NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Region 9 270 Michigan Avenue, Buffalo, NY 14203-2915 P: (716) 851-7220 | F: (716) 851-7226 www.dec.ny.gov

MEMORANDUM

TO: Stanley Radon, P.G., Regional Remediation Geologist

FROM: Steven Moeller, P.G., Professional Geologist 1

DATE: March 29, 2022

SUBJECT: RCRA GROUNDWATER OPERATION & MAINTENANCE INSPECTION

(OMI) REPORT

Facility: Tecumseh Redevelopment (former Bethlehem Steel)

3555 Lake Shore Drive

Lackawanna, Erie County, NY 14218

DEC Site # 915009 EPA ID - NYD002134880

Background: The Tecumseh Redevelopment Site encompasses approximately ± 943 acres of the former Bethlehem Steel Corporation (BSC) property located between NYS Route 5 and Lake Erie in Lackawanna, New York. The former Bethlehem Steel property is divided into two areas, referred to as the "process area" and the "slag fill area." The process area was where the majority of production units were located and is generally located on naturally occurring lake sediments in the eastern portion of the Site. The slag fill area (SFA) is located on the western portion of the Site adjacent to Lake Erie. This area consists of approximately 440 acres which have been reclaimed from Lake Erie by filling it with slag, iron scrap, and steel scrap.

In the late 1970's Bethlehem Steel Corporation (BSC) filed an application with the NYSDEC under 6 NYCRR Part 360 for a permit to operate an industrial landfill in the SFA. The permit was granted in June 1978. On November 18, 1980, pursuant to RCRA Section 3005(e), BSC submitted a Part A "interim Status" application to USEPA for two solid waste disposal facilities, designated Hazardous Waste Management Unit 1 [HWMU-1] and HWMU-2. HWMU-2 is also referred to as Solid Waste Management Unit (SWMU) S-3. HWMU-1 is comprised of two units: HWMU-1A (SWMU S-13) and HWMU-1B (SWMU S-16). HWMU-1A, also known as the Tar Sludge Impoundment, was closed in October 1988 in accordance with a NYSDEC approved closure plan. Petitions to delist the waste (that is, to remove them from regulation under federal hazardous waste laws) in HWMU-2 and HWMU-1B were submitted by the BSC to USEPA on July 18, 1984 and June 20, 1985, respectively. On April 24, 1996, USEPA granted the delisting petition for HWMU-2 (Ammonia Still Lime Sludge and Blast Furnace Thickener Sludge Impoundment). Subsequently, in October 1997, NYSDEC agreed to delist the waste in HWMU-2. The



petition for HWMU-1B, also known as Lime Stabilized Spent Pickle Liquor Sludge is still pending.

In March 1994, BSC submitted a Groundwater Monitoring, Sampling, and Analysis Plan (GWMSAP) for HWMU-1 and HWMU-2. On May 28, 2009, a request to revise the GWMSAP was submitted to the NYSDEC. The revisions were to reduce the parameters list, discontinue quality assurance/quality control samples (MS, MSD, and blind samples), and reduce the sample frequency to annual sampling. This request was approved by the NYSDEC on September 2, 2009. The GWMSAP was updated in December 2017.

The annual groundwater monitoring and sampling fieldwork for HWMU-1 and HWMU-2 includes:

- Measuring groundwater elevations in 21 monitoring wells and four piezometers around HWMU-1A/1B and eight monitoring wells around HWMU-2;
- Sampled groundwater from a network of four wells in the vicinity of HWMU-1A: MW-1D2, MW-1D3, MW-1D4, and MW-1U1 (upgradient);
- Sampled groundwater from a network of five wells in the vicinity of HWMU-1B: MW-1D1, MW-1D6, MW-1D7, MW-1D8, and MWN-12 (up-gradient); and
- Sampled groundwater from a network of four wells in the vicinity of HWMU-2: MW-2D2, MW-2D3, MW-2D4, and MWS-11A (upgradient).

Groundwater samples are collected with submersible pumps with dedicated tubing using low-flow techniques, or with disposable polyethylene bailers (typically a three well volume purge). Field measurements are recorded during well purging/sampling (e.g., pH, temperature, turbidity, dissolved oxygen, ORP, specific conductance and water level), along with visual and olfactory field observations. Groundwater samples are analyzed for site-specific constituents of concern. Figures 1 and 2, showing the well monitoring locations, and Table 1, indicating the site-specific constituents of concern for each HWMU, are included in Attachment A.

Upon completion of the groundwater monitoring and sampling fieldwork, a comprehensive Annual Groundwater Quality Monitoring Report is completed and submitted to the NYSDEC annually by the end of the year. The Annual Groundwater Quality Monitoring Report includes the following information and documentation:

- Introduction:
- Groundwater elevation and flow data;
- Field activities and findings;
- Groundwater analytical trends from 2003 to present;
- Tabular comparison of analytical results to groundwater quality standards;
- Planimetric maps showing sampling locations and groundwater potentiometric contours:
- Field sampling forms;
- Laboratory data report;
- HWMU 1A cover system inspection report: and
- Planned upcoming activities.

I. Office Evaluation

Prior to the field inspection, relevant documents were compiled and reviewed, including:

- Groundwater Monitoring, Sampling, and Analysis Plan for HWMU-1 and HWMU-2 (2017)
- HWMUs 1A, 1B, and 2 Annual Groundwater Quality Monitoring Reports (2019-2021)
- Recent Correspondence (2019-2021)
- Previous HWMU 1 & 2 RCRA Groundwater OMI Report (2015)

II. Field Evaluation

On October 21, 2021, Steven Moeller, PG, conducted a field inspection at the Tecumseh Redevelopment facility during the HWMUs 1A, 1B, and 2 Annual Groundwater Sampling Event. Sampling and monitoring activities during this event were to be performed in accordance with the GWMSAP (2017), with approved changes. This inspection included observation of groundwater sample collection activities and limited inspection of HWMUs 1A and 1B monitoring wells and surrounding areas.

Onsite Personnel: Steven Moeller (NYSDEC – PM/Inspector) and Rick Dubisz (TurnKey Environmental Restoration, LLC [TurnKey] – Senior Technician/Inspector)

Weather: Overcast, 59° F, windy

TurnKey performed the annual groundwater monitoring event at HWMUs 1A, 1B, and 2 on October 20 and 22, 2021. On October 20, 2021, Turnkey personnel measured groundwater elevations in 21 monitoring wells and four piezometers around HWMU-1A/1B and eight monitoring wells around HWMU-2 to development groundwater potentiometric contour maps.

On October 21, 2021, I observed Rick Dubisz (Turnkey) purge and sample HWMU 1B wells MW-1D8 and MWN-12. Prior to conducting any purging or sampling activities, water level and total depth measurements were recorded in each well with a Solinst Model 101 electronic water level indicator to calculate the volume of the water column in each well. The wells were purged and sampled using low-flow sampling techniques with a Proactive Monsoon submersible pump with dedicated high-density polyethylene (HDPE) tubing. Field water quality parameters were recorded from purge water aliquots using a Hach 2100Q turbidimeter, a Hach HQ30d dissolved oxygen meter, and a Myron L Ultrameter II (pH, temperature, specific conductance, and oxidation-reduction potential [ORP]) to ensure water quality parameters stabilized prior to sample collection. These and other field observations were recorded on field sampling forms; the Groundwater Field Forms for wells MW-1D8 and MWN-12 are included in Attachment B. All purge water was containerized, treated with muriatic acid to lower the pH below 9.5, and filtered through activated carbon before discharge to the ground surface. Upon field parameter stabilization, samples were collected from the pump tubing. Immediately following collection, sample bottles were placed into a cooler filled with ice to maintain an approximate temperature of 4 degrees Celsius. The samples were later delivered under proper chain-of-custody (see Attachment B) to Eurofins/TestAmerica Laboratory in Amherst, New York, a New York State Environmental Laboratory Approval Program-certified laboratory. The submersible pump was decontaminated between sampling locations using Alconox detergent and potable water. Attachment C contains photographs of the field sampling activities.

I also performed a limited inspection in the vicinity of HWMUs 1A and 1B. All groundwater monitoring wells observed were locked and in reasonably good condition. The grassy vegetative cover on the HWMU 1A (SWMU S-13) landfill was in good condition with no signs of erosion or breach by vectors. "Danger Unauthorized Personnel Keep Out" signage was present around both HWMUs 1A and 1B. Remnants of the green 30-mil reinforced polyvinyl chloride (PVC) cover that formerly covered HWMU 1B (SWMU S-16) were visible on and in the vicinity of the landfill. The PVC cover was destroyed by a severe wind event sometime in late 2005. HWMU 1B (SWMU S-16), and adjacent SWMU S-23 and AOC-D, will be consolidated and covered in place in accordance with the Statement of Basis Corrective Measures Selection for Bethlehem Steel (Tecumseh Redevelopment, Inc.) OU-05 Slag Fill Area Zone 2 and OU-08 Slag Fill Area Zones 4 and 5 (November 2021).

III. Summary

Based upon a review of site-related documents (including the GWMSAP), oversight of groundwater sample collection activities, and limited inspection in the vicinity of HWMUs 1A and 1B, the Department has determined that Tecumseh Redevelopment Inc. is in compliance with the Groundwater Monitoring, Sampling, and Analysis Plan for HWMU-1 and HWMU-2.

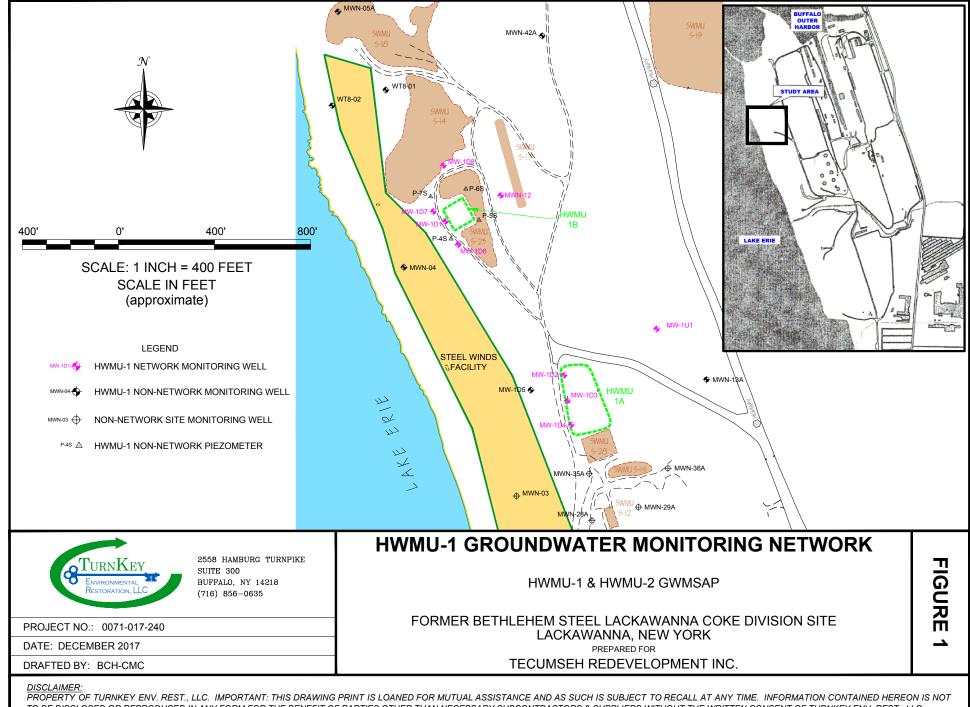
ATTACHMENTS

Attachment A - Figures and Table

Attachment B - Groundwater Field Forms and Chain-of-Custody Forms

Attachment C - Photographs

ATTACHMENT A Figures and Table



TO BE DISCLOSED OR REPRODUCED IN ANY FORM FOR THE BENEFIT OF PARTIES OTHER THAN NECESSARY SUBCONTRACTORS & SUPPLIERS WITHOUT THE WRITTEN CONSENT OF TURNKEY ENV. REST., LLC.

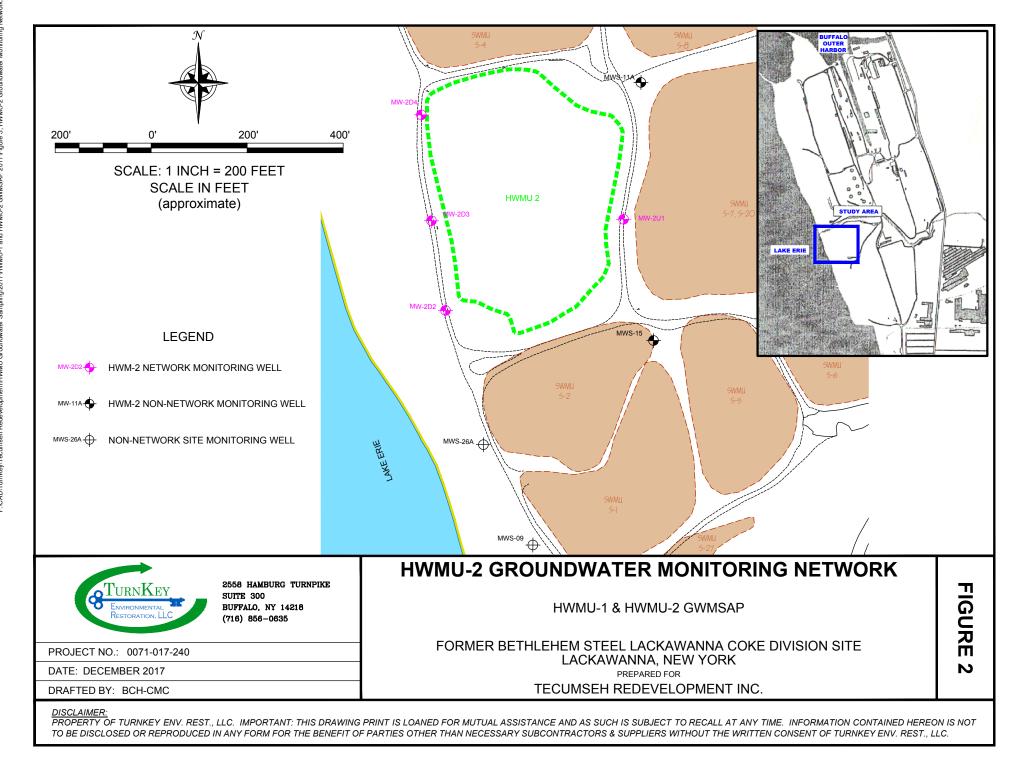




TABLE 1 SUMMARY OF SITE-SPECIFIC CONSTITUENTS OF CONCERN

Hazardous Waste Management Units HWMU-1 & HWMU-2 Tecumseh Redevelopment Inc. Lackawanna, New York

Parameter	HWMU 1A	HWMU 1A HWMU 1B			
Site-Specific Volatile Organic Com	pounds (SS-VOCs)-Metho	od 8260C (CP-51 compou	ınds in blue)		
Benzene	X	X	X		
cis-1,2-Dichloroethene		Х			
trans-1,2-Dichloroethene		Х			
Ethylbenzene		X	X		
Toluene	X	X	X		
Trichloroethene		Х			
1,2,4-Trimethylbenzene	X	X	X		
1,3,5-Trimethylbenzene	X				
Vinyl chloride		Х			
Xylenes, Total	X	X	X		
TCL List Semi-Volatile Organic Col	mpounds (SS-SVOCs)-Me	thod 8270D			
Benzo(a)anthracene		Х			
Bis(2-ethylhexyl) phthalate		Х			
Chrysene		X	Х		
Naphthalene	Х	X	х		
Phenolic Compounds	Х	Х	Х		

Notes:

1. Parameter lists were modified in September 2009 with NYSDEC approval.

ATTACHMENT B

Groundwater Field Forms and Chain-of-Custody Forms



GROUNDWATER FIELD FORM

Project Name: HWM-1A & B Groundwater Monitoring

Location: Tecumseh Redevelopment, Inc Project No.: 0071-013-240

Date: / 0 | 2 | Field Team: RLD

Well N	o.	MW-1D8	Diameter (in	nches):	4-inch	Sample Date / Time:										
Product D	epth (fbTOR):		Water Colur	mn (ft):		DTW when sampled:										
DTW (stat	ic) (fbTOR):	35.40	One Well Vo	olume (gal):	1.37	Purpose: Development Sample Purge & Sample										
Total Dept	h (fbTOR):	43.55	Total Volum	e Purged (gal)	:	Purge Meth										
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp, (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor							
1039	o Initial		10.68	15-6	2464	20.7	152	+23	Cley							
1042	36.40		10,62	155	2367	4:37	110	<i>fy</i>	cleur							
1047	2 36.40		10.09	105.3	2355	312	1007	-121	Cleur							
	4															
	5															
	6															
	7															
	8															
	9															
	10															
Sample	Information:															
1049	s1 36.40	5	10.0	153	2380	45	148	-10	C1							
	S2 36.40		10.58	15.2	2317	1.45	1.50	-10	cien							

Well No. MW-1U1			Diameter (in	iches): 4-ind	ch	Sample Dat	e / Time:	10/22						
Product Depth (fbTOR):			Water Colur	nn (ft):		DTW when sampled:								
DTW (stati	c) (fbTOR):	39 45	One Well Vo	olume (gal): /	7.85	Purpose: Development Sample Purge & Sample								
Total Depth	(fbTOR):	66.5	Total Volum	e Purged (gal):		Purge Method: Mini-Monsoon Purge Rate:								
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	Temp. SC		DO (mg/L)	ORP (mV)	Appearance & Odor					
2570	o Initial	0	12.17	12.8	1996	150		-220	Chein					
0825	1 39.45	0.5	12.19	12.5	1992	16.7	1,92	-237	clean					
0851	2 39 45	.85	12.17	12.6	1996	14.7	1.84	-226	clean					
0732	3 39 45	2.5	12.17	12.4	2002	9.98	1.33	- 230	clean					
	5													
	6													
	7					V								
	8													
	9													
	10													
Sample I	nformation:													
0332	s1 39 25	3	12.15	12.6	2005	3,18	1.03	- a43	llean					
0838	82 3945	4	12.17	12.5	2000	2.36	0.78	-239	CLEAN					

REMARKS:	
Note: All measurements are	in feet, distance from top of riser.

Volume Calculation Diam. Vol. (g/ft) 1" 0.041 2" 0.163 4" 0.653 1.469

Stabilization Criteria Parameter Criteria рΗ ± 0.1 unit SC ± 3% Turbidity ± 10% DO ± 0.3 mg/L ORP ± 10 mV



GROUNDWATER FIELD FORM

10/21121 RAD Project Name: HWM-1A & B Groundwater Monitoring Date: Tecumseh Redevelopment, Inc Project No.: 0071-013-240 Field Team:

Well No. MWN-12			Diameter (in	ches):	4-inch	Sample Date / Time: /0/21/21								
Product De	pth (fbTOR):		Water Colur	nn (ft):		DTW when sampled:								
DTW (statio	c) (fbTOR):	3530	One Well Vo	olume (gal):	3.36	Purpose:	Development	t 🔽 Sample	Purge & Sample					
Total Depth	ı (fbTOR):	40.40	Total Volum	e Purged (gal):		Purge Metho	od: <i>Mini-Typt</i>	noon Purge Ra	te:					
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)			Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor					
11.59	o Initial		12.39	16.9	4573	3.71	5-23	-94	Clear					
	135.30	2.50	12.50	15-9	4746	2.45	5.67	-117	cress					
1202	2 35.30	4	1248	159	4661	1,69	5.27	-126	Clein					
Rose	3	3	12.50	16-1	4 592	1.36	21.35	761	Chien					
	4													
	5													
	6													
	7													
	8													
	9													
	10													
Sample	Information:						3.06		,					
1211	S1	6.5	12.49	15.4	4178	1.35	Fist	-115	Cler					
1517	S2	2.5	12.47	15-6	40 16	0.41	4	-199	Clean					
							7.72							

Well N	o. M	-	Diameter (i	nches):		Sample Date / Time:								
	epth (fbTOR):		Water Colu			DTW when sampled:								
DTW (stat	c) (fbTOR): 🔫	3.58		olume (gal):		Purpose: Development Sample Purge & Sa								
II .	n (fbTOR):			ne Purged (gal):		Purge Metho	od:	Purge Rate	:					
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)			Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor					
6999	o Initial	æ				100								
	1													
	2													
	3													
	4													
	5													
	6													
	7													
	8													
	9													
	10													
Sample	Information:													
	S1													
	82													

Stabilization Criteria **REMARKS:** Volume Calculation Parameter Criteria Diam. Vol. (g/ft) рΗ ± 0.1 unit 0.041 SC ± 3% 2" 0.163 Turbidity ± 10% 4" 0.653 DO ± 0.3 mg/L Note: All measurements are in feet, distance from top of riser. 1.469 ± 10 mV

PREPARED BY:

Eurofins TestAmerica, Buffalo

Chain of Custody Record

eurofins Environment Testing

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Phone: 716-691-2600 Fax: 716-691-7991																Amer	rica	
Client Information	Sampler:)		Lab I Fisc		Carrier Tracking N					ing No(s):	No(s): COC No: 480-165682-36294.1						
Client Contact: Mr. Brock Greene	Phone: E-Mail Brian					State of Origin:					n:	Page: Page 1 of 2						
Company: Turnkey Environmental Restoration, LLC						Analysis Requested												
Address: 2558 Hamburg Turnpike Suite 300	Due Date Requeste	ed:							,	loquo					Preservation (Codes:		
Dity: Lackawanna	TAT Requested (da	iys):					3	Napht Wen			,			<u> </u>		M - He	xane	
State, Zip: NY, 14218	Compliance Project	t: A Yes	A No		-		0	r. P										
Phone: 716-225-3314(Tel)	PO #: Purchase Order					90	ie i	Stars										
email: pgreene@bm-tk.com	WO #:				or No		- naph	١ ١				480-1	91356	Chain	of Custody	11101 01110 01111		Irate
Project Name: Fecumseh - HWMU Groundwater	Project #: 48022794				Soy N	OLM04.2	(STARS)	IISt OLIMU4.2						aine	L - EDA	Z - oth	er (specify	/)
Site:	SSOW#:				Sample SO (%	0 - V	CP-51 (8	S S						of containe	Other:			
Canada Idantiffanti		Sample	Sample Type (C=comp,	Matrix (w=water, S=solid, O=waste/oil,	old Filtered	8270D - TCL SVC	8260C - (MOD) C	SZEUC - (MOD) I CL						Number				
Sample Identification	Sample Date	Time	G=grab) Preservat) E E	1		-						Total	Specia	l Instructi	ions/Not	te:
MW-1D2	10-27-21	0410	ricscivat	Water	m	21	A A							X				
MW-1D3	10-22-21	1012	6	Water	H^-	X	$\frac{C}{X}$	+		+	++	+		36				
MW-1D4	10-22-21	1040	6	Water	\sqcap	X	X				\dagger							
MW2D2	10-22-21	1134	6	Water	T	X	X				TT							
MW2D3	10-22-21	1200	6	Water	T	X	X					+						
MW2D4	10-22-21	1225	6	Water	П	X	X											
MWS11A	10-22-21	1252	G	Water		X	X							Sec. A				
MW-1D1	10-21-21	1305	6	Water		X)	<										
MW-1D6	10-21-21	0903	, 6	Water		X	>											
MW-1D7	1021-11	0941	6	Water	Ш	X	1	X										
MW-1D8 Possible Hazard Identification	10-21-21	1049	G	Water	Ш	X		X						20.2				
Non-Hazard Flammable Skin Irritant Pois	son B Unkn	own \square	Radiological		Sa	mple	Dispo	sal (A o Clier	fee may b	e asse	ssed if osal By	sample	es are r	1	d longer tha			
Deliverable Requested: I, II, III, IV, Other (specify)			radiorogicar		Sp				C Requirer	ments:	osai by	Lab	+	Archi	e For	Mo	onths	
Empty Kit Relinquished by:		Date:			Time:			٨			Method	of Shipm	ent:					
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Relinquished by:	Date/Time:		C	Company		Recei	ved by:					Date	/Time:			Compa	any	
Custody Seal No.: Δ Yes Δ No						Coole	r Tempe	erature(s	°C and Other	r Remark	(S:	H	2/	72	18			

10 Hazelwood Drive

Amherst, NY 14228-2298 Phone: 716-691-2600 Fax: 716-691-7991

Chain of Custody Record

🔆 eurofins

Environment Testing America

Sampler: Carrier Tracking No(s): Client Information Fischer, Brian J 480-165682-36294.2 Client Contact: Mr. Brock Greene State of Origin: Brian.Fischer@Eurofinset.com Page 2 of 2 Company: PWSID: Job #: Turnkey Environmental Restoration, LLC **Analysis Requested** Due Date Requested: 2558 Hamburg Turnpike Suite 300 Preservation Codes: Naphth TAT Requested (days): A - HCL M - Hexane Lackawanna B - NaOH N - None State, Zip: C - Zn Acetate O - AsNaO2 NY, 14218 D - Nitric Acid P - Na2O4S Compliance Project: A Yes A No E - NaHSO4 Q - Na2SO3 Phone: F - MeOH R - Na2S2O3 716-225-3314(Tel) Purchase Order Requested 8260C - (MOD) TCL list OLM04.2 + Stars G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice bgreene@bm-tk.com U - Acetone J - DI Water V - MCAA J - DI V K - ED Cother: Project Name: Project #: K - EDTA W - pH 4-5 Tecumseh - HWMU Groundwater 48022794 L - EDA Z - other (specify) SSOW#: Matrix Total Number Sample (W=water, Type Sample (C=comp, Sample Identification Sample Date Time G=grab) | BT=Tissue, A=Air) Special Instructions/Note: XXN Preservation Code: MW1U1 10-22-21 0832 6 Water MWN-12 Water 157501 1211 TRIP BLANK Water Hold TRIP BLANK Water Possible Hazard Identification Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) Non-Hazard Flammable Skin Irritant Poison B Unknown Radiological Return To Client Disposal By Lab Archive For Deliverable Requested: I, II, III, IV, Other (specify) Months Special Instructions/QC Requirements: Empty Kit Relinquished by: Date: Time: Method of Shipment: Relinquished by: Date/Time: Company Received by: Date/Time: Company Relinquished by: Date/Time: Company Received by Date/Time: Company Relinquished by: Date/Time: Company Received by: Date/Time: Company Custody Seals Intact: Custody Seal No. Cooler Temperature(s) "C and Other Remarks △ Yes △ No

11/3/2021

Ver: 06 08 2021









ATTACHMENT C Photographs

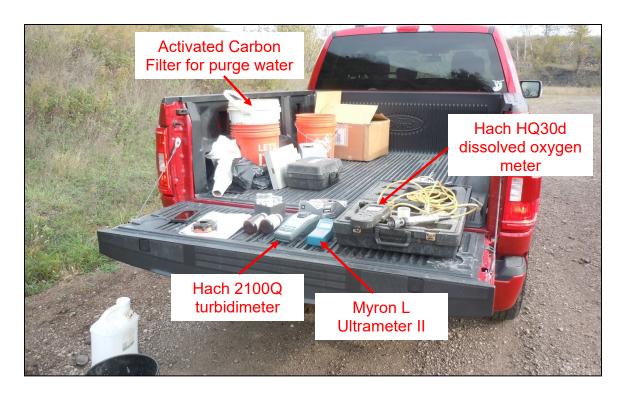
(all photos were taken on October 21, 2021)



Proactive Monsoon submersible sampling pump used for well purging/sampling.



Solinst Model 101 electronic water level indicator.



Field water quality meters and sampling equipment.



Hach HQ30d dissolved oxygen meter.



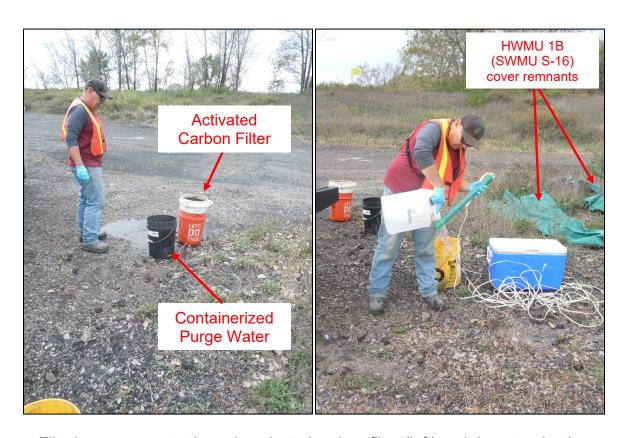
Hach 2100Q turbidimeter (left) and Groundwater Field Form (right).



Sample collection at well MWN-12.



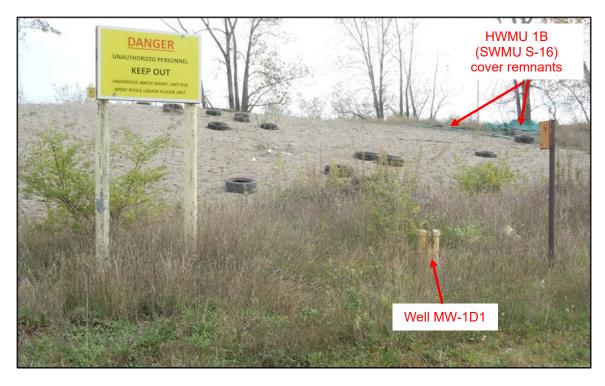
Sample bottles on ice in cooler.



Filtering purge water through activated carbon filter (left) and decontaminating submersible pump with potable water and Alconox (right).



Southwestward view of HWMU 1A (SWMU S-13) showing grassy landfill cover and perimeter warning signage.



Westward view of HWMU 1B (SWMU S-16) showing perimeter warning signage and damaged landfill cover remnants.