



June 19, 2025

Christopher Biro
Ohio Environmental Protection Agency
Northeast District Office
2110 East Aurora Road
Twinsburg, Ohio 44087

**Re: Preliminary Ditch Interim Measure
Operation & Maintenance Plan
Material Sciences Corporation
460 W Main Street
Canfield, Ohio 44406
OHD000810283
August Mack Project Number: JZ0412.372**

Dear Mr. Biro,

On behalf of Material Sciences Corporation (MSC), August Mack Environmental, Inc. (August Mack) is submitting this preliminary Ditch Interim Measure (IM) Operation and Maintenance (O&M) Plan to outline inspection, maintenance, and repair procedures for the Ditch IM. Following Ohio EPA approval to release stormwater, the pump around sumps will be utilized to allow stormwater to flow to Sawmill Creek and this preliminary Ditch IM O&M Plan and the Ditch IM Monitoring Plan, which was approved by Ohio EPA on April 21, 2025, will be followed.

After the liner is connected and the final dam constructed, the Ditch IM Completion Report will be prepared and include details of any modifications to the design or liner based on field observations, photos documenting liner installation, as-built drawings of the Ditch IM, and a finalized O&M Plan to ensure the Ditch IM continues to function as designed.

Should you have any questions or need any additional information, please do not hesitate to contact us.

Sincerely,

Brandon C. Lewis, CP, CHMM
Regional Director, Ohio Offices

Bryant Hoffer, LPG, CHMM
Senior Manager, Geologist

Ditch IM Operation & Maintenance Plan
June 19, 2025
Preliminary – To Be Updated with Ditch IM Implementation Report

1. Introduction

August Mack Environmental, Inc. (August Mack) has prepared this preliminary Operation and Maintenance (O&M) Plan to outline inspection, maintenance, and repair procedures for the Ditch Interim Measure (IM). The purpose of this O&M Plan is to maintain the ditch liner's integrity and its ability to isolate subsurface contamination from stormwater. The Ditch IM Plan included the proposed liner construction details, which was provided to the Ohio Environmental Protection Agency (Ohio EPA) and approved on November 15, 2024. This O&M Plan will supplement the Ohio EPA approved Ditch IM Monitoring Plan (April 8, 2025). Updated Ditch IM drawings, which depicted the two access points under the ditch liner at transect T-90 and T-250 were subsequently submitted to the Ohio EPA on April 17, 2025.

This is the preliminary Ditch IM O&M Plan, which will be followed while the pump around sumps are operating to allow stormwater to flow to Sawmill Creek. A finalized Ditch IM O&M Plan will be resubmitted with the Ditch IM Completion Report. The Preliminary Ditch IM O&M Plan includes the following sections:

1. O&M Plan Objectives
2. Health and Safety
3. Inspection Schedule and Documentation
4. Maintenance and Corrective Action Procedures
5. Emergency Response Procedures
6. Ditch O&M Plan Review and Updates

2. O&M Plan Objectives

Several objectives have been identified as critical to maintain the ditch's integrity and ability to fulfill its purpose. These objectives include:

1. Maintaining the stone cover to provide liner protection since displacement of the stone cover will allow the underlying geotextile and reinforced polyethylene (RPE) liner to be exposed and potentially susceptible to damage.
2. Maintaining the RPE liner integrity since damage of the RPE liner will allow impacts from the shallow perched water and soils to mix with stormwater runoff flowing through the ditch.
3. Mitigating bank erosion to maintain the structural integrity of the ditch and prevent potential undermining of the liner.

4. Removing debris from the ditch to allow for unimpeded stormwater runoff. If left unchecked, accumulation of debris (e.g., fallen trees, branches, leaves, etc.) and obstructions will allow water to back up in the ditch or overflow, thus increasing the potential for ditch scour and erosion.
5. Maintaining the conveyance pipes to allow for proper stormwater flow. If the two 18-inch diameter pipes at the downstream dam become clogged or moved during natural flooding, the stormwater runoff through the ditch will be disrupted. Disruption of the water flow may result in backup of water in the ditch, leading to erosion and scour of the ditch banks and the downstream dam.

3. Health and Safety

August Mack personnel will follow the previously prepared Health and Safety Plan (HASP) when conducting the weekly O&M inspections. Personnel will wear Level D personal protective equipment (i.e., steel-toed boots, hard hats, safety glasses, and high visibility vests) when conducting the weekly inspections. Personnel will wear chemical resistant personal protective equipment (PPE) as detailed in the HASP if repair of the ditch liner is necessary or if personnel will potentially come into contact with impacted water, soils, or sediments.

4. Inspection Schedule and Documentation

The Ditch IM will be inspected on a weekly basis by August Mack personnel. The weekly inspections will be coordinated with the weekly sampling events to monitor the stormwater within Sawmill Creek, which is discussed in the *Ditch IM Monitoring Plan* (Monitoring Plan) submitted on April 8, 2025 and subsequently approved by Ohio EPA on April 21, 2025 (**Attachment A**). In accordance with the Monitoring Plan, the sampling frequency will be weekly and include a minimum of one and up to four storm sampling events per month. Adjustments to the O&M Plan inspections and durations could include extension, modification, or termination.

The weekly inspections will be documented on the Weekly Inspection Log provided in **Attachment B**. The inspection will include a walk alongside the entire length of the Ditch IM area looking for concerns (do not walk on top of the liner when possible unless you use plywood or other methods to prevent damage). The Inspection Log contains a questionnaire to be filled out during and after the inspection walk to assist with documenting the findings and potential damage that may jeopardize the integrity and the ability of the Ditch IM to fulfill its intended purpose. Photographs will also be taken to document the conditions identified. August Mack will also use the Inspection Log to track repair actions taken along with the date actions are taken. Copies of the Inspection

Logs will be included in the monthly monitoring reports to be submitted to the Ohio EPA in the applicable Monthly Report that is due by the 10th of each month.

5. Maintenance and Corrective Action Procedures

The following sections provide ditch inspection general maintenance and corrective action procedures August Mack will use to maintain the ditch liner's integrity. When performing any maintenance or corrective action activities, use plywood or other methods to access locations on top of the liner, which will prevent additional damage.

5.1 Cover Stone Inspection and Displacement Maintenance

The RPE liner is overlain by a geotextile layer and covered by stone as a protective layer. Displacement of the stone cover risks subjecting the liner and geotextile layer to erosion and potential UV damage. The protective stone layer consists of two sizes of stone including a 2 to 3-inch (nominal size) Ohio Department of Transportation (OH DOT) #1 stone for the majority of the stone layer and a 6 to 8-inch riprap stone located approximately every 200 liner feet within ditch check dams and as cover for both the upstream and downstream dams. The cover stone inspection will include the following activities:

- Visually inspecting the liner for bare spots (typically larger than a 1-foot area) that expose the underlying geotextile and liner,
- Visually examining the ditch for unusually thick accumulations of stone indicating the stone is washing from upstream to downstream sections of the ditch; and,
- Visually examining the stone check dams and the upstream and downstream dams for displacement of riprap.

If any of these conditions are observed, the following corrective actions will be performed:

- Documenting the location of the stone displacement and taking pictures;
- Checking the underlying liner for damage or leakage. If damage or leakage is observed, follow the emergency response procedures below to repair the liner;
- Informing the August Mack Project Manager of the observed condition(s);
- Repositioning or replenishing missing or displaced stone using the appropriate stone sizes; and,
- Documenting the stone repositioning/replenishment date and taking pictures of the completed actions.

5.2 Liner Integrity Inspection and Repair

Maintaining the integrity of the RPE liner is a critical component of the Ditch IM, which was installed to isolate the subsurface conditions from the stormwater run-off. The liner is a 20-mil reinforced polyethylene material and is available from several suppliers. The two liner suppliers used for the Ditch IM in order of priority include ITW Cargo Guard (phone number 201-248-5193) and AgTec LLC (phone number 207-692-0700). Rips or punctures of the liner must be identified and repaired to maintain the integrity of the Ditch IM. If suspected impacted material is identified on top of the liner, then follow the Emergency Procedures detailed below. The liner inspection will include the following activities:

- Looking for rips, tears, or punctures in the liner;
- Looking for evidence of elevated hydrostatic pressure under the liner (i.e. “bubbling” under the liner). If “bubbles” are identified in proximity to transect T-90 or T-250, remove liquid from beneath the liner by pumping from the access points;
- Looking for evidence of impacted liquid on the stone surface as an indicator of a liner rip and puncture. Evidence of suspect liquid will require additional inspection to identify the source and to determine if the liner has been compromised. These additional inspections will include coordination with the August Mack Project Manager to document pH conditions in proximity to the liquid and movement of stone to locate the location of potential rips and punctures.

If either of these conditions are observed, the following corrective actions will be performed:

- Refer to the emergency procedures later in this document for the immediate actions that will be taken if a rip, tear, or puncture is identified;
- Small tears (<6”) can be patched using manufacturer-approved methods;
- Larger tears require removing the affected section and welding or adhering new liner segment with overlap;
- Repair will require the movement of stone and geotextile liner away from rip or puncture areas;
- All surfaces must be clean and dry before conducting repairs;
- Replace the geotextile and stone over the repaired liner;
- Document repair locations with photos and notes; and,
- Notify the Ohio EPA of the repair activities.

5.3 Bank Erosion Inspection and Repair

Limiting bank erosion is important to maintain the structural integrity of the ditch and prevent potential undermining of the liner. The bank erosion inspection will include the following activities:

- Looking for signs of rills, gullies, exposed roots, or sediment deposits at base of slope; and,
- Observing where the top slopes of the liner are experiencing water infiltration or undercutting.

If either of these conditions are observed, conduct the following procedures:

- Document the location of the bank erosion, including taking pictures;
- Contact the August Mack Project Manager and provide the field notes and pictures for review;
- August Mack personnel will determine the best course of action to repair and limit further erosion;
- The selected course(s) of action may include re-grading of the affected areas, installing additional check dams and/or applying other erosion control measures; and,
- Following erosion repair, documenting the completion of the repairs with pictures and notes.

5.4 Ditch Debris Inspection and Removal

Debris including fallen trees, branches, trash, and other objects can clog sections of the ditch resulting in scour, stone displacement, and erosion. Debris removal is important to maintain the proper flow capacity in the ditch.

Debris inspection will include the following activities:

- Inspecting the ditch for the accumulation of trees, branches, and trash, especially after large storms; and,
- Identifying scour or erosion of the ditch line due to the accumulation of debris that has altered its flow pattern.

If either of these conditions are observed, follow the following procedures:

- Document the location and type of debris and take pictures;
- Manually remove tree(s), branches, and/or trash during the inspection. Note that trees and large branches may require additional personnel and equipment to perform so report their presence to the August Mack Project Manager;
- Debris, excluding trash, which has not come into contact with impacted water or impacted sediment may be moved away from the ditch and into the surrounding wooded area;
- Debris and trash that has come into contact with impacted water or impacted sediment must be containerized and properly disposed of off-Site;

- Trash that has not come into contact with impacted water or impacted sediment should be disposed of into a trash container;
- If erosion is present, refer to the previous section on erosion; and,
- Document the removal of debris and proper disposal and take pictures of the cleared debris areas.

5.5 Downstream Drainage Inspection and Corrective Action

The two 18-inch conveyance pipes located at the downstream dam are used to move stormwater from the ditch directly towards Sawmill Creek. If these pipes become clogged or if they are displaced due to high water conditions, corrective action may be necessary to return these pipes to function. The pipe inspection includes the following activities:

- Inspecting for clogs. An indication of clogging will be if water is being retained behind the downstream dam under non-storm conditions; and,
- Visually identifying that the pipes extending downstream of the dam and over the wetlands have been displaced. The pipes are held in place downstream of the dam with stone that could potentially be displaced during high flow events in the wetlands.

If either of these conditions are observed, follow the following procedures:

- Document either the clog condition or displacement and take pictures;
- If the pipe is clogged, remove debris to restore the flow if the clog can be safely accessed;
- If the debris in the pipe cannot be safely removed contact the August Mack Project Manager to arrange for additional personnel and equipment to remove the clog;
- After the clog has been removed, properly dispose of the clogged material;
- If the pipe(s) have been displaced, contact the August Mack Project Manager to arrange for personnel and equipment to restore to their proper positions and add additional stone; and,
- Document the completed work with notes and pictures.

6. Emergency Response Procedures

If potentially impacted dark brown liquid is identified on the liner, the following emergency response procedures should be followed:

1. Notify the August Mack Project Manager immediately.
2. Collect a sample of the suspected impacted water to screen for pH utilizing a pHep®5 pH meter and/or Oakton pH150 pH meter.

3. If the pH is greater than 12, then collect an additional sample of the liquid for free cyanide using the Hach DR900¹.
4. If the free cyanide concentration from within the suspected impacted water is above 0.4 mg/L, the next steps will be dependent on precipitation and if there is water flowing in the conveyance pipes:
 - a. *If there is precipitation and water flowing in the conveyance pipes,* collect samples from the five Sawmill Creek locations in the Monitoring Plan for the Hach DR900.
 - b. If the free cyanide concentration from within Sawmill Creek is **below 0.4 mg/L** at all five locations from the Ditch IM Monitoring, then continue to let the stormwater flow and conduct the next steps detailed below when there is no precipitation.
 - c. If the free cyanide concentration from within Sawmill Creek is **above 0.4 mg/L** at any of the five locations collected during the Ditch IM Monitoring, then stop the pump around sumps and deploy available equipment (i.e., sewer plugs, sandbags, pumps) to containerize any impacted liquid and prevent it from flowing through the conveyance piping.
 - i. If necessary, personnel can insert the appropriate sewer plugs within the two 18-inch drainage pipes at the downstream pipe opening to prevent flow to Sawmill Creek. The existing 18-inch plugs, other appropriate sewer plugs, and any applicable PPE will be housed in the system shed when not in use.
 - d. Collect and pump the impacted water into a designated tank for POTW treatment or proper off-Site disposal.
 - e. *If there is no precipitation and water is not flowing in the conveyance pipes,* then use sump pumps to remove the impacted water from on top of the liner and containerize the impacted liquid into a designated tank for POTW treatment or proper off-Site disposal.
 - f. Conduct a Liner Integrity Inspection in accordance with the section above to identify the source of the impacted water.
 - g. If the impacted water is **not** present within 24 hours after being initially removed, then continue to let stormwater flow and conduct the ditch inspections at a daily frequency for one week.
 - h. If the impacted water is present again within 24 hours after being initially removed, then deploy available equipment (i.e., plugs, sandbags, pumps)

¹ The Hach® DR900 Multiparameter Portable Colorimeter is a device utilized in the field to screen water for free cyanide.

to containerize any future stormwater and prevent it from flowing through the conveyance piping.

5. Within 48 hours of identifying free cyanide impacts greater than 0.4 mg/L on the liner, August Mack will notify Ohio EPA of the incident and detail next steps.
6. After the source is identified, schedule the repair of the liner following the procedures discussed above.
7. Continue collecting the impacted stormwater until the repairs are made and the free cyanide concentration in stormwater on the liner is below 0.4 mg/L.
8. After the free cyanide in stormwater is below 0.4 mg/L, remove the deployed equipment (i.e., plugs, sandbags, pumps) and resume stormwater flow through the conveyance pipes.
9. Conduct post-event assessment and update the O&M procedures, if needed.

7. Ditch O&M Plan Review and Updates

August Mack has prepared this preliminary Ditch IM O&M Plan with the intent of updating the plan with the future submittal of the Ditch Implementation Report. This O&M plan will be reviewed and modified as necessary at least annually for the duration of the inspection period.

ATTACHMENT A

Ditch IM Monitoring Plan



April 8, 2025

Christopher Biro
Ohio Environmental Protection Agency
Northeast District Office
2110 East Aurora Road
Twinsburg, Ohio 44087

**Re: Ditch Interim Measure Monitoring Plan
Material Sciences Corporation
460 W Main Street
Canfield, Ohio 44406
OHD000810283
August Mack Project Number: JY2380.372**

Dear Mr. Biro,

On behalf of Material Sciences Corporation, August Mack Environmental, Inc. (August Mack) is submitting the attached Ditch Interim Measure Monitoring Plan.

Should you have any questions or need any additional information, please do not hesitate to contact us,

Sincerely,

Brandon C. Lewis, CP, CHMM
Regional Director, Ohio Offices

Bryant Hoffer, LPG, CHMM
Senior Manager, Geologist

OBJECTIVE

August Mack Environmental, Inc. (August Mack), on behalf of Material Sciences Corporation (MSC), is proposing to monitor surface water in the vicinity of the MSC Canfield property (Site) in Canfield, Ohio. This scope of work is intended to monitor the effectiveness of the Ditch Interim Measure (IM) in isolating subsurface contamination and minimizing impacts to surficial runoff flowing within the ditch. The purpose of the Ditch IM is to isolate the known subsurface contamination within the ditch from surface runoff and ultimately reduce the potential for subsurface contamination to impact the ditch and features downstream of the ditch. Following completion of the Ditch IM, an Implementation Report, including an Operations, Maintenance, and Monitoring (OM&M) Plan describing how the Ditch IM will be routinely assessed and maintained, will be submitted for Ohio EPA review. The Ditch IM is one of the initial phases of remediation at the Site. As such, the data collected from this Monitoring Plan will be incorporated into the overall remedial strategy for the Site.

BACKGROUND

The Site is a metal galvanizing and coil coating facility located in Canfield, Ohio. MSC acquired the facility in 2013. In July 2024, brown liquid was visually observed in the ditch by a pedestrian on the bikeway. This brown liquid discharge was believed to be associated with cleaning and pressure washing activities conducted during a routine facility shutdown. Discharges from that incident were contained and collected, however, during the response efforts associated with the July 2024 release, residual impacts from historic facility operations were discovered in soil, surface water, sediment and groundwater at multiple locations in and around the Site. MSC was issued a Notice of Violation (NOV) from the Ohio Environmental Protection Agency (EPA) in October 2024 and the Director's Final Findings and Orders (DFFO) were effective December 2024. The Site is currently undergoing Resource Conservation and Recovery Act (RCRA) Corrective Action (CA) through the RCRA FIRST pathway.

Investigations have been conducted on- and off-Site, and an Initial Site Investigation (ISI) Report was submitted to Ohio EPA in December 2024. The ISI documented elevated concentrations of cyanide in sediment, soil and surface water within the ditch, the adjacent wetland, and the downstream tributary of Sawmill Creek. These impacts are believed to be associated with historical operations at the Site. The range of cyanide detections in surface water prior to IM activities is summarized in the table below¹.

¹ The table below is indicative of data collected by August Mack since our involvement (August 2024) which is included in the December 2024 ISI Report.

	Total Cyanide Values (mg/L)		Free Cyanide Values (mg/L)	
<u>Location</u>	<u>Low</u>	<u>High</u>	<u>Low</u>	<u>High</u>
Ditch	0.84	4.9	0.021	0.094
Wetland	2.4	8.1	0.13	0.13
Tributary	0.18	0.44	0.011	0.026

A Ditch IM Plan was submitted to Ohio EPA in November 2024. Ohio EPA reviewed the plan and suggested modifications to the plan (including installation of a conveyance pipe across the wetland), which were implemented by MSC. Ohio EPA approved the plan and uploaded it onto the eDocs system on November 15, 2024. Work has been progressing on constructing the IM and on February 28, 2025, the OPEA requested additional sampling and analysis prior to activation of the IM conveyance. This Monitoring Plan has been prepared to respond to the recent Ohio EPA request for additional sampling.

DITCH IM MONITROING PLAN

August Mack will routinely collect and analyze surface water and subsurface water as part of IM Operations.

Sampling Frequency:

One baseline sampling event was conducted the week of March 3, 2025, prior to the initiation of the ongoing routine sampling events described below. The baseline sampling event included one non-storm event (i.e., baseflow) and one storm event focusing on cyanide screening and laboratory analysis.

Ongoing routine efforts will include surface sampling of the tributary, and subsurface water beneath the liner. These samples will be collected and analyzed weekly during storm events. A storm event will be considered any precipitation of 0.1-inch or greater of accumulation. Up to four storm events per month will be sampled. During storm events, samples will be collected following the first flush and within the first four hours of precipitation. Adjustments to sampling frequency will be guided by the data collected.

Sample Locations:

Surface water samples will be collected from multiple locations within the downstream tributary. These locations are as follows:

- T2-0 (near the Mill Creek Metro Park Bikeway)
- T2-100 (approximately 100 feet downstream of T2-0), and
- T2-250 (approximately 250 feet downstream of T2-0), and
- At the location the creek crosses Cardinal Drive, and
- At the location the creek crosses Verdant Lane.

A figure showing the T2-0, T2-100, T2-250, and Cardinal Drive was provided in the December 2024 ISI Report; a copy of that figure is provided herein.

The baseline sampling conducted on March 3, 2025 was of liquids from under the liner at approximately transect T-1050. Upon liner completion future samples of liquid from under the liner will be collected from within the Ditch IM system shed. In the interim, samples will continue to be collected from T-1050.

Sample Collection Procedures

Surface water samples collected from T2-0, T2-100, T2-250, Cardinal Drive, and Verdant Drive will be collected from the centerline of the tributary using a decontaminated grab or cup-style sampler, final sampling locations will be dependent on flow, accessibility, and health and safety considerations. Subsurface water samples will be collected from T-1050 or within the Ditch IM system shed (following IM completion, specifically from a dedicated sampling port). All water samples will be transferred to clean, labeled, pre-preserved sample containers (provided by the laboratory) and placed on ice in a cooler for preservation in the field.

Sample Analysis

Surface water and subsurface water samples will be screened in the field as well as submitted for laboratory analysis. Field analysis will include the following:

- A Hach® DR900 Multiparameter Portable Colorimeter (DR900) will be used to field screen water for free cyanide. The user manual for this device is provided in **Attachment A**. The DR900 will be properly calibrated for free cyanide each day prior to use.
- A pHep-5 pH meter and/or Oakton pH150 pH meter will be used to field screen the water for pH. The user manuals for both devices are provided in **Attachment A**. As indicated on the user manuals, the accuracy for the pH meters range from 0.05 for the pHep-5 to 0.01 for the Oakton pH150. The pH meter will be properly calibrated each day prior to use.

Surface water and subsurface water samples collected for laboratory analysis will be submitted to Eurofins Environment Testing, LLC, Barberton and analyzed for free cyanide via OIA-1677, and total cyanide via Kelada - 01.

Monitoring Plan Duration and Reporting

As requested by Ohio EPA, the sampling in this Monitoring Plan will be conducted at a weekly frequency and include a minimum of one storm event sampling per month. It is anticipated that this Monitoring Plan will be conducted for a period of six months. Adjustments to the sampling plan frequency and duration will be determined based on data and coordination with Ohio EPA. Adjustments to the plan could include extension,

modification or termination. Reporting will be provided on a monthly basis, and will be included in the applicable Monthly Report that is due by the 10th of each month.

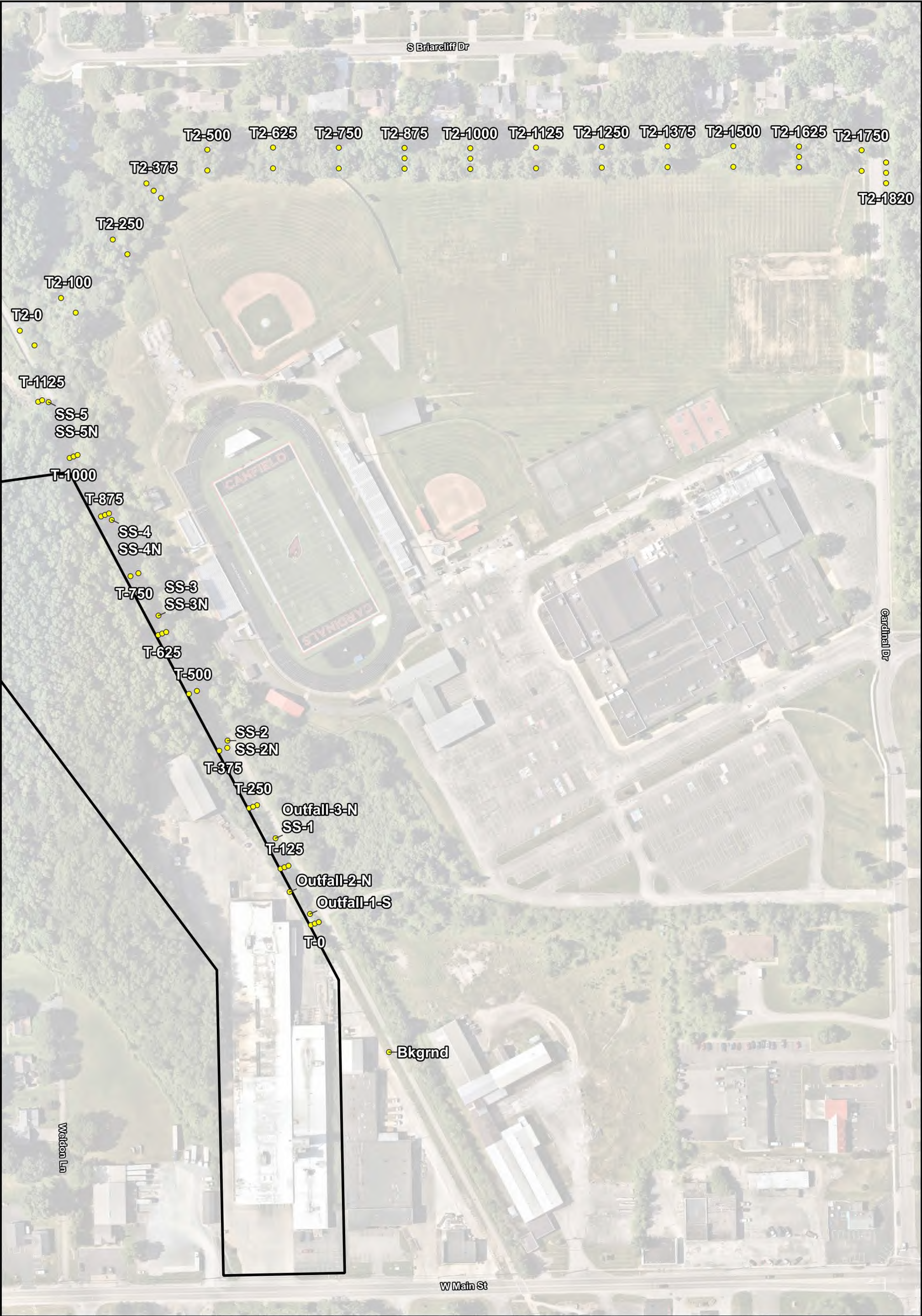
The baseline sampling was completed before and after the storm event that occurred during the week of March 3, 2025. Data collected during that time is provided in the reporting form provided in **Attachment B**. The laboratory report is included as **Attachment C** and results are summarized in the table below.

	Total Cyanide Values (mg/L)	
<u>Location</u>	<u>Base Flow</u>	<u>Following First Flush</u>
Under Liner	550	Not Sampled ²
T2-0	0.23	0.29
T2-100	0.57	0.59
T2-250	0.47	2.8

² Although an under liner sample was not collected during the baseline sampling effort, under liner samples will be collected as proposed in this plan during future sampling.

REFERENCED FIGURE

Figure 1C (December 2024 ISI Report) – Site Plan showing T2-0, T2-100, and T2-250 Locations

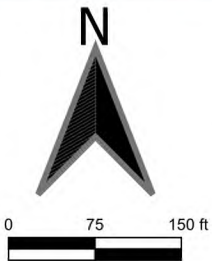


- Subject Property
- Soil Sample

Nearmap Aerial Imagery:
June 15, 2024

**Material Sciences Corporation
Canfield**
Adjacent Ditch and
Sawmill Creek Sampling Locations

460 West Main Street
Canfield, Ohio 44406



4401 Rockside Road, Suite 300
Independence, Ohio 44131

August Mack
ENVIRONMENTAL

(330) 576-3229

PROJECT NO.: JY2380.372	DATE: 12/10/2024
FIGURE: 1C	SCALE: 1:2,000
	CREATED BY: CC

ATTACHMENT A

Hach® DR900 Multiparameter Portable Colorimeter User Manual

pHep-5 pH meter User Manual

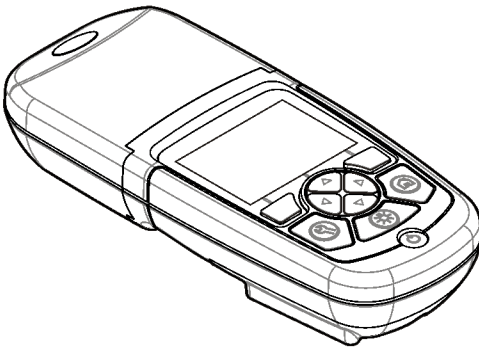
Oakton pH150 pH meter User Manual



DOC022.97.80344

DR 900

04/2022, Edition 4



User Manual
Manuel de l'utilisateur
Manual del usuario
Manual do Usuário

用戶手冊
取扱説明書
사용 설명서
ကျွမ်းကျင်မှု
دليل المستخدم

Table of Contents

English.....	3
Français.....	22
Español.....	42
Português.....	62
中文.....	82
日本語.....	99
한국어.....	117
ไทย.....	135
العربية.....	153

Table of Contents

1	Specifications	on page 3	7	Advanced operation	on page 16
2	General information	on page 4	8	Maintenance	on page 19
3	Installation	on page 7	9	Troubleshooting	on page 20
4	User interface and navigation	on page 10	10	Replacement parts and accessories	on page 21
5	Startup	on page 12			
6	Standard operation	on page 13			

Section 1 Specifications

Specifications are subject to change without notice.

Specification	Details
Measurement mode	Transmittance (%), Absorbance (Abs) and Concentration (Conc)
Dimensions (W x D x H)	23.6 x 8.7 x 4.7 cm (9.3 x 3.4 x 1.9 in.)
Enclosure rating	IP67
Weight	0.6 kg (1.3 lb)
Power requirements (internal)	AA Alkaline batteries (4x)
Battery life	6 months (typical) at 5 readings a day/5 day week without the backlight
Interface	USB mini
Operating temperature	0 to 50 °C (32 to 122 °F), maximum 90% relative humidity non-condensing
Storage temperature	–30 to 60 °C (–22 to 140 °F), maximum 90% relative humidity non-condensing
Lamp source	Light emitting diode (LED)
Detector	Silicon photodiode
Wavelength range	420, 520, 560, 610 nm
Photometric measuring range	0–2 Abs
Wavelength accuracy	±1 nm
Photometric accuracy	±0.03 Abs
Photometric linearity	±0.002 Abs (0–1 Abs)
Wavelength selection	Automatic, based on the method selection
Photometric repeatability	±0.002 Abs (0–1 Abs)
Data readout	Graphical display, 240 x 160 pixel (backlit)
Sample cells	16 mm, 1 cm/10 mL, 1-inch (25 mm) round
Protection class	Class III
Certifications	CE certified
Warranty	1 year (EU: 2 years)

Section 2 General information

In no event will the manufacturer be liable for direct, indirect, special, incidental or consequential damages resulting from any defect or omission in this manual. The manufacturer reserves the right to make changes in this manual and the products it describes at any time, without notice or obligation. Revised editions are found on the manufacturer's website.

2.1 Safety information

The manufacturer is not responsible for any damages due to misapplication or misuse of this product including, without limitation, direct, incidental and consequential damages, and disclaims such damages to the full extent permitted under applicable law. The user is solely responsible to identify critical application risks and install appropriate mechanisms to protect processes during a possible equipment malfunction.

Please read this entire manual before unpacking, setting up or operating this equipment. Pay attention to all danger and caution statements. Failure to do so could result in serious injury to the operator or damage to the equipment.




Make sure that the protection provided by this equipment is not impaired. Do not use or install this equipment in any manner other than that specified in this manual.




2.2 Use of hazard information

⚠ DANGER
Indicates a potentially or imminently hazardous situation which, if not avoided, will result in death or serious injury.
⚠ WARNING
Indicates a potentially or imminently hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION
Indicates a potentially hazardous situation that may result in minor or moderate injury.
NOTICE
Indicates a situation which, if not avoided, may cause damage to the instrument. Information that requires special emphasis.

2.3 Precautionary labels

Read all labels and tags attached to the instrument. Personal injury or damage to the instrument could occur if not observed. A symbol on the instrument is referenced in the manual with a precautionary statement.

	This symbol, if noted on the instrument, references the instruction manual for operation and/or safety information.
	This symbol indicates that a risk of explosion is present.
	This symbol indicates that a risk of fire is present.

	This symbol identifies a risk of chemical harm and indicates that only individuals qualified and trained to work with chemicals should handle chemicals or perform maintenance on chemical delivery systems associated with the equipment.
	This symbol indicates the need for protective eye wear.
	Electrical equipment marked with this symbol may not be disposed of in European domestic or public disposal systems. Return old or end-of-life equipment to the manufacturer for disposal at no charge to the user.

2.4 Compliance and certification

⚠ CAUTION

This equipment is not intended for use in residential environments and may not provide adequate protection to radio reception in such environments.

Canadian Radio Interference-Causing Equipment Regulation, ICES-003, Class A:

Supporting test records reside with the manufacturer.

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de classe A répond à toutes les exigences de la réglementation canadienne sur les équipements provoquant des interférences.

FCC Part 15, Class "A" Limits

Supporting test records reside with the manufacturer. The device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

1. The equipment may not cause harmful interference.
2. The equipment must accept any interference received, including interference that may cause undesired operation.

Changes or modifications to this equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at their expense. The following techniques can be used to reduce interference problems:

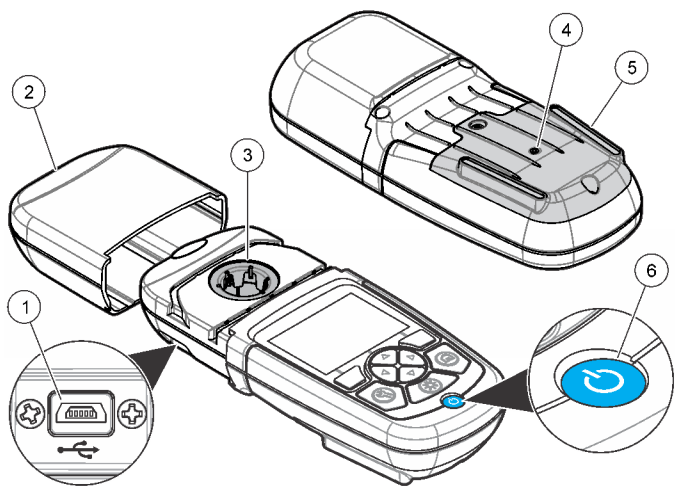
1. Disconnect the equipment from its power source to verify that it is or is not the source of the interference.
2. If the equipment is connected to the same outlet as the device experiencing interference, connect the equipment to a different outlet.
3. Move the equipment away from the device receiving the interference.
4. Reposition the receiving antenna for the device receiving the interference.
5. Try combinations of the above.

2.5 Product overview

The DR 900 is a portable, LED-sourced colorimeter that measures at wavelengths of 420, 520, 560 and 610 nm. The instrument is used to measure various parameters in drinking water,

wastewater and industrial applications. The instrument comes with a complete set of stored programs (pre-installed methods) and the availability of user program storage and favorite program selection. Refer to [Figure 1](#).

Figure 1 Instrument overview

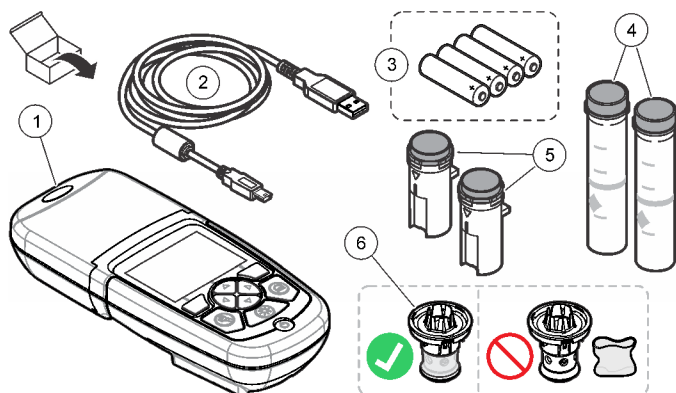


1 USB port	4 Vent
2 Instrument cap	5 Battery compartment
3 Cell compartment	6 Power key

2.6 Product components

Make sure that all components have been received. Refer to [Figure 2](#). If any items are missing or damaged, contact the instrument supplier or a sales representative immediately.

Figure 2 Product components



1 DR 900	4 Glass sample cell, 1-inch (25 mm) round, 10, 20, 25-mL marks (2x)
2 USB cable with mini-USB connector	5 Sample cell, 1 cm/10 mL (2x)
3 AA alkaline batteries (4x)	6 Sample cell adapter

Section 3 Installation

⚠ WARNING



Multiple hazards. Only qualified personnel must conduct the tasks described in this section of the document.

NOTICE

Make sure not to cause a blockage of the instrument battery vent during use or storage.

3.1 Install the batteries

⚠ WARNING



Explosion hazard. Incorrect battery installation can cause the release of explosive gases. Be sure that the batteries are of the same approved chemical type and are inserted in the correct orientation. Do not mix new and used batteries.

⚠ WARNING



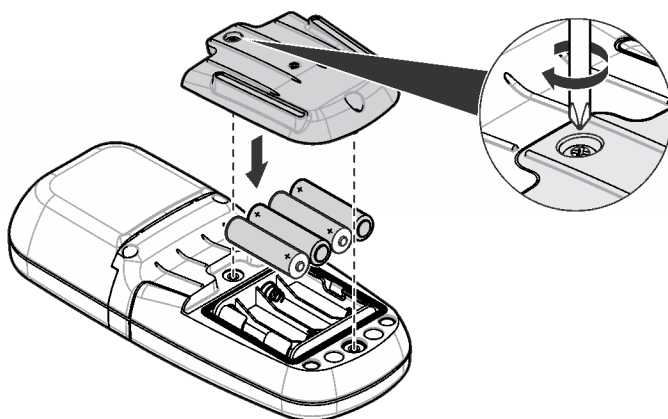
Fire hazard. Battery substitution is not permitted. Use only alkaline batteries.

NOTICE

Make sure to tighten the screws to 1–1.4 N·m (9–12 in.·lb) for a correct seal fit and to maintain the enclosure environmental rating.

The instrument is powered with four AA alkaline batteries. Make sure that the batteries are installed in the correct orientation. Refer to [Figure 3](#) for the battery installation.

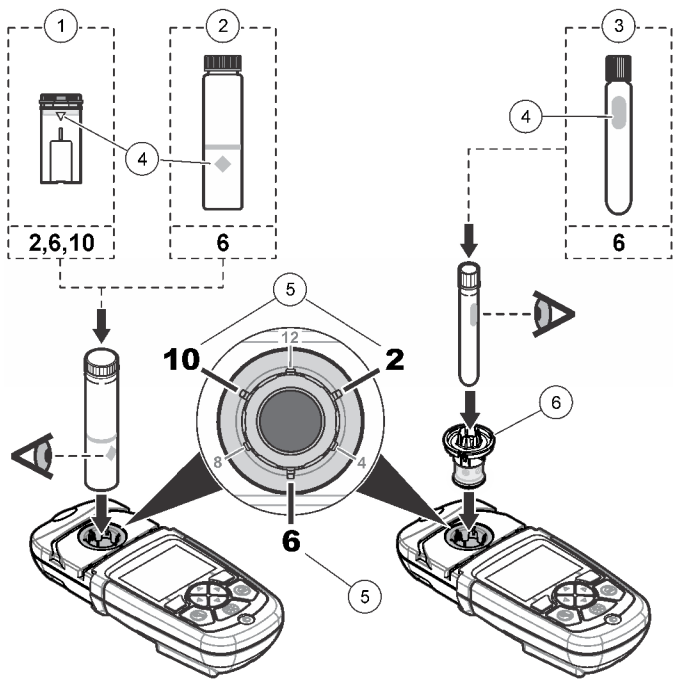
Figure 3 Battery installation



3.2 Install the sample cell and cell adapter

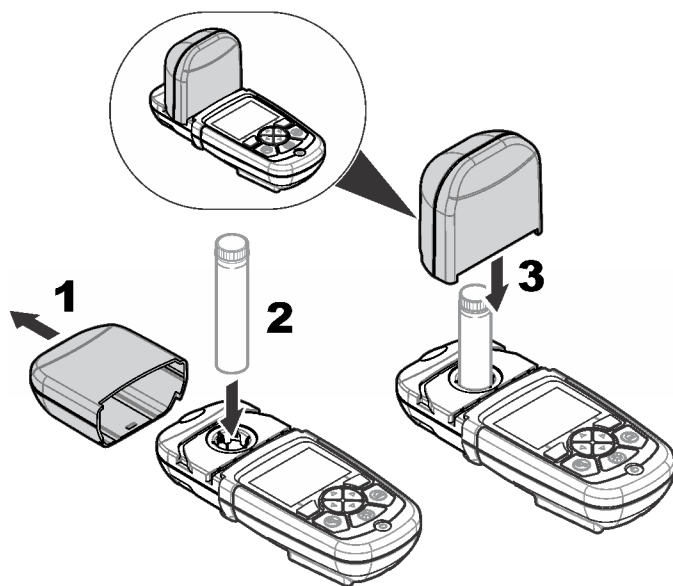
The instrument has one cell compartment which can use one adapter for different sample cell types. Make sure to install the sample cell in the correct orientation and in a consistent orientation so that the results are more repeatable and precise. Refer to [Figure 4](#). Close the instrument cap before the instrument zero is set or a measurement is made to prevent light interferences. Refer to [Figure 5](#).

Figure 4 Sample cell orientation



1 1-cm/10-mL plastic sample cell	4 Orientation mark
2 1-inch (25 mm) glass sample cell	5 Orientation position (clockwise)
3 16-mm glass test vial	6 Sample cell adapter

Figure 5 Sample cell and instrument cap installation

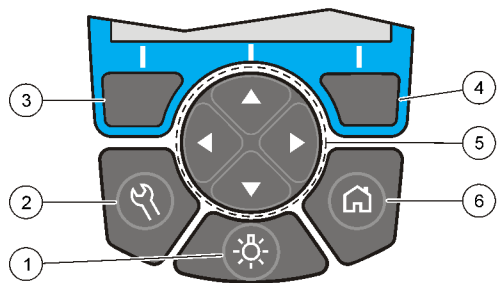


Section 4 User interface and navigation

4.1 Keypad description

Refer to [Figure 6](#) for the keypad description and navigation information.

Figure 6 Keypad description



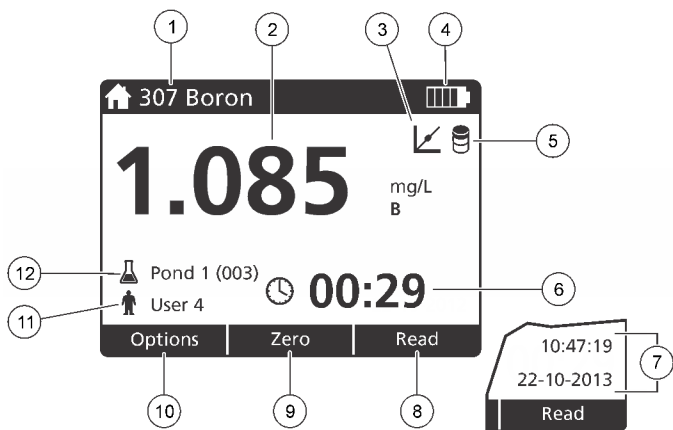
1 BACKLIGHT: set the display illumination to on or off	4 RIGHT selection key (contextual): read sample, selects or confirms options, opens sub-menus
2 SETTINGS: setup options ¹	5 Navigation keys UP, DOWN, RIGHT, LEFT: scroll through menus, enter numbers and letters ²
3 LEFT selection key (contextual): access for options, cancels or exits the current menu screen to the previous one	6 HOME/Options: go to the main reading screen ¹ , select program, data management

4.2 Display description

The reading screen shows the selected mode, unit, date and time, operator ID and sample ID. Refer to [Figure 7](#).

¹ While in an edit mode, the key does not operate.
² When an UP or DOWN key is held, it scrolls fast. When a LEFT or RIGHT key is pushed, it scrolls by page.

Figure 7 Single screen display



1 Program name and number	7 Time and date
2 Reading value, unit, chemical form, under "—" or over measuring range "+++"	8 Read (contextual: done, select, start, ok)
3 Standard adjust icon	9 Zero (contextual: navigation key UP arrow)
4 Battery status	10 Options (contextual: back, cancel)
5 Reagent blank icon	11 Operator identification
6 Timer	12 Sample identification

4.3 Navigation

The instrument contains menus to change various options. Use the navigation keys (**UP**, **DOWN**, **RIGHT** and **LEFT** arrows) to highlight different options. Push the **RIGHT** selection key to select an option. Enter an option value with the navigation keys. Push the navigation keys (**UP**, **DOWN**, **RIGHT** and **LEFT** arrows) to enter or change a value. Push the **RIGHT** arrow to advance to the next space. Push the **RIGHT** selection key under **Done** to accept the value. Push the **LEFT** selection key to exit the current menu screen to the previous one.

Section 5 Startup

5.1 Set the instrument to on or off

Push the **POWER** key to set the instrument to on or off. If the instrument does not power on, make sure that the batteries are correctly installed.

5.2 Set the language

There are two options to set the language:

- Set the display language when the instrument is set to on for the first time.
- Set the language from the **SETTINGS** menu.

1. Push **SETTINGS>Setup>Language**.
2. Select a language from the list.

5.3 Set the date and time

There are two options to set the date and time:

- Set the date and time when the instrument is set to on for the first time.
- Set the date and time from the Date & Time menu.

1. Push **SETTINGS>Setup>Date & Time**.
2. Select **Set Date & Time Format**, then select a format for the date and time.
3. Select **Set Date & Time**.
4. Use the navigation keys to enter the current date and time, then push **OK**.

Section 6 Standard operation

6.1 Program list

The instrument is delivered with a complete series of application programs. Refer to [Table 1](#) for the program descriptions.

Table 1 Program options

Program option	Description
Stored programs	Stored programs are factory-installed, pre-programmed methods. Refer to Select a stored program on page 13.
User programs	Methods can be developed and can be saved as a user program. ³ Refer to User programs on page 16.
Favorites	Methods which are often used can be saved in the favorite list. ¹

6.1.1 Select a stored program

1. Push **HOME>Options>All Programs**.
2. Select the applicable method and push **Start**.
3. Select **Options>Add to Favorites** to add the selected method to favorites for faster access.

6.1.2 Select basic program options

When a program is selected, additional parameter options are available.

1. Push **Options** to access the option menu.
2. Select the applicable options.

Option	Description
Start Timer	Select a pre-set timer or set a manual timer to make sure that the steps of an analysis are correctly timed (e.g., reaction times or wait times can be exactly specified). When the timer is on, the timer icon is shown on the display. The instrument makes an audible sound when the time is over. Pre-set timer —Select the applicable pre-set timer for one or more stored procedure steps and push Start . Timer Manual —Enter the applicable time with the navigation keys and push Done . Default = 00:00
Favorites/User Programs	Select from the stored favorites or user programs list. Refer to Select a favorite or a user program on page 16 for more information.
All Programs	Select a pre-programmed method from the list.
Data Log	Show all saved readings. Refer to Data log on page 15 for more information.

³ A maximum of ten methods (user programs and/or favorites) can be saved.

Option	Description
Add to Favorites	Save stored programs and user programs methods which are often used in the favorites list. Refer to Add a program to favorites on page 16.
%T/Abs/Conc	Switch to % transmittance, absorbance or concentration readings. Transmittance reading (%) —Reads the percent of the original light that passes through the sample and reaches the detector. Absorbance readings —The light absorbed by the sample is read in absorbance units. Concentration readings —The measured absorbance values are converted into concentration values with the program-specific stored equation.
Advanced Options	Use the advanced options to specify more parameters. Refer to Select advanced program options on page 14.
Save	Save the last reading manually when the auto save option is set to Off.

6.1.3 Select advanced program options

Every program has various additional advanced options from which to select.

1. Push **Options** to access **Options>Advanced Options**.
2. Use the advanced options to specify more parameters.

Option	Description
Auto Save	Toggle between On and Off. Every reading is automatically saved when the option is set to On. The reading can be saved manually when the option is set to Off.
Chemical Form	Select the alternate chemical form and the associated measuring range on some factory-installed methods.
Reagent Blank	The Reagent Blank correction can be used with some of the factory-installed methods. Enter the result of a completed test using deionized water as the sample. The blank value is subtracted from every result to correct for any background color due to reagents. Enter the blank correction before the Standard Adjust option is used. Complete this correction for each new lot of test reagents.
Standard Adjust	Change stored calibration. Complete a test on a known standard at a concentration near the top of the test range. Use this function to adjust the result to align the standard concentration.
Sort Program	Select an alphabetical or numerical program order for the stored program list.

6.2 Use an operator ID

The operator ID tag associates readings with an individual operator. All stored data will include this ID.

1. Push **SETTINGS>Operator ID** in the reading screen.
2. Select, create or delete an operator ID:

Option	Description
Current ID	Select an ID from a list. The current ID will be associated with the sample data until a different ID is selected.
Create New ID	Enter a name for a new operator ID. A maximum of 10 names can be entered.
Delete ID	Erase an existing operator ID.

6.3 Use a sample ID

The sample ID tag is used to associate readings with a particular sample or with a location. If assigned, stored data will include this ID.

1. Push **SETTINGS>Sample ID** in the reading screen.
2. Select, create or delete an operator ID:

Option	Description
Current ID	Select an ID from a list. The current ID will be associated with the sample data until a different ID is selected.
Create New ID	Enter a name for a new sample ID. A maximum of 10 names can be entered. The samples are numbered in sequence for each measurement until a different ID is selected (e.g., Pond 1, Pond 2).
Delete ID	Erase an existing sample ID.

6.4 How to do a measurement

Basic measurement steps are necessary to complete a measurement. Every method has a step-by-step procedure. Refer to the applicable method to run a specific test. The example that follows is a basic procedure to complete a measurement.

1. Select the applicable program from the programs menu (e.g., Stored Programs, User Programs, Favorites).
2. Install the cell adapter, if necessary.
3. Push **Start** to start the program.
4. Prepare the blank according to the method document. Close the sample cell and clean the optical faces of the sample cell with a lint-free cloth.
5. Insert the blank sample cell into the cell compartment. Make sure to install the blank sample cell in the correct and in a consistent orientation so that the results are more repeatable and precise. Refer to [Figure 4](#) on page 9.
6. Close the instrument cap to prevent light interferences. Refer to [Figure 5](#) on page 10.
7. Push **Zero**. The display shows a concentration of zero (e.g., mg/L, ABS, µg/L).
8. Prepare the sample. Add reagents as specified by the method document.
9. Select **Options>Start Timer** to use the stored timers within the program.
10. Close the sample cell and clean the optical surfaces of the cell with a lint-free cloth
11. Insert the sample into the cell compartment. Make sure to install the sample cell in the correct and in a consistent orientation so that the results are more repeatable and precise. Refer to [Figure 4](#) on page 9.
12. Close the instrument cap to prevent light interferences. Refer to [Figure 5](#) on page 10.
13. Push **Read**. The display shows the results in the selected units.

Note: The display shows "+++" or "---" if the measured absorbance is less or more than the calibration range of the test.

6.5 Data log

The data log shows all saved readings. Push **HOME>Options>Data Log** to see the readings. Refer to [Export the data log](#) on page 19 for information about the data log export.

Section 7 Advanced operation

7.1 Select a favorite or a user program

The favorite and user programs database is empty when the instrument is started for the first time. A method can be saved in the favorites for faster access. A user program can be programmed for specific needs.

1. Push **HOME>Options>Favorites/User Programs>Select**.
2. Push **New Program** to make a new user program. Refer to [User programs](#) on page 16.

7.2 Add a program to favorites

Stored programs and user programs methods which are often used can be saved in the favorites list.

1. Select **HOME>Options>All Programs**.
2. Select the applicable method and push **Start**.
3. Select **Options>Add to Favorites** to add the selected method to favorites.

7.3 User programs

The user programs database is empty when the instrument is started for the first time. Use **New Program** to make new programs for specific needs. To make a new user program, do the steps that follow.

1. Push **HOME>Options>Favorites/User Programs>Select>New Program**.
2. Select an available program number from 1001 to 1010.
Note: A maximum of ten programs (user programs and/or favorites) can be saved.
3. Enter a method name (up to 12 characters).
4. Select the wavelength: 420, 520, 560 or 610 nm.
5. Select the unit: None, µg/L, mg/L or g/L.
6. Select the resolution: 0000, 000.0, 00.00 or 0.000.
7. Add the calibration points: a minimum of 2 and a maximum of 12 calibration points.⁴ Select **Edit Std 1** and enter the first standard concentration value. Push **Done**.
Note: A beep means that the concentration is a duplicate of a previously entered standard or the concentration is too high for the selected resolution. Enter a different value and continue.
8. Enter the absorbance value:

Option	Description
Edit ABS Manual	Use the navigation keys to enter the absorbance value manually.
Edit ABS Auto	<ol style="list-style-type: none">1. Put the blank into the cell holder and push Zero.2. Put the prepared sample into the cell holder and push Read.3. Push Done.

Note: A beep means that the absorbance is a duplicate of a previously entered standard or that it falls between two previous standards. Enter a different value and continue.

9. Push **Done**.
10. Select **Add Cal Point**.

⁴ If the curve is known to be linear, only two concentration data points (e.g., a standard with zero absorbance and another known standard) are necessary. Use additional data points to confirm linearity or define a nonlinear curve.

11. Enter additional calibration points as described in steps 7–9.

12. Select **Save User Program**.

7.3.1 Edit a user program

To edit a stored user program:

1. Select **HOME>Favorites/User Programs**.
2. Select the applicable program and push **Options**.
3. Push **Edit**.
4. Obey the screen prompts to edit the procedure.

7.3.2 Delete a user or a favorite program

Delete a stored user or favorite program if the program is not used anymore.

1. Select **HOME>Options>Favorites/User Programs**.
2. Highlight the applicable program and push **Options>Delete** and obey the screen prompts.

7.4 Instrument information

The instrument information menu shows specific information such as the instrument name, serial number, software version, database version, memory used and program availability. Push **SETTINGS>Instrument Information**.

7.5 Set the password

The password settings options are used to prevent access to restricted menus.

Note: If the specified password is forgotten and Security Options is set to on, the operator is locked out of the restricted menus. Contact technical support if the password is forgotten.

1. Push **SETTINGS>Setup>Password Settings**.
2. Select an option.

Option	Description
Password Settings	Select On or Off to set the password protection to on or off.
Protected Items	Shows the list of protected items: edit operator ID, edit sample ID, edit user programs, date & time, upgrade firmware, upgrade methods, language and edit favorites list.

7.6 Set the display and sound

Use the display options to change the display contrast, the battery auto-shutoff options or the backlight option. Use the sound options for an audible sound when a key is pushed or a reading is complete.

1. Push **SETTINGS>Setup>Display & Sound>Display Options**.
2. Select an option.

Option	Description
Contrast	Adjust the display contrast. The lightest setting is 0 and the darkest setting is 9. Default: 5

Option	Description
Auto-Shutoff	To maximize battery life, set a time period after which the instrument will automatically set the power to off if no key is pushed (5, 10, 15, 20, 30 minutes, 1 hour, 2 hours or Disable). Default: 10 minutes
Backlight	The display backlight is set to on when BACKLIGHT is pushed. Set a time period after which the backlight will automatically power off if no key is pushed (10, 20, 30 seconds, 1, 2, 5, 10 minutes or Disable). Default: 1 minute

3. Push **SETTINGS>Setup>Display & Sound>Sounds**.

4. Select an option.

Option	Description
Keystroke	The instrument will make an audible sound whenever a key is pushed. Default: off
Reading Complete	The instrument will make an audible sound whenever a reading is complete. Default: on

7.7 USB main menu

When the instrument is connected with a USB cable to a computer, the USB Main Menu opens. Update the software, export or import programs or export the data log and event log from the USB Main Menu.

7.7.1 Update the firmware

Find the firmware upgrade file on the product website or contact the instrument supplier. Save the file from the website to the computer.

1. Set the instrument to on and connect the USB cable to the instrument and to the computer. The USB Main Menu prompts.
2. Select **Update DR900**.
The instrument shows as a USB drive on the computer. Open the folder.
3. Copy the file DR900.bin to the open folder.
4. Push **Ok**.
5. When the update is done, push **Ok**.
6. Select **Disconnect USB**, push **Ok** and disconnect the USB cable.
7. Push **Ok**.
8. Restart the instrument.

7.7.2 Manage programs

With the Manage Programs function, user programs can be exported and/or imported and new factory programs can be imported.

1. Set the instrument to on and connect the USB cable to the instrument and to the computer. The USB Main Menu prompts.
2. Select **Manage Programs** and select an option:

Option	Description
Export User Programs	Export all user programs to the computer for storage or to move the user programs to another DR 900.

Option	Description
Import User Programs	Replace all user programs with the user programs from another DR 900 via computer.
Import Factory Programs	Import new factory programs from the manufacturer website.

The instrument shows as a USB drive on the computer. Open the folder.

3. Copy the export file from drive to the computer or copy the import file from the computer to the drive.
4. Push **Ok**.
5. When the transfer is done, select **Disconnect USB** and disconnect the USB cable.
6. Push **Ok**.

7.7.3 Export the data log

The event log and the data log can be exported to the computer. The event log contains the date, time, event number, parameter and the description of a configuration related action. Sample measurements are stored manually or automatically in the data log. Refer to [Select advanced program options](#) on page 14.

1. Set the instrument to on and connect the USB cable to the instrument and to the computer. The USB Main Menu prompts.
2. Select **Export Datalog**.
The instrument shows as a USB drive on the computer. Open the folder.
3. Copy and save the export files (DR900_DataLog.csv and DR900_EventLog.csv) to the computer.
4. Push **Ok**.
5. When the files are copied to the computer, select **Disconnect USB** and disconnect the USB cable.
6. Push **Ok**.

Section 8 Maintenance

⚠ WARNING



Multiple hazards. Only qualified personnel must conduct the tasks described in this section of the document.

8.1 Clean the instrument

Clean the exterior of the instrument with a moist cloth and a mild soap solution and then wipe the instrument dry as necessary.

8.2 Clean the sample cells

⚠ CAUTION



Chemical exposure hazard. Obey laboratory safety procedures and wear all of the personal protective equipment appropriate to the chemicals that are handled. Refer to the current safety data sheets (MSDS/SDS) for safety protocols.

⚠ CAUTION



Chemical exposure hazard. Dispose of chemicals and wastes in accordance with local, regional and national regulations.

Most laboratory detergents are used at recommended concentrations. Neutral detergents, such as Liquinox, are safer to use when regular cleaning is necessary. To decrease the cleaning times, increase the temperature or use an ultrasonic bath. To complete the cleaning, rinse a few times with deionized water and then let the sample cell air dry.

Sample cells may also be cleaned with acid, followed by a thorough rinse with deionized water.

Note: Always use acid to clean sample cells that were used for low-level metal tests.

Special cleaning methods are necessary for individual procedures. When a brush is used to clean sample cells, take extra care to avoid scratches on the interior surfaces of the sample cells.

8.3 Replace the batteries

⚠ WARNING



Explosion hazard. Expired batteries can cause hydrogen gas buildup inside the instrument. Replace the batteries before they expire and do not store the instrument for long periods with the batteries installed.

⚠ WARNING



Fire hazard. Battery substitution is not permitted. Use only alkaline batteries.

NOTICE

Make sure to tighten the screws to 1–1.4 N·m (9–12 in.·lb) for a correct seal fit and to maintain the enclosure environmental rating.

Refer to [Install the batteries](#) on page 7 for battery replacement.

Section 9 Troubleshooting

Error code	Possible cause	Solution
1	Instrument is not configured.	Contact technical support.
2	Could not read program data	
3	Could not write program data	
4	Battery error	Replace the batteries.
5	A/D error during a measurement	Contact technical support.
6	Offset error during a measurement	Make sure that the instrument cap is correctly installed.

Error code	Possible cause	Solution
7	Low light error during a measurement	<ul style="list-style-type: none"> • Make sure that there is no light path blockage. • Zero is out of instrument range • Contact technical support.
8	Over range error during a measurement, a potential light blockage or the concentration is too high	<ul style="list-style-type: none"> • Make sure that there is no light path blockage and that the concentration is not too high for the program. • Make sure that the instrument cap is correctly installed. • Contact technical support.

Section 10 Replacement parts and accessories

⚠ WARNING



Personal injury hazard. Use of non-approved parts may cause personal injury, damage to the instrument or equipment malfunction. The replacement parts in this section are approved by the manufacturer.

Note: Product and Article numbers may vary for some selling regions. Contact the appropriate distributor or refer to the company website for contact information.

Replacement parts

Description	Item no.
Adapter assembly, COD	4846400
Battery set, AA alkaline batteries (4x)	1938004
Sample cell with cap, 25 x 95 mm, 10-20-25 mL (6x)	2401906
Sample cell with cap, 1 cm/10 mL (2x)	4864302
USB cable	LZV818

Accessories

Description	Item no.
Cap, sample cell, for 25 x 95 mL cell	2401812
Carrying case, hard-sided	4942500
Carrying case, soft-sided with shoulder strap	2722000
Carrying case, portable laboratory	4943000
DR/Check™ absorbance standards	2763900
Instrument cap, DR 900	9390500

HI98127 (pHep®4) · HI98128 (pHep®5)

pH and Temperature Testers

- **Waterproof**
 - Designed to float if accidentally dropped in a tank
- **Automatic Temperature Compensation**
 - All readings are compensated for variations in temperature
 - Temperature displayed in °C or °F along with pH reading
- **Stability indicator**
 - Meter displays a clock tag that will disappear when the reading has achieved stability
- **HOLD button**
 - Freezes reading on the display to allow recording of measurement
- **BEPS (Battery Error Prevention System)**
 - Meter will automatically shut off if there is not enough power to get an accurate measurement
- **Battery % level at startup**
- **Low Battery Indicator**
- **Automatic Shut-Off**
 - The meter can be set to automatically turn off after 8 minutes or 60 minutes to conserve battery life in the event that the meter is left on. The auto off feature can be disabled.



The pHep®4 and pHep®5 are waterproof pH testers that have many advanced features found in more expensive portable instrumentation. These ergonomic meters feature automatic one or two point calibration to a known buffer, automatic temperature compensation, battery percent level indicator at start up, and a stability indicator to alert the user when a stable reading has been obtained. The large multi level LCD display shows both pH and temperature simultaneously.



These meters also feature the HI73127 replaceable electrode with a stainless steel round connector and extendable cloth junction. This cartridge design has no pins to line up or that can break.

Specifications		HI98127 (pHep®4)	HI98128 (pHep®5)
pH	Range	-2.0 to 16.0 pH	-2.00 to 16.00 pH
	Resolution	0.1 pH	0.01 pH
	Accuracy	±0.1 pH	±0.05 pH
Temperature	Range	-5.0 to 60.0°C / 23.0 to 140.0°F	-5.0 to 60.0°C / 23.0 to 140.0°F
	Resolution	0.1°C / 0.1°F	0.1°C / 0.1°F
	Accuracy	±0.5°C / ±1°F	±0.5°C / ±1°F
Additional Specifications	pH Calibration	automatic, one or two-point with two sets of standard buffers (pH 4.01 / 7.01 / 10.01 or pH 4.01 / 6.86 / 9.18)	
	Temperature Compensation	automatic	
	Battery Type / Life	1.5V (4) / approx. 300 hours of continuous use; auto-off after 8 minutes of non-use	
	Environment	-5 to 50°C (23 to 122°F); RH max 100%	
	Dimensions	163 x 40 x 26 mm (6.4 x 1.6 x 1.0")	
	Weight	100 g (3.5 oz.)	
Ordering Information		HI98127 (pHep®4) and HI98128 (pHep®5) are supplied with HI73127 pH electrode, HI73128 electrode removal tool, batteries and instructions.	

Water Quality Meters

Oakton Waterproof pH 150 and CON 150 Meters

Oakton Waterproof 150 Meters are easy-to-use handheld meters for measuring water quality parameters in the lab, plant or field. All meters have an IP-67 waterproof rating, best value for IP-67 rated waterproof meters!

FEATURES

- Rugged, accurate, and reliable
- Get more data at a glance – view measurement with temperature on large, three-line LCD
- Store up to 150 measurements along with temperature via built-in memory
- Know when to recalibrate – calibration alarm reminds you when it is time to recalibrate
- Get more accurate readings – selectable manual or automatic temperature compensation (ATC) eliminates temperature effects on readings
- Selectable °C or °F to best fit your application
- Convenient hold function, ready indicator, automatic shut-off, and battery life indicator
- Intuitive, user-friendly icons show electrode status as pH slope or cell constant
- Keep hands free with built-in stand—ideal for benchtop or long-term use
- Save on bench space with wall-mount option
- Quickly and easily secure the electrode to your beaker or container with Grip-Clip™ holder
- Operates for 700 hours continuous in the field with batteries; optional AC adapter for benchtop measurements

pH 150

- Six-point pH calibration—choose from USA, NIST, or DIN buffer sets
- Auto buffer recognition automatically identifies the correct pH buffer for rapid calibration
- mV offset for calibration to ORP standards, zeroing mV value, and pH diagnostics
- Compatible with pH electrodes having a BNC connector
- Meter includes Grip-Clip holder and batteries; meter with probe adds on electrode (12101034); kit further adds buffers, solutions, and hard carrying case

CON 150

- Autoranging across five ranges for fast response and best resolution over a wide range
- Auto-cal features one calibration point per each conductivity range – provides $\pm 1\%$ full-scale accuracy
- Select a probe with a 0.1, 1.0, or 10 cell constant
- Adjustable conductivity-to-TDS conversion factor from 0.4 to 1.0
- Temperature coefficient from 0.0 to 10.0%/°C
- Meter with probe includes cell (12101033), Grip-Clip holder, and batteries; kit adds on calibration solutions and hard carrying case



CALL GEOTECH TODAY (800) 833-7958

Geotech Environmental Equipment, Inc.

2650 East 40th Avenue • Denver, Colorado 80205

(303) 320-4764 • (800) 833-7958 • FAX (303) 322-7242

email: sales@geotechenv.com website: www.geotechenv.com

Water Quality Meters



Oakton Waterproof pH 150 and CON 150 Meters

SPECIFICATIONS

	Range	Resolution	Accuracy	Calibration
pH 150				
pH	–2.00 to 16.00 pH	0.01 pH	±0.01 pH	Up to six points: USA, NIST, DINr
mV	±2000 mV	0.1 mV ±999.9 mV; 1 mV beyond	±0.2 mV ±2 LSD or ±0.5% of reading; whichever is greater	±200 mV
Temperature	–17.0 to 230.0°F (–10.0 to 110.0°C)	0.1°F/°C	±0.9°F (±0.5°C)	Offset 0.1 increments
CON 150				
Conductivity	0 to 200 mS	0.01 µS to 0.1 mS	±1% full-scale	Auto/manual; 1 point/range
TDS	0 to 200 ppt	0.01 ppm to 0.1 ppt	±1% full-scale	Auto/manual; 1 point/range
Temperature	–17.0 to 230.0°F (–10.0 to 110.0°C)	0.1°F/°C	±0.9°F (±0.5°C)	Offset 0.1 increments

All Meters

Temperature Compensation	Automatic or manual from –10 to 110°C
Data Logging	Stores up to 150 data sets
Power	Two AA batteries (included), universal power adapter (optional)

ORDERING INFORMATION

Meters

Description	Oakton Part No.	Geotech Part No.
pH 150 Meter Only	WD-35614-32	72101076
pH 150 Meter with Probe	WD-35614-30	72101077
pH 150 Meter Kit	WD-35614-90	–
CON 150 Meter with Probe	WD-35607-32	72101079
CON 150 Meter Kit	WD-35607-90	–

Accessories

Description	Oakton Part No.	Geotech Part No.
Replacement "All-in-One" pH Electrode	WD-35808-71	12101034
"All-in-One" pH Electrode	WD-35808-72	12101075
ATC Probe	WD-35618-05	72101031
Conductivity Cell, K=0.1	WD-35608-55	–
Replacement Conductivity Cell, K=1.0	WD-35608-50	12101033
Conductivity Cell, K=10	WD-35608-51	–
Replacement Grip-Clip Holder	WD-35614-50	–
Hard Carrying Case	WD-35614-51	12101272
Optional Power Adapter, 110/220 VAC	WD-35420-72	–

CALL GEOTECH TODAY (800) 833-7958

Geotech Environmental Equipment, Inc.

2650 East 40th Avenue • Denver, Colorado 80205

(303) 320-4764 • **(800) 833-7958** • FAX (303) 322-7242

email: sales@geotechenv.com website: www.geotechenv.com

ATTACHMENT B

Field Reporting Form – Week of March 3, 2025



Project Name	MSC - Canfield OH
Project Number	JY2380.372
Report Date	3/5/2025
Field Personnel	E.Webber

Pre Rain (Base Flow) - Ditch Samples

Sample Name	Date	Time	DR 900 Test Results (Free Cyanide)
T2-0	3/4/2025	4:40 PM	0.136 mg/L
T2-100	3/4/2025	4:35 PM	0.12 mg/L
T2-250	3/4/2025	4:30 PM	0.17 mg/L
T-1050 (under the liner)	3/4/2025	5:00 PM	350 mg/L

Post Rain - Ditch Samples

Sample Name	Date	Time	DR 900 Test Results (Free Cyanide)
T2-0	3/5/2025	7:50 AM	1.8 mg/L
T2-100	3/5/2025	7:45 AM	0.156 mg/L
T2-250	3/5/2025	7:40 AM	0.5 mg/L

Weather Conditions

Field Observations

Storm Start Time: 6:00 am

Pre Rain Weather Conditions:

45° F. Wind 8-10 mph

Post Rain Weather Conditions:

50° F. Wind 10-24 mph

Rainfall Amount: 0.32"

NOTE: Weather Conditions were obtained from Weather Underground
(<https://www.wunderground.com/weather/us/oh/canfield/41.02,-80.76>)

ATTACHMENT C

Laboratory Analytical Report

ANALYTICAL REPORT

PREPARED FOR

Attn: Kain Lager-Lowe
August Mack Environmental, Inc.
7830 North Central Drive, Suite B
Lewis Center, Ohio 43035

Generated 3/6/2025 6:24:59 PM

JOB DESCRIPTION

MSC Canfield - SW Sampling

JOB NUMBER

240-219893-1

Eurofins Cleveland

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

Authorization



Generated
3/6/2025 6:24:59 PM

Authorized for release by
Nicole Kalis, Project Manager I
Nicole.Kalis@et.eurofinsus.com
(330)497-9396



Table of Contents

Cover Page	1
Table of Contents	3
Definitions/Glossary	4
Case Narrative	5
Method Summary	6
Sample Summary	7
Detection Summary	8
Client Sample Results	9
QC Sample Results	16
QC Association Summary	17
Lab Chronicle	18
Certification Summary	19
Chain of Custody	20

Definitions/Glossary

Client: August Mack Environmental, Inc.
Project/Site: MSC Canfield - SW Sampling

Job ID: 240-219893-1

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: August Mack Environmental, Inc.
Project: MSC Canfield - SW Sampling

Job ID: 240-219893-1

Job ID: 240-219893-1

Eurofins Cleveland

Job Narrative 240-219893-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable.

- Matrix QC may not be reported if insufficient sample is provided or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt

The samples were received on 3/5/2025 2:05 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 4.6°C.

General Chemistry

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Eurofins Cleveland

Method Summary

Client: August Mack Environmental, Inc.
Project/Site: MSC Canfield - SW Sampling

Job ID: 240-219893-1

Method	Method Description	Protocol	Laboratory
Kelada 01	Cyanide, Total, Acid Dissociable and Thiocyanate	EPA	EET CLE

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

EET CLE = Eurofins Cleveland, 180 S. Van Buren Avenue, Barberton, OH 44203, TEL (330)497-9396

Sample Summary

Client: August Mack Environmental, Inc.
Project/Site: MSC Canfield - SW Sampling

Job ID: 240-219893-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-219893-1	T2-0-SW-PRE	Water	03/04/25 16:40	03/05/25 14:05
240-219893-2	T2-100-SW-PRE	Water	03/04/25 16:35	03/05/25 14:05
240-219893-3	T2-250-SW-PRE	Water	03/04/25 16:30	03/05/25 14:05
240-219893-4	T-1050-SW-PRE	Water	03/04/25 17:00	03/05/25 14:05
240-219893-5	T2-250-SW-POST	Water	03/05/25 07:40	03/05/25 14:05
240-219893-6	T2-100-SW-POST	Water	03/05/25 07:45	03/05/25 14:05
240-219893-7	T2-0-SW-POST	Water	03/05/25 07:50	03/05/25 14:05

Detection Summary

Client: August Mack Environmental, Inc.
Project/Site: MSC Canfield - SW Sampling

Job ID: 240-219893-1

Client Sample ID: T2-0-SW-PRE

Lab Sample ID: 240-219893-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cyanide, Total	0.23		0.025	0.014	mg/L	5		Kelada 01	Total/NA

Client Sample ID: T2-100-SW-PRE

Lab Sample ID: 240-219893-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cyanide, Total	0.57		0.025	0.014	mg/L	5		Kelada 01	Total/NA

Client Sample ID: T2-250-SW-PRE

Lab Sample ID: 240-219893-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cyanide, Total	0.47		0.025	0.014	mg/L	5		Kelada 01	Total/NA

Client Sample ID: T-1050-SW-PRE

Lab Sample ID: 240-219893-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cyanide, Total	550		20	11	mg/L	4000		Kelada 01	Total/NA

Client Sample ID: T2-250-SW-POST

Lab Sample ID: 240-219893-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cyanide, Total	2.8		0.50	0.28	mg/L	100		Kelada 01	Total/NA

Client Sample ID: T2-100-SW-POST

Lab Sample ID: 240-219893-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cyanide, Total	0.59		0.50	0.28	mg/L	100		Kelada 01	Total/NA

Client Sample ID: T2-0-SW-POST

Lab Sample ID: 240-219893-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cyanide, Total	0.29		0.050	0.028	mg/L	10		Kelada 01	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cleveland

Client Sample Results

Client: August Mack Environmental, Inc.
Project/Site: MSC Canfield - SW Sampling

Job ID: 240-219893-1

Client Sample ID: T2-0-SW-PRE

Lab Sample ID: 240-219893-1

Date Collected: 03/04/25 16:40

Matrix: Water

Date Received: 03/05/25 14:05

General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total (EPA Kelada 01)	0.23		0.025	0.014	mg/L			03/06/25 15:49	5

Client Sample Results

Client: August Mack Environmental, Inc.
Project/Site: MSC Canfield - SW Sampling

Job ID: 240-219893-1

Client Sample ID: T2-100-SW-PRE

Lab Sample ID: 240-219893-2

Date Collected: 03/04/25 16:35

Matrix: Water

Date Received: 03/05/25 14:05

General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total (EPA Kelada 01)	0.57		0.025	0.014	mg/L			03/06/25 15:53	5

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13

Client Sample Results

Client: August Mack Environmental, Inc.
Project/Site: MSC Canfield - SW Sampling

Job ID: 240-219893-1

Client Sample ID: T2-250-SW-PRE

Lab Sample ID: 240-219893-3

Date Collected: 03/04/25 16:30

Matrix: Water

Date Received: 03/05/25 14:05

General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total (EPA Kelada 01)	0.47		0.025	0.014	mg/L			03/06/25 15:56	5

Client Sample Results

Client: August Mack Environmental, Inc.
Project/Site: MSC Canfield - SW Sampling

Job ID: 240-219893-1

Client Sample ID: T-1050-SW-PRE

Lab Sample ID: 240-219893-4

Date Collected: 03/04/25 17:00

Matrix: Water

Date Received: 03/05/25 14:05

General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total (EPA Kelada 01)	550		20	11	mg/L			03/06/25 16:38	4000

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13

Client Sample Results

Client: August Mack Environmental, Inc.
Project/Site: MSC Canfield - SW Sampling

Job ID: 240-219893-1

Client Sample ID: T2-250-SW-POST

Lab Sample ID: 240-219893-5

Date Collected: 03/05/25 07:40

Matrix: Water

Date Received: 03/05/25 14:05

General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total (EPA Kelada 01)	2.8		0.50	0.28	mg/L			03/06/25 15:39	100

Client Sample Results

Client: August Mack Environmental, Inc.
Project/Site: MSC Canfield - SW Sampling

Job ID: 240-219893-1

Client Sample ID: T2-100-SW-POST

Lab Sample ID: 240-219893-6

Date Collected: 03/05/25 07:45

Matrix: Water

Date Received: 03/05/25 14:05

General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total (EPA Kelada 01)	0.59		0.50	0.28	mg/L			03/06/25 15:42	100

Client Sample Results

Client: August Mack Environmental, Inc.
Project/Site: MSC Canfield - SW Sampling

Job ID: 240-219893-1

Client Sample ID: T2-0-SW-POST

Lab Sample ID: 240-219893-7

Date Collected: 03/05/25 07:50

Matrix: Water

Date Received: 03/05/25 14:05

General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total (EPA Kelada 01)	0.29		0.050	0.028	mg/L			03/06/25 16:42	10

QC Sample Results

Client: August Mack Environmental, Inc.
Project/Site: MSC Canfield - SW Sampling

Job ID: 240-219893-1

Method: Kelada 01 - Cyanide, Total, Acid Dissociable and Thiocyanate

Lab Sample ID: MB 240-647191/55

Matrix: Water

Analysis Batch: 647191

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	ND		0.0050	0.0028	mg/L			03/06/25 15:00	1

Lab Sample ID: LCS 240-647191/56

Matrix: Water

Analysis Batch: 647191

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Cyanide, Total	0.654	0.649		mg/L		99	90 - 110

Lab Sample ID: MRL 240-647191/17

Matrix: Water

Analysis Batch: 647191

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
Cyanide, Total	0.00500	0.00553		mg/L		111	70 - 130

QC Association Summary

Client: August Mack Environmental, Inc.
Project/Site: MSC Canfield - SW Sampling

Job ID: 240-219893-1

General Chemistry

Analysis Batch: 647191

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-219893-1	T2-0-SW-PRE	Total/NA	Water	Kelada 01	
240-219893-2	T2-100-SW-PRE	Total/NA	Water	Kelada 01	
240-219893-3	T2-250-SW-PRE	Total/NA	Water	Kelada 01	
240-219893-4	T-1050-SW-PRE	Total/NA	Water	Kelada 01	
240-219893-5	T2-250-SW-POST	Total/NA	Water	Kelada 01	
240-219893-6	T2-100-SW-POST	Total/NA	Water	Kelada 01	
240-219893-7	T2-0-SW-POST	Total/NA	Water	Kelada 01	
MB 240-647191/55	Method Blank	Total/NA	Water	Kelada 01	
LCS 240-647191/56	Lab Control Sample	Total/NA	Water	Kelada 01	
MRL 240-647191/17	Lab Control Sample	Total/NA	Water	Kelada 01	

Lab Chronicle

Client: August Mack Environmental, Inc.
Project/Site: MSC Canfield - SW Sampling

Job ID: 240-219893-1

Client Sample ID: T2-0-SW-PRE

Lab Sample ID: 240-219893-1

Date Collected: 03/04/25 16:40

Matrix: Water

Date Received: 03/05/25 14:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	Kelada 01		5	647191	VH6H	EET CLE	03/06/25 15:49

Client Sample ID: T2-100-SW-PRE

Lab Sample ID: 240-219893-2

Date Collected: 03/04/25 16:35

Matrix: Water

Date Received: 03/05/25 14:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	Kelada 01		5	647191	VH6H	EET CLE	03/06/25 15:53

Client Sample ID: T2-250-SW-PRE

Lab Sample ID: 240-219893-3

Date Collected: 03/04/25 16:30

Matrix: Water

Date Received: 03/05/25 14:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	Kelada 01		5	647191	VH6H	EET CLE	03/06/25 15:56

Client Sample ID: T-1050-SW-PRE

Lab Sample ID: 240-219893-4

Date Collected: 03/04/25 17:00

Matrix: Water

Date Received: 03/05/25 14:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	Kelada 01		4000	647191	VH6H	EET CLE	03/06/25 16:38

Client Sample ID: T2-250-SW-POST

Lab Sample ID: 240-219893-5

Date Collected: 03/05/25 07:40

Matrix: Water

Date Received: 03/05/25 14:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	Kelada 01		100	647191	VH6H	EET CLE	03/06/25 15:39

Client Sample ID: T2-100-SW-POST

Lab Sample ID: 240-219893-6

Date Collected: 03/05/25 07:45

Matrix: Water

Date Received: 03/05/25 14:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	Kelada 01		100	647191	VH6H	EET CLE	03/06/25 15:42

Client Sample ID: T2-0-SW-POST

Lab Sample ID: 240-219893-7

Date Collected: 03/05/25 07:50

Matrix: Water

Date Received: 03/05/25 14:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	Kelada 01		10	647191	VH6H	EET CLE	03/06/25 16:42

Laboratory References:

EET CLE = Eurofins Cleveland, 180 S. Van Buren Avenue, Barberton, OH 44203, TEL (330)497-9396

Eurofins Cleveland

Accreditation/Certification Summary

Client: August Mack Environmental, Inc.
Project/Site: MSC Canfield - SW Sampling

Job ID: 240-219893-1

Laboratory: Eurofins Cleveland

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Connecticut	State	PH-0806	12-31-26
Georgia	State	4062	02-27-26
Illinois	NELAP	200004	08-31-25
Iowa	State	421	06-01-25
Kansas	NELAP	E-10336	01-31-26
Kentucky (WW)	State	KY98016	12-31-25
Minnesota	NELAP	039-999-348	12-31-25
New Hampshire	NELAP	225024	09-30-25
New Jersey	NELAP	OH001	07-03-25
New York	NELAP	10975	04-01-25
Ohio	State	8303	11-04-25
Ohio VAP	State	ORELAP 4062	02-28-26
Oregon	NELAP	4062	02-27-26
Pennsylvania	NELAP	68-00340	08-31-25
Texas	NELAP	T104704517-22-19	08-31-25
USDA	US Federal Programs	P330-18-00281	01-05-27
Virginia	NELAP	460175	09-14-25
West Virginia DEP	State	210	12-31-25
Wisconsin	State	399167560	08-31-25

Regulatory Program: ☒ DW ☐ NPDES ☐ RCRA ☐ Other:

240-219893 COC

Eurofins - Cleveland Sample Receipt Form/Narrative		Login # : _____
Barberton Facility		
Client <u>Allyus Judd Environmental</u>	Cooler unpacked by <u>JC</u>	
Cooler Received on <u>3-5-25</u>	Opened on <u>3-5-25</u>	
FedEx, 1 st Grd Exp <u>UPS FAS Waypoint</u>	Client Drop Off <u>Eurofins Courier</u> Other _____	
Receipt After-hours Drop-off Date/Time _____		Storage Location _____
Eurofins Cooler # <u>EC</u>	Foam Box _____	Client Cooler _____
Packing material used: <u>Bubble Wrap</u>	Foam _____	Plastic Bag <u>None</u>
<u>COOLANT</u> <u>Wet Ice</u>	Blue Ice _____	Dry Ice _____
Water _____	None _____	Other _____
1 Cooler temperature upon receipt _____	<input type="checkbox"/> See Multiple Cooler Form	
IR GUN # <u>13</u> (of <u>0.0</u> °C)	Observed Cooler Temp. <u>4.6</u> °C	Corrected Cooler Temp <u>4.6</u> °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity _____		
-Were the seals on the outside of the cooler(s) signed & dated? Yes <u>No</u> No <u>NA</u>		
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/Methg)? Yes <u>No</u> No <u>NA</u>		
-Were tamper/custody seals intact and uncompromised? Yes <u>No</u> No <u>NA</u>		
3 Shippers' packing slip attached to the cooler(s)? Yes <u>No</u> No <u>NA</u>		
4. Did custody papers accompany the sample(s)? Yes <u>No</u> No <u>NA</u>		
5 Were the custody papers relinquished & signed in the appropriate place? Yes <u>No</u> No <u>NA</u>		
6 Was/were the person(s) who collected the samples clearly identified on the COC? Yes <u>No</u> No <u>NA</u>		
7 Did all bottles arrive in good condition (Unbroken)? Yes <u>No</u> No <u>NA</u>		
8 Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes <u>No</u> No <u>NA</u>		
9 For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)? Yes <u>No</u> No <u>NA</u>		
10 Were correct bottle(s) used for the test(s) indicated? Yes <u>No</u> No <u>NA</u>		
11 Sufficient quantity received to perform indicated analyses? Yes <u>No</u> No <u>NA</u>		
12 Are these work share samples and all listed on the COC? Yes <u>No</u> No <u>NA</u>		
13 If yes, Questions 13-17 have been checked at the originating laboratory		
13 Were all preserved sample(s) at the correct pH upon receipt? Yes <u>No</u> No <u>NA</u> pH Strip Lot# HC448976		
14 Were VOAs on the COC? Yes <u>No</u> No <u>NA</u>		
15 Were air bubbles >6 mm in any VOA vials? <u>Yes</u> Larger than this Yes <u>No</u> No <u>NA</u>		
16 Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____ Yes <u>No</u> No <u>NA</u>		
17 Was a LL Hg or Me Hg trip blank present? Yes <u>No</u> No <u>NA</u>		
Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other _____		
Concerning _____		
18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES <input type="checkbox"/> additional next page		Samples processed by: _____
19. SAMPLE CONDITION		
Sample(s) _____ were received after the recommended holding time had expired		
Sample(s) _____ were received in a broken container		
Sample(s) _____ were received with bubble >6 mm in diameter (Notify PM)		
20. SAMPLE PRESERVATION		
Sample(s) _____ were further preserved in the laboratory		
Time preserved. _____ Preservative(s) added/Lot number(s): _____		
VOA Sample Preservation - Date/Time VOAs Frozen _____		

Temperature readings.

Client Sample ID	Lab ID	Container Type	Container			Preservation	Preservation
			pH	Temp	Added		
T2-0-SW-PRE	240-219893-A-1	Amber Plastic 125 mL - NaOH	>12	_____	_____	_____	_____
T2-100-SW-PRE	240-219893-A-2	Amber Plastic 125 mL - NaOH	>12	_____	_____	_____	_____
T2-250-SW-PRE	240-219893-A-3	Amber Plastic 125 mL - NaOH	>12	_____	_____	_____	_____
T-1050-SW-PRE	240-219893-A-4	Amber Plastic 125 mL - NaOH	>12	_____	_____	_____	_____
T2-250-SW-POST	240-219893-A-5	Amber Plastic 125 mL - NaOH	>12	_____	_____	_____	_____
T2-100-SW-POST	240-219893-A-6	Amber Plastic 125 mL - NaOH	>12	_____	_____	_____	_____
T2-0-SW-POST	240-219893-A-7	Amber Plastic 125 mL - NaOH	>12	_____	_____	_____	_____

ATTACHMENT B

Ditch IM Weekly Inspection Log

**Ditch IM Operation & Maintenance Plan
Weekly Inspection Log**

Inspector: _____ Date: _____ Time: _____

Weather: _____

Checklist:

Entire length of the Ditch IM transversed: Yes _____ No _____

1. Any displacement of liner stone observed? Yes _____ No _____

Describe location of stone displacement: _____

If displacement of liner stone is observed greater than a 1-foot area, document with pictures, and follow instructions in the O&M Plan to replace a minimum of 4 inches of OH DOT #1 stone or a sufficient thickness of rip-rap, as applicable, and document here when replaced. Document the stone replacement with pictures.

Stone was replaced on liner: _____
Date

Note any further measures recommended to limit future stone displacement:

2. Any rips or punctures observed in the liner? Yes _____ No _____

If Yes, describe type and location: _____

If a liner rip or puncture is observed, document with pictures and follow instructions in the O&M Plan to repair the liner and document when the repair is completed. Upon liner repair, ensure repaired liner is covered with geotextile and covered with protective stone. Document the liner repair date and take pictures.

The liner was repaired:

Date

How was the liner repaired? _____

3. Any impacted liquid observed within ditch?

Yes____ No____

If impacted liquid is observed, document with pictures and follow instructions in O&M Plan to recover the impacted liquid and investigate the source of the impacted liquid. If the source of the impacted liquid is a rip or a puncture, document the rip or puncture in Item 2 above and follow the instructions in the O&M Plan for repair. If impacted liquid is from a source outside of ditch liner, contact the August Mack Project Manager to determine proper response action.

Impacted liquid was recovered:

Date

Impacted liquid volume recovered: _____

Gallons

How was the impacted liquid recovered and where was the impacted liquid contained?

4. Any bank erosion seen along the ditch as evidenced by rills, gullies, exposed roots, or sediment deposits at base of slope? Yes____ No____

Where is the erosion observed? _____

If erosion of the banks of the ditch is observed, document with pictures and contact the August Mack Project Manager for potential solutions to mitigate current and future erosion.

5. Any debris/obstructions observed within ditch? Yes____ No____

Describe debris/obstructions and location: _____

If trees or any debris is observed, document, remove, and move the debris into the nearby woods unless the debris has come into contact with impacted liquid. If the debris has come into contact with impacted liquid, containerize the debris for proper off-Site disposal.

What was disposition of the debris? _____

6. Obstruction of the two 18 inch diameter downstream
drainage pipes observed? Yes____ No

If so, document obstructions here:

If erosion of the ditch banks and/or dam is observed, document with pictures and contact the August Mack Project Manager for potential solutions to mitigate current and future erosion.

Any displacement of the two 18-inch diameter
drainage pipes observed? Yes____ No ____

If the two 18-inch diameter drainage tiles are displaced, take pictures and document here: _____

Contact the August Mack Project Manager to arrange for the drainage pipe(s) to be moved back in place and recovered in stone, as necessary.