

TO
Christine Matlock, EGLE
Joe Rogers, EGLE
John McCabe, EGLE
Shaun Shields, EGLE

COPIES TO
Dave Favero, RACER Trust

DATE
July 5, 2023

PROJECT NUMBER
30171056

DEPARTMENT
Resilience Environment

FROM
Patrick Curry
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SUBJECT
MW-16-79 Abandonment Summary Memo
RACER Trust Industrial Land, Plant 2, Lansing, Michigan

The following provides a summary of the MW-16-79 monitoring well abandonment activities completed April 10 to 11, 2023 at RACER Trust, Plant 2 located in Lansing, Michigan (Site). The scope of work was provided to the Michigan Department of Environment, Great Lakes and Energy (EGLE) as the *MW-16-79 Abandonment Plan*, dated March 7, 2023, and approved on April 6, 2023. The locations of MW-16-79 and surrounding borings are shown on **Figure 1**.

Monitoring Well Abandonment at MW-16-79

Weathered bedrock monitoring well MW-16-79 is screened at 68 to 73 feet below ground surface (ft bgs) in weathered sandstone and was used as a sentinel well for 1,4-dioxane monitoring southeast of the lower 1,4-dioxane plume. As described in the *MW-16-79 Abandonment Plan*, a thin layer, or sheen, of light non-aqueous phase liquid (LNAPL) (i.e., <0.1 ft thick) was detected in the well and confirmed with a bailer during a routine gauging event completed in November 2022.

Following the detection, the LNAPL was bailed and removed from the well. LNAPL sampling was attempted but the volume removed was not sufficient to submit for laboratory analysis. After removal of the LNAPL from the well, a groundwater sample was collected on November 2, 2022. The results of the sampling indicate the groundwater was non-detect for VOCs and 1,4-dioxane and had low concentrations of SVOCs, including chrysene (9 micrograms per liter [$\mu\text{g/L}$]), phenanthrene (9 $\mu\text{g/L}$), and pyrene (5 $\mu\text{g/L}$).

After removal of the LNAPL from the well, an adsorbent sock was placed in the well for a period of two weeks. The sock was removed on November 15, 2022, and had minimal LNAPL staining. Follow-up gauging was completed on December 5, 2022, and did not identify LNAPL. A full record of groundwater sampling dates and analytical results are summarized in the *MW-16-79 Abandonment Plan*.

Based on the historical data collected around well MW-16-79, there appears to be intermittent residual LNAPL present in shallow soils the area. The most likely explanations for the LNAPL present at depth in MW-16-79 are:

- 1) Migration of LNAPL down around the outside of the well casing around or through the grout (i.e., leaking seal) to the well screen, or
- 2) Perched groundwater and LNAPL entering the well through a shallow break in the PVC casing, or casing joint, thereby allowing shallow water/LNAPL to enter the casing and accumulate at the water surface in the well.

Christine Matlock
EGLE
July 5, 2023

Based on discussion with EGLE during our quarterly meeting on December 16, 2022, and follow-up discussion on January 27, 2023, abandonment of MW-16-79 was approved to eliminate any potential pathway that may be present from the perched aquifer to the deeper weathered bedrock. RACER completed the following approach for well abandonment:

- An absorbent sock was placed in MW-16-79 on February 10, 2023, to remove any additional LNAPL. Prior to abandonment, the sock was removed, and the well was gauged with an interface probe.
- MW-16-79 was gauged to confirm total well depth and check for presence of LNAPL. LNAPL was not present.
- The MW-16-79 well casing was pressure grouted from the bottom up with a thick bentonite grout to a depth of approximately 10 feet bgs and was allowed to setup for 24 hours.
- Once the grout had setup, the upper portion of MW-16-79 was over-drilled using a 10-inch sonic casing to a depth of at least 2-feet into the underlying glacial till (~25 feet bgs).
- The upper portion of MW-16-79 was then removed from the borehole.
- Once the casing was removed, the borehole extending into the clay till was abandoned with neat cement mixed with 5-10% bentonite to reduce the potential for shrinkage of the concrete. The mixture was added from the bottom up using a tremie line to seal the borehole (0 to 25 feet bgs).
- The borehole was patched with cement to bring it up to grade with the surrounding slab.

All well abandonment logs and relevant details are included in **Attachment 1**. Based on the available analytical results for samples from this well, there is no indication that any significant contamination has made it into the weathered bedrock groundwater at this location. However, to further verify these results, additional sampling will be completed downgradient at monitoring wells MW-16-78 and MW-21-140 for analysis of VOCs, 1,4-dioxane, SVOCs, and PFAS during the 2023 groundwater monitoring events.

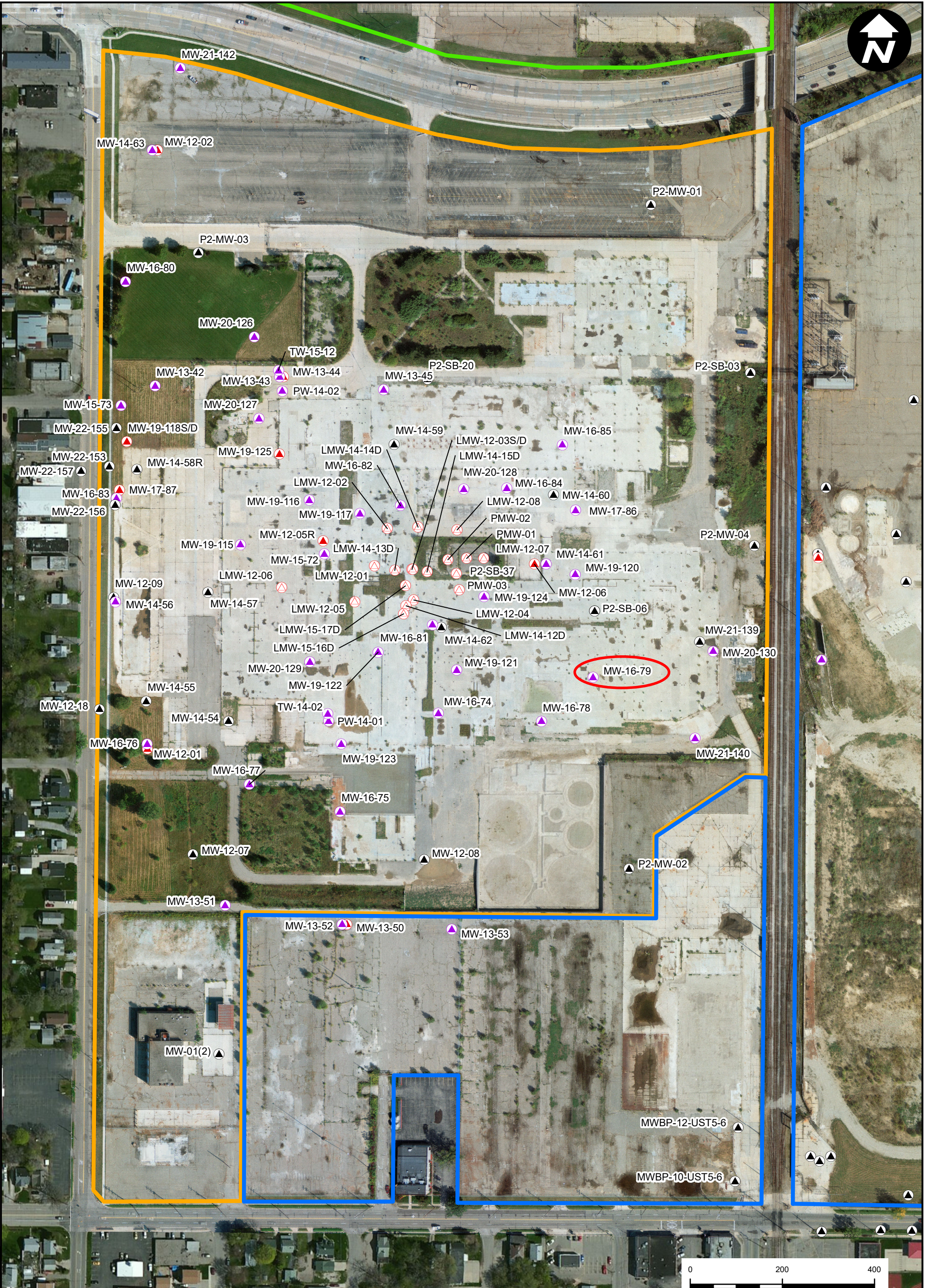
Should you have any questions regarding the results of this evaluation, please contact David Favero at (217) 741-6235 or Patrick Curry at (810) 225-1926.

Enclosures:

Figure 1 – Summary of Plant 2 Monitoring Well Locations
Attachment 1 – MW-16-79 Abandonment Log and Notes

FIGURES





CITY: Novi DIV: ENV PIC: J. BARRETT TR: PROJECT NUMBER: 30112892 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl T:_ENV\RACER\Buffalo\MXDs\2022 Annual Groundwater Monitoring Report\Figure 1A - P2 Monitoring Wells.mxd PLOTTED: 3/7/2023 1:25:44 PM BY: M.Joye

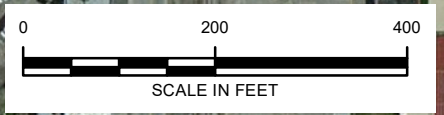
Legend

- LNAPL MONITORING WELL
- PERCHED ZONE MONITORING WELL
- DEEP OVBURDEN MONITORING WELL
- WEATHERED BEDROCK MONITORING WELL
- BEDROCK MONITORING WELL

PLANT BOUNDARIES

- PLANT 2
- PLANT 3
- PLANT 6

NOTE:
APC = ADAMS PLATING CO.



RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

**SUMMARY OF PLANT 2
MONITORING WELL LOCATIONS**



FIGURE
1

ATTACHMENT 1

MW-16-79 Abandonment Log and Notes



Project Name : RACER **Weather(°F) :** 48 degrees F
Project Number : 30171056 **Prepared By:** Sam Sukaria
Purpose : Well abandoned. Well converted to flush mount
PPE : Level D
Equipment: Interface Probe (IP), Photoionization Detector (PID)

Date	Time	Description of Activities
04/10/2023	08:58	Arrive on-site, meet Cascade crew. Examine well going to be abandoned (MW-16-79).
04/10/2023	09:15	Security must move cars around well before working. Examine well for repair work on Plant 3 (TW-14-06).
04/10/2023	10:00	Return to Plant 2. Cars are moved in vicinity of MW-16-79. Gauge DTW and TD.
04/10/2023	10:07	Drill team begins abandonment work (grouting).
04/10/2023	11:20	Finish initial grouting, prepare for tomorrow's grout, allow to cure. Mobilize to Plant 3 to TW-14-06.
04/10/2023	11:54	TW-14-06: DTW 73.3 ft btoc, TD 89.1ft btoc. 1.5-2.0" of sediment present at base of well.
04/10/2023	12:28	Will need a jackhammer to remove concrete around TW-14-06. Will return to site with proper equipment tomorrow. Head off-site for the day.

Signature: 

Waste Management:										
Drums On Site										
Date	Are there any waste drums on site?	Number of Drums upon Arrival	Size of Drums	Type of Drums	Condition of Drums	Waste Drummed Today?	Number of drums Created	Size of drums	Condition of Drums	General Waste Comments
04/10/2023	yes	10	55-gallon	Stainless Steel		no				

Equipment and Calibration Information:

Supplier: Geotech **Model:** MiniRae 3000
Rental Number: 5941 **Calibrated:** yes
Bump Checked: no **Calibration Passed:** yes

PIDSN:

Date	Time	Calibrated Fluid and Value	Lot #	Expiration Date	Initial Reading	Final Reading
04/10/2023	--					

Daily Log

Project Name : RACER **Weather(°F) :** 48 degrees F
Project Number : 30171056 **Prepared By:** Sam Sukaria
Purpose : Well abandoned. Well converted to flush mount
PPE : Level D
Equipment: Interface Probe (IP), Photoionization Detector (PID)

Date	Time	Description of Activities
04/11/2023	08:25	Arrive on-site, meet Cascade crew.
04/11/2023	10:00	Drill team finishes repair work and converting TW-14-06 well to flush-mount construction.
04/11/2023	11:07	Drill team over-drilled well MW-16-79 for abandonment. Well is filled with water and possible product in water. IP does not confirm LNAPL presence. Wait for pumping equipment and barrels from Cascade.
04/11/2023	13:30	Cascade pump and barrels arrive on-site. Begin removing outer well cavity for grout.
04/11/2023	14:01	Begin pumping out water from annular space.
04/11/2023	15:15	Finish pumping water out and grouting well. All abandonment work complete. Demob.

Signature: 

Waste Management:										
Drums On Site										
Date	Are there any waste drums on site?	Number of Drums upon Arrival	Size of Drums	Type of Drums	Condition of Drums	Waste Drummed Today?	Number of drums Created	Size of drums	Condition of Drums	General Waste Comments
04/11/2023	yes	10	55-gallon	Stainless Steel		no				

Equipment and Calibration Information:

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PIDSN:

Date	Time	Calibrated Fluid and Value	Lot #	Expiration Date	Initial Reading	Final Reading
04/11/2023	--					

MONITOR WELL ABANDONMENT RECORD



Site Name : **Racer lansing**

Well ID: **MW-16-79**

Site Name: Racer Lansing

County: Ingham

Well ID: MW-16-79

Project Number: 30171056

Date Installed: 6/13/2016

Date Abandoned: 4/11/2023

Well Installation Subcontractor: Cascade

Well Depth: 76.35 ft

Well Abandonment Subcontractor: Cascade

Screen Depth from TOC (ft): 68-73 ft bgs

Water Table Depth from TOC: 66.42 ft

Casing Type: Galvanized PVC Stainless Steel ID: 2in 4in

Screen Type: PVC Stainless steel Abandoned Screen Length: 5.0 ft

2in Annulus Grouted: Yes No from 25 ft to 0 ft Grout Type: Bentonite

4in Annulus Grouted: Yes No from ft to ft Grout Type:

Casing: Pulled Cut Depth BGS: Well Grouted? Yes No

Grout Type: Bentonite Cement Grout Mixture: Chips Slurry

Grouting Method: Through Casing Tremie Poured

Other Grouting Method Other:

Crew: Cascade

Comments:

Notes:

bgs - below ground surface

ft - feet

ID - inside diameter

in - inches

TOC - top of casing

MONITOR WELL ABANDONMENT RECORD



Site Name : Racer Lansing

Well ID: MW-16-79

Well before Abandonment



Well after Abandonment



Additional Photos



Signature Of Consultant

Geologic Specialist I

Company / Position

4/11/2023

Date

Date Start: 06/13/2016 Date Finish: 06/13/2016 Drilling Company: Cascade Driller's Name: Scott Parkes Drilling Method: Rotosonic Sampling Method: 4X6 Casing Rig Type: Rotosonic Water Level Start (ft. bgs.): Water Level Finish (ft. btoc.):	Northing: NA Easting: NA Casing Elevation: NA Borehole Depth (ft. bgs.): 75.0 Surface Elevation: NA Descriptions By: K. Voet/A. Villhauer	Well/Boring ID: SB-A5.3-OR159/MW-16-79 Client: RACER Location: RACER Lansing Plant 2 Weather Conditions: 60 F, Cloudy
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
0	0									
		1	0.0-2.0'	NA	NA		[Cross-hatched pattern]	(0.0 - 2.0') CONCRETE		
		2	2.0-7.0'	2.0			[Diagonal lines pattern]	(2.0 - 11.5') CLAY, high plasticity, slow dilatancy; moist; soft; black (10YR 2/1). NOTE: Slight odor; debris in concrete and soil; metal grating.		
		3	7.0-17.0'	10.0			[Diagonal lines pattern]	(11.5 - 17.0') CLAY, medium plasticity, no dilatancy, trace fine sand, trace granules to medium pebbles, subround to round; moist; soft; dark gray (10YR 4/1). NOTE: Strong odor.		
		4	17.0-27.0'	10.0			[Grid pattern]	(17.0 - 19.5') CLAY, medium plasticity, no dilatancy, trace silt, trace fine sand; soft; dark gray (10YR 4/1). (19.5 - 29.5') SILT and CLAY, low plasticity, no dilatancy, little fine sand, trace granules to small pebbles, subround; moist; medium stiff; dark gray (10YR 4/1).		

Remarks: bgs = below ground surface
No staining observed



Date Start: 06/13/2016
Date Finish: 06/13/2016
Drilling Company: Cascade
Driller's Name: Scott Parkes
Drilling Method: Rotosonic
Sampling Method: 4X6 Casing
Rig Type: Rotosonic
Water Level Start (ft. bgs.):
Water Level Finish (ft. btoc.):

Northing: NA
Easting: NA
Casing Elevation: NA

Borehole Depth (ft. bgs.): 75.0
Surface Elevation: NA

Descriptions By: K. Voet/A. Villhauer

Well/Boring ID: SB-A5.3-OR159/MW-16-79
Client: RACER
Location: RACER Lansing Plant 2

Weather Conditions: 60 F, Cloudy

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
25	-25				0.1					
					0.1					
					0.1					
30	-30	5	27.0-37.0'	10.0	0.1			(29.5 - 30.5') SAND, fine to medium, some silt, trace granules to medium pebble, subround poorly sorted; moist; dark gray (10YR 4/1).		
					0.1			(30.5 - 56.0') SILT, low plasticity, no dilatancy, little clay, little fine sand, trace granules to medium pebble, subround to subangular; moist; medium stiff; dark gray (10YR 4/1).		
					0.1					2" PVC well casing (0-68' bgs)
35	-35				0.1					
					0.1					
					0.1					
40	-40	6	37.0-47.0'	10.0	0.1					
					0.1					
					0.1					
45	-45				0.1					
					0.1					
					0.1					
50	-50				0.1					
					0.1					
					0.1					

Remarks: bgs = below ground surface
 No staining observed



Date Start: 06/13/2016
Date Finish: 06/13/2016
Drilling Company: Cascade
Driller's Name: Scott Parkes
Drilling Method: Rotasonic
Sampling Method: 4X6 Casing
Rig Type: Rotasonic
Water Level Start (ft. bgs.):
Water Level Finish (ft. btoc.):

Northing: NA
Easting: NA
Casing Elevation: NA

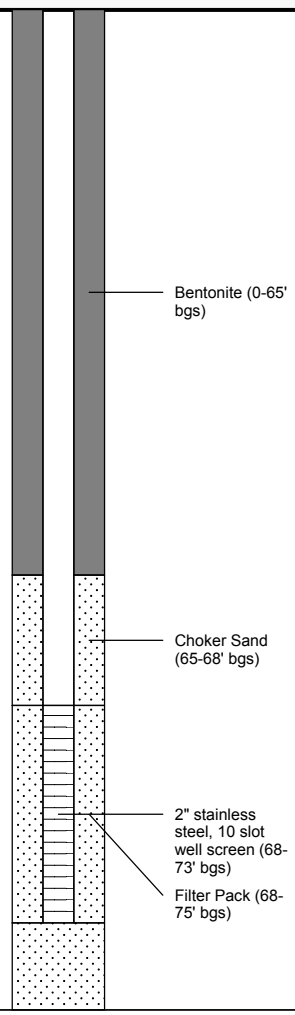
Borehole Depth (ft. bgs.): 75.0
Surface Elevation: NA

Descriptions By: K. Voet/A. Villhauer

Well/Boring ID: SB-A5.3-OR159/MW-16-79
Client: RACER
Location: RACER Lansing Plant 2

Weather Conditions: 60 F, Cloudy

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
55	-55	7	47.0-57.0'	10.0	0.1					
					0.1			(56.0 - 59.0') SAND, fine, trace silt, trace granules to coarse pebbles, subangular; moist; well sorted; grayish brown (10YR 5/2).		
60	-60				0.1			(59.0 - 62.0') SILT and CLAY, low plasticity, no dilatancy, little fine sand, trace granules to small pebbles, subangular; moist; stiff; dark gray (10YR 4/1).		
		8	57.0-67.0'	10.0	0.1			(62.0 - 75.0') SANDSTONE, weathered, interbedded with shale; dark grayish brown (10YR 4/2).		
65	-65				0.1					
					0.1					
70	-70	9	67.0-72.0'	5.0	0.3			NOTE: VAP groundwater samples collected from 62' to 67' and 70' to 75' bgs.		
					0.4					
		10	72.0-75.0'	0.0	NA			NOTE: Hot rock melted bag.		
					NA					
75	-75							End of boring at 75' bgs.		



Remarks: bgs = below ground surface
 No staining observed