

MEMO

Project name **Coldwater Road**
 Project no. **1088190/1940102192/5**
 Client **RACER Trust**
 Memo no. **01**
 Version **01**
 To **John McCabe**
 From **Clifford Yantz**
 Copy (via email) to **Ms. Nicole Sanabria – EGLE**
Ms. Christina Hebert – EGLE
Mr. David Favero – RACER Trust
Mr. Kevin Schneider – O’Brien & Gere

Prepared by **Clifford Yantz**
 Checked by **Clifford Yantz**
 Approved by **Clifford Yantz**

Date February 9, 2023

This technical memorandum has been prepared by Ramboll Americas Engineering Solutions, Inc. (Ramboll), on behalf of the Revitalizing Auto Communities Environmental Response Trust (RACER Trust) to document the abandonment of piezometer PZ-1 and replacement (i.e., installation) of monitoring well OBG MW-25 and piezometer PZ-3 (see **Figure 1**) at the Coldwater Road facility located in Flint, Michigan (Site).

Piezometer PZ-1 was abandoned due to being in standing water after the completion of the storm water modifications and monitoring well OBG MW-25 and piezometer PZ-3 were replaced after being abandoned in July 2020 to facilitate construction of the Middle Pond berm. The wells were in the way of the storm water modifications being undertaken at that time to improve stormwater management; therefore, the Michigan Department of Environment, Great Lakes, and Energy (EGLE) approved their abandonment in 2020.

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The 2022 Annual PFAS Sampling Report dated September 28, 2022 indicated our intent to abandon PZ-1 and replace OBG MW-25 and PZ-3.

A summary of the well abandonment and replacement activities that were undertaken on December 21, 2022, are provided in this memorandum (memo).

PZ-1 Abandonment Activities

The proposed method to abandon PZ-1 was to utilize a tremie pipe to pressure inject a cement/bentonite grout or bentonite slurry with more than 20% solids mixture into the well with the well materials left in place. Followed by the removal of the above ground materials (riser and protective casing) to approximately 2 ft below grade and “capping” the abandoned well with 50 pounds of granular bentonite that will be hydrated.

However, due to the existence of an approximately 3-foot-deep drainage ditch surrounding the area containing PZ-1 the drillers were not able to get their trailer mounted grout mixer close enough to the well to allow pressure grouting of the

well. Furthermore, as the drillers attempted to pull the existing protective casing from around PZ-1 the well materials raised along with the protective casing. In addition, several attempts were made to break out the bottom of the well using the Geoprobe push rods to use the entire well as a tremie pipe; however, the bottom of the well would not break out and the well materials simply pushed slightly deeper into the ground.

Therefore, PZ-1 was abandoned by removing the well casing and screened section followed by filling the resulting borehole with granular bentonite, in accordance with Part 127 of Public Act 268 of 1978 Rules R 325.1663 and R 325.1664. The borehole stayed open to approximately 17 feet below grade (fbg) where the sand pack collapsed to fill the void left by the removal of the well screen/casing materials. Fifty (50) pounds of granular bentonite was used to fill the borehole to the ground surface and was hydrated. A well abandonment log is provided in **Attachment A**.

Well Replacement Activities

Monitoring well OBG MW-25 and piezometer PZ-3 were replaced to provide water quality data, as needed and appropriate, and more importantly water level data just outside of the Middle Pond. The water level data will be utilized in the creation of the piezometric surface/contour maps for the Perched zone at the Site to aid in evaluating the influence the impoundments have on the hydrogeology in the area.

The replacement well for OBG MW-25, OBG MW-25R(2022), was placed approximately 20 feet south and a few feet west of the original well location based on the GPS coordinates for the original well location. The replacement well for PZ-3, PZ-3R(2022), was installed about 70 feet west-southwest of its original location based on its original GPS coordinates. The location and elevation survey for OBG MW-25R(2022) and PZ-3R(2022) will be conducted this spring at the same time that the Middle Pond berm will be resurveyed to evaluate the adequacy of repairs made to the berm in December 2022.

Prior to installing OBG MW-25R(2022) and PZ-3R(2022) Geoprobe® soil sampling techniques using DT37 (3.75 inch diameter dual tube) sampling tooling to collect 2-inch diameter continuous soil core samples to evaluate where to set the well screens at the replacement well locations. The soils were visually logged using the Unified Soil Classification System (USCS). Boring logs for OBG MW-25R(2022) and PZ-3R(2022) are provided in **Attachment B**. Cuttings will be spread on the ground surface around the well.

The geology at both OBG MW-25R(2022) and PZ-3R(2022) were more clayey in their screened zones than in the original well locations. The original OBG MW-25 was screened from 10 to 15 fbg with sand seams noted from 12.3 to 12.8 fbg and from 13.5 to 14.9 fbg; whereas at the replacement well location, there was a sandy, silty CLAY from 13.4 to 13.7 fbg and a silty sand seam from 16.5 to 16.7 fbg. The replacement well was screened from 12.5 to 17.5 fbg. The original PZ-3 was screened from 15.5 to 20.5 fbg with a sand seam encountered from 19.8 to 20.5 fbg; whereas at the replacement location there was a thin silt seam from 18.7 to 19.0 fbg. The replacement piezometer was screened from 18.0 to 23.0 fbg.

OBG MW-25R(2022) and PZ-3R(2022) were constructed using 2-in diameter, flush-threaded PVC casing. The screen lengths were 5 ft long PVC with slot openings of 0.010 in and a PVC plug on the bottom of the screen. The annular space around the screen was back-filled with silica sand to a height of 2 ft above the top of the screen. A seal of hydrated coarse granular bentonite (chips) was placed above the sand pack to the base of the cement utilized to secure the protective casing around each well.

The drilling contractor only brought flush mount protector casings with them; therefore, the 4-in diameter steel stick up, locking, protective casing from the original PZ-3 location was installed at the surface with a concrete anchor at OBG MW-25R(2022) and a new 8-inch diameter flush mount protector casing was installed around PZ-3R(2022). We are considering converting protective casing for PZ-3R(2022) to a stick up protective casing prior to surveying the location and top of casing the wells by extending the riser at PZ-3R to approximately 2.5 feet above grade using a coupler and a section of new riser pipe. Well construction logs for OBG MW-25R(2022) and PZ-3R(2022) are provided in **Attachment C**.

The two replacement wells will be developed this spring prior to the annual PFAS sampling event that is scheduled for June 2023. Other wells are in need of redevelopment this year prior to the annual sampling event; therefore, all wells needing development will be developed at least two weeks prior to the annual sampling event. Well development will be performed using the pump and surge method used to redevelop wells at the Site every three years.

If you have any questions or comments concerning this memo, please feel free to contact me at 313.333.0211 or clifford.yantz@ramboll.com, or Dave Favero with RACER Trust at 734.879.9525 or dfavero@racertrust.org.

Yours sincerely,

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.



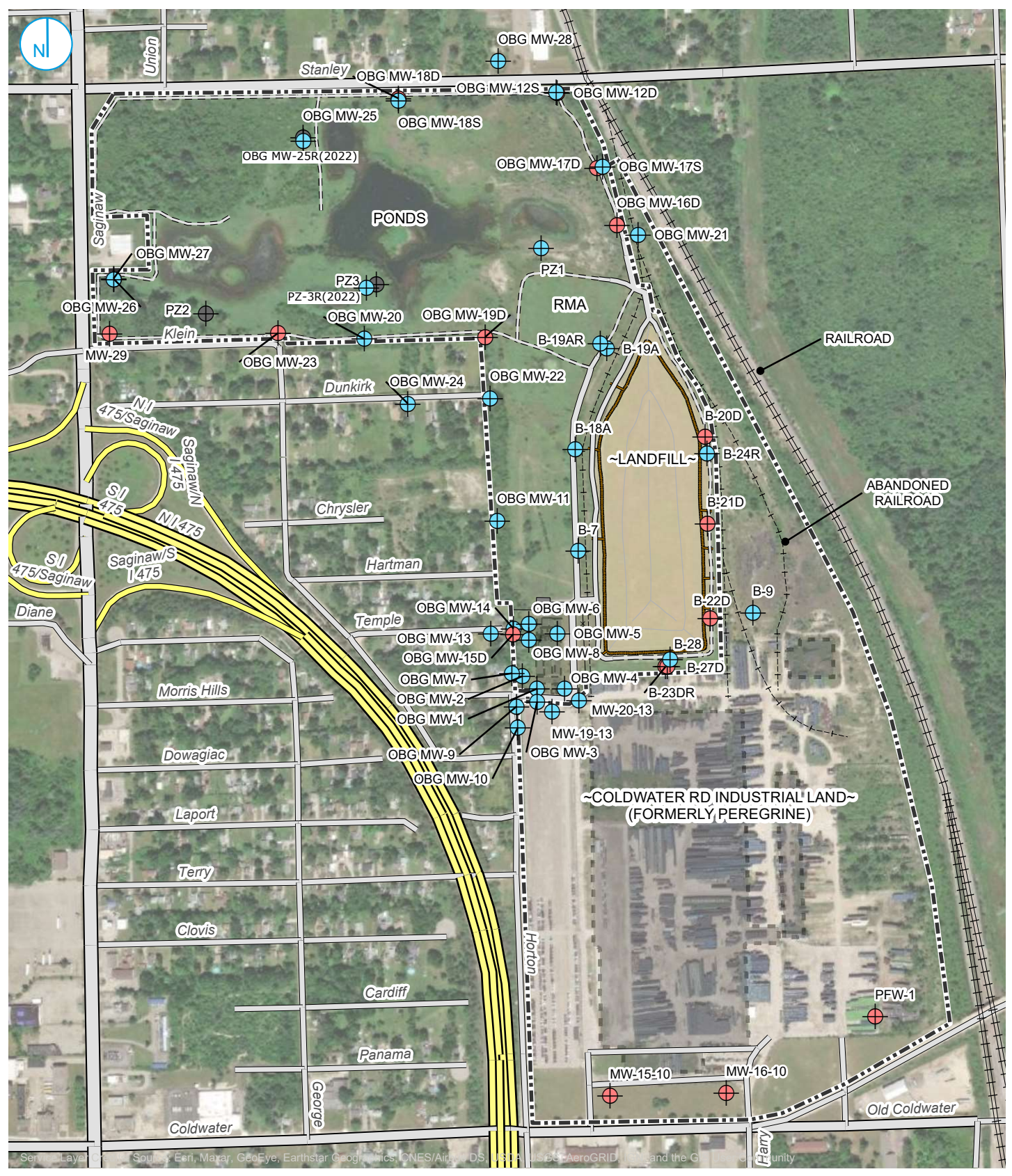
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ENCLOSURES:

- Figure 1 – Proposed Wells for Abandonment
- Attachment A – Well Abandonment Log
- Attachment B – Boring Logs
- Attachment C – Well Construction Logs

FIGURES



LEGEND

- PERCHED MONITORING WELL / PIEZOMETER
- DRIFT MONITORING WELL / PIEZOMETER
- ABANDONED MONITORING WELL / PIEZOMETER
- PROPERTY BOUNDARY
- FORMER BUILDING



MONITORING WELL LOCATION MAP

FIGURE 1

RACER TRUST
COLDWATER ROAD
FLINT, MICHIGAN

RAMBOLL US CORPORATION
A RAMBOLL COMPANY





ATTACHMENT A

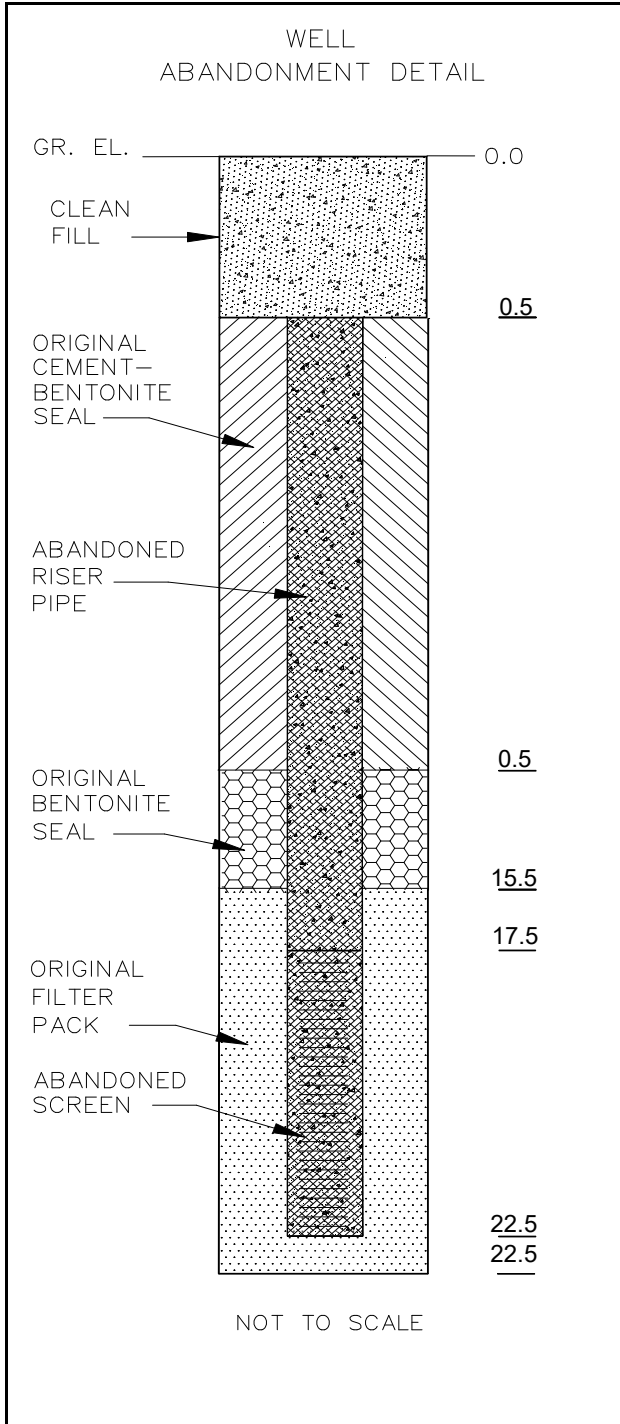
WELL ABANDONMENT LOG

WELL ABANDONMENT LOG

Well ID: PZ-1

Project: Coldwater Road Facility
 Location: Genesee Twp., Michigan
 Project No.: 1940102192

Client: RACER Trust
 Date Installed: December 10, 2018
 Date Abandoned: December 21, 2022



Inspection Notes:

Inspector: Clifford S. Yantz
 Drilling Contractor: Job Site Services
 Type of Well: Environmental Monitoring Well

Height of Stickup (ft): Formerly 2.43 ft-Casing Removed

Abandonment Method:

Type: Backfilled with Granular Bentonite
 Date of Casing Removal: December 21, 2022

Drilling Method:

Type: Hollow-stem Auger Diameter: 8.5"
 Casing: 4.25"

Seal(s):

Type: Granular Bentonite Interval: 0 - 17 ft bg
 Type: Sand Pack Collapse Interval: 17 - 22.5 ft bg
 Volume: 0.5 cu. ft. (50 lbs.)

Riser Pipe Left in Place:

Material: Sch 40 PVC Diameter: 2" ID
 Interval: REMOVED

Screen Material Left in Place:

Material: Sch 40 PVC Diameter: 2" ID
 Interval: REMOVED

Notes:

1. Riser pipe and screen removed to a depth of 22.5 feet below grade and (50 pounds) of bentonite used to fill borehole.
3. "NA" indicates not applicable.
4. "ft bg" indicates feet below grade.
5. All Elevations in feet above mean sea level.
6. Abandoned in accordance with GWQC Act (Part 127 of PA 368 of 1978) Rules R 325.1663 and R 325.1664.





ATTACHMENT B

BORING LOGS



BORING LOG

WELL NO. OBG-MW-25R(2022)

PROJECT: Coldwater Road Landfill
CLIENT: RACER Trust
INSPECTOR: Clifford Yantz

SHEET 1 OF 1
 JOB NO. 1940102192

DRILLING CONTRACTOR: JSS
DRILLER: Ed
PURPOSE: Well Replacement
DRILLING METHOD: Direct Push
DRILL RIG TYPE: Geoprobe 7822DT

GROUND ELEV.
 DATUM
 DATE STARTED 12/21/2022
 DATE FINISHED 12/21/2022

	SAMPLE	CORE	CASING
TYPE	SS	Soil	Dual Tube
DIA.	2"	3.75"	---

DEPTH (ft)	Sample Type Number	Blows/6" (N Value)	Penetration/ Recovery	MATERIAL DESCRIPTION	Graphic Log	JCS Symbol	Stratum Change	Field Testing PID (ppm)	Well Graphic	REMARKS
0				Dark brown, clayey TOPSOIL, some humus and roots	0.3			0		
2	SS-1		5.0'/3.7'	Moist, stiff to very stiff, brown and gray mottled, silty CLAY, little to some coarse to fine sand, trace fine gravel (reworked clay, FILL)		CL		0		
4				-----	4.6			0		
6				Becomes a little sandier - some sand	5.2	CL		0		
8	SS-2		5.0'/5.0'	Moist, stiff to very stiff, brown with little gray mottling, silty CLAY, little to some coarse to fine sand, trace to little fine to coarse gravel (Glacial Till)		CL		0		
10					9.9			0		
12	SS-3		5.0'/5.0'	Moist, stiff, gray, silty CLAY, little to some coarse to fine sand, trace to little fine gravel (Glacial Till)				0		
14					13.4			0		
14				Moist to wet, sandy, silty CLAY to clayey SAND	13.7	CL-SC		0		
16	SS-4		2.5'/2.5'	Moist, stiff, gray, silty CLAY, trace to some coarse to fine sand, trace to little fine gravel (Glacial Till)		CL		0		
18					16.5			0		
18				Wet, grayish brown, silty SAND, trace clay	16.7	SM		0		
20	SS-5		2.5'/2.5'	Moist, medium stiff, gray, silty CLAY, trace to little sand, trace fine gravel (Glacial Till)		CL		0		
20				End of Borehole at 20.0'	20.0					
22										
24										
26										
28										
30										
32										

Report Name: NEW OBG BORING LOG Data Template: OBG GINT STD US.GDT

Notes: Boring location west of northwest portion of Middle Pond berm a little south of original well location. Installed well with screen from 12.5-17.5', sand pack to 10.5' hole plug to 0.5'.



BORING LOG

WELL NO. PZ-3R(2022)

PROJECT: Coldwater Road Landfill
CLIENT: RACER Trust
INSPECTOR: Clifford Yantz

SHEET 1 OF 1
 JOB NO. 1940102192

DRILLING CONTRACTOR: JSS
DRILLER: Ed
PURPOSE: Piezometer Replacement
DRILLING METHOD: Direct Push
DRILL RIG TYPE: Geoprobe 7822DT

GROUND ELEV. _____
 DATUM _____
 DATE STARTED 12/21/2022
 DATE FINISHED 12/21/2022

	SAMPLE	CORE	CASING
TYPE	SS	Soil	Dual Tube
DIA.	2"	3.75"	---

DEPTH (ft)	Sample Type Number	Blows/6" (N Value)	Penetration/ Recovery	MATERIAL DESCRIPTION	Graphic Log	JCS Symbol	Stratum Change	Field Testing PID (ppm)	Well Graphic	REMARKS
0.3				Moist, gray, silty clayey TOPSOIL				0		
2	SS-1		5.0'/4.2'	Moist, medium dense, brown with gray mottling, silty SAND, little clay, trace fine gravel (reworked clay, FILL)		SC-SM		0		
3.3										
4				Moist, stiff to very stiff, brown with little orange mottling, silty CLAY, little to some coarse to fine sand, little fine gravel (Glacial Till)				0		
8	SS-2		5.0'/4.1'			CL		0		
8.5				Moist zone, infiltrating water in thin siltier zone at 8.5'				0		
11.5								0		
12	SS-3		5.0'/4.6'	Moist, stiff to very stiff, gray, silty CLAY, little to some coarse to fine sand, trace gravel (Glacial Till)				0		
14						CL		0		
16								0		
18	SS-4		5.0'/5.0'					0		
18.7								0		
19.0				Wet, clayey silt seam		ML		0		
20				Moist, stiff to very stiff, gray, silty CLAY, little to some coarse to fine sand, trace gravel (Glacial Till)				0		
22	SS-5		5.0'/5.0'			CL		0		
24				1" thick clayey silt seam at 24.1'				0		
25.0				End of Borehole at 25.0'.				0		

Report Name: NEW OBG BORING LOG Data Template: OBG GINT STD US.GDT

Notes: Piezometer PZ-3 was installed south/west of southern portion of Middle Pond berm about 70 feet southwest of original location. Installed well with screen from 18-23', sand pack to 16' hole plug to 0.5'.



ATTACHMENT C

WELL CONSTRUCTION LOGS

WELL CONSTRUCTION LOG

Well ID: OBG MW-25(2022)

Project: Coldwater Road Site
Location: Flint, MI
Project No.: 1940102192

Client: RACER Trust
Date Installed: December 21, 2022

Inspection Notes:

Inspector: Clifford Yantz
Drilling Contractor: Job Site Services
Type of Well: Environmental Monitoring Well

Drilling Method:

Type: Geoprobe: Dual Tube (DT37)
Casing: Stainless Steel Diameter: 3.75 inch

Protective Casing:

Type: Stick-Up Diameter: 4 inch

Surface Seal:

Type: Cement Interval: 0 - 0.5 fbg

Isolation Casing:

Casing: N/A Diameter: N/A
Interval: _____

Riser Pipe:

Material: Sch. 40 PVC Diameter: 2" ID
Interval: +2.5 fbg - 12.5 fbg

Grout

Type: N/A Interval: N/A

Bentonite Seal:

Type: Bentonite Chips Interval: 0.5 fbg - 10.5 fbg

Sand Pack:

Type: Silica Sand Interval: 10.5 fbg - 20.0 fbg

Screen Material:

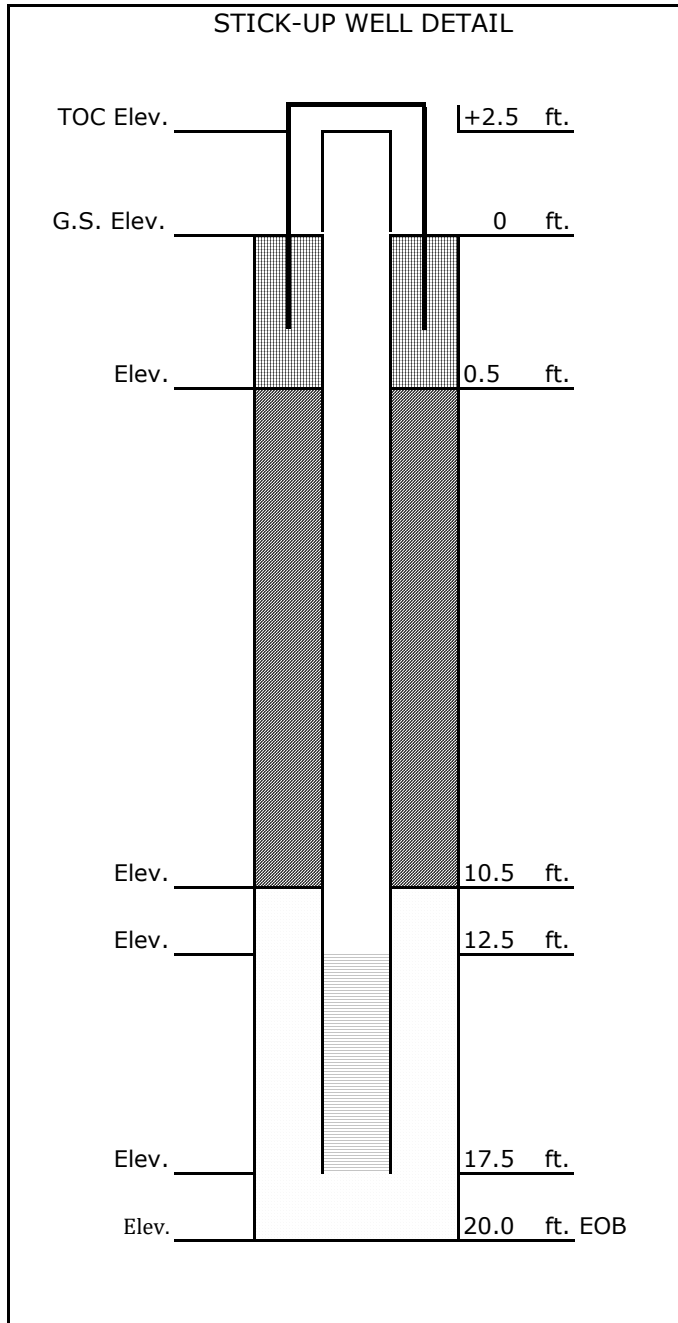
Material: Sch. 40 PVC Diameter: 2" ID
Interval: 12.5 fbg - 17.5 fbg Slot Size: 0.010

Material Below Sand Pack:

Type: Silica Sand Interval: (see Sand Pack)

Notes:

1. Steel protective casing has cement collar.
2. "NA" indicates not applicable.
3. "fbg" indicates feet below grade.



WELL CONSTRUCTION LOG

Well ID: PZ-3R(2022)

Project: Coldwater Road Site
Location: Flint, MI
Project No.: 1940102192

Client: RACER Trust
Date Installed: December 21, 2022

Inspection Notes:

Inspector: Clifford Yantz
Drilling Contractor: Job Site Services
Type of Well: Environmental Monitoring Well

Drilling Method:

Type: Geoprobe: Dual Tube (DT37)
Casing: Stainless Steel Diameter: 3.75 inch

Protective Casing:

Type: Flush Mount Diameter: 8 inch

Surface Seal:

Type: Cement Interval: 0 - 1.0 fbg

Isolation Casing:

Casing: N/A Diameter: N/A
Interval: _____

Riser Pipe:

Material: Sch. 40 PVC Diameter: 2" ID
Interval: 0.3 fbg - 18.0 fbg

Grout

Type: N/A Interval: N/A

Bentonite Seal:

Type: Bentonite Chips Interval: 1.0 fbg - 16.0 fbg

Sand Pack:

Type: Silica Sand Interval: 16.0 fbg - 25.0 fbg

Screen Material:

Material: Sch. 40 PVC Diameter: 2" ID
Interval: 18.0 fbg - 23.0 fbg Slot Size: 0.010

Material Below Sand Pack:

Type: Silica Sand Interval: (see Sand Pack)

Notes:

1. Steel protective casing has cement collar.
2. "NA" indicates not applicable.
3. "fbg" indicates feet below grade.

