.0	1.0		µg/L	1	7/13/2024
Hexachloroethane	ND	5.0	5.0		µg/L	1	7/13/2024
Isopropylbenzene	ND	5.0	5.0		µg/L	1	7/13/2024
m,p-Xylene	ND	2.0	2.0		µg/L	1	7/13/2024
Methyl iodide	ND	5.0	1.0		µg/L	1	7/13/2024
Methyl tert-butyl ether	ND	5.0	5.0		µg/L	1	7/13/2024
Methylene chloride	ND	5.0	5.0		µg/L	1	7/13/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Mackinac Environmental Technology, Inc. **Client Sample ID:** HA-4
Work Order: 24070451 **Collection Date:** 7/9/2024 12:02:00 PM
Project: Superior Township Dump M23-4099
Lab ID: 24070451-05 **Matrix:** GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Naphthalene	ND	5.0	5.0		µg/L	1	7/13/2024
n-Propylbenzene	ND	1.0	1.0		µg/L	1	7/13/2024
o-Xylene	ND	1.0	1.0		µg/L	1	7/13/2024
Styrene	ND	1.0	1.0		µg/L	1	7/13/2024
Tetrachloroethene	ND	1.0	1.0		µg/L	1	7/13/2024
Toluene	ND	1.0	1.0		µg/L	1	7/13/2024
trans-1,2-Dichloroethene	ND	1.0	1.0		µg/L	1	7/13/2024
trans-1,3-Dichloropropene	ND	1.0	1.0		µg/L	1	7/13/2024
trans-1,4-Dichloro-2-butene	ND	2.0	1.0		µg/L	1	7/13/2024
Trichloroethene	ND	1.0	1.0		µg/L	1	7/13/2024
Trichlorofluoromethane	ND	1.0	1.0		µg/L	1	7/13/2024
Vinyl acetate	ND	100	100		µg/L	1	7/13/2024
Vinyl chloride	ND	1.0	1.0		µg/L	1	7/13/2024
Xylenes, Total	ND	3.0	3.0		µg/L	1	7/13/2024
Surr: 1,2-Dichloroethane-d4	*97.8*	*80-120*			*%REC*	1	7/13/2024
Surr: 4-Bromofluorobenzene	*100*	*80-120*			*%REC*	1	7/13/2024
Surr: Dibromofluoromethane	*97.8*	*80-120*			*%REC*	1	7/13/2024
Surr: Toluene-d8	*98.5*	*80-120*			*%REC*	1	7/13/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	Mackinac Environmental Technology, Inc.	**Client Sample ID:**	MW-1
Work Order:	24070451	**Collection Date:**	7/9/2024 1:25:00 PM
Project:	Superior Township Dump M23-4099		
Lab ID:	24070451-06	**Matrix:**	GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7470A**		Prep Date: **7/18/2024**		Analyst: **KSC**
Mercury	ND	0.00020	0.00020		mg/L	1	7/19/2024
METALS BY ICP-MS			**SW6020B**		Prep Date: **7/16/2024**		Analyst: **STP**
Aluminum	**1.7**	**0.10**	**0.050**		**mg/L**	10	7/18/2024
Arsenic	ND	0.0050	0.0050		mg/L	1	7/17/2024
Barium	**0.26**	**0.10**	**0.10**		**mg/L**	10	7/18/2024
Iron	**4.1**	**0.20**	**0.20**		**mg/L**	1	7/17/2024
Lead	ND	0.0050	0.0030		mg/L	1	7/17/2024
Manganese	**1.1**	**0.050**	**0.050**		**mg/L**	1	7/17/2024
POLYNUCLEAR AROMATIC HYDROCARBONS (SIM)			**SW8270E**		Prep Date: **7/15/2024**		Analyst: **SMT**
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	7/16/2024
Acenaphthene	ND	5.0	5.0		µg/L	1	7/16/2024
Acenaphthylene	ND	5.0	5.0		µg/L	1	7/16/2024
Anthracene	ND	5.0	5.0		µg/L	1	7/16/2024
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	7/16/2024
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	7/16/2024
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	7/16/2024
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	7/16/2024
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	7/16/2024
Chrysene	ND	1.0	1.0		µg/L	1	7/16/2024
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	7/16/2024
Fluoranthene	ND	1.0	1.0		µg/L	1	7/16/2024
Fluorene	ND	5.0	5.0		µg/L	1	7/16/2024
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	7/16/2024
Naphthalene	ND	5.0	5.0		µg/L	1	7/16/2024
Phenanthrene	ND	2.0	2.0		µg/L	1	7/16/2024
Pyrene	ND	5.0	5.0		µg/L	1	7/16/2024
Surr: 2-Fluorobiphenyl	*108*	*62-135*			*%REC*	1	7/16/2024
Surr: 4-Terphenyl-d14	*67.1*	*48-133*			*%REC*	1	7/16/2024
Surr: Nitrobenzene-d5	*43.6*	*21-57*			*%REC*	1	7/16/2024
VOLATILE ORGANIC COMPOUNDS			**SW8260D**				Analyst: **JGV**
1,1,1,2-Tetrachloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1,1-Trichloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1,2,2-Tetrachloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1,2-Trichloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1,2-Trichlorotrifluoroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1-Dichloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1-Dichloroethene	ND	1.0	1.0		µg/L	1	7/13/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Mackinac Environmental Technology, Inc. **Client Sample ID:** MW-1
Work Order: 24070451 **Collection Date:** 7/9/2024 1:25:00 PM
Project: Superior Township Dump M23-4099
Lab ID: 24070451-06 **Matrix:** GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,2,3-Trichloropropane	ND	1.0	1.0		µg/L	1	7/13/2024
1,2,4-Trichlorobenzene	ND	5.0	5.0		µg/L	1	7/13/2024
1,2,4-Trimethylbenzene	ND	1.0	1.0		µg/L	1	7/13/2024
1,2-Dibromo-3-chloropropane	ND	1.0	0.20		µg/L	1	7/13/2024
1,2-Dibromoethane	ND	1.0	0.050		µg/L	1	7/13/2024
1,2-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/13/2024
1,2-Dichloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,2-Dichloropropane	ND	1.0	1.0		µg/L	1	7/13/2024
1,3,5-Trimethylbenzene	ND	1.0	1.0		µg/L	1	7/13/2024
1,3-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/13/2024
1,4-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/13/2024
2-Butanone	ND	25	25		µg/L	1	7/13/2024
2-Hexanone	ND	50	50		µg/L	1	7/13/2024
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	7/13/2024
4-Methyl-2-pentanone	ND	50	50		µg/L	1	7/13/2024
Acetone	ND	50	50		µg/L	1	7/13/2024
Acrylonitrile	ND	2.0	2.0		µg/L	1	7/13/2024
Benzene	ND	1.0	1.0		µg/L	1	7/13/2024
Bromochloromethane	ND	1.0	1.0		µg/L	1	7/13/2024
Bromodichloromethane	ND	1.0	1.0		µg/L	1	7/13/2024
Bromoform	ND	1.0	1.0		µg/L	1	7/13/2024
Bromomethane	ND	5.0	5.0		µg/L	1	7/13/2024
Carbon disulfide	ND	5.0	5.0		µg/L	1	7/13/2024
Carbon tetrachloride	ND	1.0	1.0		µg/L	1	7/13/2024
Chlorobenzene	ND	1.0	1.0		µg/L	1	7/13/2024
Chloroethane	ND	5.0	5.0		µg/L	1	7/13/2024
Chloroform	ND	1.0	1.0		µg/L	1	7/13/2024
Chloromethane	ND	5.0	5.0		µg/L	1	7/13/2024
cis-1,2-Dichloroethene	ND	1.0	1.0		µg/L	1	7/13/2024
cis-1,3-Dichloropropene	ND	1.0	1.0		µg/L	1	7/13/2024
Dibromochloromethane	ND	5.0	5.0		µg/L	1	7/13/2024
Dibromomethane	ND	5.0	5.0		µg/L	1	7/13/2024
Dichlorodifluoromethane	ND	5.0	5.0		µg/L	1	7/13/2024
Diethyl ether	ND	10	10		µg/L	1	7/13/2024
Ethylbenzene	ND	1.0	1.0		µg/L	1	7/13/2024
Hexachloroethane	ND	5.0	5.0		µg/L	1	7/13/2024
Isopropylbenzene	ND	5.0	5.0		µg/L	1	7/13/2024
m,p-Xylene	ND	2.0	2.0		µg/L	1	7/13/2024
Methyl iodide	ND	5.0	1.0		µg/L	1	7/13/2024
Methyl tert-butyl ether	ND	5.0	5.0		µg/L	1	7/13/2024
Methylene chloride	ND	5.0	5.0		µg/L	1	7/13/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Mackinac Environmental Technology, Inc. **Client Sample ID:** MW-1
Work Order: 24070451 **Collection Date:** 7/9/2024 1:25:00 PM
Project: Superior Township Dump M23-4099
Lab ID: 24070451-06 **Matrix:** GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Naphthalene	ND	5.0	5.0		µg/L	1	7/13/2024
n-Propylbenzene	ND	1.0	1.0		µg/L	1	7/13/2024
o-Xylene	ND	1.0	1.0		µg/L	1	7/13/2024
Styrene	ND	1.0	1.0		µg/L	1	7/13/2024
Tetrachloroethene	ND	1.0	1.0		µg/L	1	7/13/2024
Toluene	ND	1.0	1.0		µg/L	1	7/13/2024
trans-1,2-Dichloroethene	ND	1.0	1.0		µg/L	1	7/13/2024
trans-1,3-Dichloropropene	ND	1.0	1.0		µg/L	1	7/13/2024
trans-1,4-Dichloro-2-butene	ND	2.0	1.0		µg/L	1	7/13/2024
Trichloroethene	ND	1.0	1.0		µg/L	1	7/13/2024
Trichlorofluoromethane	ND	1.0	1.0		µg/L	1	7/13/2024
Vinyl acetate	ND	100	100		µg/L	1	7/13/2024
Vinyl chloride	ND	1.0	1.0		µg/L	1	7/13/2024
Xylenes, Total	ND	3.0	3.0		µg/L	1	7/13/2024
Surr: 1,2-Dichloroethane-d4	*100*	*80-120*			*%REC*	1	7/13/2024
Surr: 4-Bromofluorobenzene	*98.0*	*80-120*			*%REC*	1	7/13/2024
Surr: Dibromofluoromethane	*98.4*	*80-120*			*%REC*	1	7/13/2024
Surr: Toluene-d8	*102*	*80-120*			*%REC*	1	7/13/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	Mackinac Environmental Technology, Inc.	**Client Sample ID:**	MW-9
Work Order:	24070451	**Collection Date:**	7/9/2024 1:25:00 PM
Project:	Superior Township Dump M23-4099		
Lab ID:	24070451-07	**Matrix:**	GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7470A**		Prep Date: **7/18/2024**		Analyst: **KSC**
Mercury	ND	0.00020	0.00020		mg/L	1	7/19/2024
METALS BY ICP-MS			**SW6020B**		Prep Date: **7/16/2024**		Analyst: **STP**
Aluminum	**1.4**	**0.10**	**0.050**		**mg/L**	10	7/18/2024
Arsenic	ND	0.0050	0.0050		mg/L	1	7/17/2024
Barium	**0.24**	**0.10**	**0.10**		**mg/L**	1	7/17/2024
Iron	**3.9**	**0.20**	**0.20**		**mg/L**	1	7/17/2024
Lead	ND	0.0050	0.0030		mg/L	1	7/17/2024
Manganese	**1.1**	**0.050**	**0.050**		**mg/L**	1	7/17/2024
POLYNUCLEAR AROMATIC HYDROCARBONS (SIM)			**SW8270E**		Prep Date: **7/15/2024**		Analyst: **SMT**
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	7/16/2024
Acenaphthene	ND	5.0	5.0		µg/L	1	7/16/2024
Acenaphthylene	ND	5.0	5.0		µg/L	1	7/16/2024
Anthracene	ND	5.0	5.0		µg/L	1	7/16/2024
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	7/16/2024
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	7/16/2024
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	7/16/2024
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	7/16/2024
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	7/16/2024
Chrysene	ND	1.0	1.0		µg/L	1	7/16/2024
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	7/16/2024
Fluoranthene	ND	1.0	1.0		µg/L	1	7/16/2024
Fluorene	ND	5.0	5.0		µg/L	1	7/16/2024
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	7/16/2024
Naphthalene	ND	5.0	5.0		µg/L	1	7/16/2024
Phenanthrene	ND	2.0	2.0		µg/L	1	7/16/2024
Pyrene	ND	5.0	5.0		µg/L	1	7/16/2024
Surr: 2-Fluorobiphenyl	*96.9*	*62-135*			*%REC*	1	7/16/2024
Surr: 4-Terphenyl-d14	*78.9*	*48-133*			*%REC*	1	7/16/2024
Surr: Nitrobenzene-d5	*47.8*	*21-57*			*%REC*	1	7/16/2024
VOLATILE ORGANIC COMPOUNDS			**SW8260D**				Analyst: **JGV**
1,1,1,2-Tetrachloroethane	ND	1.0	1.0		µg/L	1	7/17/2024
1,1,1-Trichloroethane	ND	1.0	1.0		µg/L	1	7/17/2024
1,1,2,2-Tetrachloroethane	ND	1.0	1.0		µg/L	1	7/17/2024
1,1,2-Trichloroethane	ND	1.0	1.0		µg/L	1	7/17/2024
1,1,2-Trichlorotrifluoroethane	ND	1.0	1.0		µg/L	1	7/17/2024
1,1-Dichloroethane	ND	1.0	1.0		µg/L	1	7/17/2024
1,1-Dichloroethene	ND	1.0	1.0		µg/L	1	7/17/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Mackinac Environmental Technology, Inc. **Client Sample ID:** MW-9
Work Order: 24070451 **Collection Date:** 7/9/2024 1:25:00 PM
Project: Superior Township Dump M23-4099
Lab ID: 24070451-07 **Matrix:** GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,2,3-Trichloropropane	ND	1.0	1.0		µg/L	1	7/17/2024
1,2,4-Trichlorobenzene	ND	5.0	5.0		µg/L	1	7/17/2024
1,2,4-Trimethylbenzene	ND	1.0	1.0		µg/L	1	7/17/2024
1,2-Dibromo-3-chloropropane	ND	1.0	0.20		µg/L	1	7/17/2024
1,2-Dibromoethane	ND	1.0	0.050		µg/L	1	7/17/2024
1,2-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/17/2024
1,2-Dichloroethane	ND	1.0	1.0		µg/L	1	7/17/2024
1,2-Dichloropropane	ND	1.0	1.0		µg/L	1	7/17/2024
1,3,5-Trimethylbenzene	ND	1.0	1.0		µg/L	1	7/17/2024
1,3-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/17/2024
1,4-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/17/2024
2-Butanone	ND	25	25		µg/L	1	7/17/2024
2-Hexanone	ND	50	50		µg/L	1	7/17/2024
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	7/17/2024
4-Methyl-2-pentanone	ND	50	50		µg/L	1	7/17/2024
Acetone	ND	50	50		µg/L	1	7/17/2024
Acrylonitrile	ND	2.0	2.0		µg/L	1	7/17/2024
Benzene	ND	1.0	1.0		µg/L	1	7/17/2024
Bromochloromethane	ND	1.0	1.0		µg/L	1	7/17/2024
Bromodichloromethane	ND	1.0	1.0		µg/L	1	7/17/2024
Bromoform	ND	1.0	1.0		µg/L	1	7/17/2024
Bromomethane	ND	5.0	5.0		µg/L	1	7/17/2024
Carbon disulfide	ND	5.0	5.0		µg/L	1	7/17/2024
Carbon tetrachloride	ND	1.0	1.0		µg/L	1	7/17/2024
Chlorobenzene	ND	1.0	1.0		µg/L	1	7/17/2024
Chloroethane	ND	5.0	5.0		µg/L	1	7/17/2024
Chloroform	ND	1.0	1.0		µg/L	1	7/17/2024
Chloromethane	ND	5.0	5.0		µg/L	1	7/17/2024
cis-1,2-Dichloroethene	ND	1.0	1.0		µg/L	1	7/17/2024
cis-1,3-Dichloropropene	ND	1.0	1.0		µg/L	1	7/17/2024
Dibromochloromethane	ND	5.0	5.0		µg/L	1	7/17/2024
Dibromomethane	ND	5.0	5.0		µg/L	1	7/17/2024
Dichlorodifluoromethane	ND	5.0	5.0		µg/L	1	7/17/2024
Diethyl ether	ND	10	10		µg/L	1	7/17/2024
Ethylbenzene	ND	1.0	1.0		µg/L	1	7/17/2024
Hexachloroethane	ND	5.0	5.0		µg/L	1	7/17/2024
Isopropylbenzene	ND	5.0	5.0		µg/L	1	7/17/2024
m,p-Xylene	ND	2.0	2.0		µg/L	1	7/17/2024
Methyl iodide	ND	5.0	1.0		µg/L	1	7/17/2024
Methyl tert-butyl ether	ND	5.0	5.0		µg/L	1	7/17/2024
Methylene chloride	ND	5.0	5.0		µg/L	1	7/17/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Mackinac Environmental Technology, Inc. **Client Sample ID:** MW-9
Work Order: 24070451 **Collection Date:** 7/9/2024 1:25:00 PM
Project: Superior Township Dump M23-4099
Lab ID: 24070451-07 **Matrix:** GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Naphthalene	ND	5.0	5.0		µg/L	1	7/17/2024
n-Propylbenzene	ND	1.0	1.0		µg/L	1	7/17/2024
o-Xylene	ND	1.0	1.0		µg/L	1	7/17/2024
Styrene	ND	1.0	1.0		µg/L	1	7/17/2024
Tetrachloroethene	ND	1.0	1.0		µg/L	1	7/17/2024
Toluene	ND	1.0	1.0		µg/L	1	7/17/2024
trans-1,2-Dichloroethene	ND	1.0	1.0		µg/L	1	7/17/2024
trans-1,3-Dichloropropene	ND	1.0	1.0		µg/L	1	7/17/2024
trans-1,4-Dichloro-2-butene	ND	2.0	1.0		µg/L	1	7/17/2024
Trichloroethene	ND	1.0	1.0		µg/L	1	7/17/2024
Trichlorofluoromethane	ND	1.0	1.0		µg/L	1	7/17/2024
Vinyl acetate	ND	100	100		µg/L	1	7/17/2024
Vinyl chloride	ND	1.0	1.0		µg/L	1	7/17/2024
Xylenes, Total	ND	3.0	3.0		µg/L	1	7/17/2024
Surr: 1,2-Dichloroethane-d4	*107*	*80-120*			*%REC*	1	7/17/2024
Surr: 4-Bromofluorobenzene	*96.4*	*80-120*			*%REC*	1	7/17/2024
Surr: Dibromofluoromethane	*101*	*80-120*			*%REC*	1	7/17/2024
Surr: Toluene-d8	*99.0*	*80-120*			*%REC*	1	7/17/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	Mackinac Environmental Technology, Inc.	**Client Sample ID:**	MW-2
Work Order:	24070451	**Collection Date:**	7/9/2024 2:25:00 PM
Project:	Superior Township Dump M23-4099		
Lab ID:	24070451-08	**Matrix:**	GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7470A**		Prep Date: **7/18/2024**		Analyst: **KSC**
Mercury	ND	0.00020	0.00020		mg/L	1	7/19/2024
METALS BY ICP-MS			**SW6020B**		Prep Date: **7/16/2024**		Analyst: **STP**
Aluminum	ND	0.050	0.050		mg/L	1	7/18/2024
Arsenic	ND	0.0050	0.0050		mg/L	1	7/17/2024
Barium	**0.12**	**0.10**	**0.10**		**mg/L**	1	7/17/2024
Iron	**7.5**	**0.20**	**0.20**		**mg/L**	1	7/17/2024
Lead	ND	0.0050	0.0030		mg/L	1	7/17/2024
Manganese	**0.48**	**0.050**	**0.050**		**mg/L**	1	7/17/2024
POLYNUCLEAR AROMATIC HYDROCARBONS (SIM)			**SW8270E**		Prep Date: **7/15/2024**		Analyst: **SMT**
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	7/16/2024
Acenaphthene	ND	5.0	5.0		µg/L	1	7/16/2024
Acenaphthylene	ND	5.0	5.0		µg/L	1	7/16/2024
Anthracene	ND	5.0	5.0		µg/L	1	7/16/2024
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	7/16/2024
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	7/16/2024
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	7/16/2024
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	7/16/2024
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	7/16/2024
Chrysene	ND	1.0	1.0		µg/L	1	7/16/2024
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	7/16/2024
Fluoranthene	ND	1.0	1.0		µg/L	1	7/16/2024
Fluorene	ND	5.0	5.0		µg/L	1	7/16/2024
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	7/16/2024
Naphthalene	ND	5.0	5.0		µg/L	1	7/16/2024
Phenanthrene	ND	2.0	2.0		µg/L	1	7/16/2024
Pyrene	ND	5.0	5.0		µg/L	1	7/16/2024
Surr: 2-Fluorobiphenyl	*119*	*62-135*			*%REC*	1	7/16/2024
Surr: 4-Terphenyl-d14	*80.5*	*48-133*			*%REC*	1	7/16/2024
Surr: Nitrobenzene-d5	*50.2*	*21-57*			*%REC*	1	7/16/2024
VOLATILE ORGANIC COMPOUNDS			**SW8260D**				Analyst: **EZH**
1,1,1,2-Tetrachloroethane	ND	1.0	1.0		µg/L	1	7/22/2024
1,1,1-Trichloroethane	ND	1.0	1.0		µg/L	1	7/22/2024
1,1,2,2-Tetrachloroethane	ND	1.0	1.0		µg/L	1	7/22/2024
1,1,2-Trichloroethane	ND	1.0	1.0		µg/L	1	7/22/2024
1,1,2-Trichlorotrifluoroethane	ND	1.0	1.0		µg/L	1	7/22/2024
1,1-Dichloroethane	ND	1.0	1.0		µg/L	1	7/22/2024
1,1-Dichloroethene	ND	1.0	1.0		µg/L	1	7/22/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Mackinac Environmental Technology, Inc. **Client Sample ID:** MW-2
Work Order: 24070451 **Collection Date:** 7/9/2024 2:25:00 PM
Project: Superior Township Dump M23-4099
Lab ID: 24070451-08 **Matrix:** GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,2,3-Trichloropropane	ND	1.0	1.0		µg/L	1	7/22/2024
1,2,4-Trichlorobenzene	ND	5.0	5.0		µg/L	1	7/22/2024
1,2,4-Trimethylbenzene	ND	1.0	1.0		µg/L	1	7/22/2024
1,2-Dibromo-3-chloropropane	ND	1.0	0.20		µg/L	1	7/22/2024
1,2-Dibromoethane	ND	1.0	0.050		µg/L	1	7/22/2024
1,2-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/22/2024
1,2-Dichloroethane	ND	1.0	1.0		µg/L	1	7/22/2024
1,2-Dichloropropane	ND	1.0	1.0		µg/L	1	7/22/2024
1,3,5-Trimethylbenzene	ND	1.0	1.0		µg/L	1	7/22/2024
1,3-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/22/2024
1,4-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/22/2024
2-Butanone	ND	25	25		µg/L	1	7/22/2024
2-Hexanone	ND	50	50		µg/L	1	7/22/2024
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	7/22/2024
4-Methyl-2-pentanone	ND	50	50		µg/L	1	7/22/2024
Acetone	ND	50	50		µg/L	1	7/22/2024
Acrylonitrile	ND	2.0	2.0		µg/L	1	7/22/2024
Benzene	ND	1.0	1.0		µg/L	1	7/22/2024
Bromochloromethane	ND	1.0	1.0		µg/L	1	7/22/2024
Bromodichloromethane	ND	1.0	1.0		µg/L	1	7/22/2024
Bromoform	ND	1.0	1.0		µg/L	1	7/22/2024
Bromomethane	ND	5.0	5.0		µg/L	1	7/22/2024
Carbon disulfide	ND	5.0	5.0		µg/L	1	7/22/2024
Carbon tetrachloride	ND	1.0	1.0		µg/L	1	7/22/2024
Chlorobenzene	ND	1.0	1.0		µg/L	1	7/22/2024
Chloroethane	ND	5.0	5.0		µg/L	1	7/22/2024
Chloroform	ND	1.0	1.0		µg/L	1	7/22/2024
Chloromethane	ND	5.0	5.0		µg/L	1	7/22/2024
cis-1,2-Dichloroethene	ND	1.0	1.0		µg/L	1	7/22/2024
cis-1,3-Dichloropropene	ND	1.0	1.0		µg/L	1	7/22/2024
Dibromochloromethane	ND	5.0	5.0		µg/L	1	7/22/2024
Dibromomethane	ND	5.0	5.0		µg/L	1	7/22/2024
Dichlorodifluoromethane	ND	5.0	5.0		µg/L	1	7/22/2024
Diethyl ether	ND	10	10		µg/L	1	7/22/2024
Ethylbenzene	ND	1.0	1.0		µg/L	1	7/22/2024
Hexachloroethane	ND	5.0	5.0		µg/L	1	7/22/2024
Isopropylbenzene	ND	5.0	5.0		µg/L	1	7/22/2024
m,p-Xylene	ND	2.0	2.0		µg/L	1	7/22/2024
Methyl iodide	ND	5.0	1.0		µg/L	1	7/22/2024
Methyl tert-butyl ether	ND	5.0	5.0		µg/L	1	7/22/2024
Methylene chloride	ND	5.0	5.0		µg/L	1	7/22/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Mackinac Environmental Technology, Inc. **Client Sample ID:** MW-2
Work Order: 24070451 **Collection Date:** 7/9/2024 2:25:00 PM
Project: Superior Township Dump M23-4099
Lab ID: 24070451-08 **Matrix:** GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Naphthalene	ND	5.0	5.0		µg/L	1	7/22/2024
n-Propylbenzene	ND	1.0	1.0		µg/L	1	7/22/2024
o-Xylene	ND	1.0	1.0		µg/L	1	7/22/2024
Styrene	ND	1.0	1.0		µg/L	1	7/22/2024
Tetrachloroethene	ND	1.0	1.0		µg/L	1	7/22/2024
Toluene	ND	1.0	1.0		µg/L	1	7/22/2024
trans-1,2-Dichloroethene	ND	1.0	1.0		µg/L	1	7/22/2024
trans-1,3-Dichloropropene	ND	1.0	1.0		µg/L	1	7/22/2024
trans-1,4-Dichloro-2-butene	ND	2.0	1.0		µg/L	1	7/22/2024
Trichloroethene	ND	1.0	1.0		µg/L	1	7/22/2024
Trichlorofluoromethane	ND	1.0	1.0		µg/L	1	7/22/2024
Vinyl acetate	ND	100	100		µg/L	1	7/22/2024
Vinyl chloride	ND	1.0	1.0		µg/L	1	7/22/2024
Xylenes, Total	ND	3.0	3.0		µg/L	1	7/22/2024
Surr: 1,2-Dichloroethane-d4	*104*	*80-120*			*%REC*	1	7/22/2024
Surr: 4-Bromofluorobenzene	*95.7*	*80-120*			*%REC*	1	7/22/2024
Surr: Dibromofluoromethane	*107*	*80-120*			*%REC*	1	7/22/2024
Surr: Toluene-d8	*95.2*	*80-120*			*%REC*	1	7/22/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	Mackinac Environmental Technology, Inc.	**Client Sample ID:**	Trip Blank
Work Order:	24070451	**Collection Date:**	7/9/2024
Project:	Superior Township Dump M23-4099		
Lab ID:	24070451-09	**Matrix:**	WATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS			**SW8260D**				Analyst: **JGV**
1,1,1,2-Tetrachloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1,1-Trichloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1,2,2-Tetrachloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1,2-Trichloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1,2-Trichlorotrifluoroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1-Dichloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,1-Dichloroethene	ND	1.0	1.0		µg/L	1	7/13/2024
1,2,3-Trichloropropane	ND	1.0	1.0		µg/L	1	7/13/2024
1,2,4-Trichlorobenzene	ND	5.0	5.0		µg/L	1	7/13/2024
1,2,4-Trimethylbenzene	ND	1.0	1.0		µg/L	1	7/13/2024
1,2-Dibromo-3-chloropropane	ND	1.0	0.20		µg/L	1	7/13/2024
1,2-Dibromoethane	ND	1.0	0.050		µg/L	1	7/13/2024
1,2-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/13/2024
1,2-Dichloroethane	ND	1.0	1.0		µg/L	1	7/13/2024
1,2-Dichloropropane	ND	1.0	1.0		µg/L	1	7/13/2024
1,3,5-Trimethylbenzene	ND	1.0	1.0		µg/L	1	7/13/2024
1,3-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/13/2024
1,4-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/13/2024
2-Butanone	ND	25	25		µg/L	1	7/13/2024
2-Hexanone	ND	50	50		µg/L	1	7/13/2024
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	7/13/2024
4-Methyl-2-pentanone	ND	50	50		µg/L	1	7/13/2024
Acetone	ND	50	50		µg/L	1	7/13/2024
Acrylonitrile	ND	2.0	2.0		µg/L	1	7/13/2024
Benzene	ND	1.0	1.0		µg/L	1	7/13/2024
Bromochloromethane	ND	1.0	1.0		µg/L	1	7/13/2024
Bromodichloromethane	ND	1.0	1.0		µg/L	1	7/13/2024
Bromoform	ND	1.0	1.0		µg/L	1	7/13/2024
Bromomethane	ND	5.0	5.0		µg/L	1	7/13/2024
Carbon disulfide	ND	5.0	5.0		µg/L	1	7/13/2024
Carbon tetrachloride	ND	1.0	1.0		µg/L	1	7/13/2024
Chlorobenzene	ND	1.0	1.0		µg/L	1	7/13/2024
Chloroethane	ND	5.0	5.0		µg/L	1	7/13/2024
Chloroform	ND	1.0	1.0		µg/L	1	7/13/2024
Chloromethane	ND	5.0	5.0		µg/L	1	7/13/2024
cis-1,2-Dichloroethene	ND	1.0	1.0		µg/L	1	7/13/2024
cis-1,3-Dichloropropene	ND	1.0	1.0		µg/L	1	7/13/2024
Dibromochloromethane	ND	5.0	5.0		µg/L	1	7/13/2024
Dibromomethane	ND	5.0	5.0		µg/L	1	7/13/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	Mackinac Environmental Technology, Inc.	**Client Sample ID:**	Trip Blank
Work Order:	24070451	**Collection Date:**	7/9/2024
Project:	Superior Township Dump M23-4099		
Lab ID:	24070451-09	**Matrix:**	WATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Dichlorodifluoromethane	ND	5.0	5.0		µg/L	1	7/13/2024
Diethyl ether	ND	10	10		µg/L	1	7/13/2024
Ethylbenzene	ND	1.0	1.0		µg/L	1	7/13/2024
Hexachloroethane	ND	5.0	5.0		µg/L	1	7/13/2024
Isopropylbenzene	ND	5.0	5.0		µg/L	1	7/13/2024
m,p-Xylene	ND	2.0	2.0		µg/L	1	7/13/2024
Methyl iodide	ND	5.0	1.0		µg/L	1	7/13/2024
Methyl tert-butyl ether	ND	5.0	5.0		µg/L	1	7/13/2024
Methylene chloride	ND	5.0	5.0		µg/L	1	7/13/2024
Naphthalene	ND	5.0	5.0		µg/L	1	7/13/2024
n-Propylbenzene	ND	1.0	1.0		µg/L	1	7/13/2024
o-Xylene	ND	1.0	1.0		µg/L	1	7/13/2024
Styrene	ND	1.0	1.0		µg/L	1	7/13/2024
Tetrachloroethene	ND	1.0	1.0		µg/L	1	7/13/2024
Toluene	ND	1.0	1.0		µg/L	1	7/13/2024
trans-1,2-Dichloroethene	ND	1.0	1.0		µg/L	1	7/13/2024
trans-1,3-Dichloropropene	ND	1.0	1.0		µg/L	1	7/13/2024
trans-1,4-Dichloro-2-butene	ND	2.0	1.0		µg/L	1	7/13/2024
Trichloroethene	ND	1.0	1.0		µg/L	1	7/13/2024
Trichlorofluoromethane	ND	1.0	1.0		µg/L	1	7/13/2024
Vinyl acetate	ND	100	100		µg/L	1	7/13/2024
Vinyl chloride	ND	1.0	1.0		µg/L	1	7/13/2024
Xylenes, Total	ND	3.0	3.0		µg/L	1	7/13/2024
Surr: 1,2-Dichloroethane-d4	*100*	*80-120*			*%REC*	1	7/13/2024
Surr: 4-Bromofluorobenzene	*99.6*	*80-120*			*%REC*	1	7/13/2024
Surr: Dibromofluoromethane	*99.8*	*80-120*			*%REC*	1	7/13/2024
Surr: Toluene-d8	*102*	*80-120*			*%REC*	1	7/13/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Batch ID: **243793** Instrument ID **HG5** Method: **SW7470A**

MBLK	Sample ID: **MBLK-243793-243793**				Units: **mg/L**			Analysis Date: **7/19/2024 02:48 PM**			
Client ID:		Run ID: **HG5_240719A**			SeqNo: **10967318**			Prep Date: **7/18/2024**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Mercury	ND	0.00020									

LCS	Sample ID: **LCS-243793-243793**				Units: **mg/L**			Analysis Date: **7/19/2024 02:50 PM**			
Client ID:		Run ID: **HG5_240719A**			SeqNo: **10967319**			Prep Date: **7/18/2024**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Mercury	0.0021	0.00020	0.002	0	105	80-120	0				

MS	Sample ID: **24070411-01CMS**				Units: **mg/L**			Analysis Date: **7/19/2024 03:06 PM**			
Client ID:		Run ID: **HG5_240719A**			SeqNo: **10967328**			Prep Date: **7/18/2024**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Mercury	0.001725	0.00020	0.002	-0.0000555	89	75-125	0				

MSD	Sample ID: **24070411-01CMSD**				Units: **mg/L**			Analysis Date: **7/19/2024 03:08 PM**			
Client ID:		Run ID: **HG5_240719A**			SeqNo: **10967329**			Prep Date: **7/18/2024**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Mercury	0.001695	0.00020	0.002	-0.0000555	87.5	75-125	0.001725	1.75	20		

The following samples were analyzed in this batch:

24070451-01C	24070451-02C	24070451-03C
24070451-04C	24070451-05C	24070451-06C
24070451-07C	24070451-08C	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Mackinac Environmental Technology, Inc.
Work Order: 24070451
Project: Superior Township Dump M23-4099

QC BATCH REPORT

Batch ID: **243562** Instrument ID **ICPMS3** Method: **SW6020B**

MBLK Sample ID: **MBLK-243562-243562** Units: **mg/L** Analysis Date: **7/17/2024 10:55 PM**
Client ID: Run ID: **ICPMS3_240717A** SeqNo: **10962712** Prep Date: **7/16/2024** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	ND	0.010								
Arsenic	ND	0.0050								
Barium	ND	0.0050								
Iron	ND	0.080								
Lead	ND	0.0050								
Manganese	ND	0.0050								

LCS Sample ID: **LCS-243562-243562** Units: **mg/L** Analysis Date: **7/17/2024 10:56 PM**
Client ID: Run ID: **ICPMS3_240717A** SeqNo: **10962713** Prep Date: **7/16/2024** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.1071	0.0050	0.1	0	107	80-120	0			
Barium	0.09992	0.0050	0.1	0	99.9	80-120	0			
Iron	10.3	0.080	10	0	103	80-120	0			
Lead	0.1044	0.0050	0.1	0	104	80-120	0			
Manganese	0.1029	0.0050	0.1	0	103	80-120	0			

LCS Sample ID: **LCS-243562-243562** Units: **mg/L** Analysis Date: **7/18/2024 06:49 PM**
Client ID: Run ID: **ICPMS3_240718A** SeqNo: **10966342** Prep Date: **7/16/2024** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1033	0.010	0.1	0	103	80-120	0			

MS Sample ID: **24070451-06CMS** Units: **mg/L** Analysis Date: **7/17/2024 11:11 PM**
Client ID: **MW-1** Run ID: **ICPMS3_240717A** SeqNo: **10962722** Prep Date: **7/16/2024** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.1051	0.0050	0.1	0.001652	103	75-125	0			
Iron	14.06	0.080	10	4.071	99.9	75-125	0			
Lead	0.1011	0.0050	0.1	0.000619	100	75-125	0			
Manganese	1.205	0.0050	0.1	1.149	56.4	75-125	0			SO

MS Sample ID: **24070451-06CMS** Units: **mg/L** Analysis Date: **7/18/2024 07:04 PM**
Client ID: **MW-1** Run ID: **ICPMS3_240718A** SeqNo: **10966351** Prep Date: **7/16/2024** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	4.114	0.10	0.1	1.738	2380	75-125	0			SO
Barium	0.3883	0.050	0.1	0.2633	125	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **243562** Instrument ID **ICPMS3** Method: **SW6020B**

MSD Sample ID: **24070451-06CMSD** Units: **mg/L** Analysis Date: **7/17/2024 11:13 PM**
Client ID: **MW-1** Run ID: **ICPMS3_240717A** SeqNo: **10962723** Prep Date: **7/16/2024** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.109	0.0050	0.1	0.001652	107	75-125	0.1051	3.69	20	
Iron	15.01	0.080	10	4.071	109	75-125	14.06	6.47	20	
Lead	0.1075	0.0050	0.1	0.000619	107	75-125	0.1011	6.14	20	
Manganese	1.302	0.0050	0.1	1.149	153	75-125	1.205	7.73	20	SO

MSD Sample ID: **24070451-06CMSD** Units: **mg/L** Analysis Date: **7/18/2024 07:06 PM**
Client ID: **MW-1** Run ID: **ICPMS3_240718A** SeqNo: **10966352** Prep Date: **7/16/2024** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	4.045	0.10	0.1	1.738	2310	75-125	4.114	1.68	20	SO
Barium	0.3871	0.050	0.1	0.2633	124	75-125	0.3883	0.296	20	

The following samples were analyzed in this batch:

24070451-01C	24070451-02C	24070451-03C
24070451-04C	24070451-05C	24070451-06C
24070451-07C	24070451-08C	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **243539** Instrument ID **SVMS6** Method: **SW8270E**

MBLK	Sample ID: **SBLKW1-243539-243539**				Units: **µg/L**			Analysis Date: **7/15/2024 09:34 PM**		
Client ID:	Run ID: **SVMS6_240715A**				SeqNo: **10956734**		Prep Date: **7/15/2024**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Chloronaphthalene	ND	0.17								
2-Methylnaphthalene	ND	0.17								
Acenaphthene	ND	0.17								
Acenaphthylene	ND	0.17								
Anthracene	ND	0.17								
Benzo(a)anthracene	ND	0.17								
Benzo(a)pyrene	ND	0.17								
Benzo(b)fluoranthene	ND	0.17								
Benzo(g,h,i)perylene	ND	0.17								
Benzo(k)fluoranthene	ND	0.17								
Chrysene	ND	0.17								
Dibenzo(a,h)anthracene	ND	0.17								
Fluoranthene	ND	0.17								
Fluorene	ND	0.17								
Indeno(1,2,3-cd)pyrene	ND	0.17								
Naphthalene	ND	0.17								
Phenanthrene	ND	0.17								
Pyrene	ND	0.17								
Surr: 2-Fluorobiphenyl	*8.536*	0	*8.34*	0	*102*	*62-135*	0			
Surr: 4-Terphenyl-d14	*5.757*	0	*8.34*	0	*69*	*48-133*	0			
Surr: Nitrobenzene-d5	*3.668*	0	*8.34*	0	*44*	*21-57*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **243539** Instrument ID **SVMS6** Method: **SW8270E**

LCS	Sample ID: **SLCSW1-243539-243539**				Units: **µg/L**			Analysis Date: **7/15/2024 10:06 PM**		
Client ID:	Run ID: **SVMS6_240715A**				SeqNo: **10956737**			Prep Date: **7/15/2024**		DF: **1**
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Chloronaphthalene	8.29	0.17	8.34	0	99.4	51-147	0			
2-Methylnaphthalene	9.279	0.17	8.34	0	111	44-138	0			
Acenaphthene	8.691	0.17	8.34	0	104	69-133	0			
Acenaphthylene	8.211	0.17	8.34	0	98.5	64-130	0			
Anthracene	8.962	0.17	8.34	0	107	75-135	0			
Benzo(a)anthracene	8.162	0.17	8.34	0	97.9	69-138	0			
Benzo(a)pyrene	8.424	0.17	8.34	0	101	68-140	0			
Benzo(b)fluoranthene	7.546	0.17	8.34	0	90.5	64-137	0			
Benzo(g,h,i)perylene	7.417	0.17	8.34	0	88.9	58-141	0			
Benzo(k)fluoranthene	7.635	0.17	8.34	0	91.5	66-141	0			
Chrysene	8.284	0.17	8.34	0	99.3	72-146	0			
Dibenzo(a,h)anthracene	7.699	0.17	8.34	0	92.3	59-138	0			
Fluoranthene	8.815	0.17	8.34	0	106	70-137	0			
Fluorene	8.8	0.17	8.34	0	106	71-133	0			
Indeno(1,2,3-cd)pyrene	8.115	0.17	8.34	0	97.3	60-143	0			
Naphthalene	8.298	0.17	8.34	0	99.5	49-134	0			
Phenanthrene	8.719	0.17	8.34	0	105	77-132	0			
Pyrene	7.941	0.17	8.34	0	95.2	60-144	0			
Surr: 2-Fluorobiphenyl	*9.342*	0	*8.34*	0	*112*	*62-135*	0			
Surr: 4-Terphenyl-d14	*6.102*	0	*8.34*	0	*73.2*	*48-133*	0			
Surr: Nitrobenzene-d5	*3.978*	0	*8.34*	0	*47.7*	*21-57*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **243539** Instrument ID **SVMS6** Method: **SW8270E**

LCSD Sample ID: **SLCSDW1-243539-243539** Units: **µg/L** Analysis Date: **7/15/2024 10:22 PM**

Client ID: Run ID: **SVMS6_240715A** SeqNo: **10956739** Prep Date: **7/15/2024** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Chloronaphthalene	8.792	0.17	8.34	0	105	51-147	8.29	5.89	30	
2-Methylnaphthalene	10.03	0.17	8.34	0	120	44-138	9.279	7.81	30	
Acenaphthene	9.455	0.17	8.34	0	113	69-133	8.691	8.42	30	
Acenaphthylene	8.702	0.17	8.34	0	104	64-130	8.211	5.8	30	
Anthracene	9.5	0.17	8.34	0	114	75-135	8.962	5.83	30	
Benzo(a)anthracene	9.068	0.17	8.34	0	109	69-138	8.162	10.5	30	
Benzo(a)pyrene	9.331	0.17	8.34	0	112	68-140	8.424	10.2	30	
Benzo(b)fluoranthene	8.22	0.17	8.34	0	98.6	64-137	7.546	8.55	30	
Benzo(g,h,i)perylene	8.244	0.17	8.34	0	98.8	58-141	7.417	10.6	30	
Benzo(k)fluoranthene	8.611	0.17	8.34	0	103	66-141	7.635	12	30	
Chrysene	9.181	0.17	8.34	0	110	72-146	8.284	10.3	30	
Dibenzo(a,h)anthracene	8.622	0.17	8.34	0	103	59-138	7.699	11.3	30	
Fluoranthene	9.529	0.17	8.34	0	114	70-137	8.815	7.79	30	
Fluorene	9.458	0.17	8.34	0	113	71-133	8.8	7.22	30	
Indeno(1,2,3-cd)pyrene	8.951	0.17	8.34	0	107	60-143	8.115	9.8	30	
Naphthalene	9.139	0.17	8.34	0	110	49-134	8.298	9.65	30	
Phenanthrene	9.333	0.17	8.34	0	112	77-132	8.719	6.8	30	
Pyrene	8.588	0.17	8.34	0	103	60-144	7.941	7.83	30	
Surr: 2-Fluorobiphenyl	*9.234*	0	*8.34*	0	*111*	*62-135*	9.342	*1.15*	*30*	
Surr: 4-Terphenyl-d14	*7.003*	0	*8.34*	0	*84*	*48-133*	6.102	*13.7*	*30*	
Surr: Nitrobenzene-d5	*4.331*	0	*8.34*	0	*51.9*	*21-57*	3.978	*8.5*	*30*	

The following samples were analyzed in this batch:

24070451-01B	24070451-02B	24070451-03B
24070451-04B	24070451-05B	24070451-06B
24070451-07B	24070451-08B	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R407901a** Instrument ID **VMS8** Method: **SW8260D**

MBLK Sample ID: **8V-BLKW2-240712-R407901a** Units: **µg/L** Analysis Date: **7/13/2024 01:00 AM**

Client ID: Run ID: **VMS8_240712B** SeqNo: **10954606** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
1,1,2-Trichlorotrifluoroethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2,3-Trichloropropane	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	1.0								
1,2-Dibromoethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,2-Dichloroethane	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
2-Butanone	ND	5.0								
2-Hexanone	ND	5.0								
2-Methylnaphthalene	ND	5.0								
4-Methyl-2-pentanone	ND	1.0								
Acetone	ND	10								
Acrylonitrile	ND	1.0								
Benzene	ND	1.0								
Bromochloromethane	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	1.0								
Carbon disulfide	ND	1.0								
Carbon tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	1.0								
Chloroform	ND	1.0								
Chloromethane	ND	1.0								
cis-1,2-Dichloroethene	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
Diethyl ether	ND	1.0								
Ethylbenzene	ND	1.0								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R407901a** Instrument ID **VMS8** Method: **SW8260D**

Hexachloroethane	ND	1.0					
Isopropylbenzene	ND	1.0					
m,p-Xylene	ND	2.0					
Methyl iodide	ND	5.0					
Methyl tert-butyl ether	ND	1.0					
Methylene chloride	ND	5.0					
Naphthalene	ND	5.0					
n-Propylbenzene	ND	1.0					
o-Xylene	ND	1.0					
Styrene	ND	1.0					
Tetrachloroethene	ND	1.0					
Toluene	ND	1.0					
trans-1,2-Dichloroethene	ND	1.0					
trans-1,3-Dichloropropene	ND	1.0					
trans-1,4-Dichloro-2-butene	ND	2.0					
Trichloroethene	ND	1.0					
Trichlorofluoromethane	ND	1.0					
Vinyl acetate	ND	5.0					
Vinyl chloride	ND	1.0					
Xylenes, Total	ND	3.0					
Surr: 1,2-Dichloroethane-d4	*19.79*	0	*20*	0	*99*	*80-120*	0
Surr: 4-Bromofluorobenzene	*19.08*	0	*20*	0	*95.4*	*80-120*	0
Surr: Dibromofluoromethane	*19.53*	0	*20*	0	*97.6*	*80-120*	0
Surr: Toluene-d8	*19.84*	0	*20*	0	*99.2*	*80-120*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R407901a** Instrument ID **VMS8** Method: **SW8260D**

LCS	Sample ID: **8V-LCSW2-240712-R407901a**				Units: **µg/L**			Analysis Date: **7/12/2024 11:46 PM**			
Client ID:		Run ID: **VMS8_240712B**			SeqNo: **10954603**			Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.33	1.0	20	0	91.6	72-119	0			
1,1,1-Trichloroethane	16.94	1.0	20	0	84.7	75-119	0			
1,1,2,2-Tetrachloroethane	19.87	1.0	20	0	99.4	80-123	0			
1,1,2-Trichloroethane	19.14	1.0	20	0	95.7	83-118	0			
1,1,2-Trichlorotrifluoroethane	18.06	1.0	20	0	90.3	64-133	0			
1,1-Dichloroethane	18.76	1.0	20	0	93.8	73-122	0			
1,1-Dichloroethene	18.06	1.0	20	0	90.3	66-131	0			
1,2,3-Trichloropropane	20.33	1.0	20	0	102	78-119	0			
1,2,4-Trichlorobenzene	19.38	1.0	20	0	96.9	73-127	0			
1,2,4-Trimethylbenzene	17.98	1.0	20	0	89.9	74-118	0			
1,2-Dibromo-3-chloropropane	20.97	1.0	20	0	105	52-141	0			
1,2-Dibromoethane	21.57	1.0	20	0	108	60-159	0			
1,2-Dichlorobenzene	19.82	1.0	20	0	99.1	80-119	0			
1,2-Dichloroethane	18.53	1.0	20	0	92.6	78-121	0			
1,2-Dichloropropane	18.56	1.0	20	0	92.8	78-120	0			
1,3,5-Trimethylbenzene	19.07	1.0	20	0	95.4	76-120	0			
1,3-Dichlorobenzene	19.51	1.0	20	0	97.6	80-120	0			
1,4-Dichlorobenzene	19.84	1.0	20	0	99.2	81-119	0			
2-Butanone	19.16	5.0	20	0	95.8	69-147	0			
2-Hexanone	16.99	5.0	20	0	85	67-140	0			
2-Methylnaphthalene	20.24	5.0	20	0	101	50-150	0			
4-Methyl-2-pentanone	18.66	1.0	20	0	93.3	68-199	0			
Acetone	18.91	10	20	0	94.6	70-166	0			
Acrylonitrile	17.84	1.0	20	0	89.2	70-133	0			
Benzene	18.13	1.0	20	0	90.6	78-120	0			
Bromochloromethane	20.19	1.0	20	0	101	70-125	0			
Bromodichloromethane	18.53	1.0	20	0	92.6	73-126	0			
Bromoform	17.45	1.0	20	0	87.2	60-124	0			
Bromomethane	13.43	1.0	20	0	67.2	20-183	0			
Carbon disulfide	18.75	1.0	20	0	93.8	67-159	0			
Carbon tetrachloride	16.88	1.0	20	0	84.4	69-124	0			
Chlorobenzene	18.99	1.0	20	0	95	80-118	0			
Chloroethane	14.81	1.0	20	0	74	35-136	0			
Chloroform	18.6	1.0	20	0	93	75-119	0			
Chloromethane	10.6	1.0	20	0	53	26-117	0			
cis-1,2-Dichloroethene	19.47	1.0	20	0	97.4	75-123	0			
cis-1,3-Dichloropropene	17.95	1.0	20	0	89.8	69-120	0			
Dibromochloromethane	17.91	1.0	20	0	89.6	63-117	0			
Dibromomethane	20.01	1.0	20	0	100	78-120	0			
Dichlorodifluoromethane	7.35	1.0	20	0	36.8	36-133	0			
Diethyl ether	19.46	1.0	20	0	97.3	57-163	0			
Ethylbenzene	18.53	1.0	20	0	92.6	76-116	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R407901a** Instrument ID **VMS8** Method: **SW8260D**

Hexachloroethane	18.69	1.0	20	0	93.4	60-130	0
Isopropylbenzene	19.09	1.0	20	0	95.4	77-118	0
m,p-Xylene	37.13	2.0	40	0	92.8	76-119	0
Methyl iodide	27.55	5.0	20	0	138	10-200	0
Methyl tert-butyl ether	19.68	1.0	20	0	98.4	77-137	0
Methylene chloride	19.69	5.0	20	0	98.4	68-125	0
Naphthalene	19	5.0	20	0	95	56-142	0
n-Propylbenzene	19.05	1.0	20	0	95.2	74-118	0
o-Xylene	18.86	1.0	20	0	94.3	77-116	0
Styrene	18.95	1.0	20	0	94.8	76-123	0
Tetrachloroethene	19.96	1.0	20	0	99.8	80-124	0
Toluene	18.39	1.0	20	0	92	78-116	0
trans-1,2-Dichloroethene	18.49	1.0	20	0	92.4	73-124	0
trans-1,3-Dichloropropene	18.13	1.0	20	0	90.6	67-118	0
trans-1,4-Dichloro-2-butene	14.61	2.0	20	0	73	58-118	0
Trichloroethene	17.82	1.0	20	0	89.1	75-122	0
Trichlorofluoromethane	14.41	1.0	20	0	72	52-115	0
Vinyl chloride	12.02	1.0	20	0	60.1	49-122	0
Xylenes, Total	55.99	3.0	60	0	93.3	77-119	0
Surr: 1,2-Dichloroethane-d4	*19.93*	0	*20*	0	*99.6*	*80-120*	0
Surr: 4-Bromofluorobenzene	*19.65*	0	*20*	0	*98.2*	*80-120*	0
Surr: Dibromofluoromethane	*18.92*	0	*20*	0	*94.6*	*80-120*	0
Surr: Toluene-d8	*19.98*	0	*20*	0	*99.9*	*80-120*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R407901a** Instrument ID **VMS8** Method: **SW8260D**

MS Sample ID: **24070451-02A MS** Units: **µg/L** Analysis Date: **7/13/2024 08:04 AM**

Client ID: **HA-5** Run ID: **VMS8_240712B** SeqNo: **10954629** Prep Date: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	198.3	10	200	0	99.2	72-119	0			
1,1,1-Trichloroethane	202.7	10	200	0	101	75-119	0			
1,1,2,2-Tetrachloroethane	197.4	10	200	0	98.7	80-123	0			
1,1,2-Trichloroethane	206.8	10	200	0	103	83-118	0			
1,1,2-Trichlorotrifluoroethane	233	10	200	0	116	64-133	0			
1,1-Dichloroethane	209.6	10	200	0	105	73-122	0			
1,1-Dichloroethene	239.1	10	200	0	120	66-131	0			
1,2,3-Trichloropropane	203.3	10	200	0	102	78-119	0			
1,2,4-Trichlorobenzene	184.3	10	200	0	92.2	73-127	0			
1,2,4-Trimethylbenzene	195.2	10	200	0	97.6	74-118	0			
1,2-Dibromo-3-chloropropane	197.4	10	200	0	98.7	52-141	0			
1,2-Dibromoethane	229.6	10	200	0	115	60-159	0			
1,2-Dichlorobenzene	189	10	200	0	94.5	80-119	0			
1,2-Dichloroethane	199.8	10	200	0	99.9	78-121	0			
1,2-Dichloropropane	196.7	10	200	0	98.4	78-120	0			
1,3,5-Trimethylbenzene	209.5	10	200	0	105	76-120	0			
1,3-Dichlorobenzene	195.6	10	200	0	97.8	80-120	0			
1,4-Dichlorobenzene	194.2	10	200	0	97.1	81-119	0			
2-Butanone	201.1	50	200	0	101	69-147	0			
2-Hexanone	182.1	50	200	0	91	67-140	0			
2-Methylnaphthalene	182.8	50	200	0	91.4	50-150	0			
4-Methyl-2-pentanone	189.4	10	200	0	94.7	68-199	0			
Acetone	195.1	100	200	0	97.6	70-166	0			
Acrylonitrile	212.2	10	200	0	106	70-133	0			
Benzene	210.1	10	200	15.7	97.2	78-120	0			
Bromochloromethane	218.3	10	200	0	109	70-125	0			
Bromodichloromethane	200.1	10	200	0	100	73-126	0			
Bromoform	176.5	10	200	0	88.2	60-124	0			
Bromomethane	142.2	10	200	0	71.1	20-183	0			
Carbon disulfide	231.6	10	200	0	116	67-159	0			
Carbon tetrachloride	206.5	10	200	0	103	69-124	0			
Chlorobenzene	204.8	10	200	0	102	80-118	0			
Chloroethane	171.5	10	200	0	85.8	35-136	0			
Chloroform	212.3	10	200	0	106	75-119	0			
Chloromethane	134.1	10	200	0	67	26-117	0			
cis-1,2-Dichloroethene	213	10	200	0	106	75-123	0			
cis-1,3-Dichloropropene	181	10	200	0	90.5	69-120	0			
Dibromochloromethane	183.1	10	200	0	91.6	63-117	0			
Dibromomethane	199.8	10	200	0	99.9	78-120	0			
Dichlorodifluoromethane	174.6	10	200	0	87.3	36-133	0			
Diethyl ether	220.7	10	200	14	103	57-163	0			
Ethylbenzene	205.7	10	200	0	103	76-116	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R407901a** Instrument ID **VMS8** Method: **SW8260D**

Hexachloroethane	192.8	10	200	0	96.4	60-130	0
Isopropylbenzene	219.8	10	200	0	110	77-118	0
m,p-Xylene	410.8	20	400	0	103	76-119	0
Methyl iodide	324.8	50	200	0	162	10-200	0
Methyl tert-butyl ether	204.5	10	200	0	102	77-137	0
Methylene chloride	215.2	50	200	0	108	68-125	0
Naphthalene	179.5	50	200	0	89.8	56-142	0
n-Propylbenzene	209.2	10	200	0	105	74-118	0
o-Xylene	205	10	200	0	102	77-116	0
Styrene	205.4	10	200	0	103	76-123	0
Tetrachloroethene	226	10	200	0	113	80-124	0
Toluene	205.8	10	200	0	103	78-116	0
trans-1,2-Dichloroethene	228.4	10	200	0	114	73-124	0
trans-1,3-Dichloropropene	189.3	10	200	0	94.6	67-118	0
trans-1,4-Dichloro-2-butene	128.6	20	200	0	64.3	58-118	0
Trichloroethene	194.7	10	200	0	97.4	75-122	0
Trichlorofluoromethane	213.3	10	200	0	107	52-115	0
Vinyl chloride	175.9	10	200	0	88	49-122	0
Xylenes, Total	615.8	30	600	0	103	77-119	0
Surr: 1,2-Dichloroethane-d4	*201*	0	*200*	0	*100*	*80-120*	0
Surr: 4-Bromofluorobenzene	*198.2*	0	*200*	0	*99.1*	*80-120*	0
Surr: Dibromofluoromethane	*193.9*	0	*200*	0	*97*	*80-120*	0
Surr: Toluene-d8	*206.8*	0	*200*	0	*103*	*80-120*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R407901a** Instrument ID **VMS8** Method: **SW8260D**

MSD Sample ID: **24070451-02A MSD** Units: **µg/L** Analysis Date: **7/13/2024 08:23 AM**

Client ID: **HA-5** Run ID: **VMS8_240712B** SeqNo: **10954630** Prep Date: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	190.3	10	200	0	95.2	72-119	198.3	4.12	30	
1,1,1-Trichloroethane	209.8	10	200	0	105	75-119	202.7	3.44	30	
1,1,2,2-Tetrachloroethane	193.6	10	200	0	96.8	80-123	197.4	1.94	30	
1,1,2-Trichloroethane	191.5	10	200	0	95.8	83-118	206.8	7.68	30	
1,1,2-Trichlorotrifluoroethane	230.4	10	200	0	115	64-133	233	1.12	30	
1,1-Dichloroethane	210.2	10	200	0	105	73-122	209.6	0.286	30	
1,1-Dichloroethene	230.4	10	200	0	115	66-131	239.1	3.71	30	
1,2,3-Trichloropropane	193.4	10	200	0	96.7	78-119	203.3	4.99	30	
1,2,4-Trichlorobenzene	187.2	10	200	0	93.6	73-127	184.3	1.56	30	
1,2,4-Trimethylbenzene	191.6	10	200	0	95.8	74-118	195.2	1.86	30	
1,2-Dibromo-3-chloropropane	208.3	10	200	0	104	52-141	197.4	5.37	30	
1,2-Dibromoethane	220.1	10	200	0	110	60-159	229.6	4.23	30	
1,2-Dichlorobenzene	206.1	10	200	0	103	80-119	189	8.66	30	
1,2-Dichloroethane	199.7	10	200	0	99.8	78-121	199.8	0.0501	30	
1,2-Dichloropropane	193	10	200	0	96.5	78-120	196.7	1.9	30	
1,3,5-Trimethylbenzene	199.7	10	200	0	99.8	76-120	209.5	4.79	30	
1,3-Dichlorobenzene	207	10	200	0	104	80-120	195.6	5.66	30	
1,4-Dichlorobenzene	206.9	10	200	0	103	81-119	194.2	6.33	30	
2-Butanone	204.9	50	200	0	102	69-147	201.1	1.87	30	
2-Hexanone	178.6	50	200	0	89.3	67-140	182.1	1.94	30	
2-Methylnaphthalene	198.2	50	200	0	99.1	50-150	182.8	8.08	30	
4-Methyl-2-pentanone	190.9	10	200	0	95.4	68-199	189.4	0.789	30	
Acetone	207.7	100	200	0	104	70-166	195.1	6.26	30	
Acrylonitrile	209.4	10	200	0	105	70-133	212.2	1.33	30	
Benzene	211.4	10	200	15.7	97.8	78-120	210.1	0.617	30	
Bromochloromethane	213	10	200	0	106	70-125	218.3	2.46	30	
Bromodichloromethane	207.2	10	200	0	104	73-126	200.1	3.49	30	
Bromoform	163	10	200	0	81.5	60-124	176.5	7.95	30	
Bromomethane	156.3	10	200	0	78.2	20-183	142.2	9.45	30	
Carbon disulfide	232.5	10	200	0	116	67-159	231.6	0.388	30	
Carbon tetrachloride	213.8	10	200	0	107	69-124	206.5	3.47	30	
Chlorobenzene	203.5	10	200	0	102	80-118	204.8	0.637	30	
Chloroethane	183.3	10	200	0	91.6	35-136	171.5	6.65	30	
Chloroform	208.7	10	200	0	104	75-119	212.3	1.71	30	
Chloromethane	139.5	10	200	0	69.8	26-117	134.1	3.95	30	
cis-1,2-Dichloroethene	207.7	10	200	0	104	75-123	213	2.52	30	
cis-1,3-Dichloropropene	190	10	200	0	95	69-120	181	4.85	30	
Dibromochloromethane	173.6	10	200	0	86.8	63-117	183.1	5.33	30	
Dibromomethane	203	10	200	0	102	78-120	199.8	1.59	30	
Dichlorodifluoromethane	162	10	200	0	81	36-133	174.6	7.49	30	
Diethyl ether	222.2	10	200	14	104	57-163	220.7	0.677	30	
Ethylbenzene	203.8	10	200	0	102	76-116	205.7	0.928	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R407901a** Instrument ID **VMS8** Method: **SW8260D**

Hexachloroethane	213.4	10	200	0	107	60-130	192.8	10.1	30
Isopropylbenzene	214.8	10	200	0	107	77-118	219.8	2.3	30
m,p-Xylene	399.7	20	400	0	99.9	76-119	410.8	2.74	30
Methyl iodide	337.1	50	200	0	169	10-200	324.8	3.72	30
Methyl tert-butyl ether	204.5	10	200	0	102	77-137	204.5	0	30
Methylene chloride	213.7	50	200	0	107	68-125	215.2	0.699	30
Naphthalene	195.2	50	200	0	97.6	56-142	179.5	8.38	30
n-Propylbenzene	199.6	10	200	0	99.8	74-118	209.2	4.7	30
o-Xylene	200.3	10	200	0	100	77-116	205	2.32	30
Styrene	198.8	10	200	0	99.4	76-123	205.4	3.27	30
Tetrachloroethene	222.4	10	200	0	111	80-124	226	1.61	30
Toluene	203.7	10	200	0	102	78-116	205.8	1.03	30
trans-1,2-Dichloroethene	224	10	200	0	112	73-124	228.4	1.95	30
trans-1,3-Dichloropropene	182.3	10	200	0	91.2	67-118	189.3	3.77	30
trans-1,4-Dichloro-2-butene	119.1	20	200	0	59.6	58-118	128.6	7.67	30
Trichloroethene	206.4	10	200	0	103	75-122	194.7	5.83	30
Trichlorofluoromethane	199.8	10	200	0	99.9	52-115	213.3	6.54	30
Vinyl chloride	172.2	10	200	0	86.1	49-122	175.9	2.13	30
Xylenes, Total	600	30	600	0	100	77-119	615.8	2.6	30
Surr: 1,2-Dichloroethane-d4	*208.3*	0	*200*	0	*104*	*80-120*	201	*3.57*	*30*
Surr: 4-Bromofluorobenzene	*191.9*	0	*200*	0	*96*	*80-120*	198.2	*3.23*	*30*
Surr: Dibromofluoromethane	*200.2*	0	*200*	0	*100*	*80-120*	193.9	*3.2*	*30*
Surr: Toluene-d8	*197.2*	0	*200*	0	*98.6*	*80-120*	206.8	*4.75*	*30*

The following samples were analyzed in this batch:

24070451-01A	24070451-02A	24070451-03A
24070451-04A	24070451-05A	24070451-06A
24070451-09A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R407981a** Instrument ID **VMS8** Method: **SW8260D**

MBLK Sample ID: **8V-BLKW1-240716-R407981a** Units: **µg/L** Analysis Date: **7/16/2024 02:10 PM**

Client ID: Run ID: **VMS8_240716A** SeqNo: **10959128** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
1,1,2-Trichlorotrifluoroethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2,3-Trichloropropane	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	1.0								
1,2-Dibromoethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,2-Dichloroethane	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
2-Butanone	ND	5.0								
2-Hexanone	ND	5.0								
2-Methylnaphthalene	ND	5.0								
4-Methyl-2-pentanone	ND	1.0								
Acetone	ND	10								
Acrylonitrile	ND	1.0								
Benzene	ND	1.0								
Bromochloromethane	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	1.0								
Carbon disulfide	ND	1.0								
Carbon tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	1.0								
Chloroform	ND	1.0								
Chloromethane	ND	1.0								
cis-1,2-Dichloroethene	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
Diethyl ether	ND	1.0								
Ethylbenzene	ND	1.0								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R407981a** Instrument ID **VMS8** Method: **SW8260D**

Hexachloroethane	ND	1.0					
Isopropylbenzene	ND	1.0					
m,p-Xylene	ND	2.0					
Methyl iodide	ND	5.0					
Methyl tert-butyl ether	ND	1.0					
Methylene chloride	ND	5.0					
Naphthalene	ND	5.0					
n-Propylbenzene	ND	1.0					
o-Xylene	ND	1.0					
Styrene	ND	1.0					
Tetrachloroethene	ND	1.0					
Toluene	ND	1.0					
trans-1,2-Dichloroethene	ND	1.0					
trans-1,3-Dichloropropene	ND	1.0					
trans-1,4-Dichloro-2-butene	ND	2.0					
Trichloroethene	ND	1.0					
Trichlorofluoromethane	ND	1.0					
Vinyl acetate	ND	5.0					
Vinyl chloride	ND	1.0					
Xylenes, Total	ND	3.0					
Surr: 1,2-Dichloroethane-d4	*20.51*	0	*20*	0	*103*	*80-120*	0
Surr: 4-Bromofluorobenzene	*19.74*	0	*20*	0	*98.7*	*80-120*	0
Surr: Dibromofluoromethane	*20.34*	0	*20*	0	*102*	*80-120*	0
Surr: Toluene-d8	*20.02*	0	*20*	0	*100*	*80-120*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R407981a** Instrument ID **VMS8** Method: **SW8260D**

LCS Sample ID: **8V-LCSW1-240716-R407981a** Units: **µg/L** Analysis Date: **7/16/2024 01:14 PM**

Client ID: Run ID: **VMS8_240716A** SeqNo: **10959126** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	16.31	1.0	20	0	81.6	72-119	0			
1,1,1-Trichloroethane	16.42	1.0	20	0	82.1	75-119	0			
1,1,2,2-Tetrachloroethane	17.16	1.0	20	0	85.8	80-123	0			
1,1,2-Trichloroethane	17.01	1.0	20	0	85	83-118	0			
1,1,2-Trichlorotrifluoroethane	16.62	1.0	20	0	83.1	64-133	0			
1,1-Dichloroethane	17.67	1.0	20	0	88.4	73-122	0			
1,1-Dichloroethene	18.08	1.0	20	0	90.4	66-131	0			
1,2,3-Trichloropropane	16.41	1.0	20	0	82	78-119	0			
1,2,4-Trichlorobenzene	18.74	1.0	20	0	93.7	73-127	0			
1,2,4-Trimethylbenzene	16.53	1.0	20	0	82.6	74-118	0			
1,2-Dibromo-3-chloropropane	16.98	1.0	20	0	84.9	52-141	0			
1,2-Dibromoethane	19.54	1.0	20	0	97.7	60-159	0			
1,2-Dichlorobenzene	18.21	1.0	20	0	91	80-119	0			
1,2-Dichloroethane	17.41	1.0	20	0	87	78-121	0			
1,2-Dichloropropane	18.09	1.0	20	0	90.4	78-120	0			
1,3,5-Trimethylbenzene	17.24	1.0	20	0	86.2	76-120	0			
1,3-Dichlorobenzene	18.31	1.0	20	0	91.6	80-120	0			
1,4-Dichlorobenzene	18.11	1.0	20	0	90.6	81-119	0			
2-Butanone	14.97	5.0	20	0	74.8	69-147	0			
2-Hexanone	16.1	5.0	20	0	80.5	67-140	0			
2-Methylnaphthalene	17.87	5.0	20	0	89.4	50-150	0			
4-Methyl-2-pentanone	16.17	1.0	20	0	80.8	68-199	0			
Acetone	15.43	10	20	0	77.2	70-166	0			
Acrylonitrile	16.04	1.0	20	0	80.2	70-133	0			
Benzene	17.07	1.0	20	0	85.4	78-120	0			
Bromochloromethane	18.75	1.0	20	0	93.8	70-125	0			
Bromodichloromethane	17.43	1.0	20	0	87.2	73-126	0			
Bromoform	14.45	1.0	20	0	72.2	60-124	0			
Bromomethane	10.48	1.0	20	0	52.4	20-183	0			
Carbon disulfide	18.48	1.0	20	0	92.4	67-159	0			
Carbon tetrachloride	16.22	1.0	20	0	81.1	69-124	0			
Chlorobenzene	17.34	1.0	20	0	86.7	80-118	0			
Chloroethane	15.19	1.0	20	0	76	35-136	0			
Chloroform	18.22	1.0	20	0	91.1	75-119	0			
Chloromethane	12.46	1.0	20	0	62.3	26-117	0			
cis-1,2-Dichloroethene	18.04	1.0	20	0	90.2	75-123	0			
cis-1,3-Dichloropropene	18.23	1.0	20	0	91.2	69-120	0			
Dibromochloromethane	17.06	1.0	20	0	85.3	63-117	0			
Dibromomethane	18.25	1.0	20	0	91.2	78-120	0			
Dichlorodifluoromethane	11.76	1.0	20	0	58.8	36-133	0			
Diethyl ether	18.49	1.0	20	0	92.4	57-163	0			
Ethylbenzene	16.97	1.0	20	0	84.8	76-116	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R407981a** Instrument ID **VMS8** Method: **SW8260D**

Hexachloroethane	17.73	1.0	20	0	88.6	60-130	0
Isopropylbenzene	17.36	1.0	20	0	86.8	77-118	0
m,p-Xylene	34.04	2.0	40	0	85.1	76-119	0
Methyl iodide	24.09	5.0	20	0	120	10-200	0
Methyl tert-butyl ether	18.05	1.0	20	0	90.2	77-137	0
Methylene chloride	18.66	5.0	20	0	93.3	68-125	0
Naphthalene	16.82	5.0	20	0	84.1	56-142	0
n-Propylbenzene	16.9	1.0	20	0	84.5	74-118	0
o-Xylene	16.99	1.0	20	0	85	77-116	0
Styrene	17.5	1.0	20	0	87.5	76-123	0
Tetrachloroethene	18.01	1.0	20	0	90	80-124	0
Toluene	16.73	1.0	20	0	83.6	78-116	0
trans-1,2-Dichloroethene	17.89	1.0	20	0	89.4	73-124	0
trans-1,3-Dichloropropene	17.61	1.0	20	0	88	67-118	0
trans-1,4-Dichloro-2-butene	13.57	2.0	20	0	67.8	58-118	0
Trichloroethene	16.49	1.0	20	0	82.4	75-122	0
Trichlorofluoromethane	15.17	1.0	20	0	75.8	52-115	0
Vinyl chloride	14.05	1.0	20	0	70.2	49-122	0
Xylenes, Total	51.03	3.0	60	0	85	77-119	0
Surr: 1,2-Dichloroethane-d4	*20.53*	0	*20*	0	*103*	*80-120*	0
Surr: 4-Bromofluorobenzene	*19.36*	0	*20*	0	*96.8*	*80-120*	0
Surr: Dibromofluoromethane	*20.43*	0	*20*	0	*102*	*80-120*	0
Surr: Toluene-d8	*19.98*	0	*20*	0	*99.9*	*80-120*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R407981a** Instrument ID **VMS8** Method: **SW8260D**

MS Sample ID: **HN2404092-003 MS** Units: **µg/L** Analysis Date: **7/16/2024 09:12 PM**

Client ID: Run ID: **VMS8_240716A** SeqNo: **10959150** Prep Date: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	96.35	5.0	100	0	96.4	72-119	0			
1,1,1-Trichloroethane	107.2	5.0	100	0	107	75-119	0			
1,1,2,2-Tetrachloroethane	91.65	5.0	100	0	91.6	80-123	0			
1,1,2-Trichloroethane	101.6	5.0	100	0	102	83-118	0			
1,1,2-Trichlorotrifluoroethane	122	5.0	100	0	122	64-133	0			
1,1-Dichloroethane	109.2	5.0	100	0	109	73-122	0			
1,1-Dichloroethene	123.6	5.0	100	0	124	66-131	0			
1,2,3-Trichloropropane	96.8	5.0	100	0	96.8	78-119	0			
1,2,4-Trichlorobenzene	99.05	5.0	100	0	99	73-127	0			
1,2,4-Trimethylbenzene	96.5	5.0	100	0	96.5	74-118	0			
1,2-Dibromo-3-chloropropane	98.2	5.0	100	0	98.2	52-141	0			
1,2-Dibromoethane	112.2	5.0	100	0	112	60-159	0			
1,2-Dichlorobenzene	101.2	5.0	100	0	101	80-119	0			
1,2-Dichloroethane	104.9	5.0	100	0	105	78-121	0			
1,2-Dichloropropane	106.2	5.0	100	0	106	78-120	0			
1,3,5-Trimethylbenzene	103.2	5.0	100	0	103	76-120	0			
1,3-Dichlorobenzene	102.2	5.0	100	0	102	80-120	0			
1,4-Dichlorobenzene	100.2	5.0	100	0	100	81-119	0			
2-Butanone	104.3	25	100	0	104	69-147	0			
2-Hexanone	95.35	25	100	0	95.4	67-140	0			
2-Methylnaphthalene	96.75	25	100	0	96.8	50-150	0			
4-Methyl-2-pentanone	96.75	5.0	100	0	96.8	68-199	0			
Acetone	669.4	50	100	569.7	99.7	70-166	0			EO
Acrylonitrile	98.05	5.0	100	0	98	70-133	0			
Benzene	110.4	5.0	100	0	110	78-120	0			
Bromochloromethane	110.5	5.0	100	0	110	70-125	0			
Bromodichloromethane	104	5.0	100	0	104	73-126	0			
Bromoform	84.9	5.0	100	0	84.9	60-124	0			
Bromomethane	72.55	5.0	100	0	72.6	20-183	0			
Carbon disulfide	120.1	5.0	100	0	120	67-159	0			
Carbon tetrachloride	112.3	5.0	100	0	112	69-124	0			
Chlorobenzene	101.2	5.0	100	0	101	80-118	0			
Chloroethane	102.6	5.0	100	0	103	35-136	0			
Chloroform	107.4	5.0	100	0	107	75-119	0			
Chloromethane	77.95	5.0	100	0	78	26-117	0			
cis-1,2-Dichloroethene	109.2	5.0	100	0	109	75-123	0			
cis-1,3-Dichloropropene	103.5	5.0	100	0	104	69-120	0			
Dibromochloromethane	91.45	5.0	100	0	91.4	63-117	0			
Dibromomethane	107	5.0	100	0	107	78-120	0			
Dichlorodifluoromethane	90.9	5.0	100	0	90.9	36-133	0			
Diethyl ether	107.2	5.0	100	0	107	57-163	0			
Ethylbenzene	104.5	5.0	100	0	104	76-116	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R407981a** Instrument ID **VMS8** Method: **SW8260D**

Hexachloroethane	104	5.0	100	0	104	60-130	0
Isopropylbenzene	110.8	5.0	100	0	111	77-118	0
m,p-Xylene	205	10	200	0	103	76-119	0
Methyl iodide	161.2	25	100	0	161	10-200	0
Methyl tert-butyl ether	106	5.0	100	0	106	77-137	0
Methylene chloride	111.9	25	100	0	112	68-125	0
Naphthalene	92.65	25	100	0	92.6	56-142	0
n-Propylbenzene	101.6	5.0	100	0	102	74-118	0
o-Xylene	102.7	5.0	100	0	103	77-116	0
Styrene	104.4	5.0	100	0	104	76-123	0
Tetrachloroethene	120.6	5.0	100	0	121	80-124	0
Toluene	102.9	5.0	100	0	103	78-116	0
trans-1,2-Dichloroethene	115.6	5.0	100	0	116	73-124	0
trans-1,3-Dichloropropene	97.6	5.0	100	0	97.6	67-118	0
trans-1,4-Dichloro-2-butene	68.1	10	100	0	68.1	58-118	0
Trichloroethene	108.2	5.0	100	0	108	75-122	0
Trichlorofluoromethane	109	5.0	100	0	109	52-115	0
Vinyl chloride	103.1	5.0	100	0	103	49-122	0
Xylenes, Total	307.8	15	300	0	103	77-119	0
Surr: 1,2-Dichloroethane-d4	*105*	0	*100*	0	*105*	*80-120*	0
Surr: 4-Bromofluorobenzene	*98.4*	0	*100*	0	*98.4*	*80-120*	0
Surr: Dibromofluoromethane	*102.5*	0	*100*	0	*102*	*80-120*	0
Surr: Toluene-d8	*101.5*	0	*100*	0	*102*	*80-120*	0

Batch ID: **R407981a** Instrument ID **VMS8** Method: **SW8260D**

MSD	Sample ID: **HN2404092-003 MSD**				Units: **µg/L**			Analysis Date: **7/16/2024 09:31 PM**			
Client ID:		Run ID: **VMS8_240716A**			SeqNo: **10959151**		Prep Date:		DF: **5**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	97.45	5.0	100	0	97.4	72-119	96.35	1.14	30	
1,1,1-Trichloroethane	106.6	5.0	100	0	107	75-119	107.2	0.561	30	
1,1,2,2-Tetrachloroethane	93.15	5.0	100	0	93.2	80-123	91.65	1.62	30	
1,1,2-Trichloroethane	104	5.0	100	0	104	83-118	101.6	2.38	30	
1,1,2-Trichlorotrifluoroethane	118.6	5.0	100	0	119	64-133	122	2.78	30	
1,1-Dichloroethane	108.2	5.0	100	0	108	73-122	109.2	0.92	30	
1,1-Dichloroethene	124.4	5.0	100	0	124	66-131	123.6	0.645	30	
1,2,3-Trichloropropane	95.8	5.0	100	0	95.8	78-119	96.8	1.04	30	
1,2,4-Trichlorobenzene	98.75	5.0	100	0	98.8	73-127	99.05	0.303	30	
1,2,4-Trimethylbenzene	99.9	5.0	100	0	99.9	74-118	96.5	3.46	30	
1,2-Dibromo-3-chloropropane	99.75	5.0	100	0	99.8	52-141	98.2	1.57	30	
1,2-Dibromoethane	114.1	5.0	100	0	114	60-159	112.2	1.72	30	
1,2-Dichlorobenzene	99.95	5.0	100	0	100	80-119	101.2	1.24	30	
1,2-Dichloroethane	102.7	5.0	100	0	103	78-121	104.9	2.12	30	
1,2-Dichloropropane	109.1	5.0	100	0	109	78-120	106.2	2.74	30	
1,3,5-Trimethylbenzene	104.5	5.0	100	0	104	76-120	103.2	1.25	30	
1,3-Dichlorobenzene	100.2	5.0	100	0	100	80-120	102.2	1.93	30	
1,4-Dichlorobenzene	100.8	5.0	100	0	101	81-119	100.2	0.597	30	
2-Butanone	102.2	25	100	0	102	69-147	104.3	2.03	30	
2-Hexanone	95.2	25	100	0	95.2	67-140	95.35	0.157	30	
2-Methylnaphthalene	101	25	100	0	101	50-150	96.75	4.25	30	
4-Methyl-2-pentanone	93.45	5.0	100	0	93.4	68-199	96.75	3.47	30	
Acetone	647.6	50	100	569.7	77.9	70-166	669.4	3.3	30	EO
Acrylonitrile	94.5	5.0	100	0	94.5	70-133	98.05	3.69	30	
Benzene	108.2	5.0	100	0	108	78-120	110.4	2.1	30	
Bromochloromethane	110.3	5.0	100	0	110	70-125	110.5	0.181	30	
Bromodichloromethane	102	5.0	100	0	102	73-126	104	1.89	30	
Bromoform	84.6	5.0	100	0	84.6	60-124	84.9	0.354	30	
Bromomethane	79.75	5.0	100	0	79.8	20-183	72.55	9.46	30	
Carbon disulfide	120.6	5.0	100	0	121	67-159	120.1	0.415	30	
Carbon tetrachloride	110.8	5.0	100	0	111	69-124	112.3	1.34	30	
Chlorobenzene	102.4	5.0	100	0	102	80-118	101.2	1.18	30	
Chloroethane	100.9	5.0	100	0	101	35-136	102.6	1.67	30	
Chloroform	107.2	5.0	100	0	107	75-119	107.4	0.186	30	
Chloromethane	75.8	5.0	100	0	75.8	26-117	77.95	2.8	30	
cis-1,2-Dichloroethene	107.6	5.0	100	0	108	75-123	109.2	1.48	30	
cis-1,3-Dichloropropene	100.1	5.0	100	0	100	69-120	103.5	3.34	30	
Dibromochloromethane	91.35	5.0	100	0	91.4	63-117	91.45	0.109	30	
Dibromomethane	103.9	5.0	100	0	104	78-120	107	2.89	30	
Dichlorodifluoromethane	83.4	5.0	100	0	83.4	36-133	90.9	8.61	30	
Diethyl ether	109	5.0	100	0	109	57-163	107.2	1.67	30	
Ethylbenzene	105.3	5.0	100	0	105	76-116	104.5	0.763	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R407981a** Instrument ID **VMS8** Method: **SW8260D**

Hexachloroethane	105.2	5.0	100	0	105	60-130	104	1.2	30	
Isopropylbenzene	111.2	5.0	100	0	111	77-118	110.8	0.36	30	
m,p-Xylene	205.5	10	200	0	103	76-119	205	0.219	30	
Methyl iodide	165.4	25	100	0	165	10-200	161.2	2.51	30	
Methyl tert-butyl ether	101.8	5.0	100	0	102	77-137	106	4.04	30	
Methylene chloride	108.2	25	100	0	108	68-125	111.9	3.41	30	
Naphthalene	94.4	25	100	0	94.4	56-142	92.65	1.87	30	
n-Propylbenzene	103.2	5.0	100	0	103	74-118	101.6	1.56	30	
o-Xylene	101.8	5.0	100	0	102	77-116	102.7	0.88	30	
Styrene	104.1	5.0	100	0	104	76-123	104.4	0.288	30	
Tetrachloroethene	125.4	5.0	100	0	125	80-124	120.6	3.98	30	S
Toluene	104	5.0	100	0	104	78-116	102.9	1.06	30	
trans-1,2-Dichloroethene	114.2	5.0	100	0	114	73-124	115.6	1.31	30	
trans-1,3-Dichloropropene	100.3	5.0	100	0	100	67-118	97.6	2.73	30	
trans-1,4-Dichloro-2-butene	69.1	10	100	0	69.1	58-118	68.1	1.46	30	
Trichloroethene	105.9	5.0	100	0	106	75-122	108.2	2.15	30	
Trichlorofluoromethane	106.6	5.0	100	0	107	52-115	109	2.23	30	
Vinyl chloride	101.5	5.0	100	0	102	49-122	103.1	1.56	30	
Xylenes, Total	307.3	15	300	0	102	77-119	307.8	0.146	30	
Surr: 1,2-Dichloroethane-d4	*102.9*	0	*100*	0	*103*	*80-120*	105	*2.07*	*30*	
Surr: 4-Bromofluorobenzene	*96.55*	0	*100*	0	*96.6*	*80-120*	98.4	*1.9*	*30*	
Surr: Dibromofluoromethane	*100.8*	0	*100*	0	*101*	*80-120*	102.5	*1.62*	*30*	
Surr: Toluene-d8	*101*	0	*100*	0	*101*	*80-120*	101.5	*0.543*	*30*	

The following samples were analyzed in this batch: 24070451-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R408060a** Instrument ID **VMS8** Method: **SW8260D**

MBLK	Sample ID: **8V-BLKW1-240717-R408060a**				Units: **µg/L**		Analysis Date: **7/17/2024 02:20 PM**			
Client ID:		Run ID: **VMS8_240717A**			SeqNo: **10963076**		Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
1,1,2-Trichlorotrifluoroethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2,3-Trichloropropane	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	1.0								
1,2-Dibromoethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,2-Dichloroethane	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
2-Butanone	ND	5.0								
2-Hexanone	ND	5.0								
2-Methylnaphthalene	ND	5.0								
4-Methyl-2-pentanone	ND	1.0								
Acetone	ND	10								
Acrylonitrile	ND	1.0								
Benzene	ND	1.0								
Bromochloromethane	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	1.0								
Carbon disulfide	ND	1.0								
Carbon tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	1.0								
Chloroform	ND	1.0								
Chloromethane	ND	1.0								
cis-1,2-Dichloroethene	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
Diethyl ether	ND	1.0								
Ethylbenzene	ND	1.0								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R408060a** Instrument ID **VMS8** Method: **SW8260D**

Hexachloroethane	ND	1.0					
Isopropylbenzene	ND	1.0					
m,p-Xylene	ND	2.0					
Methyl iodide	ND	5.0					
Methyl tert-butyl ether	ND	1.0					
Methylene chloride	ND	5.0					
Naphthalene	ND	5.0					
n-Propylbenzene	ND	1.0					
o-Xylene	ND	1.0					
Styrene	ND	1.0					
Tetrachloroethene	ND	1.0					
Toluene	ND	1.0					
trans-1,2-Dichloroethene	ND	1.0					
trans-1,3-Dichloropropene	ND	1.0					
trans-1,4-Dichloro-2-butene	ND	2.0					
Trichloroethene	ND	1.0					
Trichlorofluoromethane	ND	1.0					
Vinyl acetate	ND	5.0					
Vinyl chloride	ND	1.0					
Xylenes, Total	ND	3.0					
Surr: 1,2-Dichloroethane-d4	*20.51*	0	*20*	0	*103*	*80-120*	0
Surr: 4-Bromofluorobenzene	*19.62*	0	*20*	0	*98.1*	*80-120*	0
Surr: Dibromofluoromethane	*19.55*	0	*20*	0	*97.8*	*80-120*	0
Surr: Toluene-d8	*20.32*	0	*20*	0	*102*	*80-120*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R408060a** Instrument ID **VMS8** Method: **SW8260D**

LCS	Sample ID: **8V-LCSW1-240717-R408060a**				Units: **µg/L**			Analysis Date: **7/17/2024 12:39 PM**			
Client ID:		Run ID: **VMS8_240717A**			SeqNo: **10963303**			Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	43.7	1.0	40	0	109	72-119	0			
1,1,1-Trichloroethane	43.13	1.0	40	0	108	75-119	0			
1,1,2,2-Tetrachloroethane	45.65	1.0	40	0	114	80-123	0			
1,1,2-Trichloroethane	44.99	1.0	40	0	112	83-118	0			
1,1,2-Trichlorotrifluoroethane	43.17	1.0	40	0	108	64-133	0			
1,1-Dichloroethane	43.47	1.0	40	0	109	73-122	0			
1,1-Dichloroethene	43.25	1.0	40	0	108	66-131	0			
1,2,3-Trichloropropane	43.62	1.0	40	0	109	78-119	0			
1,2,4-Trichlorobenzene	45.81	1.0	40	0	115	73-127	0			
1,2,4-Trimethylbenzene	44.7	1.0	40	0	112	74-118	0			
1,2-Dibromo-3-chloropropane	41.64	1.0	40	0	104	52-141	0			
1,2-Dibromoethane	44.78	1.0	40	0	112	60-159	0			
1,2-Dichlorobenzene	46.4	1.0	40	0	116	80-119	0			
1,2-Dichloroethane	45.9	1.0	40	0	115	78-121	0			
1,2-Dichloropropane	45.1	1.0	40	0	113	78-120	0			
1,3,5-Trimethylbenzene	44.27	1.0	40	0	111	76-120	0			
1,3-Dichlorobenzene	46.48	1.0	40	0	116	80-120	0			
1,4-Dichlorobenzene	46.58	1.0	40	0	116	81-119	0			
2-Butanone	39.96	5.0	40	0	99.9	69-147	0			
2-Hexanone	42.44	5.0	40	0	106	67-140	0			
2-Methylnaphthalene	43.42	5.0	40	0	109	50-150	0			
4-Methyl-2-pentanone	40.49	1.0	40	0	101	68-199	0			
Acetone	38.34	10	40	0	95.8	70-166	0			
Acrylonitrile	42.48	1.0	40	0	106	70-133	0			
Benzene	44.12	1.0	40	0	110	78-120	0			
Bromochloromethane	45.4	1.0	40	0	114	70-125	0			
Bromodichloromethane	45.22	1.0	40	0	113	73-126	0			
Bromoform	42.76	1.0	40	0	107	60-124	0			
Bromomethane	36.27	1.0	40	0	90.7	20-183	0			
Carbon disulfide	43.83	1.0	40	0	110	67-159	0			
Carbon tetrachloride	42.06	1.0	40	0	105	69-124	0			
Chlorobenzene	44.31	1.0	40	0	111	80-118	0			
Chloroethane	38.86	1.0	40	0	97.2	35-136	0			
Chloroform	44.51	1.0	40	0	111	75-119	0			
Chloromethane	37.74	1.0	40	0	94.4	26-117	0			
cis-1,2-Dichloroethene	44.51	1.0	40	0	111	75-123	0			
cis-1,3-Dichloropropene	45.71	1.0	40	0	114	69-120	0			
Dibromochloromethane	44.07	1.0	40	0	110	63-117	0			
Dibromomethane	46.52	1.0	40	0	116	78-120	0			
Dichlorodifluoromethane	37.43	1.0	40	0	93.6	36-133	0			
Diethyl ether	46.79	1.0	40	0	117	57-163	0			
Ethylbenzene	43.64	1.0	40	0	109	76-116	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R408060a** Instrument ID **VMS8** Method: **SW8260D**

Hexachloroethane	47.26	1.0	40	0	118	60-130	0
Isopropylbenzene	44.57	1.0	40	0	111	77-118	0
m,p-Xylene	88.94	2.0	80	0	111	76-119	0
Methyl iodide	35.07	5.0	40	0	87.7	10-200	0
Methyl tert-butyl ether	43.84	1.0	40	0	110	77-137	0
Methylene chloride	45.86	5.0	40	0	115	68-125	0
Naphthalene	43.49	5.0	40	0	109	56-142	0
n-Propylbenzene	44	1.0	40	0	110	74-118	0
o-Xylene	45.05	1.0	40	0	113	77-116	0
Styrene	45.74	1.0	40	0	114	76-123	0
Tetrachloroethene	43.57	1.0	40	0	109	80-124	0
Toluene	43.68	1.0	40	0	109	78-116	0
trans-1,2-Dichloroethene	45.68	1.0	40	0	114	73-124	0
trans-1,3-Dichloropropene	46.49	1.0	40	0	116	67-118	0
trans-1,4-Dichloro-2-butene	45.76	2.0	40	0	114	58-118	0
Trichloroethene	42.7	1.0	40	0	107	75-122	0
Trichlorofluoromethane	37.59	1.0	40	0	94	52-115	0
Vinyl acetate	54.55	5.0	40	0	136		0
Vinyl chloride	37.07	1.0	40	0	92.7	49-122	0
Xylenes, Total	134	3.0	120	0	112	77-119	0
Surr: 1,2-Dichloroethane-d4	*20.16*	0	*20*	0	*101*	*80-120*	0
Surr: 4-Bromofluorobenzene	*19.75*	0	*20*	0	*98.8*	*80-120*	0
Surr: Dibromofluoromethane	*20.46*	0	*20*	0	*102*	*80-120*	0
Surr: Toluene-d8	*19.72*	0	*20*	0	*98.6*	*80-120*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R408060a** Instrument ID **VMS8** Method: **SW8260D**

MS Sample ID: **24070451-08A MS** Units: **µg/L** Analysis Date: **7/17/2024 11:32 PM**

Client ID: **MW-2** Run ID: **VMS8_240717A** SeqNo: **10963098** Prep Date: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	975.5	50	1000	0	97.6	72-119	0			
1,1,1-Trichloroethane	1056	50	1000	0	106	75-119	0			
1,1,2,2-Tetrachloroethane	957	50	1000	0	95.7	80-123	0			
1,1,2-Trichloroethane	1002	50	1000	0	100	83-118	0			
1,1,2-Trichlorotrifluoroethane	1232	50	1000	0	123	64-133	0			
1,1-Dichloroethane	1148	50	1000	0	115	73-122	0			
1,1-Dichloroethene	1257	50	1000	0	126	66-131	0			
1,2,3-Trichloropropane	945.5	50	1000	0	94.6	78-119	0			
1,2,4-Trichlorobenzene	949	50	1000	0	94.9	73-127	0			
1,2,4-Trimethylbenzene	967.5	50	1000	0	96.8	74-118	0			
1,2-Dibromo-3-chloropropane	974.5	50	1000	0	97.4	52-141	0			
1,2-Dibromoethane	1110	50	1000	0	111	60-159	0			
1,2-Dichlorobenzene	1000	50	1000	0	100	80-119	0			
1,2-Dichloroethane	1049	50	1000	0	105	78-121	0			
1,2-Dichloropropane	1100	50	1000	0	110	78-120	0			
1,3,5-Trimethylbenzene	1025	50	1000	0	102	76-120	0			
1,3-Dichlorobenzene	1020	50	1000	0	102	80-120	0			
1,4-Dichlorobenzene	1008	50	1000	0	101	81-119	0			
2-Butanone	1086	250	1000	0	109	69-147	0			
2-Hexanone	983	250	1000	0	98.3	67-140	0			
2-Methylnaphthalene	922	250	1000	0	92.2	50-150	0			
4-Methyl-2-pentanone	953.5	50	1000	0	95.4	68-199	0			
Acetone	971.5	500	1000	0	97.2	70-166	0			
Acrylonitrile	1061	50	1000	0	106	70-133	0			
Benzene	1074	50	1000	0	107	78-120	0			
Bromochloromethane	1154	50	1000	0	115	70-125	0			
Bromodichloromethane	1022	50	1000	0	102	73-126	0			
Bromoform	795	50	1000	0	79.5	60-124	0			
Bromomethane	803.5	50	1000	0	80.4	20-183	0			
Carbon disulfide	1186	50	1000	0	119	67-159	0			
Carbon tetrachloride	1070	50	1000	0	107	69-124	0			
Chlorobenzene	1003	50	1000	0	100	80-118	0			
Chloroethane	959	50	1000	0	95.9	35-136	0			
Chloroform	1105	50	1000	0	110	75-119	0			
Chloromethane	757.5	50	1000	0	75.8	26-117	0			
cis-1,2-Dichloroethene	1162	50	1000	0	116	75-123	0			
cis-1,3-Dichloropropene	994.5	50	1000	0	99.4	69-120	0			
Dibromochloromethane	910.5	50	1000	0	91	63-117	0			
Dibromomethane	1036	50	1000	0	104	78-120	0			
Dichlorodifluoromethane	733	50	1000	0	73.3	36-133	0			
Diethyl ether	1138	50	1000	0	114	57-163	0			
Ethylbenzene	1034	50	1000	0	103	76-116	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R408060a** Instrument ID **VMS8** Method: **SW8260D**

Hexachloroethane	1002	50	1000	0	100	60-130	0
Isopropylbenzene	1091	50	1000	0	109	77-118	0
m,p-Xylene	2044	100	2000	0	102	76-119	0
Methyl iodide	1834	250	1000	0	183	10-200	0
Methyl tert-butyl ether	1098	50	1000	0	110	77-137	0
Methylene chloride	1148	250	1000	0	115	68-125	0
Naphthalene	902	250	1000	0	90.2	56-142	0
n-Propylbenzene	1041	50	1000	0	104	74-118	0
o-Xylene	1041	50	1000	0	104	77-116	0
Styrene	1014	50	1000	0	101	76-123	0
Tetrachloroethene	1206	50	1000	0	121	80-124	0
Toluene	1038	50	1000	0	104	78-116	0
trans-1,2-Dichloroethene	1196	50	1000	0	120	73-124	0
trans-1,3-Dichloropropene	949.5	50	1000	0	95	67-118	0
trans-1,4-Dichloro-2-butene	689	100	1000	0	68.9	58-118	0
Trichloroethene	1034	50	1000	0	103	75-122	0
Trichlorofluoromethane	1075	50	1000	0	108	52-115	0
Vinyl chloride	927.5	50	1000	0	92.8	49-122	0
Xylenes, Total	3085	150	3000	0	103	77-119	0
Surr: 1,2-Dichloroethane-d4	*1044*	0	*1000*	0	*104*	*80-120*	0
Surr: 4-Bromofluorobenzene	*981*	0	*1000*	0	*98.1*	*80-120*	0
Surr: Dibromofluoromethane	*1024*	0	*1000*	0	*102*	*80-120*	0
Surr: Toluene-d8	*1014*	0	*1000*	0	*101*	*80-120*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R408060a** Instrument ID **VMS8** Method: **SW8260D**

MSD Sample ID: **24070451-08A MSD** Units: **µg/L** Analysis Date: **7/17/2024 11:50 PM**

Client ID: **MW-2** Run ID: **VMS8_240717A** SeqNo: **10963099** Prep Date: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	946	50	1000	0	94.6	72-119	975.5	3.07	30	
1,1,1-Trichloroethane	1036	50	1000	0	104	75-119	1056	1.96	30	
1,1,2,2-Tetrachloroethane	920.5	50	1000	0	92	80-123	957	3.89	30	
1,1,2-Trichloroethane	985	50	1000	0	98.5	83-118	1002	1.66	30	
1,1,2-Trichlorotrifluoroethane	1095	50	1000	0	110	64-133	1232	11.8	30	
1,1-Dichloroethane	1054	50	1000	0	105	73-122	1148	8.63	30	
1,1-Dichloroethene	1162	50	1000	0	116	66-131	1257	7.85	30	
1,2,3-Trichloropropane	861	50	1000	0	86.1	78-119	945.5	9.36	30	
1,2,4-Trichlorobenzene	932	50	1000	0	93.2	73-127	949	1.81	30	
1,2,4-Trimethylbenzene	919	50	1000	0	91.9	74-118	967.5	5.14	30	
1,2-Dibromo-3-chloropropane	902	50	1000	0	90.2	52-141	974.5	7.73	30	
1,2-Dibromoethane	1094	50	1000	0	109	60-159	1110	1.41	30	
1,2-Dichlorobenzene	994.5	50	1000	0	99.4	80-119	1000	0.552	30	
1,2-Dichloroethane	1016	50	1000	0	102	78-121	1049	3.2	30	
1,2-Dichloropropane	1053	50	1000	0	105	78-120	1100	4.41	30	
1,3,5-Trimethylbenzene	968.5	50	1000	0	96.8	76-120	1025	5.67	30	
1,3-Dichlorobenzene	1024	50	1000	0	102	80-120	1020	0.44	30	
1,4-Dichlorobenzene	1006	50	1000	0	101	81-119	1008	0.149	30	
2-Butanone	996	250	1000	0	99.6	69-147	1086	8.69	30	
2-Hexanone	911	250	1000	0	91.1	67-140	983	7.6	30	
2-Methylnaphthalene	899	250	1000	0	89.9	50-150	922	2.53	30	
4-Methyl-2-pentanone	891.5	50	1000	0	89.2	68-199	953.5	6.72	30	
Acetone	883	500	1000	0	88.3	70-166	971.5	9.54	30	
Acrylonitrile	961.5	50	1000	0	96.2	70-133	1061	9.84	30	
Benzene	1038	50	1000	0	104	78-120	1074	3.41	30	
Bromochloromethane	1076	50	1000	0	108	70-125	1154	6.95	30	
Bromodichloromethane	985.5	50	1000	0	98.6	73-126	1022	3.59	30	
Bromoform	764	50	1000	0	76.4	60-124	795	3.98	30	
Bromomethane	793.5	50	1000	0	79.4	20-183	803.5	1.25	30	
Carbon disulfide	1110	50	1000	0	111	67-159	1186	6.62	30	
Carbon tetrachloride	1033	50	1000	0	103	69-124	1070	3.52	30	
Chlorobenzene	977.5	50	1000	0	97.8	80-118	1003	2.58	30	
Chloroethane	869.5	50	1000	0	87	35-136	959	9.79	30	
Chloroform	1048	50	1000	0	105	75-119	1105	5.29	30	
Chloromethane	665	50	1000	0	66.5	26-117	757.5	13	30	
cis-1,2-Dichloroethene	1083	50	1000	0	108	75-123	1162	7.04	30	
cis-1,3-Dichloropropene	979	50	1000	0	97.9	69-120	994.5	1.57	30	
Dibromochloromethane	889.5	50	1000	0	89	63-117	910.5	2.33	30	
Dibromomethane	1014	50	1000	0	101	78-120	1036	2.05	30	
Dichlorodifluoromethane	689.5	50	1000	0	69	36-133	733	6.12	30	
Diethyl ether	1070	50	1000	0	107	57-163	1138	6.21	30	
Ethylbenzene	987	50	1000	0	98.7	76-116	1034	4.65	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R408060a** Instrument ID **VMS8** Method: **SW8260D**

Hexachloroethane	1012	50	1000	0	101	60-130	1002	0.944	30
Isopropylbenzene	1044	50	1000	0	104	77-118	1091	4.45	30
m,p-Xylene	1964	100	2000	0	98.2	76-119	2044	3.99	30
Methyl iodide	1736	250	1000	0	174	10-200	1834	5.49	30
Methyl tert-butyl ether	1026	50	1000	0	103	77-137	1098	6.78	30
Methylene chloride	1082	250	1000	0	108	68-125	1148	5.92	30
Naphthalene	901	250	1000	0	90.1	56-142	902	0.111	30
n-Propylbenzene	994	50	1000	0	99.4	74-118	1041	4.62	30
o-Xylene	986	50	1000	0	98.6	77-116	1041	5.43	30
Styrene	1002	50	1000	0	100	76-123	1014	1.09	30
Tetrachloroethene	1174	50	1000	0	117	80-124	1206	2.65	30
Toluene	985.5	50	1000	0	98.6	78-116	1038	5.19	30
trans-1,2-Dichloroethene	1090	50	1000	0	109	73-124	1196	9.28	30
trans-1,3-Dichloropropene	959	50	1000	0	95.9	67-118	949.5	0.996	30
trans-1,4-Dichloro-2-butene	697	100	1000	0	69.7	58-118	689	1.15	30
Trichloroethene	1000	50	1000	0	100	75-122	1034	3.29	30
Trichlorofluoromethane	976	50	1000	0	97.6	52-115	1075	9.65	30
Vinyl chloride	877	50	1000	0	87.7	49-122	927.5	5.6	30
Xylenes, Total	2950	150	3000	0	98.3	77-119	3085	4.47	30
Surr: 1,2-Dichloroethane-d4	*1054*	0	*1000*	0	*105*	*80-120*	1044	*0.953*	*30*
Surr: 4-Bromofluorobenzene	*961*	0	*1000*	0	*96.1*	*80-120*	981	*2.06*	*30*
Surr: Dibromofluoromethane	*1003*	0	*1000*	0	*100*	*80-120*	1024	*2.02*	*30*
Surr: Toluene-d8	*984*	0	*1000*	0	*98.4*	*80-120*	1014	*3*	*30*

The following samples were analyzed in this batch: 24070451-07A 24070451-08A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R408274a** Instrument ID **VMS11** Method: **SW8260D**

MBLK	Sample ID: **11V-BLKW1-240722-R408274a**				Units: **µg/L**		Analysis Date: **7/22/2024 02:05 PM**			
Client ID:		Run ID: **VMS11_240722A**			SeqNo: **10971510**		Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
1,1,2-Trichlorotrifluoroethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2,3-Trichloropropane	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	1.0								
1,2-Dibromoethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,2-Dichloroethane	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
2-Butanone	ND	5.0								
2-Hexanone	ND	5.0								
2-Methylnaphthalene	ND	5.0								
4-Methyl-2-pentanone	ND	1.0								
Acetone	ND	10								
Acrylonitrile	ND	1.0								
Benzene	ND	1.0								
Bromochloromethane	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	1.0								
Carbon disulfide	ND	1.0								
Carbon tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	1.0								
Chloroform	ND	1.0								
Chloromethane	ND	1.0								
cis-1,2-Dichloroethene	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
Diethyl ether	ND	1.0								
Ethylbenzene	ND	1.0								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R408274a** Instrument ID **VMS11** Method: **SW8260D**

Hexachloroethane	ND	1.0					
Isopropylbenzene	ND	1.0					
m,p-Xylene	ND	2.0					
Methyl iodide	ND	5.0					
Methyl tert-butyl ether	ND	1.0					
Methylene chloride	ND	5.0					
Naphthalene	ND	5.0					
n-Propylbenzene	ND	1.0					
o-Xylene	ND	1.0					
Styrene	ND	1.0					
Tetrachloroethene	ND	1.0					
Toluene	ND	1.0					
trans-1,2-Dichloroethene	ND	1.0					
trans-1,3-Dichloropropene	ND	1.0					
trans-1,4-Dichloro-2-butene	ND	2.0					
Trichloroethene	ND	1.0					
Trichlorofluoromethane	ND	1.0					
Vinyl acetate	ND	5.0					
Vinyl chloride	ND	1.0					
Xylenes, Total	ND	3.0					
Surr: 1,2-Dichloroethane-d4	*20.42*	0	*20*	0	*102*	*80-120*	0
Surr: 4-Bromofluorobenzene	*20.19*	0	*20*	0	*101*	*80-120*	0
Surr: Dibromofluoromethane	*21.13*	0	*20*	0	*106*	*80-120*	0
Surr: Toluene-d8	*19.28*	0	*20*	0	*96.4*	*80-120*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **R408274a** Instrument ID **VMS11** Method: **SW8260D**

LCS	Sample ID: **11V-LCSW1-240722-R408274a**				Units: **µg/L**			Analysis Date: **7/22/2024 12:57 PM**			
Client ID:		Run ID: **VMS11_240722A**			SeqNo: **10971508**			Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.16	1.0	20	0	101	72-119	0			
1,1,1-Trichloroethane	21.65	1.0	20	0	108	75-119	0			
1,1,2,2-Tetrachloroethane	20.98	1.0	20	0	105	80-123	0			
1,1,2-Trichloroethane	18.08	1.0	20	0	90.4	83-118	0			
1,1,2-Trichlorotrifluoroethane	20.74	1.0	20	0	104	64-133	0			
1,1-Dichloroethane	22.77	1.0	20	0	114	73-122	0			
1,1-Dichloroethene	23.99	1.0	20	0	120	66-131	0			
1,2,3-Trichloropropane	22.87	1.0	20	0	114	78-119	0			
1,2,4-Trichlorobenzene	21.5	1.0	20	0	108	73-127	0			
1,2,4-Trimethylbenzene	19.43	1.0	20	0	97.2	74-118	0			
1,2-Dibromo-3-chloropropane	17.41	1.0	20	0	87	52-141	0			
1,2-Dibromoethane	21.67	1.0	20	0	108	60-159	0			
1,2-Dichlorobenzene	19.51	1.0	20	0	97.6	80-119	0			
1,2-Dichloroethane	22.43	1.0	20	0	112	78-121	0			
1,2-Dichloropropane	20.64	1.0	20	0	103	78-120	0			
1,3,5-Trimethylbenzene	20.65	1.0	20	0	103	76-120	0			
1,3-Dichlorobenzene	21.56	1.0	20	0	108	80-120	0			
1,4-Dichlorobenzene	19.72	1.0	20	0	98.6	81-119	0			
2-Butanone	16.79	5.0	20	0	84	69-147	0			
2-Hexanone	22.83	5.0	20	0	114	67-140	0			
2-Methylnaphthalene	24.42	5.0	20	0	122	50-150	0			
4-Methyl-2-pentanone	28.72	1.0	20	0	144	68-199	0			
Acetone	20.41	10	20	0	102	70-166	0			
Acrylonitrile	22.5	1.0	20	0	112	70-133	0			
Benzene	21.16	1.0	20	0	106	78-120	0			
Bromochloromethane	24.41	1.0	20	0	122	70-125	0			
Bromodichloromethane	21.03	1.0	20	0	105	73-126	0			
Bromoform	19.32	1.0	20	0	96.6	60-124	0			
Bromomethane	22.42	1.0	20	0	112	20-183	0			
Carbon disulfide	24.04	1.0	20	0	120	67-159	0			
Carbon tetrachloride	22.37	1.0	20	0	112	69-124	0			
Chlorobenzene	20.13	1.0	20	0	101	80-118	0			
Chloroethane	22.31	1.0	20	0	112	35-136	0			
Chloroform	21.47	1.0	20	0	107	75-119	0			
Chloromethane	18.98	1.0	20	0	94.9	26-117	0			
cis-1,2-Dichloroethene	23.82	1.0	20	0	119	75-123	0			
cis-1,3-Dichloropropene	19.72	1.0	20	0	98.6	69-120	0			
Dibromochloromethane	21.23	1.0	20	0	106	63-117	0			
Dibromomethane	22.3	1.0	20	0	112	78-120	0			
Dichlorodifluoromethane	12.82	1.0	20	0	64.1	36-133	0			
Diethyl ether	18.96	1.0	20	0	94.8	57-163	0			
Ethylbenzene	19.4	1.0	20	0	97	76-116	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R408274a** Instrument ID **VMS11** Method: **SW8260D**

Hexachloroethane	21.59	1.0	20	0	108	60-130	0
Isopropylbenzene	21.02	1.0	20	0	105	77-118	0
m,p-Xylene	40.53	2.0	40	0	101	76-119	0
Methyl iodide	27.31	5.0	20	0	137	10-200	0
Methyl tert-butyl ether	18.23	1.0	20	0	91.2	77-137	0
Methylene chloride	24.3	5.0	20	0	122	68-125	0
Naphthalene	18.35	5.0	20	0	91.8	56-142	0
n-Propylbenzene	19.46	1.0	20	0	97.3	74-118	0
o-Xylene	20	1.0	20	0	100	77-116	0
Styrene	20.1	1.0	20	0	100	76-123	0
Tetrachloroethene	23.16	1.0	20	0	116	80-124	0
Toluene	20.72	1.0	20	0	104	78-116	0
trans-1,2-Dichloroethene	21.38	1.0	20	0	107	73-124	0
trans-1,3-Dichloropropene	20.07	1.0	20	0	100	67-118	0
trans-1,4-Dichloro-2-butene	14.27	2.0	20	0	71.4	58-118	0
Trichloroethene	20.71	1.0	20	0	104	75-122	0
Trichlorofluoromethane	19.38	1.0	20	0	96.9	52-115	0
Vinyl chloride	20	1.0	20	0	100	49-122	0
Xylenes, Total	60.53	3.0	60	0	101	77-119	0
Surr: 1,2-Dichloroethane-d4	*19.78*	0	*20*	0	*98.9*	*80-120*	0
Surr: 4-Bromofluorobenzene	*20*	0	*20*	0	*100*	*80-120*	0
Surr: Dibromofluoromethane	*20.44*	0	*20*	0	*102*	*80-120*	0
Surr: Toluene-d8	*19.9*	0	*20*	0	*99.5*	*80-120*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R408274a** Instrument ID **VMS11** Method: **SW8260D**

MS	Sample ID: **24070716-02A MS**				Units: **µg/L**			Analysis Date: **7/22/2024 11:12 PM**		
Client ID:		Run ID: **VMS11_240722A**			SeqNo: **10971530**		Prep Date:		DF: **200**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	4082	200	4000	0	102	72-119	0			
1,1,1-Trichloroethane	4370	200	4000	0	109	75-119	0			
1,1,2,2-Tetrachloroethane	4294	200	4000	0	107	80-123	0			
1,1,2-Trichloroethane	4032	200	4000	0	101	83-118	0			
1,1,2-Trichlorotrifluoroethane	4740	200	4000	0	118	64-133	0			
1,1-Dichloroethane	4242	200	4000	0	106	73-122	0			
1,1-Dichloroethene	4586	200	4000	0	115	66-131	0			
1,2,3-Trichloropropane	4162	200	4000	0	104	78-119	0			
1,2,4-Trichlorobenzene	4200	200	4000	0	105	73-127	0			
1,2,4-Trimethylbenzene	3756	200	4000	0	93.9	74-118	0			
1,2-Dibromo-3-chloropropane	3698	200	4000	0	92.4	52-141	0			
1,2-Dibromoethane	4122	200	4000	0	103	60-159	0			
1,2-Dichlorobenzene	3876	200	4000	0	96.9	80-119	0			
1,2-Dichloroethane	4318	200	4000	0	108	78-121	0			
1,2-Dichloropropane	4082	200	4000	0	102	78-120	0			
1,3,5-Trimethylbenzene	4186	200	4000	0	105	76-120	0			
1,3-Dichlorobenzene	4504	200	4000	0	113	80-120	0			
1,4-Dichlorobenzene	4208	200	4000	0	105	81-119	0			
2-Butanone	5168	1,000	4000	0	129	69-147	0			
2-Hexanone	4776	1,000	4000	0	119	67-140	0			
2-Methylnaphthalene	4118	1,000	4000	0	103	50-150	0			
4-Methyl-2-pentanone	6124	200	4000	0	153	68-199	0			
Acetone	6348	2,000	4000	148	155	70-166	0			
Acrylonitrile	4232	200	4000	0	106	70-133	0			
Benzene	4344	200	4000	0	109	78-120	0			
Bromochloromethane	4504	200	4000	0	113	70-125	0			
Bromodichloromethane	4128	200	4000	0	103	73-126	0			
Bromoform	3772	200	4000	0	94.3	60-124	0			
Bromomethane	3358	200	4000	0	84	20-183	0			
Carbon disulfide	4470	200	4000	0	112	67-159	0			
Carbon tetrachloride	4716	200	4000	0	118	69-124	0			
Chlorobenzene	3844	200	4000	0	96.1	80-118	0			
Chloroethane	3942	200	4000	0	98.6	35-136	0			
Chloroform	4122	200	4000	0	103	75-119	0			
Chloromethane	3784	200	4000	0	94.6	26-117	0			
cis-1,2-Dichloroethene	6220	200	4000	2158	102	75-123	0			
cis-1,3-Dichloropropene	3936	200	4000	0	98.4	69-120	0			
Dibromochloromethane	3860	200	4000	0	96.5	63-117	0			
Dibromomethane	4120	200	4000	0	103	78-120	0			
Dichlorodifluoromethane	3496	200	4000	0	87.4	36-133	0			
Diethyl ether	4116	200	4000	0	103	57-163	0			
Ethylbenzene	3892	200	4000	0	97.3	76-116	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R408274a** Instrument ID **VMS11** Method: **SW8260D**

Hexachloroethane	4232	200	4000	0	106	60-130	0
Isopropylbenzene	4382	200	4000	0	110	77-118	0
m,p-Xylene	8254	400	8000	0	103	76-119	0
Methyl iodide	4778	1,000	4000	56	118	10-200	0
Methyl tert-butyl ether	3956	200	4000	0	98.9	77-137	0
Methylene chloride	4444	1,000	4000	0	111	68-125	0
Naphthalene	3758	1,000	4000	0	94	56-142	0
n-Propylbenzene	4042	200	4000	0	101	74-118	0
o-Xylene	3858	200	4000	0	96.4	77-116	0
Styrene	4046	200	4000	0	101	76-123	0
Tetrachloroethene	4838	200	4000	0	121	80-124	0
Toluene	3942	200	4000	0	98.6	78-116	0
trans-1,2-Dichloroethene	4360	200	4000	0	109	73-124	0
trans-1,3-Dichloropropene	3814	200	4000	0	95.4	67-118	0
trans-1,4-Dichloro-2-butene	2766	400	4000	0	69.2	58-118	0
Trichloroethene	4392	200	4000	0	110	75-122	0
Trichlorofluoromethane	4202	200	4000	0	105	52-115	0
Vinyl chloride	12150	200	4000	9264	72.1	49-122	0
Xylenes, Total	12110	600	12000	0	101	77-119	0
Surr: 1,2-Dichloroethane-d4	*3874*	0	*4000*	0	*96.8*	*80-120*	0
Surr: 4-Bromofluorobenzene	*4046*	0	*4000*	0	*101*	*80-120*	0
Surr: Dibromofluoromethane	*4054*	0	*4000*	0	*101*	*80-120*	0
Surr: Toluene-d8	*3852*	0	*4000*	0	*96.3*	*80-120*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **R408274a** Instrument ID **VMS11** Method: **SW8260D**

MSD	Sample ID: **24070716-02A MSD**				Units: **µg/L**			Analysis Date: **7/22/2024 11:35 PM**		
Client ID:	Run ID: **VMS11_240722A**				SeqNo: **10971531**		Prep Date:		DF: **200**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	4328	200	4000	0	108	72-119	4082	5.85	30	
1,1,1-Trichloroethane	4436	200	4000	0	111	75-119	4370	1.5	30	
1,1,2,2-Tetrachloroethane	4018	200	4000	0	100	80-123	4294	6.64	30	
1,1,2-Trichloroethane	3868	200	4000	0	96.7	83-118	4032	4.15	30	
1,1,2-Trichlorotrifluoroethane	4582	200	4000	0	115	64-133	4740	3.39	30	
1,1-Dichloroethane	4148	200	4000	0	104	73-122	4242	2.24	30	
1,1-Dichloroethene	4664	200	4000	0	117	66-131	4586	1.69	30	
1,2,3-Trichloropropane	4242	200	4000	0	106	78-119	4162	1.9	30	
1,2,4-Trichlorobenzene	3848	200	4000	0	96.2	73-127	4200	8.75	30	
1,2,4-Trimethylbenzene	3806	200	4000	0	95.2	74-118	3756	1.32	30	
1,2-Dibromo-3-chloropropane	3964	200	4000	0	99.1	52-141	3698	6.94	30	
1,2-Dibromoethane	4206	200	4000	0	105	60-159	4122	2.02	30	
1,2-Dichlorobenzene	3766	200	4000	0	94.2	80-119	3876	2.88	30	
1,2-Dichloroethane	4308	200	4000	0	108	78-121	4318	0.232	30	
1,2-Dichloropropane	4216	200	4000	0	105	78-120	4082	3.23	30	
1,3,5-Trimethylbenzene	4008	200	4000	0	100	76-120	4186	4.34	30	
1,3-Dichlorobenzene	4136	200	4000	0	103	80-120	4504	8.52	30	
1,4-Dichlorobenzene	3922	200	4000	0	98	81-119	4208	7.04	30	
2-Butanone	4234	1,000	4000	0	106	69-147	5168	19.9	30	
2-Hexanone	4746	1,000	4000	0	119	67-140	4776	0.63	30	
2-Methylnaphthalene	4256	1,000	4000	0	106	50-150	4118	3.3	30	
4-Methyl-2-pentanone	5904	200	4000	0	148	68-199	6124	3.66	30	
Acetone	4528	2,000	4000	148	110	70-166	6348	33.5	30	R
Acrylonitrile	4504	200	4000	0	113	70-133	4232	6.23	30	
Benzene	4376	200	4000	0	109	78-120	4344	0.734	30	
Bromochloromethane	4590	200	4000	0	115	70-125	4504	1.89	30	
Bromodichloromethane	4224	200	4000	0	106	73-126	4128	2.3	30	
Bromoform	3754	200	4000	0	93.8	60-124	3772	0.478	30	
Bromomethane	3790	200	4000	0	94.8	20-183	3358	12.1	30	
Carbon disulfide	4506	200	4000	0	113	67-159	4470	0.802	30	
Carbon tetrachloride	4714	200	4000	0	118	69-124	4716	0.0424	30	
Chlorobenzene	3936	200	4000	0	98.4	80-118	3844	2.37	30	
Chloroethane	3932	200	4000	0	98.3	35-136	3942	0.254	30	
Chloroform	4014	200	4000	0	100	75-119	4122	2.65	30	
Chloromethane	3642	200	4000	0	91	26-117	3784	3.82	30	
cis-1,2-Dichloroethene	6108	200	4000	2158	98.8	75-123	6220	1.82	30	
cis-1,3-Dichloropropene	3772	200	4000	0	94.3	69-120	3936	4.26	30	
Dibromochloromethane	4130	200	4000	0	103	63-117	3860	6.76	30	
Dibromomethane	4334	200	4000	0	108	78-120	4120	5.06	30	
Dichlorodifluoromethane	3402	200	4000	0	85	36-133	3496	2.73	30	
Diethyl ether	4028	200	4000	0	101	57-163	4116	2.16	30	
Ethylbenzene	3968	200	4000	0	99.2	76-116	3892	1.93	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R408274a** Instrument ID **VMS11** Method: **SW8260D**

Hexachloroethane	4070	200	4000	0	102	60-130	4232	3.9	30
Isopropylbenzene	4202	200	4000	0	105	77-118	4382	4.19	30
m,p-Xylene	8064	400	8000	0	101	76-119	8254	2.33	30
Methyl iodide	5032	1,000	4000	56	124	10-200	4778	5.18	30
Methyl tert-butyl ether	3852	200	4000	0	96.3	77-137	3956	2.66	30
Methylene chloride	4372	1,000	4000	0	109	68-125	4444	1.63	30
Naphthalene	3858	1,000	4000	0	96.4	56-142	3758	2.63	30
n-Propylbenzene	4010	200	4000	0	100	74-118	4042	0.795	30
o-Xylene	3916	200	4000	0	97.9	77-116	3858	1.49	30
Styrene	4018	200	4000	0	100	76-123	4046	0.694	30
Tetrachloroethene	4556	200	4000	0	114	80-124	4838	6	30
Toluene	3896	200	4000	0	97.4	78-116	3942	1.17	30
trans-1,2-Dichloroethene	4212	200	4000	0	105	73-124	4360	3.45	30
trans-1,3-Dichloropropene	3858	200	4000	0	96.4	67-118	3814	1.15	30
trans-1,4-Dichloro-2-butene	2604	400	4000	0	65.1	58-118	2766	6.03	30
Trichloroethene	4226	200	4000	0	106	75-122	4392	3.85	30
Trichlorofluoromethane	4294	200	4000	0	107	52-115	4202	2.17	30
Vinyl chloride	13040	200	4000	9264	94.4	49-122	12150	7.08	30
Xylenes, Total	11980	600	12000	0	99.8	77-119	12110	1.1	30
Surr: 1,2-Dichloroethane-d4	*3966*	0	*4000*	0	*99.2*	*80-120*	3874	*2.35*	*30*
Surr: 4-Bromofluorobenzene	*4044*	0	*4000*	0	*101*	*80-120*	4046	*0.0494*	*30*
Surr: Dibromofluoromethane	*3948*	0	*4000*	0	*98.7*	*80-120*	4054	*2.65*	*30*
Surr: Toluene-d8	*3926*	0	*4000*	0	*98.2*	*80-120*	3852	*1.9*	*30*

The following samples were analyzed in this batch: 24070451-08A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Simi Valley, CA +1 805 526 7161
Kelso, WA +1 360 577 7222
Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Middletown, PA +1 717 944 5541
Valparaiso, IN +1 219 299 8127
Salt Lake City, UT +1 801 266 7700
South Charleston, WV +1 304 356 3168
Rochester, NY +1 585 288 5380

Chain of Custody Form

Page 1 of 1

COC ID: 063686

ALS Project Manager: | ALS Work Order #:

Customer Information

Purchase Order	
Quote #	
Company Name	MET
Send Report To	Matt Radsvick
Address	300 Ferry Lane
City/State/Zip	St. Ignace MI 49781
Phone	
Fax	
e-Mail Address	met@sault.com

Project Information

Project Name	Superior Township Dump
Project Number	M23-4099
Bill To Company	SAME
Invoice Attn	
Address	AS
City/State/Zip	
Phone	LEFT
Fax	
e-Mail Address	

Parameter/Method Request for Analysis

A VOCs
B PAH
C Metals (As, Ba, Hg, Al, Mn, Fe, Pb)
D
E
F
G
H
I
J

24070451
MACENVTECH: Mackinac Environmental Technology
Project: Superior Township Dump

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	HA-6	7.9.24	10:56	GW		6	X	X	X								
2	HA-5		11:40														
3	HA-8		13:28														
4	HA-9		14:30														
5	HA-4		12:02														
6	MW-1		13:25														
7	MW-9		13:25														
8	MW-2		14:25														
9																	
10																	

Sampler(s) Please Print & Sign: Jerry Reynolds

Shipment Method: Fed EX

Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☐ 2 BD ☐ 1 BD Other:

Results Due Date:

Relinquished by:	Date: 7.10.24	Time: 16:00	Received by:
Relinquished by: FedEx	Date: 7/11/24	Time: 1700	Received by (Laboratory):
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes: Non-Musta

Cooler ID	Cooler Temp.
IR3	4.7

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Date ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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ALS Group, USA
Holland, Michigan

Sample Receipt Checklist

Client Name: **MACKINAC ENVIRONMENTAL TE** Date/Time Received: **11-Jul-24 12:00**

Work Order: **24070451** Received by: **HTB**

Checklist completed by Keith Wierenga (eSignature) 11-Jul-24 (Date) Reviewed by: Alex J. Csaszar (eSignature) 11-Jul-24 (Date)

Matrices: GroundWater
Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Sample(s) received on ice?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	4.7/5.7 C	IR3	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	7/11/2024 1:51:53 PM		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:	-		

Login Notes: pH check <2

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

23-Jul-2024

Matt Radsvick
Mackinac Environmental Technology, Inc.
4 Pennsylvania Plz.
Petoskey, MI 49770

Re: **Superior Township Dump M23-4099** Work Order: **24070484**

Dear Matt,

ALS Environmental received 2 samples on 12-Jul-2024 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 27.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Alex J. Csaszar

Alex J. Csaszar
Project Manager

ALS Group, USA

Date: 23-Jul-24

Client: Mackinac Environmental Technology, Inc.
Project: Superior Township Dump M23-4099
Work Order: **24070484**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
24070484-01	HA-9	Groundwater		7/11/2024 12:43	7/12/2024 09:00	☐
24070484-02	MW-2A	Groundwater		7/11/2024 13:27	7/12/2024 09:00	☐

Client:	Mackinac Environmental Technology, Inc.
Project:	Superior Township Dump M23-4099
Work Order:	24070484

Case Narrative

The attached "Sample Receipt Checklist" documents the date of receipt, status of custody seals, container integrity, preservation, and temperature compliance.

Samples were analyzed according to the analytical methodology previously transmitted in the "Work Order Acknowledgement". Methodologies are also documented in the "Analytical Result" section for each sample. Quality control results are listed in the "QC Report" section. A copy of the laboratory's scope of accreditation is available upon request.

Sample association for the reported quality control is located at the end of each batch summary. If applicable, results are appropriately qualified in the Analytical Result and QC Report sections. The "Qualifiers" section documents the various qualifiers, units, and acronyms utilized in reporting.

Any flags on MS/MSD samples not addressed in this narrative are unrelated to samples in this report.

With the following exceptions, all sample analyses achieved analytical criteria.

Batch 243674, Method SW8270E, Sample HA-9 (24070484-01B): One or more surrogate recoveries were above the upper control limits. The sample was non-detect, therefore, no qualification is needed.

Client:	Mackinac Environmental Technology, Inc.
Project:	Superior Township Dump M23-4099
WorkOrder:	**24070484**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Analyte accreditation is not offered
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

Units Reported	Description
µg/L	Micrograms per Liter
mg/L	Milligrams per Liter

ALS Group, USA

Date: *23-Jul-24*

Client:	Mackinac Environmental Technology, Inc.	**Client Sample ID:**	HA-9
Work Order:	24070484	**Collection Date:**	7/11/2024 12:43:00 PM
Project:	Superior Township Dump M23-4099		
Lab ID:	24070484-01	**Matrix:**	GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7470A**		Prep Date: **7/18/2024**		Analyst: **KSC**
Mercury	ND	0.00020	0.00020		mg/L	1	7/19/2024
METALS BY ICP-MS			**SW6020B**		Prep Date: **7/18/2024**		Analyst: **STP**
Aluminum	**59**	**1.0**	**0.050**		**mg/L**	100	7/22/2024
Arsenic	**0.0060**	**0.0050**	**0.0050**		**mg/L**	1	7/19/2024
Barium	**0.31**	**0.10**	**0.10**		**mg/L**	1	7/19/2024
Iron	**42**	**0.20**	**0.20**		**mg/L**	1	7/19/2024
Lead	**0.14**	**0.0050**	**0.0030**		**mg/L**	1	7/19/2024
Manganese	**0.51**	**0.050**	**0.050**		**mg/L**	1	7/19/2024
POLYNUCLEAR AROMATIC HYDROCARBONS (SIM)			**SW8270E**		Prep Date: **7/17/2024**		Analyst: **SMT**
2-Chloronaphthalene	ND	5.0	5.0		µg/L	1	7/17/2024
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	7/17/2024
Acenaphthene	ND	5.0	5.0		µg/L	1	7/17/2024
Acenaphthylene	ND	5.0	5.0		µg/L	1	7/17/2024
Anthracene	ND	5.0	5.0		µg/L	1	7/17/2024
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	7/17/2024
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	7/17/2024
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	7/17/2024
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	7/17/2024
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	7/17/2024
Chrysene	ND	1.0	1.0		µg/L	1	7/17/2024
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	7/17/2024
Fluoranthene	ND	1.0	1.0		µg/L	1	7/17/2024
Fluorene	ND	5.0	5.0		µg/L	1	7/17/2024
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	7/17/2024
Naphthalene	ND	5.0	5.0		µg/L	1	7/17/2024
Phenanthrene	ND	2.0	2.0		µg/L	1	7/17/2024
Pyrene	ND	5.0	5.0		µg/L	1	7/17/2024
Surr: 2-Fluorobiphenyl	*142*	*62-135*		S	*%REC*	1	7/17/2024
Surr: 4-Terphenyl-d14	*94.5*	*48-133*			*%REC*	1	7/17/2024
Surr: Nitrobenzene-d5	*80.0*	*21-57*		S	*%REC*	1	7/17/2024
VOLATILE ORGANIC COMPOUNDS			**SW8260D**				Analyst: **JGV**
1,1,1,2-Tetrachloroethane	ND	1.0	1.0		µg/L	1	7/17/2024
1,1,1-Trichloroethane	ND	1.0	1.0		µg/L	1	7/17/2024
1,1,2,2-Tetrachloroethane	ND	1.0	1.0		µg/L	1	7/17/2024
1,1,2-Trichloroethane	ND	1.0	1.0		µg/L	1	7/17/2024
1,1,2-Trichlorotrifluoroethane	ND	1.0	1.0		µg/L	1	7/17/2024
1,1-Dichloroethane	ND	1.0	1.0		µg/L	1	7/17/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Mackinac Environmental Technology, Inc. **Client Sample ID:** HA-9
Work Order: 24070484 **Collection Date:** 7/11/2024 12:43:00 PM
Project: Superior Township Dump M23-4099
Lab ID: 24070484-01 **Matrix:** GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	ND	1.0	1.0		µg/L	1	7/17/2024
1,2,3-Trichloropropane	ND	1.0	1.0		µg/L	1	7/17/2024
1,2,4-Trichlorobenzene	ND	5.0	5.0		µg/L	1	7/17/2024
1,2,4-Trimethylbenzene	ND	1.0	1.0		µg/L	1	7/17/2024
1,2-Dibromo-3-chloropropane	ND	1.0	0.20		µg/L	1	7/17/2024
1,2-Dibromoethane	ND	1.0	0.050		µg/L	1	7/17/2024
1,2-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/17/2024
1,2-Dichloroethane	ND	1.0	1.0		µg/L	1	7/17/2024
1,2-Dichloropropane	ND	1.0	1.0		µg/L	1	7/17/2024
1,3,5-Trimethylbenzene	ND	1.0	1.0		µg/L	1	7/17/2024
1,3-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/17/2024
1,4-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/17/2024
2-Butanone	ND	25	25		µg/L	1	7/17/2024
2-Hexanone	ND	50	50		µg/L	1	7/17/2024
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	7/17/2024
4-Methyl-2-pentanone	ND	50	50		µg/L	1	7/17/2024
Acetone	ND	50	50		µg/L	1	7/17/2024
Acrylonitrile	ND	2.0	2.0		µg/L	1	7/17/2024
Benzene	ND	1.0	1.0		µg/L	1	7/17/2024
Bromochloromethane	ND	1.0	1.0		µg/L	1	7/17/2024
Bromodichloromethane	ND	1.0	1.0		µg/L	1	7/17/2024
Bromoform	ND	1.0	1.0		µg/L	1	7/17/2024
Bromomethane	ND	5.0	5.0		µg/L	1	7/17/2024
Carbon disulfide	ND	5.0	5.0		µg/L	1	7/17/2024
Carbon tetrachloride	ND	1.0	1.0		µg/L	1	7/17/2024
Chlorobenzene	ND	1.0	1.0		µg/L	1	7/17/2024
Chloroethane	ND	5.0	5.0		µg/L	1	7/17/2024
Chloroform	ND	1.0	1.0		µg/L	1	7/17/2024
Chloromethane	ND	5.0	5.0		µg/L	1	7/17/2024
cis-1,2-Dichloroethene	ND	1.0	1.0		µg/L	1	7/17/2024
cis-1,3-Dichloropropene	ND	1.0	1.0		µg/L	1	7/17/2024
Dibromochloromethane	ND	5.0	5.0		µg/L	1	7/17/2024
Dibromomethane	ND	5.0	5.0		µg/L	1	7/17/2024
Dichlorodifluoromethane	ND	5.0	5.0		µg/L	1	7/17/2024
Diethyl ether	ND	10	10		µg/L	1	7/17/2024
Ethylbenzene	ND	1.0	1.0		µg/L	1	7/17/2024
Hexachloroethane	ND	5.0	5.0		µg/L	1	7/17/2024
Isopropylbenzene	ND	5.0	5.0		µg/L	1	7/17/2024
m,p-Xylene	ND	2.0	2.0		µg/L	1	7/17/2024
Methyl iodide	ND	5.0	1.0		µg/L	1	7/17/2024
Methyl tert-butyl ether	ND	5.0	5.0		µg/L	1	7/17/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Mackinac Environmental Technology, Inc. **Client Sample ID:** HA-9
Work Order: 24070484 **Collection Date:** 7/11/2024 12:43:00 PM
Project: Superior Township Dump M23-4099
Lab ID: 24070484-01 **Matrix:** GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Methylene chloride	ND	5.0	5.0		µg/L	1	7/17/2024
Naphthalene	ND	5.0	5.0		µg/L	1	7/17/2024
n-Propylbenzene	ND	1.0	1.0		µg/L	1	7/17/2024
o-Xylene	ND	1.0	1.0		µg/L	1	7/17/2024
Styrene	ND	1.0	1.0		µg/L	1	7/17/2024
Tetrachloroethene	ND	1.0	1.0		µg/L	1	7/17/2024
Toluene	ND	1.0	1.0		µg/L	1	7/17/2024
trans-1,2-Dichloroethene	ND	1.0	1.0		µg/L	1	7/17/2024
trans-1,3-Dichloropropene	ND	1.0	1.0		µg/L	1	7/17/2024
trans-1,4-Dichloro-2-butene	ND	2.0	1.0		µg/L	1	7/17/2024
Trichloroethene	ND	1.0	1.0		µg/L	1	7/17/2024
Trichlorofluoromethane	ND	1.0	1.0		µg/L	1	7/17/2024
Vinyl acetate	ND	100	100		µg/L	1	7/17/2024
Vinyl chloride	ND	1.0	1.0		µg/L	1	7/17/2024
Xylenes, Total	ND	3.0	3.0		µg/L	1	7/17/2024
Surr: 1,2-Dichloroethane-d4	*101*	*80-120*			*%REC*	1	7/17/2024
Surr: 4-Bromofluorobenzene	*98.3*	*80-120*			*%REC*	1	7/17/2024
Surr: Dibromofluoromethane	*97.2*	*80-120*			*%REC*	1	7/17/2024
Surr: Toluene-d8	*102*	*80-120*			*%REC*	1	7/17/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Mackinac Environmental Technology, Inc. **Client Sample ID:** MW-2A
Work Order: 24070484 **Collection Date:** 7/11/2024 1:27:00 PM
Project: Superior Township Dump M23-4099
Lab ID: 24070484-02 **Matrix:** GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7470A**		Prep Date: **7/18/2024**		Analyst: **KSC**
Mercury	ND	0.00020	0.00020		mg/L	1	7/19/2024
METALS BY ICP-MS			**SW6020B**		Prep Date: **7/18/2024**		Analyst: **STP**
Aluminum	**0.29**	**0.10**	**0.050**		**mg/L**	10	7/22/2024
Arsenic	ND	0.0050	0.0050		mg/L	1	7/19/2024
Barium	ND	0.10	0.10		mg/L	1	7/19/2024
Iron	**4.9**	**0.20**	**0.20**		**mg/L**	1	7/19/2024
Lead	ND	0.0050	0.0030		mg/L	1	7/19/2024
Manganese	**0.52**	**0.050**	**0.050**		**mg/L**	1	7/19/2024
POLYNUCLEAR AROMATIC HYDROCARBONS (SIM)			**SW8270E**		Prep Date: **7/17/2024**		Analyst: **SMT**
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	7/17/2024
Acenaphthene	ND	5.0	5.0		µg/L	1	7/17/2024
Acenaphthylene	ND	5.0	5.0		µg/L	1	7/17/2024
Anthracene	ND	5.0	5.0		µg/L	1	7/17/2024
Benzo(a)anthracene	ND	1.0	1.0		µg/L	1	7/17/2024
Benzo(a)pyrene	ND	1.0	1.0		µg/L	1	7/17/2024
Benzo(b)fluoranthene	ND	1.0	1.0		µg/L	1	7/17/2024
Benzo(g,h,i)perylene	ND	1.0	1.0		µg/L	1	7/17/2024
Benzo(k)fluoranthene	ND	1.0	1.0		µg/L	1	7/17/2024
Chrysene	ND	1.0	1.0		µg/L	1	7/17/2024
Dibenzo(a,h)anthracene	ND	2.0	2.0		µg/L	1	7/17/2024
Fluoranthene	ND	1.0	1.0		µg/L	1	7/17/2024
Fluorene	ND	5.0	5.0		µg/L	1	7/17/2024
Indeno(1,2,3-cd)pyrene	ND	2.0	2.0		µg/L	1	7/17/2024
Naphthalene	ND	5.0	5.0		µg/L	1	7/17/2024
Phenanthrene	ND	2.0	2.0		µg/L	1	7/17/2024
Pyrene	ND	5.0	5.0		µg/L	1	7/17/2024
Surr: 2-Fluorobiphenyl	*93.6*	*62-135*			*%REC*	1	7/17/2024
Surr: 4-Terphenyl-d14	*59.8*	*48-133*			*%REC*	1	7/17/2024
Surr: Nitrobenzene-d5	*42.0*	*21-57*			*%REC*	1	7/17/2024
VOLATILE ORGANIC COMPOUNDS			**SW8260D**				Analyst: **JGV**
1,1,1,2-Tetrachloroethane	ND	1.0	1.0		µg/L	1	7/17/2024
1,1,1-Trichloroethane	ND	1.0	1.0		µg/L	1	7/17/2024
1,1,2,2-Tetrachloroethane	ND	1.0	1.0		µg/L	1	7/17/2024
1,1,2-Trichloroethane	ND	1.0	1.0		µg/L	1	7/17/2024
1,1,2-Trichlorotrifluoroethane	ND	1.0	1.0		µg/L	1	7/17/2024
1,1-Dichloroethane	ND	1.0	1.0		µg/L	1	7/17/2024
1,1-Dichloroethene	ND	1.0	1.0		µg/L	1	7/17/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Mackinac Environmental Technology, Inc. **Client Sample ID:** MW-2A
Work Order: 24070484 **Collection Date:** 7/11/2024 1:27:00 PM
Project: Superior Township Dump M23-4099
Lab ID: 24070484-02 **Matrix:** GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
1,2,3-Trichloropropane	ND	1.0	1.0		µg/L	1	7/17/2024
1,2,4-Trichlorobenzene	ND	5.0	5.0		µg/L	1	7/17/2024
1,2,4-Trimethylbenzene	ND	1.0	1.0		µg/L	1	7/17/2024
1,2-Dibromo-3-chloropropane	ND	1.0	0.20		µg/L	1	7/17/2024
1,2-Dibromoethane	ND	1.0	0.050		µg/L	1	7/17/2024
1,2-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/17/2024
1,2-Dichloroethane	ND	1.0	1.0		µg/L	1	7/17/2024
1,2-Dichloropropane	ND	1.0	1.0		µg/L	1	7/17/2024
1,3,5-Trimethylbenzene	ND	1.0	1.0		µg/L	1	7/17/2024
1,3-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/17/2024
1,4-Dichlorobenzene	ND	1.0	1.0		µg/L	1	7/17/2024
2-Butanone	ND	25	25		µg/L	1	7/17/2024
2-Hexanone	ND	50	50		µg/L	1	7/17/2024
2-Methylnaphthalene	ND	5.0	5.0		µg/L	1	7/17/2024
4-Methyl-2-pentanone	ND	50	50		µg/L	1	7/17/2024
Acetone	ND	50	50		µg/L	1	7/17/2024
Acrylonitrile	ND	2.0	2.0		µg/L	1	7/17/2024
Benzene	ND	1.0	1.0		µg/L	1	7/17/2024
Bromochloromethane	**2.5**	**1.0**	**1.0**		**µg/L**	1	7/17/2024
Bromodichloromethane	ND	1.0	1.0		µg/L	1	7/17/2024
Bromoform	ND	1.0	1.0		µg/L	1	7/17/2024
Bromomethane	ND	5.0	5.0		µg/L	1	7/17/2024
Carbon disulfide	ND	5.0	5.0		µg/L	1	7/17/2024
Carbon tetrachloride	ND	1.0	1.0		µg/L	1	7/17/2024
Chlorobenzene	ND	1.0	1.0		µg/L	1	7/17/2024
Chloroethane	ND	5.0	5.0		µg/L	1	7/17/2024
Chloroform	ND	1.0	1.0		µg/L	1	7/17/2024
Chloromethane	ND	5.0	5.0		µg/L	1	7/17/2024
cis-1,2-Dichloroethene	ND	1.0	1.0		µg/L	1	7/17/2024
cis-1,3-Dichloropropene	ND	1.0	1.0		µg/L	1	7/17/2024
Dibromochloromethane	ND	5.0	5.0		µg/L	1	7/17/2024
Dibromomethane	ND	5.0	5.0		µg/L	1	7/17/2024
Dichlorodifluoromethane	ND	5.0	5.0		µg/L	1	7/17/2024
Diethyl ether	ND	10	10		µg/L	1	7/17/2024
Ethylbenzene	ND	1.0	1.0		µg/L	1	7/17/2024
Hexachloroethane	ND	5.0	5.0		µg/L	1	7/17/2024
Isopropylbenzene	ND	5.0	5.0		µg/L	1	7/17/2024
m,p-Xylene	ND	2.0	2.0		µg/L	1	7/17/2024
Methyl iodide	ND	5.0	1.0		µg/L	1	7/17/2024
Methyl tert-butyl ether	ND	5.0	5.0		µg/L	1	7/17/2024
Methylene chloride	ND	5.0	5.0		µg/L	1	7/17/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Mackinac Environmental Technology, Inc. **Client Sample ID:** MW-2A
Work Order: 24070484 **Collection Date:** 7/11/2024 1:27:00 PM
Project: Superior Township Dump M23-4099
Lab ID: 24070484-02 **Matrix:** GROUNDWATER

Analyses	Result	Report Limit	MDEQ OP Memo 2 TDL	Qual	Units	Dilution Factor	Date Analyzed
Naphthalene	ND	5.0	5.0		µg/L	1	7/17/2024
n-Propylbenzene	ND	1.0	1.0		µg/L	1	7/17/2024
o-Xylene	ND	1.0	1.0		µg/L	1	7/17/2024
Styrene	ND	1.0	1.0		µg/L	1	7/17/2024
Tetrachloroethene	ND	1.0	1.0		µg/L	1	7/17/2024
Toluene	ND	1.0	1.0		µg/L	1	7/17/2024
trans-1,2-Dichloroethene	ND	1.0	1.0		µg/L	1	7/17/2024
trans-1,3-Dichloropropene	ND	1.0	1.0		µg/L	1	7/17/2024
trans-1,4-Dichloro-2-butene	ND	2.0	1.0		µg/L	1	7/17/2024
Trichloroethene	ND	1.0	1.0		µg/L	1	7/17/2024
Trichlorofluoromethane	ND	1.0	1.0		µg/L	1	7/17/2024
Vinyl acetate	ND	100	100		µg/L	1	7/17/2024
Vinyl chloride	ND	1.0	1.0		µg/L	1	7/17/2024
Xylenes, Total	ND	3.0	3.0		µg/L	1	7/17/2024
Surr: 1,2-Dichloroethane-d4	*102*	*80-120*			*%REC*	1	7/17/2024
Surr: 4-Bromofluorobenzene	*98.4*	*80-120*			*%REC*	1	7/17/2024
Surr: Dibromofluoromethane	*98.2*	*80-120*			*%REC*	1	7/17/2024
Surr: Toluene-d8	*102*	*80-120*			*%REC*	1	7/17/2024

Note: See Qualifiers page for a list of qualifiers and their definitions.

Batch ID: **243793** Instrument ID **HG5** Method: **SW7470A**

MBLK	Sample ID: **MBLK-243793-243793**			Units: **mg/L**			Analysis Date: **7/19/2024 02:48 PM**			
Client ID:	Run ID: **HG5_240719A**			SeqNo: **10967318**			Prep Date: **7/18/2024**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.00020								

LCS	Sample ID: **LCS-243793-243793**			Units: **mg/L**			Analysis Date: **7/19/2024 02:50 PM**			
Client ID:	Run ID: **HG5_240719A**			SeqNo: **10967319**			Prep Date: **7/18/2024**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.0021	0.00020	0.002	0	105	80-120	0			

MS	Sample ID: **24070411-01CMS**			Units: **mg/L**			Analysis Date: **7/19/2024 03:06 PM**			
Client ID:	Run ID: **HG5_240719A**			SeqNo: **10967328**			Prep Date: **7/18/2024**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.001725	0.00020	0.002	-0.0000555	89	75-125	0			

MSD	Sample ID: **24070411-01CMSD**			Units: **mg/L**			Analysis Date: **7/19/2024 03:08 PM**			
Client ID:	Run ID: **HG5_240719A**			SeqNo: **10967329**			Prep Date: **7/18/2024**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.001695	0.00020	0.002	-0.0000555	87.5	75-125	0.001725	1.75	20	

The following samples were analyzed in this batch: 24070484-01C 24070484-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **243721** Instrument ID **ICPMS3** Method: **SW6020B**

MBLK Sample ID: **MBLK-243721-243721** Units: **mg/L** Analysis Date: **7/19/2024 03:29 PM**
Client ID: Run ID: **ICPMS3_240719A** SeqNo: **10967788** Prep Date: **7/18/2024** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	ND	0.010								
Arsenic	ND	0.0050								
Barium	ND	0.0050								
Iron	ND	0.080								
Lead	ND	0.0050								
Manganese	ND	0.0050								

LCS Sample ID: **LCS-243721-243721** Units: **mg/L** Analysis Date: **7/19/2024 03:30 PM**
Client ID: Run ID: **ICPMS3_240719A** SeqNo: **10967789** Prep Date: **7/18/2024** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09763	0.010	0.1	0	97.6	80-120	0			
Arsenic	0.09647	0.0050	0.1	0	96.5	80-120	0			
Barium	0.09444	0.0050	0.1	0	94.4	80-120	0			
Iron	9.617	0.080	10	0	96.2	80-120	0			
Lead	0.09903	0.0050	0.1	0	99	80-120	0			
Manganese	0.0953	0.0050	0.1	0	95.3	80-120	0			

MS Sample ID: **24070484-02CMS** Units: **mg/L** Analysis Date: **7/19/2024 03:54 PM**
Client ID: **MW-2A** Run ID: **ICPMS3_240719A** SeqNo: **10967804** Prep Date: **7/18/2024** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.09843	0.0050	0.1	0.000502	97.9	75-125	0			
Barium	0.1678	0.0050	0.1	0.06916	98.6	75-125	0			
Iron	14.69	0.080	10	4.928	97.7	75-125	0			
Lead	0.1047	0.0050	0.1	0.003741	101	75-125	0			
Manganese	0.6202	0.0050	0.1	0.5249	95.4	75-125	0			O

MS Sample ID: **24070484-02CMS** Units: **mg/L** Analysis Date: **7/22/2024 05:07 PM**
Client ID: **MW-2A** Run ID: **ICPMS3_240722A** SeqNo: **10972352** Prep Date: **7/18/2024** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.4779	0.10	0.1	0.2932	185	75-125	0			S

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **243721** Instrument ID **ICPMS3** Method: **SW6020B**

MSD Sample ID: **24070484-02CMSD** Units: **mg/L** Analysis Date: **7/19/2024 03:56 PM**
Client ID: **MW-2A** Run ID: **ICPMS3_240719A** SeqNo: **10967805** Prep Date: **7/18/2024** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.09926	0.0050	0.1	0.000502	98.8	75-125	0.09843	0.837	20	
Barium	0.1716	0.0050	0.1	0.06916	102	75-125	0.1678	2.23	20	
Iron	14.8	0.080	10	4.928	98.8	75-125	14.69	0.749	20	
Lead	0.1038	0.0050	0.1	0.003741	100	75-125	0.1047	0.79	20	
Manganese	0.6405	0.0050	0.1	0.5249	116	75-125	0.6202	3.21	20	O

MSD Sample ID: **24070484-02CMSD** Units: **mg/L** Analysis Date: **7/22/2024 05:09 PM**
Client ID: **MW-2A** Run ID: **ICPMS3_240722A** SeqNo: **10972353** Prep Date: **7/18/2024** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.4786	0.10	0.1	0.2932	185	75-125	0.4779	0.154	20	S

The following samples were analyzed in this batch: 24070484-01C 24070484-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **243674** Instrument ID **SVMS6** Method: **SW8270E**

MBLK Sample ID: **SBLKW1-243674-243674** Units: **µg/L** Analysis Date: **7/17/2024 09:21 PM**

Client ID: Run ID: **SVMS6_240717A** SeqNo: **10963521** Prep Date: **7/17/2024** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Chloronaphthalene	ND	0.17								
2-Methylnaphthalene	ND	0.17								
Acenaphthene	ND	0.17								
Acenaphthylene	ND	0.17								
Anthracene	ND	0.17								
Benzo(a)anthracene	ND	0.17								
Benzo(a)pyrene	ND	0.17								
Benzo(b)fluoranthene	ND	0.17								
Benzo(g,h,i)perylene	ND	0.17								
Benzo(k)fluoranthene	ND	0.17								
Chrysene	ND	0.17								
Dibenzo(a,h)anthracene	ND	0.17								
Fluoranthene	ND	0.17								
Fluorene	ND	0.17								
Indeno(1,2,3-cd)pyrene	ND	0.17								
Naphthalene	ND	0.17								
Phenanthrene	ND	0.17								
Pyrene	ND	0.17								
Surr: 2-Fluorobiphenyl	*7.045*	0	*8.34*	0	*84.5*	*62-135*	0			
Surr: 4-Terphenyl-d14	*4.695*	0	*8.34*	0	*56.3*	*48-133*	0			
Surr: Nitrobenzene-d5	*3.422*	0	*8.34*	0	*41*	*21-57*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **243674** Instrument ID **SVMS6** Method: **SW8270E**

LCS Sample ID: **SLCSW1-243674-243674** Units: **µg/L** Analysis Date: **7/17/2024 09:53 PM**

Client ID: Run ID: **SVMS6_240717A** SeqNo: **10963523** Prep Date: **7/17/2024** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Chloronaphthalene	8.229	0.17	8.34	0	98.7	51-147	0			
2-Methylnaphthalene	9.08	0.17	8.34	0	109	44-138	0			
Acenaphthene	8.659	0.17	8.34	0	104	69-133	0			
Acenaphthylene	8.277	0.17	8.34	0	99.2	64-130	0			
Anthracene	9.058	0.17	8.34	0	109	75-135	0			
Benzo(a)anthracene	8.442	0.17	8.34	0	101	69-138	0			
Benzo(a)pyrene	8.703	0.17	8.34	0	104	68-140	0			
Benzo(b)fluoranthene	7.878	0.17	8.34	0	94.5	64-137	0			
Benzo(g,h,i)perylene	6.964	0.17	8.34	0	83.5	58-141	0			
Benzo(k)fluoranthene	7.899	0.17	8.34	0	94.7	66-141	0			
Chrysene	8.427	0.17	8.34	0	101	72-146	0			
Dibenzo(a,h)anthracene	7.651	0.17	8.34	0	91.7	59-138	0			
Fluoranthene	8.78	0.17	8.34	0	105	70-137	0			
Fluorene	8.879	0.17	8.34	0	106	71-133	0			
Indeno(1,2,3-cd)pyrene	8.366	0.17	8.34	0	100	60-143	0			
Naphthalene	8.333	0.17	8.34	0	99.9	49-134	0			
Phenanthrene	8.584	0.17	8.34	0	103	77-132	0			
Pyrene	8.167	0.17	8.34	0	97.9	60-144	0			
Surr: 2-Fluorobiphenyl	*9.665*	0	*8.34*	0	*116*	*62-135*	0			
Surr: 4-Terphenyl-d14	*6.181*	0	*8.34*	0	*74.1*	*48-133*	0			
Surr: Nitrobenzene-d5	*4.301*	0	*8.34*	0	*51.6*	*21-57*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **243674** Instrument ID **SVMS6** Method: **SW8270E**

LCSD Sample ID: **SLCSDW1-243674-243674** Units: **µg/L** Analysis Date: **7/17/2024 10:09 PM**

Client ID: Run ID: **SVMS6_240717A** SeqNo: **10963524** Prep Date: **7/17/2024** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Chloronaphthalene	8.854	0.17	8.34	0	106	51-147	8.229	7.32	30	
2-Methylnaphthalene	9.861	0.17	8.34	0	118	44-138	9.08	8.25	30	
Acenaphthene	9.181	0.17	8.34	0	110	69-133	8.659	5.85	30	
Acenaphthylene	8.816	0.17	8.34	0	106	64-130	8.277	6.31	30	
Anthracene	9.565	0.17	8.34	0	115	75-135	9.058	5.45	30	
Benzo(a)anthracene	8.855	0.17	8.34	0	106	69-138	8.442	4.78	30	
Benzo(a)pyrene	8.896	0.17	8.34	0	107	68-140	8.703	2.2	30	
Benzo(b)fluoranthene	8.102	0.17	8.34	0	97.2	64-137	7.878	2.81	30	
Benzo(g,h,i)perylene	7.21	0.17	8.34	0	86.4	58-141	6.964	3.47	30	
Benzo(k)fluoranthene	8.111	0.17	8.34	0	97.3	66-141	7.899	2.65	30	
Chrysene	8.837	0.17	8.34	0	106	72-146	8.427	4.75	30	
Dibenzo(a,h)anthracene	7.983	0.17	8.34	0	95.7	59-138	7.651	4.24	30	
Fluoranthene	9.328	0.17	8.34	0	112	70-137	8.78	6.05	30	
Fluorene	9.31	0.17	8.34	0	112	71-133	8.879	4.74	30	
Indeno(1,2,3-cd)pyrene	8.414	0.17	8.34	0	101	60-143	8.366	0.572	30	
Naphthalene	8.945	0.17	8.34	0	107	49-134	8.333	7.08	30	
Phenanthrene	9.101	0.17	8.34	0	109	77-132	8.584	5.84	30	
Pyrene	8.6	0.17	8.34	0	103	60-144	8.167	5.17	30	
Surr: 2-Fluorobiphenyl	*9.519*	0	*8.34*	0	*114*	*62-135*	9.665	*1.52*	*30*	
Surr: 4-Terphenyl-d14	*6.379*	0	*8.34*	0	*76.5*	*48-133*	6.181	*3.15*	*30*	
Surr: Nitrobenzene-d5	*4.119*	0	*8.34*	0	*49.4*	*21-57*	4.301	*4.32*	*30*	

The following samples were analyzed in this batch: 24070484-01B 24070484-02B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **R408060a** Instrument ID **VMS8** Method: **SW8260D**

MBLK Sample ID: **8V-BLKW1-240717-R408060a** Units: **µg/L** Analysis Date: **7/17/2024 02:20 PM**

Client ID: Run ID: **VMS8_240717A** SeqNo: **10963076** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
1,1,2-Trichlorotrifluoroethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2,3-Trichloropropane	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	1.0								
1,2-Dibromoethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,2-Dichloroethane	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
2-Butanone	ND	5.0								
2-Hexanone	ND	5.0								
2-Methylnaphthalene	ND	5.0								
4-Methyl-2-pentanone	ND	1.0								
Acetone	ND	10								
Acrylonitrile	ND	1.0								
Benzene	ND	1.0								
Bromochloromethane	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	1.0								
Carbon disulfide	ND	1.0								
Carbon tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	1.0								
Chloroform	ND	1.0								
Chloromethane	ND	1.0								
cis-1,2-Dichloroethene	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
Diethyl ether	ND	1.0								
Ethylbenzene	ND	1.0								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R408060a** Instrument ID **VMS8** Method: **SW8260D**

Hexachloroethane	ND	1.0					
Isopropylbenzene	ND	1.0					
m,p-Xylene	ND	2.0					
Methyl iodide	ND	5.0					
Methyl tert-butyl ether	ND	1.0					
Methylene chloride	ND	5.0					
Naphthalene	ND	5.0					
n-Propylbenzene	ND	1.0					
o-Xylene	ND	1.0					
Styrene	ND	1.0					
Tetrachloroethene	ND	1.0					
Toluene	ND	1.0					
trans-1,2-Dichloroethene	ND	1.0					
trans-1,3-Dichloropropene	ND	1.0					
trans-1,4-Dichloro-2-butene	ND	2.0					
Trichloroethene	ND	1.0					
Trichlorofluoromethane	ND	1.0					
Vinyl acetate	ND	5.0					
Vinyl chloride	ND	1.0					
Xylenes, Total	ND	3.0					
Surr: 1,2-Dichloroethane-d4	*20.51*	0	*20*	0	*103*	*80-120*	0
Surr: 4-Bromofluorobenzene	*19.62*	0	*20*	0	*98.1*	*80-120*	0
Surr: Dibromofluoromethane	*19.55*	0	*20*	0	*97.8*	*80-120*	0
Surr: Toluene-d8	*20.32*	0	*20*	0	*102*	*80-120*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **R408060a** Instrument ID **VMS8** Method: **SW8260D**

LCS Sample ID: **8V-LCSW1-240717-R408060a** Units: **µg/L** Analysis Date: **7/17/2024 12:39 PM**

Client ID: Run ID: **VMS8_240717A** SeqNo: **10963303** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	43.7	1.0	40	0	109	72-119	0			
1,1,1-Trichloroethane	43.13	1.0	40	0	108	75-119	0			
1,1,2,2-Tetrachloroethane	45.65	1.0	40	0	114	80-123	0			
1,1,2-Trichloroethane	44.99	1.0	40	0	112	83-118	0			
1,1,2-Trichlorotrifluoroethane	43.17	1.0	40	0	108	64-133	0			
1,1-Dichloroethane	43.47	1.0	40	0	109	73-122	0			
1,1-Dichloroethene	43.25	1.0	40	0	108	66-131	0			
1,2,3-Trichloropropane	43.62	1.0	40	0	109	78-119	0			
1,2,4-Trichlorobenzene	45.81	1.0	40	0	115	73-127	0			
1,2,4-Trimethylbenzene	44.7	1.0	40	0	112	74-118	0			
1,2-Dibromo-3-chloropropane	41.64	1.0	40	0	104	52-141	0			
1,2-Dibromoethane	44.78	1.0	40	0	112	60-159	0			
1,2-Dichlorobenzene	46.4	1.0	40	0	116	80-119	0			
1,2-Dichloroethane	45.9	1.0	40	0	115	78-121	0			
1,2-Dichloropropane	45.1	1.0	40	0	113	78-120	0			
1,3,5-Trimethylbenzene	44.27	1.0	40	0	111	76-120	0			
1,3-Dichlorobenzene	46.48	1.0	40	0	116	80-120	0			
1,4-Dichlorobenzene	46.58	1.0	40	0	116	81-119	0			
2-Butanone	39.96	5.0	40	0	99.9	69-147	0			
2-Hexanone	42.44	5.0	40	0	106	67-140	0			
2-Methylnaphthalene	43.42	5.0	40	0	109	50-150	0			
4-Methyl-2-pentanone	40.49	1.0	40	0	101	68-199	0			
Acetone	38.34	10	40	0	95.8	70-166	0			
Acrylonitrile	42.48	1.0	40	0	106	70-133	0			
Benzene	44.12	1.0	40	0	110	78-120	0			
Bromochloromethane	45.4	1.0	40	0	114	70-125	0			
Bromodichloromethane	45.22	1.0	40	0	113	73-126	0			
Bromoform	42.76	1.0	40	0	107	60-124	0			
Bromomethane	36.27	1.0	40	0	90.7	20-183	0			
Carbon disulfide	43.83	1.0	40	0	110	67-159	0			
Carbon tetrachloride	42.06	1.0	40	0	105	69-124	0			
Chlorobenzene	44.31	1.0	40	0	111	80-118	0			
Chloroethane	38.86	1.0	40	0	97.2	35-136	0			
Chloroform	44.51	1.0	40	0	111	75-119	0			
Chloromethane	37.74	1.0	40	0	94.4	26-117	0			
cis-1,2-Dichloroethene	44.51	1.0	40	0	111	75-123	0			
cis-1,3-Dichloropropene	45.71	1.0	40	0	114	69-120	0			
Dibromochloromethane	44.07	1.0	40	0	110	63-117	0			
Dibromomethane	46.52	1.0	40	0	116	78-120	0			
Dichlorodifluoromethane	37.43	1.0	40	0	93.6	36-133	0			
Diethyl ether	46.79	1.0	40	0	117	57-163	0			
Ethylbenzene	43.64	1.0	40	0	109	76-116	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R408060a** Instrument ID **VMS8** Method: **SW8260D**

Hexachloroethane	47.26	1.0	40	0	118	60-130	0
Isopropylbenzene	44.57	1.0	40	0	111	77-118	0
m,p-Xylene	88.94	2.0	80	0	111	76-119	0
Methyl iodide	35.07	5.0	40	0	87.7	10-200	0
Methyl tert-butyl ether	43.84	1.0	40	0	110	77-137	0
Methylene chloride	45.86	5.0	40	0	115	68-125	0
Naphthalene	43.49	5.0	40	0	109	56-142	0
n-Propylbenzene	44	1.0	40	0	110	74-118	0
o-Xylene	45.05	1.0	40	0	113	77-116	0
Styrene	45.74	1.0	40	0	114	76-123	0
Tetrachloroethene	43.57	1.0	40	0	109	80-124	0
Toluene	43.68	1.0	40	0	109	78-116	0
trans-1,2-Dichloroethene	45.68	1.0	40	0	114	73-124	0
trans-1,3-Dichloropropene	46.49	1.0	40	0	116	67-118	0
trans-1,4-Dichloro-2-butene	45.76	2.0	40	0	114	58-118	0
Trichloroethene	42.7	1.0	40	0	107	75-122	0
Trichlorofluoromethane	37.59	1.0	40	0	94	52-115	0
Vinyl acetate	54.55	5.0	40	0	136		0
Vinyl chloride	37.07	1.0	40	0	92.7	49-122	0
Xylenes, Total	134	3.0	120	0	112	77-119	0
Surr: 1,2-Dichloroethane-d4	*20.16*	0	*20*	0	*101*	*80-120*	0
Surr: 4-Bromofluorobenzene	*19.75*	0	*20*	0	*98.8*	*80-120*	0
Surr: Dibromofluoromethane	*20.46*	0	*20*	0	*102*	*80-120*	0
Surr: Toluene-d8	*19.72*	0	*20*	0	*98.6*	*80-120*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **R408060a** Instrument ID **VMS8** Method: **SW8260D**

MS Sample ID: **24070451-08A MS** Units: **µg/L** Analysis Date: **7/17/2024 11:32 PM**

Client ID: Run ID: **VMS8_240717A** SeqNo: **10963098** Prep Date: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	975.5	50	1000	0	97.6	72-119	0			
1,1,1-Trichloroethane	1056	50	1000	0	106	75-119	0			
1,1,2,2-Tetrachloroethane	957	50	1000	0	95.7	80-123	0			
1,1,2-Trichloroethane	1002	50	1000	0	100	83-118	0			
1,1,2-Trichlorotrifluoroethane	1232	50	1000	0	123	64-133	0			
1,1-Dichloroethane	1148	50	1000	0	115	73-122	0			
1,1-Dichloroethene	1257	50	1000	0	126	66-131	0			
1,2,3-Trichloropropane	945.5	50	1000	0	94.6	78-119	0			
1,2,4-Trichlorobenzene	949	50	1000	0	94.9	73-127	0			
1,2,4-Trimethylbenzene	967.5	50	1000	0	96.8	74-118	0			
1,2-Dibromo-3-chloropropane	974.5	50	1000	0	97.4	52-141	0			
1,2-Dibromoethane	1110	50	1000	0	111	60-159	0			
1,2-Dichlorobenzene	1000	50	1000	0	100	80-119	0			
1,2-Dichloroethane	1049	50	1000	0	105	78-121	0			
1,2-Dichloropropane	1100	50	1000	0	110	78-120	0			
1,3,5-Trimethylbenzene	1025	50	1000	0	102	76-120	0			
1,3-Dichlorobenzene	1020	50	1000	0	102	80-120	0			
1,4-Dichlorobenzene	1008	50	1000	0	101	81-119	0			
2-Butanone	1086	250	1000	0	109	69-147	0			
2-Hexanone	983	250	1000	0	98.3	67-140	0			
2-Methylnaphthalene	922	250	1000	0	92.2	50-150	0			
4-Methyl-2-pentanone	953.5	50	1000	0	95.4	68-199	0			
Acetone	971.5	500	1000	0	97.2	70-166	0			
Acrylonitrile	1061	50	1000	0	106	70-133	0			
Benzene	1074	50	1000	0	107	78-120	0			
Bromochloromethane	1154	50	1000	0	115	70-125	0			
Bromodichloromethane	1022	50	1000	0	102	73-126	0			
Bromoform	795	50	1000	0	79.5	60-124	0			
Bromomethane	803.5	50	1000	0	80.4	20-183	0			
Carbon disulfide	1186	50	1000	0	119	67-159	0			
Carbon tetrachloride	1070	50	1000	0	107	69-124	0			
Chlorobenzene	1003	50	1000	0	100	80-118	0			
Chloroethane	959	50	1000	0	95.9	35-136	0			
Chloroform	1105	50	1000	0	110	75-119	0			
Chloromethane	757.5	50	1000	0	75.8	26-117	0			
cis-1,2-Dichloroethene	1162	50	1000	0	116	75-123	0			
cis-1,3-Dichloropropene	994.5	50	1000	0	99.4	69-120	0			
Dibromochloromethane	910.5	50	1000	0	91	63-117	0			
Dibromomethane	1036	50	1000	0	104	78-120	0			
Dichlorodifluoromethane	733	50	1000	0	73.3	36-133	0			
Diethyl ether	1138	50	1000	0	114	57-163	0			
Ethylbenzene	1034	50	1000	0	103	76-116	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R408060a** Instrument ID **VMS8** Method: **SW8260D**

Hexachloroethane	1002	50	1000	0	100	60-130	0
Isopropylbenzene	1091	50	1000	0	109	77-118	0
m,p-Xylene	2044	100	2000	0	102	76-119	0
Methyl iodide	1834	250	1000	0	183	10-200	0
Methyl tert-butyl ether	1098	50	1000	0	110	77-137	0
Methylene chloride	1148	250	1000	0	115	68-125	0
Naphthalene	902	250	1000	0	90.2	56-142	0
n-Propylbenzene	1041	50	1000	0	104	74-118	0
o-Xylene	1041	50	1000	0	104	77-116	0
Styrene	1014	50	1000	0	101	76-123	0
Tetrachloroethene	1206	50	1000	0	121	80-124	0
Toluene	1038	50	1000	0	104	78-116	0
trans-1,2-Dichloroethene	1196	50	1000	0	120	73-124	0
trans-1,3-Dichloropropene	949.5	50	1000	0	95	67-118	0
trans-1,4-Dichloro-2-butene	689	100	1000	0	68.9	58-118	0
Trichloroethene	1034	50	1000	0	103	75-122	0
Trichlorofluoromethane	1075	50	1000	0	108	52-115	0
Vinyl chloride	927.5	50	1000	0	92.8	49-122	0
Xylenes, Total	3085	150	3000	0	103	77-119	0
Surr: 1,2-Dichloroethane-d4	*1044*	0	*1000*	0	*104*	*80-120*	0
Surr: 4-Bromofluorobenzene	*981*	0	*1000*	0	*98.1*	*80-120*	0
Surr: Dibromofluoromethane	*1024*	0	*1000*	0	*102*	*80-120*	0
Surr: Toluene-d8	*1014*	0	*1000*	0	*101*	*80-120*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Mackinac Environmental Technology, Inc.
Work Order: 24070484
Project: Superior Township Dump M23-4099

QC BATCH REPORT

Batch ID: **R408060a** Instrument ID **VMS8** Method: **SW8260D**

MSD Sample ID: **24070451-08A MSD** Units: **µg/L** Analysis Date: **7/17/2024 11:50 PM**
Client ID: Run ID: **VMS8_240717A** SeqNo: **10963099** Prep Date: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	946	50	1000	0	94.6	72-119	975.5	3.07	30	
1,1,1-Trichloroethane	1036	50	1000	0	104	75-119	1056	1.96	30	
1,1,2,2-Tetrachloroethane	920.5	50	1000	0	92	80-123	957	3.89	30	
1,1,2-Trichloroethane	985	50	1000	0	98.5	83-118	1002	1.66	30	
1,1,2-Trichlorotrifluoroethane	1095	50	1000	0	110	64-133	1232	11.8	30	
1,1-Dichloroethane	1054	50	1000	0	105	73-122	1148	8.63	30	
1,1-Dichloroethene	1162	50	1000	0	116	66-131	1257	7.85	30	
1,2,3-Trichloropropane	861	50	1000	0	86.1	78-119	945.5	9.36	30	
1,2,4-Trichlorobenzene	932	50	1000	0	93.2	73-127	949	1.81	30	
1,2,4-Trimethylbenzene	919	50	1000	0	91.9	74-118	967.5	5.14	30	
1,2-Dibromo-3-chloropropane	902	50	1000	0	90.2	52-141	974.5	7.73	30	
1,2-Dibromoethane	1094	50	1000	0	109	60-159	1110	1.41	30	
1,2-Dichlorobenzene	994.5	50	1000	0	99.4	80-119	1000	0.552	30	
1,2-Dichloroethane	1016	50	1000	0	102	78-121	1049	3.2	30	
1,2-Dichloropropane	1053	50	1000	0	105	78-120	1100	4.41	30	
1,3,5-Trimethylbenzene	968.5	50	1000	0	96.8	76-120	1025	5.67	30	
1,3-Dichlorobenzene	1024	50	1000	0	102	80-120	1020	0.44	30	
1,4-Dichlorobenzene	1006	50	1000	0	101	81-119	1008	0.149	30	
2-Butanone	996	250	1000	0	99.6	69-147	1086	8.69	30	
2-Hexanone	911	250	1000	0	91.1	67-140	983	7.6	30	
2-Methylnaphthalene	899	250	1000	0	89.9	50-150	922	2.53	30	
4-Methyl-2-pentanone	891.5	50	1000	0	89.2	68-199	953.5	6.72	30	
Acetone	883	500	1000	0	88.3	70-166	971.5	9.54	30	
Acrylonitrile	961.5	50	1000	0	96.2	70-133	1061	9.84	30	
Benzene	1038	50	1000	0	104	78-120	1074	3.41	30	
Bromochloromethane	1076	50	1000	0	108	70-125	1154	6.95	30	
Bromodichloromethane	985.5	50	1000	0	98.6	73-126	1022	3.59	30	
Bromoform	764	50	1000	0	76.4	60-124	795	3.98	30	
Bromomethane	793.5	50	1000	0	79.4	20-183	803.5	1.25	30	
Carbon disulfide	1110	50	1000	0	111	67-159	1186	6.62	30	
Carbon tetrachloride	1033	50	1000	0	103	69-124	1070	3.52	30	
Chlorobenzene	977.5	50	1000	0	97.8	80-118	1003	2.58	30	
Chloroethane	869.5	50	1000	0	87	35-136	959	9.79	30	
Chloroform	1048	50	1000	0	105	75-119	1105	5.29	30	
Chloromethane	665	50	1000	0	66.5	26-117	757.5	13	30	
cis-1,2-Dichloroethene	1083	50	1000	0	108	75-123	1162	7.04	30	
cis-1,3-Dichloropropene	979	50	1000	0	97.9	69-120	994.5	1.57	30	
Dibromochloromethane	889.5	50	1000	0	89	63-117	910.5	2.33	30	
Dibromomethane	1014	50	1000	0	101	78-120	1036	2.05	30	
Dichlorodifluoromethane	689.5	50	1000	0	69	36-133	733	6.12	30	
Diethyl ether	1070	50	1000	0	107	57-163	1138	6.21	30	
Ethylbenzene	987	50	1000	0	98.7	76-116	1034	4.65	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **R408060a** Instrument ID **VMS8** Method: **SW8260D**

Hexachloroethane	1012	50	1000	0	101	60-130	1002	0.944	30
Isopropylbenzene	1044	50	1000	0	104	77-118	1091	4.45	30
m,p-Xylene	1964	100	2000	0	98.2	76-119	2044	3.99	30
Methyl iodide	1736	250	1000	0	174	10-200	1834	5.49	30
Methyl tert-butyl ether	1026	50	1000	0	103	77-137	1098	6.78	30
Methylene chloride	1082	250	1000	0	108	68-125	1148	5.92	30
Naphthalene	901	250	1000	0	90.1	56-142	902	0.111	30
n-Propylbenzene	994	50	1000	0	99.4	74-118	1041	4.62	30
o-Xylene	986	50	1000	0	98.6	77-116	1041	5.43	30
Styrene	1002	50	1000	0	100	76-123	1014	1.09	30
Tetrachloroethene	1174	50	1000	0	117	80-124	1206	2.65	30
Toluene	985.5	50	1000	0	98.6	78-116	1038	5.19	30
trans-1,2-Dichloroethene	1090	50	1000	0	109	73-124	1196	9.28	30
trans-1,3-Dichloropropene	959	50	1000	0	95.9	67-118	949.5	0.996	30
trans-1,4-Dichloro-2-butene	697	100	1000	0	69.7	58-118	689	1.15	30
Trichloroethene	1000	50	1000	0	100	75-122	1034	3.29	30
Trichlorofluoromethane	976	50	1000	0	97.6	52-115	1075	9.65	30
Vinyl chloride	877	50	1000	0	87.7	49-122	927.5	5.6	30
Xylenes, Total	2950	150	3000	0	98.3	77-119	3085	4.47	30
Surr: 1,2-Dichloroethane-d4	*1054*	0	*1000*	0	*105*	*80-120*	1044	*0.953*	*30*
Surr: 4-Bromofluorobenzene	*961*	0	*1000*	0	*96.1*	*80-120*	981	*2.06*	*30*
Surr: Dibromofluoromethane	*1003*	0	*1000*	0	*100*	*80-120*	1024	*2.02*	*30*
Surr: Toluene-d8	*984*	0	*1000*	0	*98.4*	*80-120*	1014	*3*	*30*

The following samples were analyzed in this batch: 24070484-01A 24070484-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

24070484

MACKINAC ENVIRONMENTAL TECHNOLOGY. Mackinac Environmental Technology, Inc.

Project: Superior Township Dump M23-4099

Collins, CO
70 490 1511

ınd, MI
16 399 6070

Chain of Custody Form

Page 1 of 1

COC ID: 065502

Houston, TX +1 281 530 5656
Middletown, PA +1 717 944 5541
Valparaiso, IN +1 219 299 8127
Salt Lake City, UT +1 801 266 7700
South Charleston, WV +1 304 356 3168
Rochester, NY +1 585 288 5380

ALS Project Manager:		ALS Work Order #:	

Project Information (STD)

Quote #		Project Number	M23-4099
Company Name	Mackinac Environmental	Bill To Company	SAME
Send Report To	Matt Radsvick	Invoice Attn	
Address	300 Ferry Lane	Address	as
City/State/Zip	St. Ignace MI 49781	City/State/Zip	
Phone	906 643 9948	Phone	Left
Fax	906 643 9977	Fax	
e-Mail Address	met@sault.com	e-Mail Address	

Parameter/Method Request for Analysis

A	VOC's
B	PAH
C	METALS (As, Ba, Hg, Al, Mn, Fe, Pb)
D	
E	
F	
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	HA-9	7.11.24	12:43	GW		6	X	X	X								
2	MW-2a	7.11.24	13:27	GW		6	X	X	X								
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Jeremy Reynolds

Shipment Method: Fed Ex

Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☐ 2 BD ☐ 1 BD Other

Results Due Date:

Relinquished by:	Date: 7.11.24	Time: 1600	Received by: FED EX	
Relinquished by: Fed Ex	Date: 7/12/24	Time: 900	Received by (Laboratory):	7/12/24 900
Logged by (Laboratory): DFS	Date: 7/12/24	Time: 1030	Checked by (Laboratory):	

Notes: Non-Muster

Cooler ID	Cooler Temp.
DF2	2.7°
	PH 38

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Date ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note:
1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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ALS Group, USA
Holland, Michigan

Sample Receipt Checklist

Client Name: **MACKINAC ENVIRONMENTAL TE** Date/Time Received: **12-Jul-24 09:00**

Work Order: **24070484** Received by: **HTB**

Checklist completed by Diane Shaw (eSignature) 12-Jul-24 (Date) Reviewed by: Alex J. Csaszar (eSignature) 12-Jul-24 (Date)

Matrices: Groundwater
Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Sample(s) received on ice?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	2.7/2.7 c	DF2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	7/12/2024 10:44:41 AM		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:	-		

Login Notes: pH check <2.

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

03-Jan-2025

Matt Radsvick
Mackinac Environmental Technology, Inc.
4 Pennsylvania Plz.
Petoskey, MI 49770

Re: **Superior Township Dump** Work Order: **24120581**

Dear Matt,

ALS Environmental received 7 samples on 21-Dec-2024 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 43.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Alex J. Csaszar

Alex J. Csaszar
Project Manager

ALS Group, USA

Date: 03-Jan-25

Client: Mackinac Environmental Technology, Inc.
Project: Superior Township Dump
Work Order: **24120581**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
24120581-01	MW-5	Groundwater		12/17/2024 11:56	12/21/2024 11:00	☐
24120581-02	MW-4	Sediment		12/17/2024 13:07	12/21/2024 11:00	☐
24120581-03	MW-1	Groundwater		12/17/2024 14:36	12/21/2024 11:00	☐
24120581-04	Initial MW-5	Groundwater		12/17/2024 11:00	12/21/2024 11:00	☑
24120581-05	Initial MW-4	Groundwater		12/17/2024 12:29	12/21/2024 11:00	☐
24120581-06	Initial MW-1	Groundwater		12/17/2024 13:57	12/21/2024 11:00	☑
24120581-07	Field Blank	Water		12/17/2024	12/21/2024 11:00	☐

Client:	Mackinac Environmental Technology, Inc.
Project:	Superior Township Dump
Work Order:	24120581

Case Narrative

The attached "Sample Receipt Checklist" documents the date of receipt, status of custody seals, container integrity, preservation, and temperature compliance.

Samples were analyzed according to the analytical methodology previously transmitted in the "Work Order Acknowledgement". Methodologies are also documented in the "Analytical Result" section for each sample. Quality control results are listed in the "QC Report" section. A copy of the laboratory's scope of accreditation is available upon request.

Sample association for the reported quality control is located at the end of each batch summary. If applicable, results are appropriately qualified in the Analytical Result and QC Report sections. The "Qualifiers" section documents the various qualifiers, units, and acronyms utilized in reporting.

Any flags on MS/MSD samples not addressed in this narrative are unrelated to samples in this report.

With the following exceptions, all sample analyses achieved analytical criteria.

LCMS:

Batch 251683, Method E537 Mod, Sample MW-5 (24120581-01A): One or more surrogate recoveries were above the upper control limits. The sample was non-detect, therefore, no qualification is needed. 13C-4:2_FTS, 13C-6:2_FTS

Batch 251683, Method E537 Mod, Sample MW-1 (24120581-03A): One or more surrogate recoveries were above the upper control limits. The sample was non-detect, therefore, no qualification is needed. 13C-4:2_FTS, 13C-6:2_FTS

Batch 251810, Method E537 Mod, Sample LCSD-251810: The LCSD recovery was below the lower control limit. The sample results may be biased low for this analyte: PFDoS

Batch 251810, Method E537 Mod, Sample LCSD-251810: The RPD between the LCS and LCSD was outside of the control limit. The sample results should be considered estimated for this analyte: PFDoS, 13C2-PFHxDA

Metals:

Batch 251745, Method SW6020B, Sample MW-4 (24120581-02B): The reporting limits are

elevated due to internal standard failure in the undiluted run for these analytes: Ag

Client:	Mackinac Environmental Technology, Inc.
Project:	Superior Township Dump
WorkOrder:	**24120581**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Analyte accreditation is not offered
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

Units Reported	Description
µg/Kg	Micrograms per Kilogram
mg/L	Milligrams per Liter
ng/L	Nanograms per Liter

Client: Mackinac Environmental Technology, Inc.
Project: Superior Township Dump **Work Order:** 24120581
Sample ID: MW-5 **Lab ID:** 24120581-01
Collection Date: 12/17/2024 11:56 AM **Matrix:** GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7470A**		Prep: SW7470 12/23/24 15:47	Analyst: **HTJ**
Mercury	ND		0.00020	mg/L	1	12/23/2024 07:19 PM
METALS BY ICP-MS			**SW6020B**		Prep: SW3005A 12/30/24 08:27	Analyst: **STP**
Aluminum	**660**		**10**	**mg/L**	100	12/31/2024 02:28 PM
Arsenic	**0.15**		**0.050**	**mg/L**	1	12/30/2024 05:58 PM
Barium	**7.2**		**0.050**	**mg/L**	1	12/30/2024 05:58 PM
Cadmium	ND		0.020	mg/L	1	12/30/2024 05:58 PM
Chromium	**0.75**		**0.050**	**mg/L**	1	12/30/2024 05:58 PM
Cobalt	**0.28**		**0.050**	**mg/L**	1	12/30/2024 05:58 PM
Iron	**470**		**0.80**	**mg/L**	1	12/30/2024 05:58 PM
Lead	**0.28**		**0.050**	**mg/L**	1	12/30/2024 05:58 PM
Manganese	**17**		**0.050**	**mg/L**	1	12/30/2024 05:58 PM
Nickel	**0.56**		**0.050**	**mg/L**	1	12/30/2024 05:58 PM
Selenium	**0.14**		**0.050**	**mg/L**	1	12/30/2024 05:58 PM
Silver	ND		0.050	mg/L	1	12/30/2024 05:58 PM
Vanadium	**1.5**		**0.050**	**mg/L**	1	12/30/2024 05:58 PM
PFAS BY EPA 537 MODIFIED			**E537 MOD**		Prep: E537 Mod 12/26/24 17:32	Analyst: **ENS**
Fluorotelomer Sulphonic Acid 4:2 (FtS 4:2)	ND		5.2	ng/L	1	12/27/2024 06:06 PM
Fluorotelomer Sulphonic Acid 6:2 (FtS 6:2)	ND		5.2	ng/L	1	12/27/2024 06:06 PM
Fluorotelomer Sulphonic Acid 8:2 (FtS 8:2)	ND		5.2	ng/L	1	12/27/2024 06:06 PM
Perfluorobutanesulfonic Acid (PFBS)	ND		5.2	ng/L	1	12/27/2024 06:06 PM
Perfluorobutanoic Acid (PFBA)	ND		5.2	ng/L	1	12/27/2024 06:06 PM
Perfluorodecanesulfonic Acid (PFDS)	ND		5.2	ng/L	1	12/27/2024 06:06 PM
Perfluorodecanoic Acid (PFDA)	ND		5.2	ng/L	1	12/27/2024 06:06 PM
Perfluorododecanoic Acid (PFDoA)	ND		5.2	ng/L	1	12/27/2024 06:06 PM
Perfluoroheptanesulfonic Acid (PFHpS)	ND		5.2	ng/L	1	12/27/2024 06:06 PM
Perfluoroheptanoic Acid (PFHpA)	ND		5.2	ng/L	1	12/27/2024 06:06 PM
Perfluorohexanesulfonic Acid (PFHxS)	ND		5.2	ng/L	1	12/27/2024 06:06 PM
Perfluorohexanoic Acid (PFHxA)	ND		5.2	ng/L	1	12/27/2024 06:06 PM
Perfluorononanesulfonic Acid (PFNS)	ND		5.2	ng/L	1	12/27/2024 06:06 PM
Perfluorononanoic Acid (PFNA)	ND		5.2	ng/L	1	12/27/2024 06:06 PM
Perfluorooctanesulfonamide (PFOSA)	ND		5.2	ng/L	1	12/27/2024 06:06 PM
Perfluorooctanesulfonic Acid (PFOS)	ND		2.1	ng/L	1	12/27/2024 06:06 PM
Perfluorooctanoic Acid (PFOA)	ND		2.1	ng/L	1	12/27/2024 06:06 PM
Perfluoropentanesulfonic Acid (PFPeS)	ND		5.2	ng/L	1	12/27/2024 06:06 PM
Perfluoropentanoic Acid (PFPeA)	ND		5.2	ng/L	1	12/27/2024 06:06 PM
Perfluorotetradecanoic Acid (PFTeA)	ND		5.2	ng/L	1	12/27/2024 06:06 PM
Perfluorotridecanoic Acid (PFTriA)	ND		5.2	ng/L	1	12/27/2024 06:06 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Mackinac Environmental Technology, Inc.
Project: Superior Township Dump **Work Order:** 24120581
Sample ID: MW-5 **Lab ID:** 24120581-01
Collection Date: 12/17/2024 11:56 AM **Matrix:** GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Perfluoroundecanoic Acid (PFUnA)	ND		5.2	ng/L	1	12/27/2024 06:06 PM
N-Ethylperfluorooctanesulfonamidoacetic Acid	ND		5.2	ng/L	1	12/27/2024 06:06 PM
N-Methylperfluorooctanesulfonamidoacetic Acid	ND		5.2	ng/L	1	12/27/2024 06:06 PM
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND		5.2	ng/L	1	12/27/2024 06:06 PM
4,8-Dioxa-3H-perfluorononanoic Acid (DONA)	ND		5.2	ng/L	1	12/27/2024 06:06 PM
11Cl-Pf3OUdS	ND		5.2	ng/L	1	12/27/2024 06:06 PM
9Cl-PF3ONS	ND		5.2	ng/L	1	12/27/2024 06:06 PM
Perfluoro-4-ethylcyclohexanesulfonic Acid (PFecHS)	ND		5.2	ng/L	1	12/27/2024 06:06 PM
Perfluorobutylsulfonamide (PFBSA)	ND		5.2	ng/L	1	12/27/2024 06:06 PM
Perfluorohexanesulfonamide (PFHxSA)	ND		5.2	ng/L	1	12/27/2024 06:06 PM
2H,2H,3H,3H-Perfluorodecanoic acid (7:3 FTCA)	ND		5.2	ng/L	1	12/27/2024 06:06 PM
2H,2H,3H,3H-Perfluorohexanoic acid (3:3 FTCA)	ND		5.2	ng/L	1	12/27/2024 06:06 PM
2H,2H,3H,3H-Perfluorooctanoic acid (5:3 FTCA)	ND		5.2	ng/L	1	12/27/2024 06:06 PM
Surr: 13C2-FtS 4:2	*209*	S	*50-150*	*%REC*	1	12/27/2024 06:06 PM
Surr: 13C2-FtS 6:2	*445*	S	*50-150*	*%REC*	1	12/27/2024 06:06 PM
Surr: 13C2-FtS 8:2	*87.2*		*50-150*	*%REC*	1	12/27/2024 06:06 PM
Surr: 13C2-PFDA	*78.4*		*50-150*	*%REC*	1	12/27/2024 06:06 PM
Surr: 13C2-PFDoA	*84.5*		*50-150*	*%REC*	1	12/27/2024 06:06 PM
Surr: 13C2-PFHxA	*86.8*		*50-150*	*%REC*	1	12/27/2024 06:06 PM
Surr: 13C2-PFTeA	*85.6*		*27-134*	*%REC*	1	12/27/2024 06:06 PM
Surr: 13C2-PFUnA	*80.5*		*50-150*	*%REC*	1	12/27/2024 06:06 PM
Surr: 13C3-HFPO-DA	*90.1*		*41-142*	*%REC*	1	12/27/2024 06:06 PM
Surr: 13C3-PFBS	*81.3*		*50-150*	*%REC*	1	12/27/2024 06:06 PM
Surr: 13C4-PFBA	*77.3*		*50-150*	*%REC*	1	12/27/2024 06:06 PM
Surr: 13C4-PFHpA	*97.2*		*42-141*	*%REC*	1	12/27/2024 06:06 PM
Surr: 13C4-PFOA	*88.8*		*50-150*	*%REC*	1	12/27/2024 06:06 PM
Surr: 13C4-PFOS	*77.2*		*50-150*	*%REC*	1	12/27/2024 06:06 PM
Surr: 13C5-PFNA	*85.8*		*50-150*	*%REC*	1	12/27/2024 06:06 PM
Surr: 13C5-PFPeA	*83.5*		*43-138*	*%REC*	1	12/27/2024 06:06 PM
Surr: 13C8-FOSA	*82.9*		*30-122*	*%REC*	1	12/27/2024 06:06 PM
Surr: 18O2-PFHxS	*76.6*		*50-150*	*%REC*	1	12/27/2024 06:06 PM
Surr: d5-N-EtFOSAA	*83.8*		*34-142*	*%REC*	1	12/27/2024 06:06 PM
Surr: d3-N-MeFOSAA	*80.9*		*35-136*	*%REC*	1	12/27/2024 06:06 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Mackinac Environmental Technology, Inc.
Project: Superior Township Dump **Work Order:** 24120581
Sample ID: MW-4 **Lab ID:** 24120581-02
Collection Date: 12/17/2024 01:07 PM **Matrix:** SEDIMENT

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7470A**		Prep: SW7470 12/23/24 15:47	Analyst: **HTJ**
Mercury	ND		0.00020	mg/L	1	12/23/2024 07:20 PM
METALS BY ICP-MS			**SW6020B**		Prep: SW3005A 12/30/24 08:27	Analyst: **STP**
Aluminum	**2,600**		**100**	**mg/L**	1000	1/2/2025 04:03 PM
Arsenic	**0.57**		**0.50**	**mg/L**	10	12/31/2024 02:32 PM
Barium	**36**		**0.50**	**mg/L**	10	12/31/2024 02:32 PM
Cadmium	ND		0.020	mg/L	1	12/30/2024 06:00 PM
Chromium	**5.4**		**0.50**	**mg/L**	10	12/31/2024 02:32 PM
Cobalt	**1.6**		**0.50**	**mg/L**	10	12/31/2024 02:32 PM
Iron	**2,400**		**8.0**	**mg/L**	10	12/31/2024 02:32 PM
Lead	**1.4**		**0.050**	**mg/L**	1	12/30/2024 06:00 PM
Manganese	**72**		**0.50**	**mg/L**	10	12/31/2024 02:32 PM
Nickel	**4.0**		**0.50**	**mg/L**	10	12/31/2024 02:32 PM
Selenium	**0.72**		**0.50**	**mg/L**	10	12/31/2024 02:32 PM
Silver	ND		0.50	mg/L	10	12/31/2024 02:32 PM
Vanadium	**5.4**		**0.050**	**mg/L**	1	12/30/2024 06:00 PM
PFAS BY EPA 537 MODIFIED			**E537 MOD**		Prep: E537 Mod 12/27/24 16:56	Analyst: **ENS**
Fluorotelomer Sulphonic Acid 4:2 (FtS 4:2)	ND		1.0	µg/Kg	1	12/28/2024 05:29 AM
Fluorotelomer Sulphonic Acid 6:2 (FtS 6:2)	ND		1.0	µg/Kg	1	12/28/2024 05:29 AM
Fluorotelomer Sulphonic Acid 8:2 (FtS 8:2)	ND		1.0	µg/Kg	1	12/28/2024 05:29 AM
Perfluorobutanesulfonic Acid (PFBS)	ND		1.0	µg/Kg	1	12/28/2024 05:29 AM
Perfluorobutanoic Acid (PFBA)	ND		1.0	µg/Kg	1	12/28/2024 05:29 AM
Perfluorodecanesulfonic Acid (PFDS)	ND		1.0	µg/Kg	1	12/28/2024 05:29 AM
Perfluorodecanoic Acid (PFDA)	ND		1.0	µg/Kg	1	12/28/2024 05:29 AM
Perfluorododecanoic Acid (PFDoA)	ND		1.0	µg/Kg	1	12/28/2024 05:29 AM
Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.0	µg/Kg	1	12/28/2024 05:29 AM
Perfluoroheptanoic Acid (PFHpA)	ND		1.0	µg/Kg	1	12/28/2024 05:29 AM
Perfluorohexanesulfonic Acid (PFHxS)	ND		1.0	µg/Kg	1	12/28/2024 05:29 AM
Perfluorohexanoic Acid (PFHxA)	ND		1.0	µg/Kg	1	12/28/2024 05:29 AM
Perfluorononanesulfonic Acid (PFNS)	ND		1.0	µg/Kg	1	12/28/2024 05:29 AM
Perfluorononanoic Acid (PFNA)	ND		1.0	µg/Kg	1	12/28/2024 05:29 AM
Perfluorooctanesulfonamide (PFOSA)	ND		1.0	µg/Kg	1	12/28/2024 05:29 AM
Perfluorooctanesulfonic Acid (PFOS)	ND		1.0	µg/Kg	1	12/28/2024 05:29 AM
Perfluorooctanoic Acid (PFOA)	ND		1.0	µg/Kg	1	12/28/2024 05:29 AM
Perfluoropentanesulfonic Acid (PFPeS)	ND		1.0	µg/Kg	1	12/28/2024 05:29 AM
Perfluoropentanoic Acid (PFPeA)	ND		1.0	µg/Kg	1	12/28/2024 05:29 AM
Perfluorotetradecanoic Acid (PFTeA)	ND		1.0	µg/Kg	1	12/28/2024 05:29 AM
Perfluorotridecanoic Acid (PFTriA)	ND		1.0	µg/Kg	1	12/28/2024 05:29 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Mackinac Environmental Technology, Inc.
Project: Superior Township Dump **Work Order:** 24120581
Sample ID: MW-4 **Lab ID:** 24120581-02
Collection Date: 12/17/2024 01:07 PM **Matrix:** SEDIMENT

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Perfluoroundecanoic Acid (PFUnA)	ND		1.0	µg/Kg	1	12/28/2024 05:29 AM
N-Ethylperfluorooctanesulfonamidoacetic Acid	ND		1.0	µg/Kg	1	12/28/2024 05:29 AM
N-Methylperfluorooctanesulfonamidoacetic Acid	ND		1.0	µg/Kg	1	12/28/2024 05:29 AM
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND		1.0	µg/Kg	1	12/28/2024 05:29 AM
4,8-Dioxa-3H-perfluorononanoic Acid (DONA)	ND		1.0	µg/Kg	1	12/28/2024 05:29 AM
11Cl-Pf3OUdS	ND		1.0	µg/Kg	1	12/28/2024 05:29 AM
9Cl-PF3ONS	ND		1.0	µg/Kg	1	12/28/2024 05:29 AM
Perfluoro-4-ethylcyclohexanesulfonic Acid (PFecHS)	ND		1.0	µg/Kg	1	12/28/2024 05:29 AM
Perfluorobutylsulfonamide (PFBSA)	ND		1.0	µg/Kg	1	12/28/2024 05:29 AM
Perfluorohexanesulfonamide (PFHxSA)	ND		1.0	µg/Kg	1	12/28/2024 05:29 AM
2H,2H,3H,3H-Perfluorohexanoic acid (3:3 FTCA)	ND		1.0	µg/Kg	1	12/28/2024 05:29 AM
2H,2H,3H,3H-Perfluorooctanoic acid (5:3 FTCA)	ND		1.0	µg/Kg	1	12/28/2024 05:29 AM
2H,2H,3H,3H-Perfluorodecanoic acid (7:3 FTCA)	ND		1.0	µg/Kg	1	12/28/2024 05:29 AM
Surr: 13C2-FtS 10:2	*88.6*		*46-150*	*%REC*	1	12/28/2024 05:29 AM
Surr: 13C2-FtS 4:2	*72.7*		*50-150*	*%REC*	1	12/28/2024 05:29 AM
Surr: 13C2-FtS 6:2	*88.9*		*50-150*	*%REC*	1	12/28/2024 05:29 AM
Surr: 13C2-FtS 8:2	*76.1*		*50-150*	*%REC*	1	12/28/2024 05:29 AM
Surr: 13C2-PFDA	*79.2*		*50-150*	*%REC*	1	12/28/2024 05:29 AM
Surr: 13C2-PFDoA	*80.3*		*50-150*	*%REC*	1	12/28/2024 05:29 AM
Surr: 13C2-PFHxA	*82.3*		*50-150*	*%REC*	1	12/28/2024 05:29 AM
Surr: 13C2-PFTeA	*78.6*		*21-170*	*%REC*	1	12/28/2024 05:29 AM
Surr: 13C2-PFUnA	*88.1*		*50-150*	*%REC*	1	12/28/2024 05:29 AM
Surr: 13C3-HFPO-DA	*85.9*		*50-150*	*%REC*	1	12/28/2024 05:29 AM
Surr: 13C3-PFBS	*75.4*		*50-150*	*%REC*	1	12/28/2024 05:29 AM
Surr: 13C4-PFBA	*76.0*		*50-150*	*%REC*	1	12/28/2024 05:29 AM
Surr: 13C4-PFHpA	*84.7*		*50-150*	*%REC*	1	12/28/2024 05:29 AM
Surr: 13C4-PFOA	*77.7*		*50-150*	*%REC*	1	12/28/2024 05:29 AM
Surr: 13C4-PFOS	*80.6*		*50-150*	*%REC*	1	12/28/2024 05:29 AM
Surr: 13C5-PFNA	*83.3*		*50-150*	*%REC*	1	12/28/2024 05:29 AM
Surr: 13C5-PFPeA	*82.3*		*50-150*	*%REC*	1	12/28/2024 05:29 AM
Surr: 13C8-FOSA	*80.2*		*50-150*	*%REC*	1	12/28/2024 05:29 AM
Surr: 18O2-PFHxS	*77.9*		*50-150*	*%REC*	1	12/28/2024 05:29 AM
Surr: d5-N-EtFOSAA	*78.0*		*50-150*	*%REC*	1	12/28/2024 05:29 AM
Surr: d9-N-EtFOSE	*74.6*		*50-150*	*%REC*	1	12/28/2024 05:29 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Mackinac Environmental Technology, Inc.
Project: Superior Township Dump **Work Order:** 24120581
Sample ID: MW-4 **Lab ID:** 24120581-02
Collection Date: 12/17/2024 01:07 PM **Matrix:** SEDIMENT

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Surr: d3-N-MeFOSAA	*76.0*		*50-150*	*%REC*	1	12/28/2024 05:29 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Mackinac Environmental Technology, Inc.
Project: Superior Township Dump **Work Order:** 24120581
Sample ID: MW-1 **Lab ID:** 24120581-03
Collection Date: 12/17/2024 02:36 PM **Matrix:** GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7470A**		Prep: SW7470 12/23/24 15:47	Analyst: **HTJ**
Mercury	ND		0.00020	mg/L	1	12/23/2024 07:22 PM
METALS BY ICP-MS			**SW6020B**		Prep: SW3005A 12/30/24 08:27	Analyst: **STP**
Aluminum	**0.87**		**0.10**	**mg/L**	10	12/31/2024 02:33 PM
Arsenic	ND		0.0050	mg/L	1	12/30/2024 06:02 PM
Barium	**0.32**		**0.0050**	**mg/L**	1	12/30/2024 06:02 PM
Cadmium	ND		0.0020	mg/L	1	12/30/2024 06:02 PM
Chromium	ND		0.0050	mg/L	1	12/30/2024 06:02 PM
Cobalt	ND		0.0050	mg/L	1	12/30/2024 06:02 PM
Iron	**3.0**		**0.080**	**mg/L**	1	12/30/2024 06:02 PM
Lead	ND		0.0050	mg/L	1	12/30/2024 06:02 PM
Manganese	**0.94**		**0.0050**	**mg/L**	1	12/30/2024 06:02 PM
Nickel	ND		0.0050	mg/L	1	12/30/2024 06:02 PM
Selenium	ND		0.0050	mg/L	1	12/30/2024 06:02 PM
Silver	ND		0.0050	mg/L	1	12/30/2024 06:02 PM
Vanadium	ND		0.0050	mg/L	1	12/30/2024 06:02 PM
PFAS BY EPA 537 MODIFIED			**E537 MOD**		Prep: E537 Mod 12/26/24 17:32	Analyst: **ENS**
Fluorotelomer Sulphonic Acid 4:2 (FtS 4:2)	ND		4.9	ng/L	1	12/27/2024 06:21 PM
Fluorotelomer Sulphonic Acid 6:2 (FtS 6:2)	ND		4.9	ng/L	1	12/27/2024 06:21 PM
Fluorotelomer Sulphonic Acid 8:2 (FtS 8:2)	ND		4.9	ng/L	1	12/27/2024 06:21 PM
Perfluorobutanesulfonic Acid (PFBS)	ND		4.9	ng/L	1	12/27/2024 06:21 PM
Perfluorobutanoic Acid (PFBA)	**12**		**4.9**	**ng/L**	1	12/27/2024 06:21 PM
Perfluorodecanesulfonic Acid (PFDS)	ND		4.9	ng/L	1	12/27/2024 06:21 PM
Perfluorodecanoic Acid (PFDA)	ND		4.9	ng/L	1	12/27/2024 06:21 PM
Perfluorododecanoic Acid (PFDoA)	ND		4.9	ng/L	1	12/27/2024 06:21 PM
Perfluoroheptanesulfonic Acid (PFHpS)	ND		4.9	ng/L	1	12/27/2024 06:21 PM
Perfluoroheptanoic Acid (PFHpA)	ND		4.9	ng/L	1	12/27/2024 06:21 PM
Perfluorohexanesulfonic Acid (PFHxS)	ND		4.9	ng/L	1	12/27/2024 06:21 PM
Perfluorohexanoic Acid (PFHxA)	ND		4.9	ng/L	1	12/27/2024 06:21 PM
Perfluorononanesulfonic Acid (PFNS)	ND		4.9	ng/L	1	12/27/2024 06:21 PM
Perfluorononanoic Acid (PFNA)	ND		4.9	ng/L	1	12/27/2024 06:21 PM
Perfluorooctanesulfonamide (PFOSA)	ND		4.9	ng/L	1	12/27/2024 06:21 PM
Perfluorooctanesulfonic Acid (PFOS)	**9.2**		**2.0**	**ng/L**	1	12/27/2024 06:21 PM
Perfluorooctanoic Acid (PFOA)	**39**		**2.0**	**ng/L**	1	12/27/2024 06:21 PM
Perfluoropentanesulfonic Acid (PFPeS)	ND		4.9	ng/L	1	12/27/2024 06:21 PM
Perfluoropentanoic Acid (PFPeA)	ND		4.9	ng/L	1	12/27/2024 06:21 PM
Perfluorotetradecanoic Acid (PFTeA)	ND		4.9	ng/L	1	12/27/2024 06:21 PM
Perfluorotridecanoic Acid (PFTriA)	ND		4.9	ng/L	1	12/27/2024 06:21 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Mackinac Environmental Technology, Inc.
Project: Superior Township Dump **Work Order:** 24120581
Sample ID: MW-1 **Lab ID:** 24120581-03
Collection Date: 12/17/2024 02:36 PM **Matrix:** GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Perfluoroundecanoic Acid (PFUnA)	ND		4.9	ng/L	1	12/27/2024 06:21 PM
N-Ethylperfluorooctanesulfonamidoacetic Acid	ND		4.9	ng/L	1	12/27/2024 06:21 PM
N-Methylperfluorooctanesulfonamidoacetic Acid	ND		4.9	ng/L	1	12/27/2024 06:21 PM
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND		4.9	ng/L	1	12/27/2024 06:21 PM
4,8-Dioxa-3H-perfluorononanoic Acid (DONA)	ND		4.9	ng/L	1	12/27/2024 06:21 PM
11Cl-Pf3OUdS	ND		4.9	ng/L	1	12/27/2024 06:21 PM
9Cl-PF3ONS	ND		4.9	ng/L	1	12/27/2024 06:21 PM
Perfluoro-4-ethylcyclohexanesulfonic Acid (PFecHS)	ND		4.9	ng/L	1	12/27/2024 06:21 PM
Perfluorobutylsulfonamide (PFBSA)	ND		4.9	ng/L	1	12/27/2024 06:21 PM
Perfluorohexanesulfonamide (PFHxSA)	ND		4.9	ng/L	1	12/27/2024 06:21 PM
2H,2H,3H,3H-Perfluorodecanoic acid (7:3 FTCA)	ND		4.9	ng/L	1	12/27/2024 06:21 PM
2H,2H,3H,3H-Perfluorohexanoic acid (3:3 FTCA)	ND		4.9	ng/L	1	12/27/2024 06:21 PM
2H,2H,3H,3H-Perfluorooctanoic acid (5:3 FTCA)	ND		4.9	ng/L	1	12/27/2024 06:21 PM
Surr: 13C2-FtS 4:2	*261*	S	*50-150*	*%REC*	1	12/27/2024 06:21 PM
Surr: 13C2-FtS 6:2	*404*	S	*50-150*	*%REC*	1	12/27/2024 06:21 PM
Surr: 13C2-FtS 8:2	*113*		*50-150*	*%REC*	1	12/27/2024 06:21 PM
Surr: 13C2-PFDA	*84.2*		*50-150*	*%REC*	1	12/27/2024 06:21 PM
Surr: 13C2-PFDoA	*76.4*		*50-150*	*%REC*	1	12/27/2024 06:21 PM
Surr: 13C2-PFHxA	*90.7*		*50-150*	*%REC*	1	12/27/2024 06:21 PM
Surr: 13C2-PFTeA	*77.3*		*27-134*	*%REC*	1	12/27/2024 06:21 PM
Surr: 13C2-PFUnA	*92.8*		*50-150*	*%REC*	1	12/27/2024 06:21 PM
Surr: 13C3-HFPO-DA	*75.1*		*41-142*	*%REC*	1	12/27/2024 06:21 PM
Surr: 13C3-PFBS	*72.8*		*50-150*	*%REC*	1	12/27/2024 06:21 PM
Surr: 13C4-PFBA	*82.2*		*50-150*	*%REC*	1	12/27/2024 06:21 PM
Surr: 13C4-PFHpA	*85.2*		*42-141*	*%REC*	1	12/27/2024 06:21 PM
Surr: 13C4-PFOA	*93.0*		*50-150*	*%REC*	1	12/27/2024 06:21 PM
Surr: 13C4-PFOS	*75.0*		*50-150*	*%REC*	1	12/27/2024 06:21 PM
Surr: 13C5-PFNA	*91.2*		*50-150*	*%REC*	1	12/27/2024 06:21 PM
Surr: 13C5-PFPeA	*73.2*		*43-138*	*%REC*	1	12/27/2024 06:21 PM
Surr: 13C8-FOSA	*74.4*		*30-122*	*%REC*	1	12/27/2024 06:21 PM
Surr: 18O2-PFHxS	*75.0*		*50-150*	*%REC*	1	12/27/2024 06:21 PM
Surr: d5-N-EtFOSAA	*79.8*		*34-142*	*%REC*	1	12/27/2024 06:21 PM
Surr: d3-N-MeFOSAA	*76.3*		*35-136*	*%REC*	1	12/27/2024 06:21 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Mackinac Environmental Technology, Inc.
Project: Superior Township Dump **Work Order:** 24120581
Sample ID: Initial MW-4 **Lab ID:** 24120581-05
Collection Date: 12/17/2024 12:29 PM **Matrix:** GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7470A**		Prep: SW7470 12/23/24 15:47	Analyst: **HTJ**
Mercury	ND		0.00020	mg/L	1	12/23/2024 07:24 PM
METALS BY ICP-MS			**SW6020B**		Prep: SW3005A 12/30/24 08:27	Analyst: **STP**
Aluminum	**1,200**		**10**	**mg/L**	100	12/31/2024 02:35 PM
Arsenic	**0.20**		**0.050**	**mg/L**	1	12/30/2024 06:04 PM
Barium	**19**		**5.0**	**mg/L**	100	12/31/2024 02:35 PM
Cadmium	ND		0.020	mg/L	1	12/30/2024 06:04 PM
Chromium	**1.5**		**0.050**	**mg/L**	1	12/30/2024 06:04 PM
Cobalt	**0.52**		**0.050**	**mg/L**	1	12/30/2024 06:04 PM
Iron	**900**		**0.80**	**mg/L**	1	12/30/2024 06:04 PM
Lead	**0.87**		**0.050**	**mg/L**	1	12/30/2024 06:04 PM
Manganese	**35**		**5.0**	**mg/L**	100	12/31/2024 02:35 PM
Nickel	**1.1**		**0.050**	**mg/L**	1	12/30/2024 06:04 PM
Selenium	**0.21**		**0.050**	**mg/L**	1	12/30/2024 06:04 PM
Silver	ND		0.050	mg/L	1	12/30/2024 06:04 PM
Vanadium	**2.9**		**0.050**	**mg/L**	1	12/30/2024 06:04 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Mackinac Environmental Technology, Inc.
Project: Superior Township Dump **Work Order:** 24120581
Sample ID: Field Blank **Lab ID:** 24120581-07
Collection Date: 12/17/2024 **Matrix:** WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
PFAS BY EPA 537 MODIFIED			**E537 MOD**		Prep: E537 Mod 12/31/24 14:10	Analyst: **MGM**
Fluorotelomer Sulphonic Acid 4:2 (FtS 4:2)	ND		5.2	ng/L	1	1/3/2025 09:19 AM
Fluorotelomer Sulphonic Acid 6:2 (FtS 6:2)	ND		5.2	ng/L	1	1/3/2025 09:19 AM
Fluorotelomer Sulphonic Acid 8:2 (FtS 8:2)	ND		5.2	ng/L	1	1/3/2025 09:19 AM
Perfluorobutanesulfonic Acid (PFBS)	ND		5.2	ng/L	1	1/3/2025 09:19 AM
Perfluorobutanoic Acid (PFBA)	ND		5.2	ng/L	1	1/3/2025 09:19 AM
Perfluorodecanesulfonic Acid (PFDS)	ND		5.2	ng/L	1	1/3/2025 09:19 AM
Perfluorodecanoic Acid (PFDA)	ND		5.2	ng/L	1	1/3/2025 09:19 AM
Perfluorododecanoic Acid (PFDoA)	ND		5.2	ng/L	1	1/3/2025 09:19 AM
Perfluoroheptanesulfonic Acid (PFHpS)	ND		5.2	ng/L	1	1/3/2025 09:19 AM
Perfluoroheptanoic Acid (PFHpA)	ND		5.2	ng/L	1	1/3/2025 09:19 AM
Perfluorohexanesulfonic Acid (PFHxS)	ND		5.2	ng/L	1	1/3/2025 09:19 AM
Perfluorohexanoic Acid (PFHxA)	ND		5.2	ng/L	1	1/3/2025 09:19 AM
Perfluorononanesulfonic Acid (PFNS)	ND		5.2	ng/L	1	1/3/2025 09:19 AM
Perfluorononanoic Acid (PFNA)	ND		5.2	ng/L	1	1/3/2025 09:19 AM
Perfluorooctanesulfonamide (PFOSA)	ND		5.2	ng/L	1	1/3/2025 09:19 AM
Perfluorooctanesulfonic Acid (PFOS)	ND		2.1	ng/L	1	1/3/2025 09:19 AM
Perfluorooctanoic Acid (PFOA)	ND		2.1	ng/L	1	1/3/2025 09:19 AM
Perfluoropentanesulfonic Acid (PFPeS)	ND		5.2	ng/L	1	1/3/2025 09:19 AM
Perfluoropentanoic Acid (PFPeA)	ND		5.2	ng/L	1	1/3/2025 09:19 AM
Perfluorotetradecanoic Acid (PFTeA)	ND		5.2	ng/L	1	1/3/2025 09:19 AM
Perfluorotridecanoic Acid (PFTriA)	ND		5.2	ng/L	1	1/3/2025 09:19 AM
Perfluoroundecanoic Acid (PFUnA)	ND		5.2	ng/L	1	1/3/2025 09:19 AM
N-Ethylperfluorooctanesulfonamidoacetic Acid	ND		5.2	ng/L	1	1/3/2025 09:19 AM
N-Methylperfluorooctanesulfonamidoacetic Acid	ND		5.2	ng/L	1	1/3/2025 09:19 AM
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND		5.2	ng/L	1	1/3/2025 09:19 AM
4,8-Dioxa-3H-perfluorononanoic Acid (DONA)	ND		5.2	ng/L	1	1/3/2025 09:19 AM
11Cl-Pf3OUdS	ND		5.2	ng/L	1	1/3/2025 09:19 AM
9Cl-PF3ONS	ND		5.2	ng/L	1	1/3/2025 09:19 AM
Perfluoro-4-ethylcyclohexanesulfonic Acid (PFecHS)	ND		5.2	ng/L	1	1/3/2025 09:19 AM
Perfluorobutylsulfonamide (PFBSA)	ND		5.2	ng/L	1	1/3/2025 09:19 AM
Perfluorohexanesulfonamide (PFHxSA)	ND		5.2	ng/L	1	1/3/2025 09:19 AM
2H,2H,3H,3H-Perfluorodecanoic acid (7:3 FTCA)	ND		5.2	ng/L	1	1/3/2025 09:19 AM
2H,2H,3H,3H-Perfluorohexanoic acid (3:3 FTCA)	ND		5.2	ng/L	1	1/3/2025 09:19 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Mackinac Environmental Technology, Inc.
Project: Superior Township Dump **Work Order:** 24120581
Sample ID: Field Blank **Lab ID:** 24120581-07
Collection Date: 12/17/2024 **Matrix:** WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
2H,2H,3H,3H-Perfluorooctanoic acid (5:3 FTCA)	ND		5.2	ng/L	1	1/3/2025 09:19 AM
Surr: 13C2-FtS 4:2	*98.5*		*50-150*	*%REC*	1	1/3/2025 09:19 AM
Surr: 13C2-FtS 6:2	*87.4*		*50-150*	*%REC*	1	1/3/2025 09:19 AM
Surr: 13C2-FtS 8:2	*94.7*		*50-150*	*%REC*	1	1/3/2025 09:19 AM
Surr: 13C2-PFDA	*90.3*		*50-150*	*%REC*	1	1/3/2025 09:19 AM
Surr: 13C2-PFDoA	*90.6*		*50-150*	*%REC*	1	1/3/2025 09:19 AM
Surr: 13C2-PFHxA	*102*		*50-150*	*%REC*	1	1/3/2025 09:19 AM
Surr: 13C2-PFTeA	*63.7*		*27-134*	*%REC*	1	1/3/2025 09:19 AM
Surr: 13C2-PFUnA	*89.8*		*50-150*	*%REC*	1	1/3/2025 09:19 AM
Surr: 13C3-HFPO-DA	*94.9*		*41-142*	*%REC*	1	1/3/2025 09:19 AM
Surr: 13C3-PFBS	*94.2*		*50-150*	*%REC*	1	1/3/2025 09:19 AM
Surr: 13C4-PFBA	*97.1*		*50-150*	*%REC*	1	1/3/2025 09:19 AM
Surr: 13C4-PFHpA	*102*		*42-141*	*%REC*	1	1/3/2025 09:19 AM
Surr: 13C4-PFOA	*101*		*50-150*	*%REC*	1	1/3/2025 09:19 AM
Surr: 13C4-PFOS	*93.9*		*50-150*	*%REC*	1	1/3/2025 09:19 AM
Surr: 13C5-PFNA	*92.1*		*50-150*	*%REC*	1	1/3/2025 09:19 AM
Surr: 13C5-PFPeA	*95.4*		*43-138*	*%REC*	1	1/3/2025 09:19 AM
Surr: 13C8-FOSA	*80.4*		*30-122*	*%REC*	1	1/3/2025 09:19 AM
Surr: 18O2-PFHxS	*96.7*		*50-150*	*%REC*	1	1/3/2025 09:19 AM
Surr: d5-N-EtFOSAA	*83.3*		*34-142*	*%REC*	1	1/3/2025 09:19 AM
Surr: d3-N-MeFOSAA	*90.1*		*35-136*	*%REC*	1	1/3/2025 09:19 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Batch ID: **251638** Instrument ID **HG4** Method: **SW7470A**

MBLK	Sample ID: **MBLK-251638-251638**			Units: **mg/L**			Analysis Date: **12/23/2024 06:59 PM**			
Client ID:	Run ID: **HG4_241223B**			SeqNo: **11330263**			Prep Date: **12/23/2024**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.00020								

LCS	Sample ID: **LCS-251638-251638**			Units: **mg/L**			Analysis Date: **12/23/2024 07:01 PM**			
Client ID:	Run ID: **HG4_241223B**			SeqNo: **11330264**			Prep Date: **12/23/2024**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.002175	0.00020	0.002	0	109	80-120	0			

MS	Sample ID: **24120554-01EMS**			Units: **mg/L**			Analysis Date: **12/23/2024 07:10 PM**			
Client ID:	Run ID: **HG4_241223B**			SeqNo: **11330269**			Prep Date: **12/23/2024**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00219	0.00020	0.002	-0.0000615	113	75-125	0			

MSD	Sample ID: **24120554-01EMSD**			Units: **mg/L**			Analysis Date: **12/23/2024 07:11 PM**			
Client ID:	Run ID: **HG4_241223B**			SeqNo: **11330270**			Prep Date: **12/23/2024**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.002355	0.00020	0.002	-0.0000615	121	75-125	0.00219	7.26	20	

The following samples were analyzed in this batch:

24120581-01B	24120581-02B	24120581-03B
24120581-05A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **251745** Instrument ID **ICPMS3** Method: **SW6020B**

MBLK Sample ID: **MBLK-251745-251745** Units: **mg/L** Analysis Date: **12/30/2024 05:23 PM**
Client ID: Run ID: **ICPMS3_241230A** SeqNo: **11342117** Prep Date: **12/30/2024** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	ND	0.010								
Arsenic	ND	0.0050								
Barium	ND	0.0050								
Cadmium	ND	0.0020								
Chromium	ND	0.0050								
Cobalt	ND	0.0050								
Iron	0.04855	0.080								J
Lead	ND	0.0050								
Manganese	ND	0.0050								
Nickel	ND	0.0050								
Selenium	ND	0.0050								
Silver	ND	0.0050								
Vanadium	ND	0.0050								

LCS Sample ID: **LCS-251745-251745** Units: **mg/L** Analysis Date: **12/30/2024 05:24 PM**
Client ID: Run ID: **ICPMS3_241230A** SeqNo: **11342118** Prep Date: **12/30/2024** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1041	0.010	0.1	0	104	80-120	0			
Arsenic	0.09788	0.0050	0.1	0	97.9	80-120	0			
Barium	0.09311	0.0050	0.1	0	93.1	80-120	0			
Cadmium	0.09815	0.0020	0.1	0	98.1	80-120	0			
Chromium	0.09755	0.0050	0.1	0	97.6	80-120	0			
Cobalt	0.097	0.0050	0.1	0	97	80-120	0			
Iron	9.642	0.080	10	0	96.4	80-120	0			
Lead	0.1053	0.0050	0.1	0	105	80-120	0			
Manganese	0.09933	0.0050	0.1	0	99.3	80-120	0			
Nickel	0.09654	0.0050	0.1	0	96.5	80-120	0			
Selenium	0.09855	0.0050	0.1	0	98.5	80-120	0			
Silver	0.09566	0.0050	0.1	0	95.7	80-120	0			
Vanadium	0.09764	0.0050	0.1	0	97.6	80-120	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **251745** Instrument ID **ICPMS3** Method: **SW6020B**

MS Sample ID: **24120496-08BMS** Units: **mg/L** Analysis Date: **12/30/2024 05:31 PM**

Client ID: Run ID: **ICPMS3_241230A** SeqNo: **11342122** Prep Date: **12/30/2024** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	4.013	0.010	0.1	2.009	2000	75-125	0			SEO
Arsenic	0.1173	0.0050	0.1	0.0225	94.8	75-125	0			
Barium	0.1926	0.0050	0.1	0.09702	95.5	75-125	0			
Cadmium	0.08289	0.0020	0.1	0.000228	82.7	75-125	0			
Chromium	0.105	0.0050	0.1	0.02131	83.7	75-125	0			
Cobalt	0.08374	0.0050	0.1	0.006403	77.3	75-125	0			
Lead	0.1016	0.0050	0.1	0.001119	101	75-125	0			
Manganese	1.31	0.0050	0.1	1.221	89.5	75-125	0			O
Selenium	0.11	0.0050	0.1	0.003419	107	75-125	0			
Vanadium	0.1213	0.0050	0.1	0.02616	95.1	75-125	0			

MS Sample ID: **24120496-16BMS** Units: **mg/L** Analysis Date: **12/30/2024 05:48 PM**

Client ID: Run ID: **ICPMS3_241230A** SeqNo: **11342131** Prep Date: **12/30/2024** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.4115	0.0050	0.1	0.3243	87.2	75-125	0			
Barium	3.122	0.0050	0.1	3.078	44	75-125	0			SEO
Chromium	0.121	0.0050	0.1	0.03274	88.3	75-125	0			
Cobalt	0.08028	0.0050	0.1	0.003028	77.3	75-125	0			
Iron	29.68	0.080	10	21.59	81	75-125	0			
Lead	0.09447	0.0050	0.1	0.004831	89.6	75-125	0			
Manganese	0.7083	0.0050	0.1	0.6386	69.6	75-125	0			SO
Selenium	0.09488	0.0050	0.1	0.001506	93.4	75-125	0			
Vanadium	0.1254	0.0050	0.1	0.03001	95.4	75-125	0			

MS Sample ID: **24120496-08BMS** Units: **mg/L** Analysis Date: **12/31/2024 02:10 PM**

Client ID: Run ID: **ICPMS3_241231A** SeqNo: **11344230** Prep Date: **12/30/2024** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	15.7	0.80	10	6.039	96.6	75-125	0			
Nickel	0.1025	0.050	0.1	0.006908	95.6	75-125	0			
Silver	0.09335	0.050	0.1	0.00229	91.1	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **251745** Instrument ID **ICPMS3** Method: **SW6020B**

MS Sample ID: **24120496-16BMS** Units: **mg/L** Analysis Date: **12/31/2024 02:18 PM**

Client ID: Run ID: **ICPMS3_241231A** SeqNo: **11344235** Prep Date: **12/30/2024** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	9.386	0.10	0.1	3.035	6350	75-125	0			SO
Cadmium	0.08355	0.020	0.1	0.000226	83.3	75-125	0			
Nickel	0.09992	0.050	0.1	0.008574	91.3	75-125	0			
Silver	0.08403	0.050	0.1	0.001366	82.7	75-125	0			

MSD Sample ID: **24120496-08BMSD** Units: **mg/L** Analysis Date: **12/30/2024 05:33 PM**

Client ID: Run ID: **ICPMS3_241230A** SeqNo: **11342123** Prep Date: **12/30/2024** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	2.772	0.010	0.1	2.009	763	75-125	4.013	36.6	20	SREO
Arsenic	0.1129	0.0050	0.1	0.0225	90.4	75-125	0.1173	3.89	20	
Barium	0.18	0.0050	0.1	0.09702	83	75-125	0.1926	6.75	20	
Cadmium	0.087	0.0020	0.1	0.000228	86.8	75-125	0.08289	4.84	20	
Chromium	0.1069	0.0050	0.1	0.02131	85.6	75-125	0.105	1.77	20	
Cobalt	0.08773	0.0050	0.1	0.006403	81.3	75-125	0.08374	4.66	20	
Lead	0.1048	0.0050	0.1	0.001119	104	75-125	0.1016	3.06	20	
Manganese	0.7506	0.0050	0.1	1.221	-470	75-125	1.31	54.3	20	SRO
Selenium	0.1086	0.0050	0.1	0.003419	105	75-125	0.11	1.28	20	
Vanadium	0.1198	0.0050	0.1	0.02616	93.6	75-125	0.1213	1.27	20	

MSD Sample ID: **24120496-16BMSD** Units: **mg/L** Analysis Date: **12/30/2024 05:50 PM**

Client ID: Run ID: **ICPMS3_241230A** SeqNo: **11342132** Prep Date: **12/30/2024** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.4223	0.0050	0.1	0.3243	97.9	75-125	0.4115	2.57	20	
Barium	3.203	0.0050	0.1	3.078	126	75-125	3.122	2.58	20	SEO
Chromium	0.122	0.0050	0.1	0.03274	89.2	75-125	0.121	0.798	20	
Cobalt	0.08106	0.0050	0.1	0.003028	78	75-125	0.08028	0.969	20	
Iron	30.06	0.080	10	21.59	84.8	75-125	29.68	1.26	20	
Lead	0.1081	0.0050	0.1	0.004831	103	75-125	0.09447	13.4	20	
Manganese	0.7404	0.0050	0.1	0.6386	102	75-125	0.7083	4.44	20	O
Selenium	0.09761	0.0050	0.1	0.001506	96.1	75-125	0.09488	2.84	20	
Vanadium	0.1262	0.0050	0.1	0.03001	96.2	75-125	0.1254	0.654	20	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **251745** Instrument ID **ICPMS3** Method: **SW6020B**

MSD Sample ID: **24120496-08BMSD** Units: **mg/L** Analysis Date: **12/31/2024 02:11 PM**
Client ID: Run ID: **ICPMS3_241231A** SeqNo: **11344231** Prep Date: **12/30/2024** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	13.28	0.80	10	6.039	72.4	75-125	15.7	16.7	20	S
Nickel	0.1007	0.050	0.1	0.006908	93.8	75-125	0.1025	1.84	20	
Silver	0.09239	0.050	0.1	0.00229	90.1	75-125	0.09335	1.03	20	

MSD Sample ID: **24120496-16BMSD** Units: **mg/L** Analysis Date: **12/31/2024 02:20 PM**
Client ID: Run ID: **ICPMS3_241231A** SeqNo: **11344236** Prep Date: **12/30/2024** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	9.603	0.10	0.1	3.035	6570	75-125	9.386	2.28	20	SO
Cadmium	0.09585	0.020	0.1	0.000226	95.6	75-125	0.08355	13.7	20	
Nickel	0.1029	0.050	0.1	0.008574	94.4	75-125	0.09992	2.99	20	
Silver	0.0911	0.050	0.1	0.001366	89.7	75-125	0.08403	8.08	20	

The following samples were analyzed in this batch: 24120581-01B 24120581-02B 24120581-03B 24120581-05A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **251683** Instrument ID **LCMS1** Method: **E537 Mod**

MBLK Sample ID: **MBLK-251683-251683** Units: **ng/L** Analysis Date: **12/27/2024 05:37 AM**

Client ID: Run ID: **LCMS1_241226B** SeqNo: **11343207** Prep Date: **12/26/2024** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Fluorotelomer Sulphonic Acid 4:2 (FtS	ND	5.0								
Fluorotelomer Sulphonic Acid 6:2 (FtS	ND	5.0								
Fluorotelomer Sulphonic Acid 8:2 (FtS	ND	5.0								
Perfluorobutanesulfonic Acid (PFBS)	ND	5.0								
Perfluorobutanoic Acid (PFBA)	ND	5.0								
Perfluorodecanesulfonic Acid (PFDS)	ND	5.0								
Perfluorodecanoic Acid (PFDA)	ND	5.0								
Perfluorododecanoic Acid (PFDoA)	ND	5.0								
Perfluoroheptanesulfonic Acid (PFHpS	ND	5.0								
Perfluoroheptanoic Acid (PFHpA)	ND	5.0								
Perfluorohexanesulfonic Acid (PFHxS)	ND	5.0								
Perfluorohexanoic Acid (PFHxA)	ND	5.0								
Perfluorononanesulfonic Acid (PFNS)	ND	5.0								
Perfluorononanoic Acid (PFNA)	ND	5.0								
Perfluorooctanesulfonamide (PFOSA)	ND	5.0								
Perfluorooctanesulfonic Acid (PFOS)	ND	2.0								
Perfluorooctanoic Acid (PFOA)	ND	2.0								
Perfluoropentanesulfonic Acid (PFPeS	ND	5.0								
Perfluoropentanoic Acid (PFPeA)	ND	5.0								
Perfluorotetradecanoic Acid (PFTeA)	ND	5.0								
Perfluorotridecanoic Acid (PFTriA)	ND	5.0								
Perfluoroundecanoic Acid (PFUnA)	ND	5.0								
N-Ethylperfluorooctanesulfonamidoace	ND	5.0								
N-Methylperfluorooctanesulfonamidoa	ND	5.0								
Hexafluoropropylene oxide dimer acid	ND	5.0								
4,8-Dioxa-3H-perfluorononanoic Acid (	ND	5.0								
11Cl-Pf3OUdS	ND	5.0								
9Cl-PF3ONS	ND	5.0								
Perfluoro-4-ethylcyclohexanesulfonic A	ND	5.0								
Perfluorobutylsulfonamide (PFBSA)	ND	5.0								
Perfluorohexanesulfonamide (PFHxSA	ND	5.0								
2H,2H,3H,3H-Perfluorodecanoic acid (	ND	5.0								
2H,2H,3H,3H-Perfluorohexanoic acid (	ND	5.0								
2H,2H,3H,3H-Perfluorooctanoic acid (S	ND	5.0								
Surr: 13C2-FtS 4:2	*130.1*	0	*149.4*	0	*87.1*	*50-150*	0			
Surr: 13C2-FtS 6:2	*138.4*	0	*152*	0	*91.1*	*50-150*	0			
Surr: 13C2-FtS 8:2	*135.4*	0	*153.3*	0	*88.3*	*50-150*	0			
Surr: 13C2-PFDA	*124.5*	0	*160*	0	*77.8*	*50-150*	0			
Surr: 13C2-PFDoA	*120.5*	0	*160*	0	*75.3*	*50-150*	0			
Surr: 13C2-PFHxA	*120.6*	0	*160*	0	*75.4*	*50-150*	0			
Surr: 13C2-PFTeA	*133.7*	0	*160*	0	*83.6*	*27-134*	0			
Surr: 13C2-PFUnA	*128.5*	0	*160*	0	*80.3*	*50-150*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **251683** Instrument ID **LCMS1** Method: **E537 Mod**

Surr: 13C3-HFPO-DA	*128.2*	0	*160*	0	*80.2*	*41-142*	0
Surr: 13C3-PFBS	*118.2*	0	*148.8*	0	*79.5*	*50-150*	0
Surr: 13C4-PFBA	*104.5*	0	*160*	0	*65.3*	*50-150*	0
Surr: 13C4-PFHpA	*141.4*	0	*160*	0	*88.4*	*42-141*	0
Surr: 13C4-PFOA	*120*	0	*160*	0	*75*	*50-150*	0
Surr: 13C4-PFOS	*106.5*	0	*152.8*	0	*69.7*	*50-150*	0
Surr: 13C5-PFNA	*130.8*	0	*160*	0	*81.8*	*50-150*	0
Surr: 13C5-PFPeA	*130.3*	0	*160*	0	*81.4*	*43-138*	0
Surr: 13C8-FOSA	*120.3*	0	*160*	0	*75.2*	*30-122*	0
Surr: 18O2-PFHxS	*112.5*	0	*151.2*	0	*74.4*	*50-150*	0
Surr: d5-N-EtFOSAA	*144.2*	0	*160*	0	*90.2*	*34-142*	0
Surr: d3-N-MeFOSAA	*132*	0	*160*	0	*82.5*	*35-136*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **251683** Instrument ID **LCMS1** Method: **E537 Mod**

LCS Sample ID: **LCS-251683-251683** Units: **ng/L** Analysis Date: **12/27/2024 05:51 AM**

Client ID: Run ID: **LCMS1_241226B** SeqNo: **11343208** Prep Date: **12/26/2024** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Fluorotelomer Sulphonic Acid 4:2 (FtS	28.16	5.0	29.9	0	94.2	67-143	0			
Fluorotelomer Sulphonic Acid 6:2 (FtS	28.77	5.0	30.3	0	95	66-151	0			
Fluorotelomer Sulphonic Acid 8:2 (FtS	31.5	5.0	30.7	0	103	61-148	0			
Perfluorobutanesulfonic Acid (PFBS)	26.51	5.0	28.3	0	93.7	69-131	0			
Perfluorobutanoic Acid (PFBA)	30.03	5.0	32	0	93.8	73-139	0			
Perfluorodecanesulfonic Acid (PFDS)	29.62	5.0	30.8	0	96.2	64-128	0			
Perfluorodecanoic Acid (PFDA)	33.3	5.0	32	0	104	77-135	0			
Perfluorododecanoic Acid (PFDoA)	33.67	5.0	32	0	105	77-137	0			
Perfluoroheptanesulfonic Acid (PFHpS	31.49	5.0	30.5	0	103	70-137	0			
Perfluoroheptanoic Acid (PFHpA)	29.71	5.0	32	0	92.8	67-130	0			
Perfluorohexanesulfonic Acid (PFHxS)	30.04	5.0	29.1	0	103	68-131	0			
Perfluorohexanoic Acid (PFHxA)	32.27	5.0	32	0	101	72-129	0			
Perfluorononanesulfonic Acid (PFNS)	30.97	5.0	30.7	0	101	70-132	0			
Perfluorononanoic Acid (PFNA)	34.64	5.0	32	0	108	75-131	0			
Perfluorooctanesulfonamide (PFOSA)	27.72	5.0	32	0	86.6	66-140	0			
Perfluorooctanesulfonic Acid (PFOS)	30.31	2.0	29.7	0	102	72-133	0			
Perfluorooctanoic Acid (PFOA)	32.37	2.0	32	0	101	71-133	0			
Perfluoropentanesulfonic Acid (PFPeS	31.12	5.0	30	0	104	73-137	0			
Perfluoropentanoic Acid (PFPeA)	26.29	5.0	32	0	82.2	72-129	0			
Perfluorotetradecanoic Acid (PFTeA)	27.68	5.0	32	0	86.5	62-139	0			
Perfluorotridecanoic Acid (PFTriA)	27.32	5.0	32	0	85.4	47-147	0			
Perfluoroundecanoic Acid (PFUnA)	32.46	5.0	32	0	101	80-135	0			
N-Ethylperfluorooctanesulfonamidoace	28.74	5.0	32	0	89.8	67-140	0			
N-Methylperfluorooctanesulfonamidoa	29.24	5.0	32	0	91.4	67-133	0			
Hexafluoropropylene oxide dimer acid	28.45	5.0	32	0	88.9	65-139	0			
4,8-Dioxa-3H-perfluorononanoic Acid (	30.62	5.0	30.1	0	102	74-135	0			
11Cl-Pf3OUdS	28.11	5.0	30.1	0	93.4	61-128	0			
9Cl-PF3ONS	29.71	5.0	29.8	0	99.7	69-133	0			
Perfluoro-4-ethylcyclohexanesulfonic A	27.78	5.0	28.8	0	96.5	74-131	0			
Perfluorobutylsulfonamide (PFBSA)	29.27	5.0	32	0	91.5	68-164	0			
Perfluorohexanesulfonamide (PFHxSA	32.28	5.0	32	0	101	69-135	0			
2H,2H,3H,3H-Perfluorodecanoic acid (	30.18	5.0	32	0	94.3	39-117	0			
2H,2H,3H,3H-Perfluorohexanoic acid (	24.72	5.0	32	0	77.3	71-138	0			
2H,2H,3H,3H-Perfluorooctanoic acid (S	29.76	5.0	32	0	93	64-134	0			
Surr: 13C2-FtS 4:2	*137.3*	0	*149.4*	0	*91.9*	*50-150*	0			
Surr: 13C2-FtS 6:2	*144.8*	0	*152*	0	*95.2*	*50-150*	0			
Surr: 13C2-FtS 8:2	*151.4*	0	*153.3*	0	*98.8*	*50-150*	0			
Surr: 13C2-PFDA	*135.8*	0	*160*	0	*84.9*	*50-150*	0			
Surr: 13C2-PFDoA	*128.7*	0	*160*	0	*80.4*	*50-150*	0			
Surr: 13C2-PFHxA	*131.5*	0	*160*	0	*82.2*	*50-150*	0			
Surr: 13C2-PFTeA	*151.4*	0	*160*	0	*94.6*	*27-134*	0			
Surr: 13C2-PFUnA	*147.5*	0	*160*	0	*92.2*	*50-150*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **251683** Instrument ID **LCMS1** Method: **E537 Mod**

Surr: 13C3-HFPO-DA	*141.6*	0	*160*	0	*88.5*	*41-142*	0
Surr: 13C3-PFBS	*130.2*	0	*148.8*	0	*87.5*	*50-150*	0
Surr: 13C4-PFBA	*118.5*	0	*160*	0	*74*	*50-150*	0
Surr: 13C4-PFHpA	*150.6*	0	*160*	0	*94.2*	*42-141*	0
Surr: 13C4-PFOA	*135.1*	0	*160*	0	*84.4*	*50-150*	0
Surr: 13C4-PFOS	*128.1*	0	*152.8*	0	*83.9*	*50-150*	0
Surr: 13C5-PFNA	*132.5*	0	*160*	0	*82.8*	*50-150*	0
Surr: 13C5-PFPeA	*143.8*	0	*160*	0	*89.9*	*43-138*	0
Surr: 13C8-FOSA	*139.9*	0	*160*	0	*87.4*	*30-122*	0
Surr: 18O2-PFHxS	*120*	0	*151.2*	0	*79.3*	*50-150*	0
Surr: d5-N-EtFOSAA	*158.8*	0	*160*	0	*99.3*	*34-142*	0
Surr: d3-N-MeFOSAA	*139.2*	0	*160*	0	*87*	*35-136*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **251683** Instrument ID **LCMS1** Method: **E537 Mod**

LCSD Sample ID: **LCSD-251683-251683** Units: **ng/L** Analysis Date: **12/27/2024 06:06 AM**

Client ID: Run ID: **LCMS1_241226B** SeqNo: **11343209** Prep Date: **12/26/2024** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Fluorotelomer Sulphonic Acid 4:2 (FtS	25.91	5.0	29.9	0	86.7	67-143	28.16	8.31	30	
Fluorotelomer Sulphonic Acid 6:2 (FtS	25.87	5.0	30.3	0	85.4	66-151	28.77	10.6	30	
Fluorotelomer Sulphonic Acid 8:2 (FtS	28.35	5.0	30.7	0	92.3	61-148	31.5	10.5	30	
Perfluorobutanesulfonic Acid (PFBS)	26.02	5.0	28.3	0	91.9	69-131	26.51	1.85	30	
Perfluorobutanoic Acid (PFBA)	30.15	5.0	32	0	94.2	73-139	30.03	0.393	30	
Perfluorodecanesulfonic Acid (PFDS)	28.2	5.0	30.8	0	91.6	64-128	29.62	4.9	30	
Perfluorodecanoic Acid (PFDA)	34.53	5.0	32	0	108	77-135	33.3	3.65	30	
Perfluorododecanoic Acid (PFDoA)	30.93	5.0	32	0	96.7	77-137	33.67	8.48	30	
Perfluoroheptanesulfonic Acid (PFHpS	30.9	5.0	30.5	0	101	70-137	31.49	1.91	30	
Perfluoroheptanoic Acid (PFHpA)	29.4	5.0	32	0	91.9	67-130	29.71	1.06	30	
Perfluorohexanesulfonic Acid (PFHxS)	29.52	5.0	29.1	0	101	68-131	30.04	1.75	30	
Perfluorohexanoic Acid (PFHxA)	32.03	5.0	32	0	100	72-129	32.27	0.756	30	
Perfluorononanesulfonic Acid (PFNS)	29.31	5.0	30.7	0	95.5	70-132	30.97	5.5	30	
Perfluorononanoic Acid (PFNA)	31.88	5.0	32	0	99.6	75-131	34.64	8.28	30	
Perfluorooctanesulfonamide (PFOSA)	28.16	5.0	32	0	88	66-140	27.72	1.56	30	
Perfluorooctanesulfonic Acid (PFOS)	29.76	2.0	29.7	0	100	72-133	30.31	1.83	30	
Perfluorooctanoic Acid (PFOA)	32.04	2.0	32	0	100	71-133	32.37	1.01	30	
Perfluoropentanesulfonic Acid (PFPeS	31.5	5.0	30	0	105	73-137	31.12	1.21	30	
Perfluoropentanoic Acid (PFPeA)	25.8	5.0	32	0	80.6	72-129	26.29	1.89	30	
Perfluorotetradecanoic Acid (PFTeA)	27.13	5.0	32	0	84.8	62-139	27.68	2.03	30	
Perfluorotridecanoic Acid (PFTriA)	26.34	5.0	32	0	82.3	47-147	27.32	3.67	30	
Perfluoroundecanoic Acid (PFUnA)	32.2	5.0	32	0	101	80-135	32.46	0.792	30	
N-Ethylperfluorooctanesulfonamidoace	25.53	5.0	32	0	79.8	67-140	28.74	11.8	30	
N-Methylperfluorooctanesulfonamidoa	28.8	5.0	32	0	90	67-133	29.24	1.51	30	
Hexafluoropropylene oxide dimer acid	29.63	5.0	32	0	92.6	65-139	28.45	4.07	30	
4,8-Dioxa-3H-perfluorononanoic Acid (	28.12	5.0	30.1	0	93.4	74-135	30.62	8.5	30	
11Cl-Pf3OUdS	28.16	5.0	30.1	0	93.6	61-128	28.11	0.205	30	
9Cl-PF3ONS	27.25	5.0	29.8	0	91.4	69-133	29.71	8.64	30	
Perfluoro-4-ethylcyclohexanesulfonic A	26.13	5.0	28.8	0	90.7	74-131	27.78	6.14	30	
Perfluorobutylsulfonamide (PFBSA)	31.25	5.0	32	0	97.7	68-164	29.27	6.53	30	
Perfluorohexanesulfonamide (PFHxSA	30.94	5.0	32	0	96.7	69-135	32.28	4.23	30	
2H,2H,3H,3H-Perfluorodecanoic acid (	32.04	5.0	32	0	100	39-117	30.18	5.96	30	
2H,2H,3H,3H-Perfluorohexanoic acid (	26.24	5.0	32	0	82	71-138	24.72	5.96	30	
2H,2H,3H,3H-Perfluorooctanoic acid (S	31.08	5.0	32	0	97.1	64-134	29.76	4.31	30	
Surr: 13C2-FtS 4:2	*120.6*	0	*149.4*	0	*80.7*	*50-150*	137.3	*12.9*	*30*	
Surr: 13C2-FtS 6:2	*124.6*	0	*152*	0	*82*	*50-150*	144.8	*14.9*	*30*	
Surr: 13C2-FtS 8:2	*136*	0	*153.3*	0	*88.7*	*50-150*	151.4	*10.7*	*30*	
Surr: 13C2-PFDA	*112.7*	0	*160*	0	*70.5*	*50-150*	135.8	*18.6*	*30*	
Surr: 13C2-PFDoA	*119.4*	0	*160*	0	*74.7*	*50-150*	128.7	*7.46*	*30*	
Surr: 13C2-PFHxA	*110.1*	0	*160*	0	*68.8*	*50-150*	131.5	*17.7*	*30*	
Surr: 13C2-PFTeA	*130*	0	*160*	0	*81.3*	*27-134*	151.4	*15.2*	*30*	
Surr: 13C2-PFUnA	*140.2*	0	*160*	0	*87.7*	*50-150*	147.5	*5.03*	*30*	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **251683** Instrument ID **LCMS1** Method: **E537 Mod**

Surr: 13C3-HFPO-DA	*117.1*	0	*160*	0	*73.2*	*41-142*	141.6	*18.9*	*30*
Surr: 13C3-PFBS	*112.1*	0	*148.8*	0	*75.3*	*50-150*	130.2	*15*	*30*
Surr: 13C4-PFBA	*92.47*	0	*160*	0	*57.8*	*50-150*	118.5	*24.7*	*30*
Surr: 13C4-PFHpA	*120*	0	*160*	0	*75*	*42-141*	150.6	*22.7*	*30*
Surr: 13C4-PFOA	*109*	0	*160*	0	*68.1*	*50-150*	135.1	*21.4*	*30*
Surr: 13C4-PFOS	*111.8*	0	*152.8*	0	*73.2*	*50-150*	128.1	*13.6*	*30*
Surr: 13C5-PFNA	*116.5*	0	*160*	0	*72.8*	*50-150*	132.5	*12.8*	*30*
Surr: 13C5-PFPeA	*121.9*	0	*160*	0	*76.2*	*43-138*	143.8	*16.5*	*30*
Surr: 13C8-FOSA	*107.6*	0	*160*	0	*67.2*	*30-122*	139.9	*26.1*	*30*
Surr: 18O2-PFHxS	*101*	0	*151.2*	0	*66.8*	*50-150*	120	*17.1*	*30*
Surr: d5-N-EtFOSAA	*130.8*	0	*160*	0	*81.7*	*34-142*	158.8	*19.4*	*30*
Surr: d3-N-MeFOSAA	*117.7*	0	*160*	0	*73.6*	*35-136*	139.2	*16.7*	*30*

The following samples were analyzed in this batch: 24120581-01A 24120581-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **251747** Instrument ID **LCMS1** Method: **E537 Mod**

MBLK	Sample ID: **MBLK-251747-251747**				Units: **µg/Kg**		Analysis Date: **12/28/2024 04:02 AM**			
Client ID:	Run ID: **LCMS1_241226B**				SeqNo: **11343405**		Prep Date: **12/27/2024**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Fluorotelomer Sulphonic Acid 4:2 (FtS	ND	1.0								
Fluorotelomer Sulphonic Acid 6:2 (FtS	ND	1.0								
Fluorotelomer Sulphonic Acid 8:2 (FtS	ND	1.0								
Perfluorobutanesulfonic Acid (PFBS)	ND	1.0								
Perfluorobutanoic Acid (PFBA)	ND	1.0								
Perfluorodecanesulfonic Acid (PFDS)	ND	1.0								
Perfluorodecanoic Acid (PFDA)	ND	1.0								
Perfluorododecanoic Acid (PFDoA)	ND	1.0								
Perfluoroheptanesulfonic Acid (PFHpS	ND	1.0								
Perfluoroheptanoic Acid (PFHpA)	ND	1.0								
Perfluorohexanesulfonic Acid (PFHxS)	ND	1.0								
Perfluorohexanoic Acid (PFHxA)	ND	1.0								
Perfluorononanesulfonic Acid (PFNS)	ND	1.0								
Perfluorononanoic Acid (PFNA)	ND	1.0								
Perfluorooctanesulfonamide (PFOSA)	ND	1.0								
Perfluorooctanesulfonic Acid (PFOS)	ND	1.0								
Perfluorooctanoic Acid (PFOA)	ND	1.0								
Perfluoropentanesulfonic Acid (PFPeS	ND	1.0								
Perfluoropentanoic Acid (PFPeA)	ND	1.0								
Perfluorotetradecanoic Acid (PFTeA)	ND	1.0								
Perfluorotridecanoic Acid (PFTriA)	ND	1.0								
Perfluoroundecanoic Acid (PFUnA)	ND	1.0								
N-Ethylperfluorooctanesulfonamidoace	ND	1.0								
N-Methylperfluorooctanesulfonamidoa	ND	1.0								
Hexafluoropropylene oxide dimer acid	ND	1.0								
4,8-Dioxa-3H-perfluorononanoic Acid (	ND	1.0								
11Cl-Pf3OUdS	ND	1.0								
9Cl-PF3ONS	ND	1.0								
Perfluoro-4-ethylcyclohexanesulfonic A	ND	1.0								
Perfluorobutylsulfonamide (PFBSA)	ND	1.0								
Perfluorohexanesulfonamide (PFHxSA	ND	1.0								
2H,2H,3H,3H-Perfluorohexanoic acid (	ND	1.0								
2H,2H,3H,3H-Perfluorooctanoic acid (S	ND	1.0								
2H,2H,3H,3H-Perfluorodecanoic acid (	ND	1.0								
Surr: 13C2-FtS 10:2	*18.51*	0	*19.28*	0	*96*	*46-150*	0			
Surr: 13C2-FtS 4:2	*14.61*	0	*18.68*	0	*78.2*	*50-150*	0			
Surr: 13C2-FtS 6:2	*17*	0	*19*	0	*89.4*	*50-150*	0			
Surr: 13C2-FtS 8:2	*16.02*	0	*19.16*	0	*83.6*	*50-150*	0			
Surr: 13C2-PFDA	*16.72*	0	*20*	0	*83.6*	*50-150*	0			
Surr: 13C2-PFDoA	*16.34*	0	*20*	0	*81.7*	*50-150*	0			
Surr: 13C2-PFHxA	*17.38*	0	*20*	0	*86.9*	*50-150*	0			
Surr: 13C2-PFTeA	*17.7*	0	*20*	0	*88.5*	*21-170*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **251747** Instrument ID **LCMS1** Method: **E537 Mod**

Surr: 13C2-PFUnA	*17.31*	0	*20*	0	*86.6*	*50-150*	0
Surr: 13C3-HFPO-DA	*18.75*	0	*20*	0	*93.7*	*50-150*	0
Surr: 13C3-PFBS	*15.19*	0	*18.6*	0	*81.7*	*50-150*	0
Surr: 13C4-PFBA	*15.64*	0	*20*	0	*78.2*	*50-150*	0
Surr: 13C4-PFHpA	*19.22*	0	*20*	0	*96.1*	*50-150*	0
Surr: 13C4-PFOA	*17.17*	0	*20*	0	*85.8*	*50-150*	0
Surr: 13C4-PFOS	*15.83*	0	*19.1*	0	*82.9*	*50-150*	0
Surr: 13C5-PFNA	*17.51*	0	*20*	0	*87.6*	*50-150*	0
Surr: 13C5-PFPeA	*17.97*	0	*20*	0	*89.9*	*50-150*	0
Surr: 13C8-FOSA	*18.52*	0	*20*	0	*92.6*	*50-150*	0
Surr: 18O2-PFHxS	*14.4*	0	*18.9*	0	*76.2*	*50-150*	0
Surr: d5-N-EtFOSAA	*15.72*	0	*20*	0	*78.6*	*50-150*	0
Surr: d9-N-EtFOSE	*16.26*	0	*20*	0	*81.3*	*50-150*	0
Surr: d3-N-MeFOSAA	*15.96*	0	*20*	0	*79.8*	*50-150*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **251747** Instrument ID **LCMS1** Method: **E537 Mod**

LCS	Sample ID: **LCS-251747-251747**				Units: **µg/Kg**		Analysis Date: **12/28/2024 04:16 AM**			
Client ID:		Run ID: **LCMS1_241226B**			SeqNo: **11343406**		Prep Date: **12/27/2024**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Fluorotelomer Sulphonic Acid 4:2 (FtS	3.496	1.0	3.736	0	93.6	62-145	0			
Fluorotelomer Sulphonic Acid 6:2 (FtS	3.438	1.0	3.792	0	90.7	64-140	0			
Fluorotelomer Sulphonic Acid 8:2 (FtS	3.809	1.0	3.832	0	99.4	65-137	0			
Perfluorobutanesulfonic Acid (PFBS)	3.516	1.0	3.536	0	99.4	72-128	0			
Perfluorobutanoic Acid (PFBA)	3.446	1.0	4	0	86.1	71-135	0			
Perfluorodecanesulfonic Acid (PFDS)	3.651	1.0	3.856	0	94.7	59-134	0			
Perfluorodecanoic Acid (PFDA)	3.864	1.0	4	0	96.6	69-133	0			
Perfluorododecanoic Acid (PFDoA)	3.848	1.0	4	0	96.2	69-135	0			
Perfluoroheptanesulfonic Acid (PFHpS	3.853	1.0	3.808	0	101	70-132	0			
Perfluoroheptanoic Acid (PFHpA)	3.751	1.0	4	0	93.8	71-131	0			
Perfluorohexanesulfonic Acid (PFHxS)	3.137	1.0	3.64	0	86.2	67-130	0			
Perfluorohexanoic Acid (PFHxA)	3.347	1.0	4	0	83.7	70-132	0			
Perfluorononanesulfonic Acid (PFNS)	3.622	1.0	3.84	0	94.3	69-125	0			
Perfluorononanoic Acid (PFNA)	3.735	1.0	4	0	93.4	72-129	0			
Perfluorooctanesulfonamide (PFOSA)	3.698	1.0	4	0	92.4	67-137	0			
Perfluorooctanesulfonic Acid (PFOS)	3.562	1.0	3.712	0	95.9	68-136	0			
Perfluorooctanoic Acid (PFOA)	3.636	1.0	4	0	90.9	69-133	0			
Perfluoropentanesulfonic Acid (PFPeS	3.146	1.0	3.752	0	83.8	73-123	0			
Perfluoropentanoic Acid (PFPeA)	3.394	1.0	4	0	84.9	69-132	0			
Perfluorotetradecanoic Acid (PFTeA)	3.886	1.0	4	0	97.2	69-133	0			
Perfluorotridecanoic Acid (PFTriA)	4.349	1.0	4	0	109	66-139	0			
Perfluoroundecanoic Acid (PFUnA)	3.564	1.0	4	0	89.1	64-136	0			
N-Ethylperfluorooctanesulfonamidoace	3.766	1.0	4	0	94.1	61-139	0			
N-Methylperfluorooctanesulfonamidoa	3.835	1.0	4	0	95.9	63-144	0			
Hexafluoropropylene oxide dimer acid	3.434	1.0	4	0	85.9	66-141	0			
4,8-Dioxa-3H-perfluorononanoic Acid (	3.169	1.0	3.768	0	84.1	52-144	0			
11Cl-Pf3OUdS	3.605	1.0	3.768	0	95.7	56-146	0			
9Cl-PF3ONS	3.64	1.0	3.728	0	97.6	66-140	0			
Perfluoro-4-ethylcyclohexanesulfonic A	3.071	1.0	3.6	0	85.3	70-130	0			
Perfluorobutylsulfonamide (PFBSA)	3.977	1.0	4	0	99.4	70-130	0			
Perfluorohexanesulfonamide (PFHxSA	3.572	1.0	4	0	89.3	70-130	0			
2H,2H,3H,3H-Perfluorohexanoic acid (	3.221	1.0	4	0	80.5	70-130	0			
2H,2H,3H,3H-Perfluorooctanoic acid (5	3.2	1.0	4	0	80	70-130	0			
2H,2H,3H,3H-Perfluorodecanoic acid (	3.254	1.0	4	0	81.4	70-130	0			
Surr: 13C2-FtS 10:2	*22.71*	0	*19.28*	0	*118*	*46-150*	0			
Surr: 13C2-FtS 4:2	*18.2*	0	*18.68*	0	*97.4*	*50-150*	0			
Surr: 13C2-FtS 6:2	*21.92*	0	*19*	0	*115*	*50-150*	0			
Surr: 13C2-FtS 8:2	*18.96*	0	*19.16*	0	*99*	*50-150*	0			
Surr: 13C2-PFDA	*22.89*	0	*20*	0	*114*	*50-150*	0			
Surr: 13C2-PFDoA	*23.97*	0	*20*	0	*120*	*50-150*	0			
Surr: 13C2-PFHxA	*24.28*	0	*20*	0	*121*	*50-150*	0			
Surr: 13C2-PFTeA	*20.92*	0	*20*	0	*105*	*21-170*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **251747** Instrument ID **LCMS1** Method: **E537 Mod**

Surr: 13C2-PFUnA	*20.68*	0	*20*	0	*103*	*50-150*	0
Surr: 13C3-HFPO-DA	*24.49*	0	*20*	0	*122*	*50-150*	0
Surr: 13C3-PFBS	*19.18*	0	*18.6*	0	*103*	*50-150*	0
Surr: 13C4-PFBA	*22.81*	0	*20*	0	*114*	*50-150*	0
Surr: 13C4-PFHpA	*24.09*	0	*20*	0	*120*	*50-150*	0
Surr: 13C4-PFOA	*22.72*	0	*20*	0	*114*	*50-150*	0
Surr: 13C4-PFOS	*20.94*	0	*19.1*	0	*110*	*50-150*	0
Surr: 13C5-PFNA	*24.35*	0	*20*	0	*122*	*50-150*	0
Surr: 13C5-PFPeA	*22.95*	0	*20*	0	*115*	*50-150*	0
Surr: 13C8-FOSA	*21.04*	0	*20*	0	*105*	*50-150*	0
Surr: 18O2-PFHxS	*21.24*	0	*18.9*	0	*112*	*50-150*	0
Surr: d5-N-EtFOSAA	*20.14*	0	*20*	0	*101*	*50-150*	0
Surr: d9-N-EtFOSE	*20.69*	0	*20*	0	*103*	*50-150*	0
Surr: d3-N-MeFOSAA	*20.11*	0	*20*	0	*101*	*50-150*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **251747** Instrument ID **LCMS1** Method: **E537 Mod**

MS Sample ID: **24120581-02A MS** Units: **µg/Kg** Analysis Date: **12/28/2024 05:00 AM**

Client ID: **MW-4** Run ID: **LCMS1_241226B** SeqNo: **11343409** Prep Date: **12/27/2024** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Fluorotelomer Sulphonic Acid 4:2 (FtS	3.62	1.0	3.736	0.002437	96.8	62-145	0			
Fluorotelomer Sulphonic Acid 6:2 (FtS	3.525	1.0	3.792	0.01015	92.7	64-140	0			
Fluorotelomer Sulphonic Acid 8:2 (FtS	3.862	1.0	3.832	0	101	65-137	0			
Perfluorobutanesulfonic Acid (PFBS)	3.682	1.0	3.536	0.006497	104	72-128	0			
Perfluorobutanoic Acid (PFBA)	4.014	1.0	4	0.06619	98.7	71-135	0			
Perfluorodecanesulfonic Acid (PFDS)	3.776	1.0	3.856	0.001624	97.9	59-134	0			
Perfluorodecanoic Acid (PFDA)	4.19	1.0	4	0.01218	104	69-133	0			
Perfluorododecanoic Acid (PFDoA)	4.06	1.0	4	0.02071	101	69-135	0			
Perfluoroheptanesulfonic Acid (PFHpS	4.27	1.0	3.808	0.001218	112	70-132	0			
Perfluoroheptanoic Acid (PFHpA)	4.043	1.0	4	0.01178	101	71-131	0			
Perfluorohexanesulfonic Acid (PFHxS)	3.4	1.0	3.64	0.04345	92.2	67-130	0			
Perfluorohexanoic Acid (PFHxA)	3.683	1.0	4	0.02112	91.6	70-132	0			
Perfluorononanesulfonic Acid (PFNS)	3.97	1.0	3.84	0	103	69-125	0			
Perfluorononanoic Acid (PFNA)	4.392	1.0	4	0.005279	110	72-129	0			
Perfluorooctanesulfonamide (PFOSA)	3.552	1.0	4	0.01056	88.5	67-137	0			
Perfluorooctanesulfonic Acid (PFOS)	3.902	1.0	3.712	0.006497	105	68-136	0			
Perfluorooctanoic Acid (PFOA)	4.271	1.0	4	0.0203	106	69-133	0			
Perfluoropentanesulfonic Acid (PFPeS	3.636	1.0	3.752	0.002437	96.8	73-123	0			
Perfluoropentanoic Acid (PFPeA)	3.617	1.0	4	0.01462	90.1	69-132	0			
Perfluorotetradecanoic Acid (PFTeA)	3.882	1.0	4	0.01746	96.6	69-133	0			
Perfluorotridecanoic Acid (PFTriA)	4.152	1.0	4	0.006091	104	66-139	0			
Perfluoroundecanoic Acid (PFUnA)	4.21	1.0	4	0.007716	105	64-136	0			
N-Ethylperfluorooctanesulfonamidoace	3.714	1.0	4	0.05523	91.5	61-139	0			
N-Methylperfluorooctanesulfonamidoa	3.672	1.0	4	0.05888	90.3	63-144	0			
Hexafluoropropylene oxide dimer acid	3.83	1.0	4	0.05523	94.4	66-141	0			
4,8-Dioxa-3H-perfluorononanoic Acid (	3.828	1.0	3.768	0	102	52-144	0			
11Cl-Pf3OUdS	3.821	1.0	3.768	0.001624	101	56-146	0			
9Cl-PF3ONS	3.8	1.0	3.728	0	102	66-140	0			
Perfluoro-4-ethylcyclohexanesulfonic A	3.386	1.0	3.6	0	94.1	70-130	0			
Perfluorobutylsulfonamide (PFBSA)	3.951	1.0	4	0	98.8	70-130	0			
Perfluorohexanesulfonamide (PFHxSA	4.249	1.0	4	0	106	70-130	0			
2H,2H,3H,3H-Perfluorohexanoic acid (	4.007	1.0	4	-0.3306	108	70-130	0			
2H,2H,3H,3H-Perfluorooctanoic acid (S	3.673	1.0	4	0.001218	91.8	70-130	0			
2H,2H,3H,3H-Perfluorodecanoic acid (	3.881	1.0	4	0.01868	96.6	70-130	0			
Surr: 13C2-FtS 10:2	*17.03*	0	*19.28*	0	*88.3*	*46-150*	0			
Surr: 13C2-FtS 4:2	*13.3*	0	*18.68*	0	*71.2*	*50-150*	0			
Surr: 13C2-FtS 6:2	*15.12*	0	*19*	0	*79.6*	*50-150*	0			
Surr: 13C2-FtS 8:2	*15.03*	0	*19.16*	0	*78.4*	*50-150*	0			
Surr: 13C2-PFDA	*15.31*	0	*20*	0	*76.6*	*50-150*	0			
Surr: 13C2-PFDoA	*15.91*	0	*20*	0	*79.6*	*50-150*	0			
Surr: 13C2-PFHxA	*16.26*	0	*20*	0	*81.3*	*50-150*	0			
Surr: 13C2-PFTeA	*15.41*	0	*20*	0	*77*	*21-170*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **251747** Instrument ID **LCMS1** Method: **E537 Mod**

Surr: 13C2-PFUnA	*15.62*	0	*20*	0	*78.1*	*50-150*	0
Surr: 13C3-HFPO-DA	*16.3*	0	*20*	0	*81.5*	*50-150*	0
Surr: 13C3-PFBS	*13.61*	0	*18.6*	0	*73.1*	*50-150*	0
Surr: 13C4-PFBA	*15.33*	0	*20*	0	*76.7*	*50-150*	0
Surr: 13C4-PFHpA	*17.01*	0	*20*	0	*85*	*50-150*	0
Surr: 13C4-PFOA	*15.02*	0	*20*	0	*75.1*	*50-150*	0
Surr: 13C4-PFOS	*14.81*	0	*19.1*	0	*77.6*	*50-150*	0
Surr: 13C5-PFNA	*15.22*	0	*20*	0	*76.1*	*50-150*	0
Surr: 13C5-PFPeA	*16.51*	0	*20*	0	*82.5*	*50-150*	0
Surr: 13C8-FOSA	*15.77*	0	*20*	0	*78.9*	*50-150*	0
Surr: 18O2-PFHxS	*14.49*	0	*18.9*	0	*76.7*	*50-150*	0
Surr: d5-N-EtFOSAA	*14.55*	0	*20*	0	*72.8*	*50-150*	0
Surr: d9-N-EtFOSE	*15.08*	0	*20*	0	*75.4*	*50-150*	0
Surr: d3-N-MeFOSAA	*15.68*	0	*20*	0	*78.4*	*50-150*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Mackinac Environmental Technology, Inc.
Work Order: 24120581
Project: Superior Township Dump

QC BATCH REPORT

Batch ID: **251747** Instrument ID **LCMS1** Method: **E537 Mod**

MSD Sample ID: **24120581-02A MSD** Units: **µg/Kg** Analysis Date: **12/28/2024 05:14 AM**
Client ID: **MW-4** Run ID: **LCMS1_241226B** SeqNo: **11343410** Prep Date: **12/27/2024** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Fluorotelomer Sulphonic Acid 4:2 (FtS	4.03	1.0	3.892	0.002437	104	62-145	3.62	10.7	30	
Fluorotelomer Sulphonic Acid 6:2 (FtS	4	1.0	3.95	0.01015	101	64-140	3.525	12.6	30	
Fluorotelomer Sulphonic Acid 8:2 (FtS	4.234	1.0	3.992	0	106	65-137	3.862	9.18	30	
Perfluorobutanesulfonic Acid (PFBS)	3.905	1.0	3.683	0.006497	106	72-128	3.682	5.89	30	
Perfluorobutanoic Acid (PFBA)	4.226	1.0	4.167	0.06619	99.8	71-135	4.014	5.16	30	
Perfluorodecanesulfonic Acid (PFDS)	3.935	1.0	4.017	0.001624	97.9	59-134	3.776	4.15	30	
Perfluorodecanoic Acid (PFDA)	4.785	1.0	4.167	0.01218	115	69-133	4.19	13.3	30	
Perfluorododecanoic Acid (PFDoA)	4.438	1.0	4.167	0.02071	106	69-135	4.06	8.91	30	
Perfluoroheptanesulfonic Acid (PFHpS	4.322	1.0	3.967	0.001218	109	70-132	4.27	1.21	30	
Perfluoroheptanoic Acid (PFHpA)	4.378	1.0	4.167	0.01178	105	71-131	4.043	7.96	30	
Perfluorohexanesulfonic Acid (PFHxS)	3.91	1.0	3.792	0.04345	102	67-130	3.4	13.9	30	
Perfluorohexanoic Acid (PFHxA)	4.112	1.0	4.167	0.02112	98.2	70-132	3.683	11	30	
Perfluorononanesulfonic Acid (PFNS)	3.872	1.0	4	0	96.8	69-125	3.97	2.51	30	
Perfluorononanoic Acid (PFNA)	4.633	1.0	4.167	0.005279	111	72-129	4.392	5.36	30	
Perfluorooctanesulfonamide (PFOSA)	3.867	1.0	4.167	0.01056	92.6	67-137	3.552	8.49	30	
Perfluorooctanesulfonic Acid (PFOS)	4.249	1.0	3.867	0.006497	110	68-136	3.902	8.52	30	
Perfluorooctanoic Acid (PFOA)	4.638	1.0	4.167	0.0203	111	69-133	4.271	8.23	30	
Perfluoropentanesulfonic Acid (PFPeS	4.093	1.0	3.908	0.002437	105	73-123	3.636	11.8	30	
Perfluoropentanoic Acid (PFPeA)	4	1.0	4.167	0.01462	95.6	69-132	3.617	10.1	30	
Perfluorotetradecanoic Acid (PFTeA)	4.267	1.0	4.167	0.01746	102	69-133	3.882	9.46	30	
Perfluorotridecanoic Acid (PFTriA)	4.216	1.0	4.167	0.006091	101	66-139	4.152	1.55	30	
Perfluoroundecanoic Acid (PFUnA)	4.393	1.0	4.167	0.007716	105	64-136	4.21	4.24	30	
N-Ethylperfluorooctanesulfonamidoace	4.281	1.0	4.167	0.05523	101	61-139	3.714	14.2	30	
N-Methylperfluorooctanesulfonamidoa	4.25	1.0	4.167	0.05888	101	63-144	3.672	14.6	30	
Hexafluoropropylene oxide dimer acid	4.062	1.0	4.167	0.05523	96.2	66-141	3.83	5.87	30	
4,8-Dioxa-3H-perfluorononanoic Acid (	4.216	1.0	3.925	0	107	52-144	3.828	9.63	30	
11Cl-Pf3OUdS	3.954	1.0	3.925	0.001624	101	56-146	3.821	3.41	30	
9Cl-PF3ONS	4.18	1.0	3.883	0	108	66-140	3.8	9.53	30	
Perfluoro-4-ethylcyclohexanesulfonic A	3.577	1.0	3.75	0	95.4	70-130	3.386	5.48	30	
Perfluorobutylsulfonamide (PFBSA)	4.144	1.0	4.167	0	99.5	70-130	3.951	4.77	30	
Perfluorohexanesulfonamide (PFHxSA	4.538	1.0	4.167	0	109	70-130	4.249	6.58	30	
2H,2H,3H,3H-Perfluorohexanoic acid (	4.276	1.0	4.167	-0.3306	111	70-130	4.007	6.5	30	
2H,2H,3H,3H-Perfluorooctanoic acid (S	3.989	1.0	4.167	0.001218	95.7	70-130	3.673	8.25	30	
2H,2H,3H,3H-Perfluorodecanoic acid (	4.26	1.0	4.167	0.01868	102	70-130	3.881	9.31	30	
Surr: 13C2-FtS 10:2	*21.05*	0	*20.08*	0	*105*	*46-150*	17.03	*21.2*	*30*	
Surr: 13C2-FtS 4:2	*15.91*	0	*19.46*	0	*81.8*	*50-150*	13.3	*17.9*	*30*	
Surr: 13C2-FtS 6:2	*18.25*	0	*19.79*	0	*92.2*	*50-150*	15.12	*18.7*	*30*	
Surr: 13C2-FtS 8:2	*16.47*	0	*19.96*	0	*82.5*	*50-150*	15.03	*9.11*	*30*	
Surr: 13C2-PFDA	*18.96*	0	*20.83*	0	*91*	*50-150*	15.31	*21.3*	*30*	
Surr: 13C2-PFDoA	*18.7*	0	*20.83*	0	*89.8*	*50-150*	15.91	*16.1*	*30*	
Surr: 13C2-PFHxA	*19.22*	0	*20.83*	0	*92.3*	*50-150*	16.26	*16.7*	*30*	
Surr: 13C2-PFTeA	*18.62*	0	*20.83*	0	*89.4*	*21-170*	15.41	*18.9*	*30*	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **251747** Instrument ID **LCMS1** Method: **E537 Mod**

Surr: 13C2-PFUnA	*17.58*	0	*20.83*	0	*84.4*	*50-150*	15.62	*11.8*	*30*
Surr: 13C3-HFPO-DA	*19.72*	0	*20.83*	0	*94.7*	*50-150*	16.3	*19*	*30*
Surr: 13C3-PFBS	*16.24*	0	*19.38*	0	*83.8*	*50-150*	13.61	*17.7*	*30*
Surr: 13C4-PFBA	*18.11*	0	*20.83*	0	*86.9*	*50-150*	15.33	*16.6*	*30*
Surr: 13C4-PFHpA	*20.13*	0	*20.83*	0	*96.6*	*50-150*	17.01	*16.8*	*30*
Surr: 13C4-PFOA	*17.87*	0	*20.83*	0	*85.8*	*50-150*	15.02	*17.3*	*30*
Surr: 13C4-PFOS	*17.8*	0	*19.9*	0	*89.5*	*50-150*	14.81	*18.3*	*30*
Surr: 13C5-PFNA	*18.98*	0	*20.83*	0	*91.1*	*50-150*	15.22	*22*	*30*
Surr: 13C5-PFPeA	*19.1*	0	*20.83*	0	*91.7*	*50-150*	16.51	*14.6*	*30*
Surr: 13C8-FOSA	*19.52*	0	*20.83*	0	*93.7*	*50-150*	15.77	*21.2*	*30*
Surr: 18O2-PFHxS	*17.44*	0	*19.69*	0	*88.6*	*50-150*	14.49	*18.5*	*30*
Surr: d5-N-EtFOSAA	*17.35*	0	*20.83*	0	*83.3*	*50-150*	14.55	*17.5*	*30*
Surr: d9-N-EtFOSE	*17.99*	0	*20.83*	0	*86.3*	*50-150*	15.08	*17.6*	*30*
Surr: d3-N-MeFOSAA	*17.88*	0	*20.83*	0	*85.8*	*50-150*	15.68	*13.1*	*30*

The following samples were analyzed in this batch: 24120581-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **251810** Instrument ID **LCMS1** Method: **E537 Mod**

MBLK Sample ID: **MBLK-251810-251810** Units: **ng/L** Analysis Date: **12/31/2024 04:53 PM**

Client ID: Run ID: **LCMS1_241231A** SeqNo: **11346694** Prep Date: **12/31/2024** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Fluorotelomer Sulphonic Acid 4:2 (FtS	ND	5.0								
Fluorotelomer Sulphonic Acid 6:2 (FtS	ND	5.0								
Fluorotelomer Sulphonic Acid 8:2 (FtS	ND	5.0								
Perfluorobutanesulfonic Acid (PFBS)	ND	5.0								
Perfluorobutanoic Acid (PFBA)	ND	5.0								
Perfluorodecanesulfonic Acid (PFDS)	ND	5.0								
Perfluorodecanoic Acid (PFDA)	ND	5.0								
Perfluorododecanoic Acid (PFDoA)	ND	5.0								
Perfluoroheptanesulfonic Acid (PFHpS	ND	5.0								
Perfluoroheptanoic Acid (PFHpA)	ND	5.0								
Perfluorohexanesulfonic Acid (PFHxS)	ND	5.0								
Perfluorohexanoic Acid (PFHxA)	ND	5.0								
Perfluorononanesulfonic Acid (PFNS)	ND	5.0								
Perfluorononanoic Acid (PFNA)	ND	5.0								
Perfluorooctanesulfonamide (PFOSA)	ND	5.0								
Perfluorooctanesulfonic Acid (PFOS)	ND	2.0								
Perfluorooctanoic Acid (PFOA)	ND	2.0								
Perfluoropentanesulfonic Acid (PFPeS	ND	5.0								
Perfluoropentanoic Acid (PFPeA)	ND	5.0								
Perfluorotetradecanoic Acid (PFTeA)	ND	5.0								
Perfluorotridecanoic Acid (PFTriA)	ND	5.0								
Perfluoroundecanoic Acid (PFUnA)	ND	5.0								
N-Ethylperfluorooctanesulfonamidoace	ND	5.0								
N-Methylperfluorooctanesulfonamidoa	ND	5.0								
Hexafluoropropylene oxide dimer acid	ND	5.0								
4,8-Dioxa-3H-perfluorononanoic Acid (	ND	5.0								
11Cl-Pf3OUdS	ND	5.0								
9Cl-PF3ONS	ND	5.0								
Perfluoro-4-ethylcyclohexanesulfonic A	ND	5.0								
Perfluorobutylsulfonamide (PFBSA)	ND	5.0								
Perfluorohexanesulfonamide (PFHxSA	ND	5.0								
2H,2H,3H,3H-Perfluorodecanoic acid (	ND	5.0								
2H,2H,3H,3H-Perfluorohexanoic acid (	ND	5.0								
2H,2H,3H,3H-Perfluorooctanoic acid (S	ND	5.0								
Surr: 13C2-FtS 4:2	*122.6*	0	*149.4*	0	*82*	*50-150*	0			
Surr: 13C2-FtS 6:2	*118.8*	0	*152*	0	*78.1*	*50-150*	0			
Surr: 13C2-FtS 8:2	*125*	0	*153.3*	0	*81.5*	*50-150*	0			
Surr: 13C2-PFDA	*123.8*	0	*160*	0	*77.4*	*50-150*	0			
Surr: 13C2-PFDoA	*97.26*	0	*160*	0	*60.8*	*50-150*	0			
Surr: 13C2-PFHxA	*133.8*	0	*160*	0	*83.6*	*50-150*	0			
Surr: 13C2-PFTeA	*64.3*	0	*160*	0	*40.2*	*27-134*	0			
Surr: 13C2-PFUnA	*130.1*	0	*160*	0	*81.3*	*50-150*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **251810** Instrument ID **LCMS1** Method: **E537 Mod**

Surr: 13C3-HFPO-DA	*130.8*	0	*160*	0	*81.8*	*41-142*	0
Surr: 13C3-PFBS	*113.9*	0	*148.8*	0	*76.5*	*50-150*	0
Surr: 13C4-PFBA	*132.7*	0	*160*	0	*82.9*	*50-150*	0
Surr: 13C4-PFHpA	*129.4*	0	*160*	0	*80.9*	*42-141*	0
Surr: 13C4-PFOA	*133.1*	0	*160*	0	*83.2*	*50-150*	0
Surr: 13C4-PFOS	*120.4*	0	*152.8*	0	*78.8*	*50-150*	0
Surr: 13C5-PFNA	*129.7*	0	*160*	0	*81.1*	*50-150*	0
Surr: 13C5-PFPeA	*126.4*	0	*160*	0	*79*	*43-138*	0
Surr: 13C8-FOSA	*108.5*	0	*160*	0	*67.8*	*30-122*	0
Surr: 18O2-PFHxS	*114.9*	0	*151.2*	0	*76*	*50-150*	0
Surr: d5-N-EtFOSAA	*118.4*	0	*160*	0	*74*	*34-142*	0
Surr: d3-N-MeFOSAA	*109.2*	0	*160*	0	*68.3*	*35-136*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **251810** Instrument ID **LCMS1** Method: **E537 Mod**

LCS Sample ID: **LCS-251810-251810** Units: **ng/L** Analysis Date: **12/31/2024 05:08 PM**
Client ID: Run ID: **LCMS1_241231A** SeqNo: **11346695** Prep Date: **12/31/2024** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Fluorotelomer Sulphonic Acid 4:2 (FtS	29.85	5.0	29.9	0	99.8	67-143	0			
Fluorotelomer Sulphonic Acid 6:2 (FtS	31.36	5.0	30.3	0	103	66-151	0			
Fluorotelomer Sulphonic Acid 8:2 (FtS	32.05	5.0	30.7	0	104	61-148	0			
Perfluorobutanesulfonic Acid (PFBS)	30.35	5.0	28.3	0	107	69-131	0			
Perfluorobutanoic Acid (PFBA)	30.84	5.0	32	0	96.4	73-139	0			
Perfluorodecanesulfonic Acid (PFDS)	27.52	5.0	30.8	0	89.4	64-128	0			
Perfluorodecanoic Acid (PFDA)	29.37	5.0	32	0	91.8	77-135	0			
Perfluorododecanoic Acid (PFDoA)	26.93	5.0	32	0	84.2	77-137	0			
Perfluoroheptanesulfonic Acid (PFHpS	31.11	5.0	30.5	0	102	70-137	0			
Perfluoroheptanoic Acid (PFHpA)	31.73	5.0	32	0	99.2	67-130	0			
Perfluorohexanesulfonic Acid (PFHxS)	26.93	5.0	29.1	0	92.6	68-131	0			
Perfluorohexanoic Acid (PFHxA)	28.76	5.0	32	0	89.9	72-129	0			
Perfluorononanesulfonic Acid (PFNS)	26.8	5.0	30.7	0	87.3	70-132	0			
Perfluorononanoic Acid (PFNA)	28.08	5.0	32	0	87.7	75-131	0			
Perfluorooctanesulfonamide (PFOSA)	33.6	5.0	32	0	105	66-140	0			
Perfluorooctanesulfonic Acid (PFOS)	29.64	2.0	29.7	0	99.8	72-133	0			
Perfluorooctanoic Acid (PFOA)	29.59	2.0	32	0	92.5	71-133	0			
Perfluoropentanesulfonic Acid (PFPeS	29.33	5.0	30	0	97.8	73-137	0			
Perfluoropentanoic Acid (PFPeA)	29.79	5.0	32	0	93.1	72-129	0			
Perfluorotetradecanoic Acid (PFTeA)	31.51	5.0	32	0	98.5	62-139	0			
Perfluorotridecanoic Acid (PFTriA)	35.98	5.0	32	0	112	47-147	0			
Perfluoroundecanoic Acid (PFUnA)	29.86	5.0	32	0	93.3	80-135	0			
N-Ethylperfluorooctanesulfonamidoace	30.41	5.0	32	0	95	67-140	0			
N-Methylperfluorooctanesulfonamidoa	32.89	5.0	32	0	103	67-133	0			
Hexafluoropropylene oxide dimer acid	31.67	5.0	32	0	99	65-139	0			
4,8-Dioxa-3H-perfluorononanoic Acid (	27.9	5.0	30.1	0	92.7	74-135	0			
11Cl-Pf3OUdS	25.24	5.0	30.1	0	83.9	61-128	0			
9Cl-PF3ONS	27.95	5.0	29.8	0	93.8	69-133	0			
Perfluoro-4-ethylcyclohexanesulfonic A	25.8	5.0	28.8	0	89.6	74-131	0			
Perfluorobutylsulfonamide (PFBSA)	36.36	5.0	32	0	114	68-164	0			
Perfluorohexanesulfonamide (PFHxSA	30.48	5.0	32	0	95.2	69-135	0			
2H,2H,3H,3H-Perfluorodecanoic acid (	20.52	5.0	32	0	64.1	39-117	0			
2H,2H,3H,3H-Perfluorohexanoic acid (	29.46	5.0	32	0	92	71-138	0			
2H,2H,3H,3H-Perfluorooctanoic acid (S	26.62	5.0	32	0	83.2	64-134	0			
Surr: 13C2-FtS 4:2	*109.4*	0	*149.4*	0	*73.2*	*50-150*	0			
Surr: 13C2-FtS 6:2	*99.48*	0	*152*	0	*65.4*	*50-150*	0			
Surr: 13C2-FtS 8:2	*111.2*	0	*153.3*	0	*72.5*	*50-150*	0			
Surr: 13C2-PFDA	*114.7*	0	*160*	0	*71.7*	*50-150*	0			
Surr: 13C2-PFDoA	*113.7*	0	*160*	0	*71.1*	*50-150*	0			
Surr: 13C2-PFHxA	*121.3*	0	*160*	0	*75.8*	*50-150*	0			
Surr: 13C2-PFTeA	*84.08*	0	*160*	0	*52.5*	*27-134*	0			
Surr: 13C2-PFUnA	*125.3*	0	*160*	0	*78.3*	*50-150*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **251810** Instrument ID **LCMS1** Method: **E537 Mod**

Surr: 13C3-HFPO-DA	*107.4*	0	*160*	0	*67.1*	*41-142*	0
Surr: 13C3-PFBS	*98.81*	0	*148.8*	0	*66.4*	*50-150*	0
Surr: 13C4-PFBA	*119.2*	0	*160*	0	*74.5*	*50-150*	0
Surr: 13C4-PFHpA	*115.6*	0	*160*	0	*72.2*	*42-141*	0
Surr: 13C4-PFOA	*117.1*	0	*160*	0	*73.2*	*50-150*	0
Surr: 13C4-PFOS	*108.7*	0	*152.8*	0	*71.1*	*50-150*	0
Surr: 13C5-PFNA	*117.7*	0	*160*	0	*73.6*	*50-150*	0
Surr: 13C5-PFPeA	*108.8*	0	*160*	0	*68*	*43-138*	0
Surr: 13C8-FOSA	*92.24*	0	*160*	0	*57.6*	*30-122*	0
Surr: 18O2-PFHxS	*107.1*	0	*151.2*	0	*70.8*	*50-150*	0
Surr: d5-N-EtFOSAA	*103.3*	0	*160*	0	*64.6*	*34-142*	0
Surr: d3-N-MeFOSAA	*91.44*	0	*160*	0	*57.2*	*35-136*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **251810** Instrument ID **LCMS1** Method: **E537 Mod**

LCSD Sample ID: **LCSD-251810-251810** Units: **ng/L** Analysis Date: **12/31/2024 05:22 PM**
Client ID: Run ID: **LCMS1_241231A** SeqNo: **11346696** Prep Date: **12/31/2024** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Fluorotelomer Sulphonic Acid 4:2 (FtS	28.34	5.0	29.9	0	94.8	67-143	29.85	5.17	30	
Fluorotelomer Sulphonic Acid 6:2 (FtS	29.63	5.0	30.3	0	97.8	66-151	31.36	5.67	30	
Fluorotelomer Sulphonic Acid 8:2 (FtS	30.68	5.0	30.7	0	99.9	61-148	32.05	4.39	30	
Perfluorobutanesulfonic Acid (PFBS)	28.17	5.0	28.3	0	99.6	69-131	30.35	7.45	30	
Perfluorobutanoic Acid (PFBA)	31.81	5.0	32	0	99.4	73-139	30.84	3.12	30	
Perfluorodecanesulfonic Acid (PFDS)	22.26	5.0	30.8	0	72.3	64-128	27.52	21.1	30	
Perfluorodecanoic Acid (PFDA)	30.09	5.0	32	0	94	77-135	29.37	2.41	30	
Perfluorododecanoic Acid (PFDoA)	27.21	5.0	32	0	85	77-137	26.93	1.02	30	
Perfluoroheptanesulfonic Acid (PFHpS	28.47	5.0	30.5	0	93.3	70-137	31.11	8.86	30	
Perfluoroheptanoic Acid (PFHpA)	29.72	5.0	32	0	92.9	67-130	31.73	6.56	30	
Perfluorohexanesulfonic Acid (PFHxS)	25.78	5.0	29.1	0	88.6	68-131	26.93	4.4	30	
Perfluorohexanoic Acid (PFHxA)	27.82	5.0	32	0	86.9	72-129	28.76	3.34	30	
Perfluorononanesulfonic Acid (PFNS)	26.39	5.0	30.7	0	86	70-132	26.8	1.52	30	
Perfluorononanoic Acid (PFNA)	27.31	5.0	32	0	85.3	75-131	28.08	2.77	30	
Perfluorooctanesulfonamide (PFOSA)	29.53	5.0	32	0	92.3	66-140	33.6	12.9	30	
Perfluorooctanesulfonic Acid (PFOS)	28.1	2.0	29.7	0	94.6	72-133	29.64	5.33	30	
Perfluorooctanoic Acid (PFOA)	26.4	2.0	32	0	82.5	71-133	29.59	11.4	30	
Perfluoropentanesulfonic Acid (PFPeS	28.76	5.0	30	0	95.9	73-137	29.33	1.96	30	
Perfluoropentanoic Acid (PFPeA)	28.57	5.0	32	0	89.3	72-129	29.79	4.17	30	
Perfluorotetradecanoic Acid (PFTeA)	29.18	5.0	32	0	91.2	62-139	31.51	7.7	30	
Perfluorotridecanoic Acid (PFTriA)	33.62	5.0	32	0	105	47-147	35.98	6.78	30	
Perfluoroundecanoic Acid (PFUnA)	29.25	5.0	32	0	91.4	80-135	29.86	2.06	30	
N-Ethylperfluorooctanesulfonamidoace	32.46	5.0	32	0	101	67-140	30.41	6.53	30	
N-Methylperfluorooctanesulfonamidoa	30.06	5.0	32	0	93.9	67-133	32.89	9	30	
Hexafluoropropylene oxide dimer acid	30.05	5.0	32	0	93.9	65-139	31.67	5.27	30	
4,8-Dioxa-3H-perfluorononanoic Acid (	27.08	5.0	30.1	0	90	74-135	27.9	3	30	
11Cl-Pf3OUdS	20.5	5.0	30.1	0	68.1	61-128	25.24	20.7	30	
9Cl-PF3ONS	26.91	5.0	29.8	0	90.3	69-133	27.95	3.8	30	
Perfluoro-4-ethylcyclohexanesulfonic A	26.16	5.0	28.8	0	90.8	74-131	25.8	1.37	30	
Perfluorobutylsulfonamide (PFBSA)	34.23	5.0	32	0	107	68-164	36.36	6.03	30	
Perfluorohexanesulfonamide (PFHxSA	29.06	5.0	32	0	90.8	69-135	30.48	4.77	30	
2H,2H,3H,3H-Perfluorodecanoic acid (	19.77	5.0	32	0	61.8	39-117	20.52	3.73	30	
2H,2H,3H,3H-Perfluorohexanoic acid (	27.99	5.0	32	0	87.5	71-138	29.46	5.11	30	
2H,2H,3H,3H-Perfluorooctanoic acid (S	27.15	5.0	32	0	84.8	64-134	26.62	1.96	30	
Surr: 13C2-FtS 4:2	*127.1*	0	*149.4*	0	*85*	*50-150*	109.4	*15*	*30*	
Surr: 13C2-FtS 6:2	*117.8*	0	*152*	0	*77.5*	*50-150*	99.48	*16.8*	*30*	
Surr: 13C2-FtS 8:2	*128.2*	0	*153.3*	0	*83.6*	*50-150*	111.2	*14.2*	*30*	
Surr: 13C2-PFDA	*131.4*	0	*160*	0	*82.1*	*50-150*	114.7	*13.5*	*30*	
Surr: 13C2-PFDoA	*114.3*	0	*160*	0	*71.4*	*50-150*	113.7	*0.508*	*30*	
Surr: 13C2-PFHxA	*136.7*	0	*160*	0	*85.4*	*50-150*	121.3	*11.9*	*30*	
Surr: 13C2-PFTeA	*72.57*	0	*160*	0	*45.4*	*27-134*	84.08	*14.7*	*30*	
Surr: 13C2-PFUnA	*132.4*	0	*160*	0	*82.8*	*50-150*	125.3	*5.56*	*30*	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Mackinac Environmental Technology, Inc.
Work Order: 24120581
Project: Superior Township Dump

QC BATCH REPORT

Batch ID: **251810** Instrument ID **LCMS1** Method: **E537 Mod**

Surr: 13C3-HFPO-DA	*129.3*	0	*160*	0	*80.8*	*41-142*	107.4	*18.5*	*30*
Surr: 13C3-PFBS	*120.6*	0	*148.8*	0	*81*	*50-150*	98.81	*19.8*	*30*
Surr: 13C4-PFBA	*139*	0	*160*	0	*86.9*	*50-150*	119.2	*15.4*	*30*
Surr: 13C4-PFHpA	*135.8*	0	*160*	0	*84.8*	*42-141*	115.6	*16.1*	*30*
Surr: 13C4-PFOA	*137.5*	0	*160*	0	*85.9*	*50-150*	117.1	*16*	*30*
Surr: 13C4-PFOS	*125.6*	0	*152.8*	0	*82.2*	*50-150*	108.7	*14.5*	*30*
Surr: 13C5-PFNA	*136.6*	0	*160*	0	*85.4*	*50-150*	117.7	*14.8*	*30*
Surr: 13C5-PFPeA	*127.7*	0	*160*	0	*79.8*	*43-138*	108.8	*16*	*30*
Surr: 13C8-FOSA	*113.3*	0	*160*	0	*70.8*	*30-122*	92.24	*20.5*	*30*
Surr: 18O2-PFHxS	*123.9*	0	*151.2*	0	*81.9*	*50-150*	107.1	*14.5*	*30*
Surr: d5-N-EtFOSAA	*126.8*	0	*160*	0	*79.2*	*34-142*	103.3	*20.4*	*30*
Surr: d3-N-MeFOSAA	*114.9*	0	*160*	0	*71.8*	*35-136*	91.44	*22.7*	*30*

The following samples were analyzed in this batch: 24120581-07A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Simi Valley, CA +1 805 526 7161
Kelso, WA +1 360 577 7222
Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Middletown, PA +1 717 944 5541
Valparaiso, IN +1 219 299 8127
Salt Lake City, UT +1 801 266 7700
South Charleston, WV +1 304 356 3168
Rochester, NY +1 585 288 5380

Chain of Custody Form

Page 1 of 1

COC ID: 067742

ALS Project Manager: | ALS Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis
Purchase Order		Project Name	Superior Township Dump	A PFAS
Quote #		Project Number	M23-4099	B RCRA + Aluminum, iron, manganese, cobalt, nickel, vanadium
Company Name	Mackinac Environmental	Bill To Company		C
Send Report To	Matt Radsvick	Invoice Attn		D
Address	300 Ferry Lane	Address	Same	E
City/State/Zip	St. Ignace, MI 49781	City/State/Zip	as	F
Phone	906 643 9948	Phone		G
Fax	906 643 9977	Fax	left	H
e-Mail Address	inbox@met-coop.com	e-Mail Address		I
				J

24120581
MACKINAC ENVIRONMENTAL TECHNOLOGY, Mackinac Environmental Technology, Inc
Project: Superior Township Dump

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-5	12.17.24	11.56	GW		4	✓	✓									
2	MW-4	↓	13.07	↓		↓	✓	✓									
3	MW-1	↓	14.36	↓		↓	✓	✓									
4	Initial MW-5		11.00			1		✗	Hold	EA Ref							
5	Initial MW-4		12.29			1		✓									
6	Initial MW-1	↓	13.57	↓		1		✗	Hold	EA Ref.							
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Steve Fondaba Jmf
Shipment Method: FedEx
Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☐ 2 BD ☐ 1 BD Other:
Results Due Date:

Relinquished by: Jmf	Date: 12.18.24	Time: 14.10	Received by: FED EX	Notes:	
Relinquished by: FED EX	Date: 12/21/24	Time: 1100	Received by (Laboratory):	Cooler ID	Cooler Temp.
Logged by (Laboratory): DES	Date: 12/23/24	Time: 0900	Checked by (Laboratory):	IR6	3.4°C pH 39

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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ALS-COC-2022-R00

ALS Group, USA
Holland, Michigan

Sample Receipt Checklist

Client Name: **MACKINAC ENVIRONMENTAL TE** Date/Time Received: **21-Dec-24 11:00**

Work Order: **24120581** Received by: **DS**

Checklist completed by Diane Shaw (eSignature) 23-Dec-24 (Date) Reviewed by: Alex J. Csaszar (eSignature) 23-Dec-24 (Date)

Matrices: Groundwater
Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Sample(s) received on ice?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.4/3.4 c	IR6	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	12/23/2024 9:37:34 AM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:	-		

Login Notes: pH check <2.

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction: