GROUNDWATER AND SURFACE WATER MONITORING DATA RELEASE
2016 SAMPLING EVENT
SHALLOW LAND DISPOSAL AREA FUSRAP SITE

U.S. Army Corps of Engineers
Building Strong®
Pittsburgh District

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Formerly Utilized Sites Remedial Action Program (FUSRAP)

FUSRAP was initiated in 1974 to identify, investigate, and if necessary, cleanup or control sites throughout the United States that were part of the Nation's early atomic weapons and energy programs during the 1940s, 1950s, and 1960s. When implementing FUSRAP, the United States Army Corps of Engineers (USACE) follows the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

The USACE is the lead federal agency under FUSRAP remediating the Shallow Land Disposal Area (SLDA) site.

Site Description

The SLDA is located in Parks Township, Armstrong County, Pennsylvania, about 23 miles (37 kilometers) east-northeast of Pittsburgh, Pennsylvania (Figure 1). The 44-acre (18-hectare) site is predominantly an open field partially bordered by woodland. Ten (10) disposal trenches were excavated in the overburden soils and together encompass approximately 1.2 acres (0.49 hectares); the trenches are separated geographically into the Trench 1 through 9 area (or the upper trench area) and Trench 10 (the lower trench area). Site topography declines approximately 115 feet (35 meters) from the southeast to northwest, or from Trenches 1 through 9 toward Trench 10 (Figure 2). The depths of the upper trenches vary between 10 and 15 feet, whereas Trench 10 varies up to 20 feet in depth.

The upper trench area is underlain by up to 20 feet of native silty soils that blanket the following four groundwater-bearing bedrock zones:

- First Shallow Bedrock - averages 13 feet in thickness between elevation 881 and 894 feet,
- Second Shallow Bedrock - averages 14-feet in thickness between elevation 856 and 870 feet,
- Upper Freeport Coal – averages 4 feet in thickness between elevations 832 and 836 feet and was subjected to room and pillar mining (now exhibits open-channel flow), and
- Deep Bedrock Zone - averages about 36 feet in thickness between elevations 757 and 793 feet.

In the Trench 10 area, the Freeport coal seam was strip mined and the general area backfilled with approximately 22 feet of shale rock spoils. Figure 3 presents a generalized northwest to southeast geologic cross section through the site to depict these site entities and groundwater zones.

Groundwater under the upper trench area flows predominantly in the following directions in each layer:

- Northerly in the soil layer (Figure 4),
- North to northeasterly in the first shallow bedrock zone (Figure 5),
- Both the northeasterly and southwesterly in the second shallow bedrock zone (Figure 6) due to a flow divide under the site,
- Southerly in the Freeport Coal (Figure 7), and
- Southwesterly in the deep bedrock zone (Figure 8).

Groundwater surrounding Trench 10 appears to enter the Upper Freeport Coal seam, which generally drains to the south (Figure 7).

The site is drained by a small ephemeral stream identified as Dry Run (Figure 2). A portion of the flow in Dry Run infiltrates into the coal mine spoils near Trench 10 and then the abandoned coal mines that underlie most of the site (see Figure 2-14 in USACE 2005). The balance of flow in Dry Run continues northwest into the Kiskiminetas River.

Land use surrounding the SLDA site consists of medium-sized residential communities and individual rural residences, small farms with croplands and pastures, idle farmland, forestlands, and light industrial areas. The closest community is Kiskimere, which is adjacent to and to the south of the SLDA; some residences are located within several hundred feet of the SLDA.

Previous Groundwater Monitoring Results

A series of non-USACE groundwater monitoring actions began in 1981 and led to a quarterly monitoring program that ceased in 2000; the USACE initiated site activities in 2002. The historical and USACE-generated data are summarized in the Remedial Investigation (RI) performed by the USACE (USACE 2005).

Groundwater sampling conducted by the USACE during the RI included the following radionuclides:

- Radium-228
- Uranium-234, -235, -238
- Thorium-228, -232
- Plutonium-239,-241
- Americium-241

In addition, 10% of the RI samples were analyzed for cesium-137, cobalt-60, thorium-230, radium-226, plutonium-238, -240, -242, and gross alpha and beta. The RI sampling of groundwater indicated that FUSRAP-related constituents were not a threat to human health and the environment (USACE 2005).

From April to December 2011 (during the initial remedial action), groundwater was sampled monthly at 14 locations for the following constituents: isotopic uranium (U-234, -235, -238), isotopic thorium (Th-228, -232), radium-228, plutonium-239 and -241, americium-241, total uranium, target analyte list (TAL) metals (plus molybdenum), anions, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), total organic carbon, and total dissolved solids. The radiological and metals analyses include both unfiltered and filtered samples. These sampling results were consistent with the RI sampling (i.e., FUSRAP-related radiologic constituents are not a risk to groundwater at the SLDA). This monitoring effort was suspended in 2012 due to a remediation hiatus and will re-initiate once remediation recommences; the 2011 data are presented in the 2013 groundwater sampling report (USACE 2014).

Annual Sampling Program Purpose

The groundwater monitoring plan that was developed in 2013 is used to guide annual sampling activities through the completion of the remedial action (USACE 2013). The overarching objective of the sampling effort is to ensure the protection of human health and the environment from FUSRAP-related constituents of concern at the SLDA site. The USACE plan delineated an optimal monitoring program to detect the potential for off-site migration, specifically towards the Kiskimere community.

The goals of the groundwater monitoring program include:

- Specify analytical parameters for collected samples (Table 1)
- Identify the locations to be sampled (Table 2)
- Identify the frequency of sampling (i.e., annual sampling)

This sampling program was developed in consultation with the U.S. Environmental Protection Agency (USEPA); the USEPA also samples groundwater at the SLDA and presents the findings under separate cover (see: www.EPA.gov).

Sampling Scope

Annual groundwater monitoring for 2016 at the SLDA was conducted on June 28 and 29, 2016. Twenty-one (21) groundwater locations were sampled and generally lie between the 10 trenches and the neighboring residences (Figure 9). Two (2) surface-water locations were also sampled to verify the protection of human health and the environment. Nine (9) wells planned for sampling did not yield water (pumped dry and did not recharge); one (1) well had minimal groundwater yield, so was only sampled for total (unfiltered) constituents. Consequently, six (6) wells were substituted to ensure completeness of the program. Table 1 lists the constituents analyzed and Table 2 lists the planned locations, along with well substitutions. The constituents listed in Table 1 are a subset of the analytes sampled during the RI and remedial action; this annual sampling program focuses on site contaminants specifically listed in the record of decision (ROD) (USACE 2007).

Static water levels from all site wells were recorded synchronously to the nearest 0.01 foot to determine whether adequate volumes were available for sampling and to confirm groundwater flow directions. These measurements are listed in Table 3; wells omitted from this list were either decommissioned during remedial action or previously damaged (unreliable). Figures 4 through 8 graphically present the groundwater elevation data and inferred flow directions for the five water bearing zones underlying the SLDA.

Low-flow sampling techniques consistent with USEPA guidance (Puls and Barcelona 1996) and the Department of Defense (DoD) (DoD 2013) were utilized for the groundwater sampling. Prior to sampling, wells were purged until the following field parameters stabilized according to the sampling plan: temperature, pH, specific conductance, oxidation-reduction potential (ORP), turbidity, and dissolved oxygen. These data are listed in Table 4.

Both unfiltered (total fraction) and field-filtered (dissolved fraction) groundwater samples were obtained where well yield allowed. All 2016 wells yielded enough groundwater to collect both sample sets for radionuclides, although two wells did not yield enough water to collect both fractions for metals (MW-03 yielded unfiltered metals and MW-50 yielded filtered metals). Filtered samples were collected by utilizing a disposable 0.45 micron in-line filter. Field duplicates provided quality control samples, which were collected at a rate of approximately one duplicate for every ten regular samples.

Samples were packaged according to standard practices and shipped to DoD Environmental Laboratory Accreditation Program (ELAP) accredited laboratories. Laboratory data were reviewed and qualified per laboratory performance quality indicators, the applicable laboratory and method criteria, and the DoD Quality Systems Manual.

The sampling task produced investigation derived waste (IDW) that consisted of solids and liquids. The solid IDW was assessed for radioactivity and either disposed of as general trash or retained on site for disposition. The liquid IDW consisted of purge water that was containerized on site for future disposition.

Sampling Results

Tables 5 and 6 list the unfiltered (total) and filtered (dissolved phase) analytical results for the 2016 monitoring event; Figure 9 highlights the wells that were sampled in 2016. Filtered data have a "-F" after the location name in the table. Table 7 presents a summary of all groundwater sampling results (2003-2016), comparative drinking water standards, and up-gradient values for radionuclides derived during the USACE RI. The 2016 analytical results are consistent with past sampling and select wells exhibit unique values for some analytes relative to the overall dataset; these are discussed below.

Metals Data:
The site-wide ranges of the 2016 data fall within the historical site ranges. The following metals exceeded their respective water quality standards in 2016 (Table 5):

- Aluminum
- Arsenic
- Beryllium
- Chromium
- Iron
- Manganese
- Nickel

The site-wide average values for aluminum, iron, and manganese exceed the primary or secondary drinking water standards (Table 7) due to the naturally low-oxygen or reducing conditions in the coal mine and deep groundwater zones below the coal mine. A singular arsenic exceedance in MW-22 (deep zone) was recorded in 2016 and reflects previous values from this well. This reducing condition commonly solubilizes these metals from natural minerals, which are persistent in the historic data ranges. The site-wide average for beryllium also exceeds the primary drinking water standard; in 2016, wells MW-03 and MW-39 near Trench 10 (coal-mine wells) show exceedances and will be monitored in future events. Nickel also was exceeded in wells MW-03 and MW-39, both coal-mine wells exhibiting very low pH (Table 4).

Radionuclides:
The site-wide ranges of the 2016 data fall within the historical site ranges. No radionuclides exceed the drinking water standards, as listed in Tables 6 and 7. Where calculated, the 2016 data generally reflect natural background ranges or are well below the drinking water standards.

Conclusions

The 2016 USACE sampling shows that radionuclides are present in site groundwater at concentrations indicative of background and well below USEPA MCLs or dose-based drinking water standards. Sampling results for metals show select constituents are above drinking water standards, primarily in the coal mine and deeper water-bearing zones. Other exceptions for metals vary throughout the hydrogeologic zones at the site and do not indicate a contiguously contaminated zone. The overall sampling results are consistent with past USACE findings that indicate no FUSRAP-related radionuclides exceed the USEPA MCLs or dose-based drinking water standards. The USACE plans to perform annual groundwater sampling again during mid-2017.

References

Department of Defense (DoD), 2013. DoD Environmental Field Sampling Handbook, Revision 1.0, DoD Environmental Data Quality Workgroup, April 2013.

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U.S. Army Corps of Engineers (USACE), 2005. Shallow Land Disposal Area Remedial Investigation Report, U.S. Army Corps of Engineers, October 2005.

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U.S. Army Corps of Engineers (USACE), 2013. Groundwater and Surface Water Data Release, U.S. Army Corps of Engineers, December 2013.

U.S. Environmental Protection Agency (USEPA), 2001. Directive number 9283.1-14, Memorandum: Use of Uranium Drinking Water Standards under 40 CFR 141 and 40 CFR 192 as Remediation Goals for Groundwater at CERCLA sites.

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TABLES

Table 1. Site Monitoring Program and Analytical Methods

Analyte	Fraction	Method
Target Analyte List (TAL) Metals	Filtered and Unfiltered	EPA 6020, Inductively Coupled Plasma Mass-Spectrometry (ICPMS)
Total Uranium	Filtered and Unfiltered	ASTM D5174, Trace Uranium by Pulsed-Laser Phosphorimetry
Thorium-228 Thorium-230 Thorium-232 Uranium-234 Uranium-235 Uranium-238 Plutonium-238 Plutonium-239/240 Americium-241	Filtered and Unfiltered	Alpha Spetrometry
Plutonium-241	Filtered and Unfiltered	Liquid Scintillation

Table 2. Shallow Land Disposal Area FUSRAP Site Groundwater Monitoring Well Summary (2016)

Well/Location	Top of Casing Elevation (ft AMSL)	Zone	Up (U) or Down (D) Gradient from Disposal Areas	Monitoring Activity			Rationale
				Water Level	Unfiltered GW	Filtered GW	
02U11	925.99	OB	D	X			Water Levels
02U13	923.45	OB	D	X			Water Levels
03U05	924.1	OB	D	X			Water Levels
05U07	935.1	OB	U	X			Water Levels
06U05	941.26	OB	D	X			Water Levels
08U04	938.94	OB	D	X			Water Levels
08U05	940.93	OB	D	X			Water Levels
09U07	927.69	OB	D	X			Water Levels
10L31	859.84	UF	U	X	X	X	Trench Containment Verification
10L32	848.69	UF	U	X			Water Levels
MW-01	845.79	UF	U	X	◊	◊	Water Levels
MW-02	884.22	DB	U	X			Water Levels
MW-02A	885.43	UF	D	X	X	X	Trench Containment Verification
MW-03	890.5	UF	D	X	X	NS	Trench Containment Verification
MW-04	NA	UF	D	X			Water Levels
MW-05	865.49	UF	U	X	X	X	Trench Containment Verification
MW-07	921.52	1S	U/cross gradient	X			Trench Containment Verification
MW-08	931.77	1S	U	X	X	X	Trench Containment Verification
MW-09A	945.45	1S	U	X	X	X	Trench Containment Verification
MW-11D	909.8	2S	D	X			Water Levels
MW-11S	909.27	OB	D	X			Water Levels
MW-12D	919.31	1S	D	X			Water Levels
MW-13	948.68	1S	U	X	X	X	Trench Containment Verification
MW-14	947.33	1S	U	X	X	X	Trench Containment Verification
MW-15	940.31	1S	U	X	X	X	Trench Containment Verification
MW-17	913.71	2S	D	X			Water Levels
MW-19	861.45	DB	U	X			Water Levels
MW-20	889.87	UF	D	X	NS	NS	Trench Containment Verification
MW-21	888.32	UF	D	X	NS	NS	Trench Containment Verification
MW-22	893.41	DB	D	X	X	X	Trench Containment Verification
MW-25	910.07	1S	D	X			Water Levels
MW-26	919.56	1S	D	X			Water Levels
MW-27	929.99	1S	D	X			Water Levels
MW-29	912.53	1S	D	X			Water Levels
MW-32	925.89	1S	U	X	NS	NS	Trench Containment Verification
MW-33	940.76	2S	U	X	X	X	Trench Containment Verification
MW-34A	926.84	DB	D	X	NS	NS	Trench Containment Verification
MW-35	913.68	DB	U	X			Water Levels
MW-37	926.58	2S	D	X			Water Levels
MW-39	891.99	UF	D	X	X	X	Trench Containment Verification
MW-40	939.63	DB	D	X	X	X	Trench Containment Verification
MW-41	912.86	1S	D	X			Water Levels
MW-42	916.5	1S	D	X			Water Levels
MW-43	916.32	2S	D	X			Water Levels
MW-44	930.98	1S	D	X	◊	◊	Water Levels
MW-45	929.9	2S	U	X	NS	NS	Trench Containment Verification
MW-46	924.18	UF	D	X	NS	NS	Trench Containment Verification
MW-47	925.18	OB	U	X	NS	NS	Trench Containment Verification
MW-50	902.02	1S	D	X	◊	NS	Water Levels
MW-51	925.43	1S	D	X	◊	◊	Water Levels
MW-52	924.73	2S	U	X	NS	NS	Trench Containment Verification
MW-53	925.34	2S	D	X	X	X	Water Levels
MW-58	838.93	DB	U	X			Water Levels
MW-59	932.45	OB	U	X	◊	◊	Water Levels
MW-61	932.49	2S	U	X	NS	NS	Trench Containment Verification
MW-62	926.22	UF	D	X			Water Levels
MW-64	946.5	OB	U	X			Water Levels
MW-69	947.43	OB	U	X			Water Levels
MW-74	925.3	OB	U	X			Water Levels
MW-80	916.07	1S	D	X			Water Levels
MW-81	898.22	1S	D	X			Water Levels
MW-82	921.22	1S	D	X			Water Levels
MW-83	916.03	OB	D	X			Water Levels
MW-84	923.36	1S	D	X			Water Levels
MW-86	928.02	1S	D	X			Water Levels
NWS-01A	931.57	Varies	Varies	--			FLUTe Well – Not Measured
NWS-02	946.35	Varies	Varies	--			FLUTe Well – Not Measured
NWS-03	946.87	Varies	Varies	--			FLUTe Well – Not Measured
NWS-04	925.25	Varies	Varies	--			FLUTe Well – Not Measured
NWS-05	914.28	Varies	Varies	--			FLUTe Well – Not Measured
PZ-01	907.53	OB	D	X	◊	◊	Water Levels
PZ-02	913.49	OB	D	X			Water Levels
PZ-03A	920.72	OB	D	X			Water Levels
PZ-04	920.85	OB	D	X			Water Levels
PZ-05	929.78	OB	D	X			Water Levels
PZ-06A	943.23	OB	D	X			Water Levels
PZ-07	942.67	OB	U	X			Water Levels
PZ-08	933.31	OB	U	X			Water Levels
PZ-09	938.49	OB	U	X	X	X	Trench Containment Verification
TPZ-01	924.3	1S	U	X			Water Levels
TPZ-02	926.38	1S	U	X			Water Levels
TPZ-03	895.5	1S	D	X			Water Levels
TPZ-04	914.09	1S	D	X			Water Levels
TPZ-05	916.51	1S	D	X			Water Levels
TPZ-06	907.77	OB	D	X			Water Levels
TPZ-07	917.35	OB	D	X			Water Levels
TPZ-08	924.45	OB	D	X			Water Levels

Notes:

ft AMSL	feet above mean sea level	UF	Upper Freeport Coal
GW	Groundwater	DB	Deep Bedrock Zone
OB	Overburden	NA	Data Not Available
1S	First Shallow Bedrock Zone		
2S	Second Shallow Bedrock Zone		
◊	Water-level Well Sampled as a Replacment for Dry or Non-producing Trench Containment Well		
NS	Dry or Non-producing Trench Containment Well		

Table 3. 2016 SLDA Groundwater Level Record Sheet

Well ID	Date	Depth to Water	Depth to Bottom from TOC	New Remarks
01U17	6/26/2016	--	16.18	Not Measured - Damaged
03U05	6/26/2016	--	11.41	Not Measured - Damaged
06U05	6/26/2016	--	17.33	Not Measured - Damaged
10L31	6/26/2016	22.58	25.00	
10L32	6/26/2016	10.62	12.20	
MW-01	6/26/2016	7.73	20.00	
MW-02	6/26/2016	77.76	92.00	
MW-02A	6/26/2016	47.04	51.30	
MW-03	6/26/2016	52.33	53.20	
MW-05	6/26/2016	26.17	27.33	
MW-07	6/26/2016	31.98	35.44	
MW-08	6/26/2016	12.58	35.88	Requires Maintenance
MW-09A	6/26/2016	20.11	37.21	
MW-11D	6/26/2016	--	42.90	Dry
MW-11S	6/26/2016	11.80	11.90	Dry
MW-13	6/26/2016	23.02	38.65	
MW-14	6/26/2016	14.20	32.20	
MW-15	6/26/2016	12.34	31.23	
MW-17	6/26/2016	42.45	53.91	
MW-19	6/26/2016	57.65	109.20	
MW-20	6/26/2016	51.82	55.00	
MW-21	6/26/2016	50.72	50.50	Dry
MW-22	6/26/2016	89.59	113.70	
MW-25	6/26/2016	--	38.65	Not Measured
MW-26	6/26/2016	21.19	28.22	
MW-27	6/26/2016	34.49	38.61	
MW-29	6/26/2016	18.40	39.16	
MW-32	6/26/2016	26.37	26.15	Dry
MW-33	6/26/2016	56.09	83.75	
MW-34A	6/26/2016	100.55	100.60	Dry
MW-35	6/26/2016	113.60	167.70	
MW-37	6/26/2016	69.04	69.20	Dry and Possibly Collapsed Riser
MW-38	6/26/2016	41.19	63.30	
MW-39	6/26/2016	55.33	58.35	
MW-40	6/26/2016	122.37	191.80	
MW-41	6/26/2016	20.45	36.70	
MW-42	6/26/2016	24.75	41.70	
MW-43	6/26/2016	41.40	46.81	
MW-44	6/26/2016	41.23	54.65	
MW-45	6/26/2016	66.25	67.25	
MW-46	6/26/2016	39.40	39.47	Dry
MW-47	6/26/2016	17.90	20.95	
MW-50	6/26/2016	35.75	37.57	
MW-51	6/26/2016	32.33	36.24	
MW-52	6/26/2016	35.53	44.29	
MW-53	6/26/2016	53.26	62.11	
MW-58	6/26/2016	6.56	36.75	Possibly Clog at 36.75 ft
MW-59	6/26/2016	6.66	14.14	
MW-61	6/26/2016	67.48	68.00	Dry
MW-62	6/26/2016	88.94	90.70	Not Measured
MW-64	6/26/2016	14.23	21.95	
MW-69	6/26/2016	15.25	22.54	
MW-74	6/26/2016	15.00	15.24	Dry
MW-80	6/26/2016	27.01	39.42	
MW-81	6/26/2016	8.95	15.10	Needs Maintenance - Ant Infestation
MW-82	6/26/2016	29.65	38.31	
MW-83	6/26/2016	48.70	74.30	
MW-84	6/26/2016	34.30	39.56	
MW-86	6/26/2016	38.10	38.09	
PZ-01	6/26/2016	13.84	18.60	
PZ-02	6/26/2016	18.54	19.80	
PZ-04	6/26/2016	10.50	16.55	
PZ-05	6/26/2016	19.65	19.74	
PZ-06A	6/26/2016	7.39	17.31	
PZ-07	6/26/2016	7.59	19.80	
PZ-08	6/26/2016	8.36	19.88	
PZ-09	6/26/2016	8.99	19.28	
TPZ-02	6/26/2016	18.50	--	Bottom Not Measured
TPZ-03	6/26/2016	13.90	13.90	
TPZ-04	6/26/2016	20.22	27.66	
TPZ-05	6/26/2016	22.54	32.26	
TPZ-06	6/26/2016	--	7.55	Not Measured
TWSP 01-01	6/26/2016	--	13.03	Not Measured
TWSP 01-02	6/26/2016	--	13.05	Not Measured
TWSP 01-03	6/26/2016	--	13.09	Not Measured
TWSP 01-04	6/26/2016	--	13.05	Not Measured
TWSP 01-05	6/26/2016	--	12.55	Not Measured
TWSP 01-07	6/26/2016	--	13.12	Not Measured
TWSP 01-08	6/26/2016	--	13.03	Not Measured
TWSP 01-09	6/26/2016	--	12.60	Not Measured
TWSP 01-10	6/26/2016	--	10.65	Not Measured
TWSP 03-01	6/26/2016	--	11.38	Not Measured
TWSP 04-01	6/26/2016	--	3.20	Not Measured
TWSP 04-02	6/26/2016	--	18.58	Not Measured
TWSP 05-01	6/26/2016	--	15.80	Not Measured
TWSP 05-02	6/26/2016	--	10.40	Not Measured
TWSP 05-03	6/26/2016	--	14.17	Not Measured
TWSP 05-04	6/26/2016	--	13.89	Not Measured
TWSP 05-05	6/26/2016	--	17.12	Not Measured
TWSP 06-01	6/26/2016	--	14.85	Not Measured
TWSP 06-02	6/26/2016	--	16.50	Not Measured
TWSP 06-03	6/26/2016	--	18.15	Not Measured
TWSP 06-04	6/26/2016	--	18.55	Not Measured
TWSP 07-01	6/26/2016	--	13.40	Not Measured
TWSP 07-02	6/26/2016	--	12.40	Not Measured
TWSP 07-03	6/26/2016	--	19.68	Not Measured
TWSP 07-04	6/26/2016	--	16.30	Not Measured
TWSP 07-05	6/26/2016	--	--	Not Measured
TWSP 07-06	6/26/2016	--	17.10	Not Measured
TWSP 08-01	6/26/2016	--	--	Not Measured
TWSP 08-02	6/26/2016	--	17.30	Not Measured
TWSP 10-01	6/26/2016	--	17.93	Not Measured
TWSP 10-02	6/26/2016	--	16.73	Not Measured
TWSP 10-05	6/26/2016	--	20.45	Not Measured
TWSP 10-06	6/26/2016	--	21.13	Not Measured
TWSP 10-08	6/26/2016	--	--	Not Measured
TWSP 10-09	6/26/2016	--	15.44	Not Measured
TWSP 10-10	6/26/2016	--	19.60	Not Measured
TWSP 10-11	6/26/2016	--	20.38	Not Measured
TWSP 10-12	6/26/2016	--	21.69	Not Measured

Table 4. Groundwater Sampling Field Data (2016)

Well ID	Collect Date	Temperature (F)	Specific Conductance (mS/cm)	pH (standard unit)	ORP (mV)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	Purge Rate (mL/min)	Comments
10L31	28-Jun-16	77.9	0.392	6.37	199	3.22	53.0	130	Neglible drawdown (<0.1 foot)
MW-01	28-Jun-16	65.5	0.308	6.02	183	1.66	0.0	140	No Drawdown
MW-02A	28-Jun-16	57.2	0.324	5.92	228	2.51	0.0	230	2.2 feet of drawdown
MW-03	28-Jun-16	57.3	2.300	2.79	420	3.76	0.0	--	Pumped dry, multi-day composite
MW-05	28-Jun-16	65.5	0.475	5.69	263	2.99	9.5	120	Neglible drawdown (<0.1 foot)
MW-08	28-Jun-16	70.0	0.261	7.50	-13	0.32	0.0	130	Slight drawdown (<0.7 foot)
MW-09A	28-Jun-16	68.1	0.230	6.90	120	2.55	91.0	150	2.0 feet of drawdown
MW-13	28-Jun-16	61.3	0.213	7.00	-89	0.75	0.0	160	Slight drawdown (<0.3 foot)
MW-14	28-Jun-16	68.3	0.205	6.16	-44	1.11	191.0	150	Neglible drawdown (<0.2 foot)
MW-15	28-Jun-16	60.6	0.170	5.80	95	3.40	44.7	250	1.5 feet of drawdown
MW-22	28-Jun-16	59.3	1.370	6.28	-73	5.46	19.2	260	No Drawdown
MW-33	28-Jun-16	62.8	0.541	6.83	-105	4.54	0.0	210	0.6 feet of drawdown
MW-39	28-Jun-16	57.9	1.220	3.05	289	4.58	0.0	360	Neglible drawdown (<0.1 foot)
MW-40	28-Jun-16	58.3	1.200	8.12	-219	3.65	0.0	1100	7.8 feet of drawdown
MW-44	29-Jun-16	59.8	0.436	6.59	19	4.46	13.7	475	5.1 feet of drawdown
MW-47	29-Jun-16	59.0	0.204	4.68	288	7.16	752.0	100	2.0 feet of drawdown; NTU error; Dry
MW-50	29-Jun-16	--	--	--	--	--	--	--	Minimal water, multi-day composite
MW-51	29-Jun-16	55.8	0.428	6.60	-13	1.98	0.0	740	0.4 foot of drawdown
MW-53	29-Jun-16	57.8	1.130	7.15	233	7.68	4.2	325	4.0 feet of drawdown
MW-59	29-Jun-16	64.1	0.147	4.69	320	1.55	0.0	100	2.6 feet of drawdown
PZ-01	29-Jun-16	58.2	0.193	5.63	248	2.17	0.0	100	Neglible drawdown (<0.2 foot)
PZ-09	28-Jun-16	66.3	0.153	4.59	396	2.08	27.7	260	0.9 foot of drawdown
SP-DR-01	28-Jun-16	80.0	0.190	5.50	184	3.97	0.0	--	Groundwater seep near Trenches 4-5
WS-CR-06	28-Jun-16	75.0	0.412	7.36	232	8.69	0.0	--	Carnahan Run Outlet at Kiski River

Maximum	80.0	2.300	8.12	420	8.69	752	1100
Minimum	55.8	0.147	2.79	-219	0.32	0	100
Average	63.7	0.544	5.97	137	3.49	52	275
Geometric Mean	63.4	0.386	5.79	--	2.78	--	213

NOTES:

Temperature (F) - Degrees Fahrenheit

Specific Conductance (mS/cm) - millisiemens per centimeter

ORP (mV) - Oxidation Reduction Potential in milliivolts

Turbidity (NTU) - Nephelometric Turbidity Units

Purge Rate (mL/min) - milliliters per minute

Table 5. Comprehensive Metals Sampling Results at SLDA

Well	Year	ALUMINUM	ANTIMONY	ARSENIC	BARIUM	BERYLLIUM	CADMIUM	CALCIUM	CHROMIUM, TOTAL	COBALT	COPPER	IRON	LEAD	MAGNESIUM	MANGANESE	MERCURY	NICKEL	POTASSIUM	SELENIUM	SILVER	SODIUM	THALLIUM	VANADIUM	ZINC
Units		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/Lg/L
10L31	2013	0.01 J	0.00052 U	0.00061 U	0.039		0.00027 U	79	0.0013 J	0.00036 J	0.0008 J	0.29	0.00024 U	42	0.046	0.000086 J	0.0042 J	3.1	0.0015 U	0.00018 U	9	0.00016 U	0.00054 J	0.016 J
	2014	0.0038 J	0.001 U	0.001 U	0.043	0.0005 U	0.0005 U	67	0.0028 J	0.0005 U	0.00035 J	0.26	0.0005 U	36	0.013	0.0001 U	0.002 J	2.7	0.003 J	0.0005 U	6.8	0.0005 U	0.0005 U	0.0031 J
	2015	0.0084 J	0.001 U	0.001 U	0.06	0.0005 U	0.0005 U	54	0.00061 J	0.0005 U	0.0005 U	0.15 J	0.0005 U	27	0.0057	0.0001 U	0.0013 J	2.8	0.0025 U	0.0005 U	5.1	0.0005 U	0.0005 U	0.0018 U
	2016	0.015 J	0.00075 U	0.001 U	0.078	0.0005 U	0.0005 U	54	0.00062 J	0.00016 J	0.00073 J	0.62 U	0.0005 U	32	0.0015 J	0.0001 U	0.0039 J	2.3 J	0.0016 J	0.0005 U	1.9 J	0.0005 U	0.0005 U	0.0054 J
10L31 (Filtered)	2013	0.0099 J	0.00052 U	0.00061 U	0.03	0.00025 U	0.00027 U	65	0.0016 J	0.00018 J	0.00088 J	0.098 J	0.00024 U	32	0.037	0.00012 J	0.0037 J	2.5	0.0017 J	0.00028 J	7	0.00016 U	0.00049 U	0.013 J
	2014	0.0025 U	0.001 U	0.001 U	0.038	0.00034 J	0.0005 U	65	0.0018 J	0.00022 J	0.0015 J	0.47	0.0005 U	33	0.013	0.0001 U	0.0017 J	2.6	0.0025 U	0.0005 U	6.2	0.0005 U	0.00094 J	0.0035 J
	2015	0.0027 J	0.00062 J	0.001 U	0.054	0.0005 U	0.0005 U	54	0.002 J	0.00026 J	0.0005 U	0.16 J	0.0005 U	29	0.00093 J	0.0001 U	0.0014 J	2.8	0.0016 J	0.0005 U	5.5	0.0005 U	0.00054 J	0.0027 J
	2016	0.38	0.00075 U	0.001 U	0.075	0.0005 U	0.0005 U	52	0.00071 J	0.00013 J	0.0013 J	0.62 U	0.0005 U	29	0.0005 U	0.0001 U	0.0023 J	2.3 J	0.0022 J	0.0005 U	1.9 J	0.0005 U	0.0005 U	0.004 J
MW-01	2013	0.012 J	0.00052 U	0.00061 U	0.048		0.00027 U	46	0.00092 J	0.00022 J	0.0008 J	0.19 J	0.0003 J	23	0.014	0.000091 J	0.0034 J	1.8	0.0022 J	0.00018 U	4.8	0.0002 J	0.00049 U	0.0067 J
	2014	0.0043 U	0.00076 J	0.001 U	0.046	0.0005 U	0.0005 U	37	0.00066 J	0.0005 U	0.00046 U	0.12 U	0.0005 U	19	0.0015 J	0.0001 U	0.0014 J	1.5	0.0019 J	0.0005 U	3.2	0.0005 U	0.0005 U	0.0061 J
	2015	0.027 J	0.001 U	0.0032	0.07	0.0005 U	0.0005 U	26	0.0005 U	0.00013 J	0.00024 U	4.2	0.0005 U	13	0.011	0.0001 U	0.001 J	1.5	0.0025 U	0.0005 U	2.1	0.0005 U	0.0005 U	0.0018 U
	2016	0.012 J	0.00075 U	0.001 U	0.048	0.0005 U	0.0005 U	29	0.00054 J	0.0005 U	0.00055 J	0.62 U	0.0005 U	18	0.00042 J	0.0001 U	0.0016 J	1.5 J	0.0023 J	0.0005 U	3.7	0.0005 U	0.0005 U	0.0058 J
MW-01 (Filtered)	2013	0.0017 J	0.00052 U	0.00061 U	0.043	0.00025 U	0.00027 U	44	0.00031 J	0.00012 U	0.0004 J	0.048 U	0.00024 U	21	0.00086 J	0.000085 J	0.0032 J	1.7	0.0018 J	0.00018 U	4.5	0.00016 U	0.00049 U	0.0027 J
	2014	0.0025 U	0.001 U	0.001 U	0.047	0.0005 U	0.0005 U	33	0.00078 J	0.0005 U	0.0003 J	0.12 U	0.0005 U	17	0.00061 J	0.0001 U	0.0012 J	1.3	0.0024 J	0.0005 U	3	0.0005 U	0.00068 J	0.0022 J
	2015	0.0044 J	0.001 U	0.001 U	0.054	0.0005 U	0.0005 U	26	0.0012 J	0.00057 J	0.0005 U	0.31	0.0005 U	13	0.012	0.0001 U	0.00098 J	1.7	0.0022 J	0.0005 U	2.4	0.0005 U	0.0005 U	0.0027 J
	2016	0.46	0.00075 U	0.001 U	0.048	0.0005 U	0.0005 U	32	0.00041 J	0.0005 U	0.0024 J	0.62 U	0.0005 U	17	0.0005 U	0.0001 U	0.0019 J	1.6 J	0.0016 J	0.0005 U	3.7	0.0005 U	0.0005 U	0.0055 J
MW-02A	2013	0.041 J	0.0011 J	0.00061 U	0.035		0.00027 U	58	0.0017 J	0.0033 J	0.0027 J	0.38	0.00046 J	15	0.21	0.000087 J	0.021	3.6	0.0015 U	0.00018 U	4.9	0.00036 J	0.00049 U	0.023 J
	2015	0.073	0.001 U	0.001 U	0.034	0.0005 U	0.0005 U	27	0.0012 J	0.00089 J	0.00024 U	0.27	0.0005 U	11	0.053	0.0001 U	0.0047 J	1.7	0.0025 U	0.0005 U	1.9	0.0005 U	0.0005 U	0.0018 U
	2016	0.028 J	0.00075 U	0.001 U	0.033	0.0005 U	0.0005 U	32	0.00041 J	0.00082 J	0.0017 J	0.62 U	0.0005 U	11	0.083	0.0001 U	0.0042 J	2.2 J	0.0017 J	0.0005 U	3.4	0.0005 U	0.0005 U	0.013 J
MW-02A (Filtered)	2013	0.0094 J	0.00052 U	0.00061 U	0.03	0.00025 U	0.00027 U	59	0.00075 J	0.003	0.0028 J	0.46	0.00024 U	14	0.25	0.000064 U	0.033	3.4	0.0023 J	0.00018 U	4.6	0.00016 U	0.00049 U	0.025 J
	2015	0.01 J	0.001 U	0.001 U	0.035	0.0005 U	0.0005 U	27	0.0011 J	0.00094 J	0.0005 U	0.091 J	0.0005 U	11	0.049	0.0001 U	0.0053 J	1.7	0.0025 U	0.0005 U	1.5	0.0005 U	0.0005 U	0.012 J
	2016	0.86	0.00075 U	0.001 U	0.029	0.0005 U	0.0005 U	35	0.00045 J	0.00084 J	0.0031 J	0.62 U	0.0005 U	11	0.089	0.0001 U	0.0045 J	2.2 J	0.0025 U	0.0005 U	3.5	0.0005 U	0.0005 U	0.0099 J
MW-03	2014	55	0.00055 J	0.011	0.025 J	0.033	0.0044	200	0.051	0.18	0.15	99	0.0014	69	2	0.0001 U	0.68	1.6	0.0025 U	0.0005 U	7.1	0.0006 J	0.0005 U	2.2
	2015	31	0.002 J	0.005	0.0063 J	0.025	0.0013	170	0.035 J	0.14	0.074 J	69	0.0023	38	1.5	0.0001 U	0.49	2.5 U	0.0016 J	0.00018 U	2.7 J	0.00064 J	0.01 U	0.94
	2016	31	0.00075 U	0.002 U	0.0036 J	0.02	0.00072 J	160	0.022	0.12	0.042	67	0.001 U	59	1.3	0.0001 U	0.41	2.5 U	0.005 U	0.0005 U	6.4 J	0.00033 J	0.001 U	0.86
MW-03 (Filtered)	2015	49	0.001 U	0.0016	0.0035 J	0.028	0.0014	190	0.032	0.14	0.064	75	0.0021	64	1.7	0.0001 U	0.48	1.3	0.0025 U	0.0005 U	5.3	0.00044 J	0.00052 J	1.1
MW-05	2014	0.035 J	0.001 U	0.001 U	0.038	0.0005 J	0.0005 U	45	0.25	0.008	0.0028 J	1.3	0.0005 U	25	0.6	0.0001 U	0.34	2.2	0.0025 U	0.0005 U	17	0.0005 U	0.0005 U	0.0086 J
	2015	0.075	0.001 J	0.001 U	0.028	0.0005 U	0.0005 U	39	0.21	0.00065 J	0.0022 J	1.1	0.0005 U	20	0.012	0.0001 U	0.051	2.1	0.0025 U	0.0005 U	2.3	0.0005 U	0.0005 U	0.0018 U
	2016	0.012 J	0.00075 U	0.001 U	0.029	0.0005 U	0.0005 U	47	0.038	0.0003 J	0.0011 J	0.25 J	0.0005 U	28	0.0061	0.0001 U	0.04	2 J	0.0025 J	0.0005 U	12	0.0005 U	0.0005 U	0.0069 J
MW-05 (Filtered)	2014	0.018 J	0.001 U	0.001 U	0.027	0.0005 U	0.0005 U	44	0.0062 J	0.0043	0.002 J	0.095 J	0.0005 U	23	0.95	0.0001 U	0.16	2.1	0.0021 J	0.0005 U	17	0.0005 U	0.00064 J	0.011 J
	2015	0.63	0.001 U	0.001 U	0.028	0.00046 J	0.0005 U	43	0.01	0.0035	0.0016 J	1.5	0.0005 U	22	0.035	0.0001 U	0.045	2.2	0.0019 J	0.0005 U	2.5	0.0005 U	0.00057 J	0.023 J
	2016	0.35	0.00075 U	0.001 U	0.028	0.0005 U	0.0005 U	46	0.0027 J	0.0003 J	0.0069	0.62 U	0.0005 U	26	0.0075	0.0001 U	0.036	2 J	0.0016 J	0.0005 U	12	0.0005 U	0.0005 U	0.0057 J
MW-07	2013	0.015 J	0.0014 J	0.00061 U	0.2		0.00027 U	70	0.002 J	0.00049 J	0.0031 J	0.16 J	0.00038 J	13	0.46 J	0.000047 J	0.0062 J	2.5	0.0015 U	0.00086 J	5.2 J	0.00025 J	0.00049 U	0.023 J
	2014	0.024 J	0.001 U	0.001 U	0.24	0.00034 J	0.0005 U	59	0.0037 J	0.0003 J	0.007	0.15 J	0.00036 J	11	0.89	0.0001 U	0.006 J	3.2	0.0023 J	0.0005 U	4.9	0.0005 U	0.0005 U	0.0059 J
	2015	0.0078 J	0.001 U	0.001 U	0.17	0.0005 U	0.0005 U	57	0.00084 J	0.00015 J	0.0006 J	0.15 J	0.00026 J	9.9	0.25	0.0001 U	0.0022 J	2.1	0.0025 U	0.0005 U	3.3	0.0005 U	0.0005 U	0.0018 U
MW-07 (Filtered)	2013	0.0095 J	0.0012 J	0.00061 U	0.16	0.00025 U	0.00027 U	58	0.0015 J	0.00027 J	0.002 J	0.048 U	0.00024 U	9.9	0.39	0.00012 J	0.0049 J	2.1	0.0015 U	0.00018 U	4	0.00016 U	0.00049 U	0.015 J
	2014	0.0025 U	0.001 U	0.001 U	0.21	0.0005 U	0.0005 U	57	0.00078 J	0.00024 J	0.00098 J	0.12 U	0.0005 U	10	0.81	0.0001 U	0.0032 J	2.1	0.0025 U	0.00034 J	4.6	0.0005 U	0.0005 U	0.0023 J
	2015	0.0023 J	0.001 U	0.001 U	0.18	0.0005 U	0.0005 U	59	0.002 J	0.00018 J	0.0005 U	0.16 J	0.0005 U	11	0.25	0.0001 U	0.0025 J	2.1	0.0025 U	0.0005 U	3.9	0.0005 U	0.00055 J	0.061
MW-08	2013	0.005 J	0.00052 U	0.0014 J	0.35 J		0.0012	43	0.0025 J	0.0015 J	0.0019 J	0.47	0.0014	8.5	0.1	0.000095 J	0.0027 J	1.7	0.002 J	0.00018 U	3.8 J	0.0009 J	0.0018 J	0.014 J
	2014	0.0028 J	0.001 U	0.001 U	0.35	0.0005 U	0.0005 U	40	0.0036 J	0.00012 J	0.0005 U	0.42	0.0005 U	8.5	0.12	0.0001 U	0.003 J	1.5	0.0025 U	0.0005 U	3.1	0.0005 U	0.0005 U	0.0019 J
	2015	0.0014 U	0.001 U	0.00064 J	0.34	0.0005 U	0.0005 U	39	0.0004 J	0.0005 U	0.00024 U	0.59	0.0005 U	7.7	0.29	0.0001 U	0.0013 J	1	0.0025 U	0.0005 U	2.8	0.0005 U	0.0005 U	0.0025 U
	2016	0.067 J	0.00075 U	0.001 U	0.37	0.0005 U	0.0005 U	38	0.00059 J	0.00032 J	0.00096 J	1.5	0.0005 U	8.7	0.55	0.0001 U	0.002 J	1.4 J	0.0025 U	0.0005 U	3.6	0.0005 U	0.0005 U	0.0088 J
MW-08 (Filtered)	2013	0.0016 J	0.00052 U	0.00061 U	0.33	0.00025 U	0.00027 U	44	0.0003 U	0.00012 U	0.00032 J	0.28	0.00024 U	8.3	0.052	0.000062 U	0.0013 J	1.7	0.0015 U	0.00018 U	3.3	0.00016 U	0.00049 U	0.013 J
	2014	0.0025 U	0.001 U	0.001 U	0.33	0.0005 U	0.0005 U	38	0.00066 J	0.0005 U	0.00049 J	0.11 J	0.0005 U	7.7	0.051	0.0001 U	0.0023 J	1.5	0.0025 U	0.0005 U	2.9	0.0005 U	0.00062 J	0.0018 J
	2015	0.0025 U	0.001 U	0.001 U	0.34	0.0005 U	0.0005 U	39	0.00092 J	0.0005 U	0.0005 U	0.28	0.0005 U	8	0.19	0.0001 U	0.0014 J	1.6	0.0025 U	0.0005 U	3	0.0005 U	0.0005 U	0.0025 U
	2016	0.78	0.00075 U	0.001 U	0.33	0.0005 U	0.0005 U	38	0.0005 U	0.00016 J	0.0028 J	0.3 J	0.0005 U	8	0.24	0.000057 J	0.0014 J	1.3 J	0.0025 U	0.0005 U	3.4	0.0005 U	0.0005 U	0.0056 J
MW-09A	2013	0.044 J	0.00052 U	0.0043	0.46		0.00027 U	30	0.005 J	0.00044 J	0.013	0.51	0.00031 J	6	0.032	0.000083 J	0.0033 J	6.5	0.0015 U	0.00018 U	8.5	0.00016 U	0.00049 U	0.026 J
	2014	0.0032 J	0.001 U	0.001 U	0.43	0.0005 U	0.0005 U	26	0.0045 J	0.0005 U	0.00029 J	0.22	0.0005 U	5.4	0.021	0.0001 U	0.0014 J	11	0.0025 U	0.0005 U	11	0.0005 U	0.0005 U	0.0019 J
	2015	0.0025 U	0.00052 U	0.001 U	0.44	0.0005 U	0.0005 U	26	0.0042 J	0.0005 U	0.0005 U	0.072 J	0.0005 U	5	0.0017 J	0.0001 U	0.00094 J	9.6	0.0025 U	0.0005 U	10	0.00019 J	0.0005 U	0.0025 U
	2016	0.014 J	0.00075 U	0.001 U	0.43	0.0005 U	0.0005 U	25	0.0032 J	0.00017 J	0.00086 J	0.62 U	0.0005 U	5.9	0.0011 J	0.0001 U	0.001 J	11	0.0025 U	0.0005 U	12	0.0005 U	0.0005 U	0.0054 J
MW-09A (Filtered)	2013	0.059	0.00052 U	0.00061 U	0.41	0.00025 U	0.00027 U	27	0.0036 J	0.00029 J	0.001 J	0.18 J	0.00024 U	5.4	0.0039 J	0.00011 J	0.0025 J	6	0.0015 U	0.00079 J	7.7	0.00016 U	0.00049 U	0.016 J
	2014	0.0025 U	0.001 U	0.001 U	0.4	0.0005 U	0.0005 U	25	0.0024 J	0.0005 U	0.00025 J	0.12 U	0.0005 U	5.3	0.0084	0.0001 U	0.0019 J	11	0.0025 U	0.0005 U	10	0.0005 U	0.0005 J	0.004 J
	2015	0.0045 J	0.001 U	0.001 U	0.47	0.0005 U	0.0005 U	29	0.0055 J	0.00023 J	0.0005 U	0.092 J	0.0005 U	5.6	0.0005 J	0.0001 U	0.0018 J	10	0.0025 U	0.0005 U	11	0.0005 U	0.0005 U	0.0023 J
	2016	0.15 J	0.00075 U	0.001 U	0.43	0.0005 U	0.0005 U	24	0.0031 J	0.00016 J	0.071	0.62 U	0.0005 U	5.7	0.00028 J	0.0001 U	0.0039 J	11	0.0025 U	0.0005 U	12	0.0005 U	0.0005 U	0.0033 J
MW-13	2013	0.01 J	0.00052 U	0.00062 J	0.49		0.00027 U	40	0.0024 J	0.00032 J	0.0012 J	1.1	0.00051 J	8	0.066	0.000076 J	0.0019 J	1.5	0.0015 U	0.00018 U	3.3	0.00024 J	0.00049 U	0.012 J
	2014	0.0017 J	0.001 U	0.001 U	0.47	0.0005 U	0.0005 U	33	0.00038 J	0.0005 U	0.0005 U	0.64	0.0005 U	6.8	0.056	0.0001 U	0.00079 J	1.2	0.0026 J	0.0005 U	2.7	0.0005 U	0.0005 U	0.0025 U
	2015	0.05	0.001 U	0.001 U	0.43	0.0005 U	0.0005 U	33	0.00062 J	0.00023 J	0.0005 U	0.79	0.0005 U	6	0.039	0.0001 U	0.0011 J	0.93	0.0025 U	0.0005 U	2	0.0005 U	0.0005 U	0.0018 U
	2016	0.017 J	0.00075 U	0.001 U	0.44	0.0005 U	0.0005 U	29	0.0005 U	0.00012 J	0.00064 J	0.56 J	0.0005 U	6.8	0.046	0.0001 U	0.00076 J	1 J	0.0025 U	0.0005 U	2.2 J	0.0005 U	0.0005 U	0.0057 J
MW-13 (Filtered)	2013	0.0092 J	0.0015 J	0.00061 U	0.43	0.00025 U	0.00027 U	35	0.00072 J	0.00012 J	0.00086 J	0.68	0.00024 U	6.6	0.052	0.000085 J	0.0016 J	1.2	0.0015 U	0.0012 J	2.5	0.00016 U	0.00049 U	0.014 J
	2014	0.0039 J	0.001 U	0.001 U	0.45	0.0005 U	0.0005 U	33	0.00034 J	0.0005 U	0.0005 U	0.59	0.00048 J	6.5	0.054	0.0001 U	0.00095 J	1.2	0.0025 U	0.0005 U	3.2	0.0005 U	0.00054 J	0.0025 U
	2015	0.026 J	0.001 U	0.001 U	0.44	0.0005 U	0.0005 U	33	0.00084 J	0.00036 J	0.0005 U	0.7	0.0005 U	6.2	0.045	0.0001 U	0.001 J	0.78	0.0025 U	0.0005 U	2.1	0.0005 U	0.0005 U	0.0047 J
	2016	1.2	0.00075 U	0.001 U	0.43	0.0005 U	0.0005 U	32	0.0005 U	0.0005 U	0.0027 J	0.53 J	0.0005 U	6.8	0.044	0.0001 U	0.0011 J	1.1 J	0.0025 U	0.0005 U	2.3 J	0.0005 U	0.0005 U	0.0092 J
MW-14	2013	0.006 J	0.00052 U	0.0019	0.36		0.00027 U	34	0.00061 J	0.0038 J	0.0027 J	10	0.00038 J	6	0.41	0.000086 J	0.005 J	0.96	0.0015 U	0.00018 U	3.7	0.00017 J	0.00049 U	0.018 J
	2014	0.0027 J	0.001 U	0.0014 J	0.36	0.00046 J	0.0005 U	29	0.0005 U	0.0042 J	0.0005 U	7.7	0.0005 U	5	0.43	0.0001 U	0.0063 J	0.78	0.0025 U	0.0005 U	3	0.0005 U	0.0005 U	0.0055 J
	2015	0.13	0.0039 J	0.12	1.6	0.0044	0.0005 U	35	0.0035 J	0.0046 J	0.001 U	190	0.00081 J	3.6	0.48	0.0001 U	0.0071 J	0.55 J	0.0025 U	0.00052 J	1.7	0.0005 U	0.001 U	0.05 J
	2016	0.013 J	0.00075 U	0.0036	0.37	0.0025 U	0.0005 U	27	0.0025 U	0.0035 J	0.0059 J	12	0.00032 J	5.4	0.37	0.0001 U	0.0056 J	0.66 J	0.0025 U	0.0005 U	3.1	0.0005 U	0.0025 U	0.01 J
MW-14 (Filtered)	2013	0.0092 J	0.00081 J	0.00061 U	0.3	0.00025 U	0.00027 U	28	0.00076 J	0.003	0.00076 J	7.5	0.00024 U	4.9	0.33	0.00011 J	0.0043 J	0.77	0.0015 U	0.00082 J	3	0.00016 U	0.00049 U	0.017 J
	2014	0.0025 U	0.001 U	0.001 U	0.33	0.0005 U	0.0005 U	28	0.0005 U	0.0039	0.0003 J	6.5	0.0005 U	4.7	0.4	0.0001 U	0.0046 J	0.79	0.0025 U	0.0005 U	3	0.0005 U	0.0005 U	0.0051 J
	2015	0.0025 U	0.001 U	0.001 J	0.39	0.0005 U	0.0005 U	31	0.00063 J	0.0031	0.0005 U	7.1	0.0005 U	5.2	0.38	0.0001 U	0.0037 J	0.51	0.0025 U	0.0005 U	2.9	0.0005 U	0.0005 U	0.0024 J
	2016	0.13 J	0.00075 U	0.0012 J	0.35	0.0005 U	0.0005 U	29	0.0005 U	0.003	0.00074 J	6.7	0.0005 U	5.4	0.36	0.0001 U	0.0049 J	0.7 J	0.0025 U	0.0005 U	3.2	0.0005 U	0.0005 U	0.0058 J
MW-15	2013	0.033 J	0.00052 U	0.00061 U	0.21		0.00027 U	17	0.00059 J	0.0007 J	0.00064 J	17	0.00027 J	4.5	0.23	0.000091 J	0.00097 J	1	0.0015 U	0.00018 U	4	0.00016 U	0.00049 U	0.016 J
	2014	0.007 J	0.001 U	0.001 U	0.2	0.00034 J	0.0005 U	16	0.0005 U	0.00064 J	0.00029 J	4.7	0.0005 U	4	0.28	0.0001 U	0.0013 J	0.93	0.0025 U	0.0005 U	4.1	0.0005 U	0.0005 U	0.0055 J
	2015	0.0058 J	0.001 U	0.00063 J	0.25	0.0005 U	0.0005 U	17	0.0005 U	0.0015 J	0.0005 U	6.2	0.0005 U	4.1	1.4	0.0001 U	0.0022 J	0.71	0.0025 U	0.0005 U	4	0.00018 J	0.0005 U	0.0025 U
	2016	0.018 J	0.00075 U	0.001 U	0.27	0.0025 U	0.0005 U	22	0.0025 U	0.002 J	0.029	3.8	0.0005 U	5.6	1.3	0.0001 U	0.0028 J	0.9 J	0.0025 U	0.0005 U	4.5	0.0005 U	0.0025 U	0.0056 J
MW-15 (Filtered)	2013	0.011 J	0.00052 U	0.00061 U	0.19	0.00025 U	0.00027 U	18	0.00078 J	0.00026 J	0.00086 J	0.14 J	0.00024 U	4.4	0.14	0.000093 J	0.0017 J	1.1	0.0015 U	0.0005 J	3.8	0.00016 U	0.00049 U	0.012 J
	2014	0.0025 U	0.001 U	0.001 U	0.2	0.0005 U	0.0005 U	18	0.0005 U	0.00029 J	0.0005 U	0.088 J	0.0005 U	4.2	0.16	0.0001 U	0.00096 J	0.97	0.0025 U	0.0005 U	4.1	0.0005 U	0.00049 J	0.002 J
	2015	0.0025 U	0.0006 J	0.001 U	0.26	0.0005 U	0.0005 U	18	0.0007 J	0.0014 J	0.0005 U	0.43	0.0005 U	4.5	1.4	0.0001 U	0.0024 J	0.72	0.0025 U	0.0005 U	4.5	0.0005 U	0.0005 U	0.0031 J
	2016	0.62	0.00075 U	0.001 U	0.27	0.0005 U	0.0005 U	23	0.0005 U	0.00088 J	0.085	0.48 J	0.0005 U	5.4	1	0.0001 U	0.0022 J	0.87 J	0.0025 U	0.0005 U	4.4	0.0005 U	0.0005 U	0.0079 J
MW-20	2015	27	0.00062 J	0.021	0.051	0.014	0.001	430	0.024 J	0.16	0.061	64	0.011	100	4.5	0.0001 U	0.37	4.8 J	0.0028 J	0.00097 J	5.7	0.0014 J	0.005 U	0.65
MW-20 (Filtered)	2015	17	0.001 U	0.0012 J	0.011 J	0.014	0.00097 J	400	0.015	0.13	0.05	52	0.0047	87	4.5	0.0001 U	0.29	4.5	0.004 J	0.0005 U	6.6	0.00086 J	0.00055 J	0.63
MW-22	2013	0.044 J	0.0014 J	0.02	0.022 J		0.00027 U	210	0.0011 J	0.00072 J	0.0008 J	37	0.00036 J	44	0.59	0.000089 J	0.0075 J	5.1	0.0015 U	0.00018 U	12	0.00018 J	0.00049 U	0.012 J
	2014	0.075	0.00056 J	0.014	0.027	0.0005 U	0.0005 U	170	0.0024 J	0.00052 J	0.0031 J	28	0.00042 J	38	0.54	0.0001 U	0.0057 J	4.3	0.0024 J	0.0005 U	10	0.0005 U	0.0005 U	0.006 J
	2015	0.0055 J	0.001 U	0.015	0.023 J	0.0005 U	0.0005 U	180	0.0005 U	0.00019 J	0.0005 U	27	0.0005 U	35	0.5	0.0001 U	0.0032 J	4.6	0.0025 U	0.0005 U	11	0.0005 U	0.0005 U	0.0018 U
	2016	2.1	0.00074 J	0.017	0.036	0.0005 U	0.0005 U	150	0.0075 J	0.0019 J	0.0039 J	32	0.0017	41	0.53	0.0001 U	0.0078 J	4.4	0.0025 U	0.0005 U	13	0.0005 U	0.0058	0.023 J
MW-22 (Filtered)	2013	0.0027 J	0.00052 U	0.018	0.018 J	0.00025 U	0.00027 U	190	0.0003 U	0.00034 J	0.0004 J	35	0.00024 U	38	0.55	0.000073 J	0.0065 J	4.5	0.002 J	0.0003 J	10	0.00016 U	0.00049 U	0.013 J
	2014	0.0026 J	0.001 U	0.015	0.023 J	0.00029 J	0.0005 U	170	0.0006 J	0.0005 J	0.0061	30	0.0005 U	37	0.55	0.0001 U	0.0042 J	4.3	0.0025 U	0.0005 U	10	0.0005 U	0.0005 U	0.003 J
	2015	0.0025 U	0.001 U	0.019	0.023 J	0.0005 U	0.0005 U	180	0.00078 J	0.00025 J	0.0005 U	31	0.0005 U	37	0.56	0.0001 U	0.0042 J	4.6	0.0025 U	0.0005 U	11	0.0005 U	0.0005 U	0.0025 U
	2016	2.9	0.00075 U	0.017	0.015 J	0.0005 U	0.0005 U	160	0.00033 J	0.00034 J	0.035	30	0.0005 U	38	0.48	0.0001 U	0.0058 J	4.1	0.0025 U	0.0005 U	12	0.0005 U	0.0005 U	0.026 J
MW-33	2013	0.15	0.00052 U	0.0018	0.81		0.00027 U	36	0.0018 J	0.00057 J	0.0022 J	1	0.00098 J	6.8	0.08	0.0001 J	0.003 J	2.4	0.0015 U	0.00018 U	72	0.00025 J	0.0006 J	0.019 J
	2014	0.038 J	0.001 U	0.001 U	0.64	0.0005 U	0.0005 U	48	0.0014 J	0.00018 J	0.0013 J	0.71	0.00029 J	9.5	0.069	0.0001 U	0.0022 J	2.5	0.0025 U	0.0005 U	38	0.0005 U	0.0005 U	0.0043 J
	2015	6.5	0.00082 J	0.0034	0.85	0.0005 U	0.00029 J	34	0.015	0.0064	0.012	12	0.0086	8.3	0.23	0.0001 U	0.017	3.5	0.0025 U	0.00034 J	60	0.0005 U	0.0097	0.041 J
	2016	6.3	0.00075 U	0.0028	0.92	0.0025 U	0.0005 U	27	0.033 J	0.0045 J	0.016 J	7.8	0.0048	7.4	0.17	0.0001 U	0.027 J	3.7	0.0025 U	0.0005 U	68	0.0005 U	0.01 J	0.035 J
MW-33 (Filtered)	2013	0.0031 J	0.00052 U	0.00061 U	0.67	0.00025 U	0.00027 U	45	0.00048 J	0.00013 J	0.00078 J	0.32	0.00024 U	8.1	0.067	0.000081 J	0.0022 J	2.4	0.0015 U	0.00018 U	44	0.00016 U	0.00049 U	0.011 J
	2014	0.0037 J	0.001 U	0.001 U	0.61	0.0004 J	0.0005 U	46	0.0011 J	0.00016 J	0.00066 J	0.35	0.0005 U	8.8	0.054	0.0001 U	0.0018 J	2.4	0.0025 U	0.0005 U	34	0.0005 U	0.0005 U	0.0019 J
	2015	0.016 J	0.001 U	0.0012 J	0.5	0.0005 U	0.0005 U	40	0.002 J	0.00013 J	0.0005 U	0.27	0.0005 U	8	0.03	0.0001 U	0.0014 J	2.4	0.0025 U	0.0005 U	47	0.0005 U	0.00062 J	0.0025 U
	2016	0.054 J	0.00068 J	0.0016	0.76	0.0005 U	0.0005 U	29	0.0005 U	0.0005 J	0.0047 J	0.32 J	0.0005 U	6	0.052	0.0001 U	0.0034 J	2.3 J	0.0025 U	0.0005 U	66	0.0005 U	0.0005 U	0.015 J
MW-39	2013	5.4	0.00052 U	0.00061 U	0.03		0.00027 U	50	0.002 J	0.036	0.014	22	0.0011	20	0.23	0.000088 J	0.1	4.1	0.0022 J	0.00018 U	13	0.00024 J	0.00049 U	0.16
	2014	2.3	0.001 U	0.001 U	0.036	0.0021	0.0005 U	37	0.0013 J	0.018	0.0054	12	0.00027 J	17	0.12	0.0001 U	0.05	2.6	0.0016 U	0.0005 U	14	0.0005 U	0.0005 U	0.096
	2015	2.9	0.001 U	0.002	0.062	0.0009 J	0.0005 U	22	0.0039 J	0.0084	0.0057	15	0.0052	8.6	0.059	0.0001 U	0.022	2.2	0.0025 U	0.0005 U	7.1	0.0005 U	0.0019 J	0.054 J
	2016	19	0.00052 J	0.0024	0.011 J	0.01	0.00038 J	52	0.0022 J	0.055	0.026	89	0.0015	22	0.27	0.0001 U	0.14	3.2	0.0025 U	0.00026 J	9.7	0.00018 J	0.0025 U	0.32
MW-39 (Filtered)	2013	5.4	0.00052 U	0.00061 U	0.026	0.0044	0.00027 U	43	0.0012 J	0.031	0.014	14	0.00074 J	17	0.2	0.00012 J	0.086	3.5	0.0015 U	0.00022 J	12	0.00016 U	0.00049 U	0.17
	2014	2.4	0.001 U	0.001 U	0.034	0.0025	0.0005 U	39	0.00062 J	0.02	0.0085	11	0.00039 J	17	0.13	0.0001 U	0.055	2.5	0.0019 J	0.0005 U	14	0.0005 U	0.0005 U	0.11
	2015	0.87	0.001 U	0.00083 J	0.032	0.00094 J	0.0005 U	24	0.00079 J	0.008	0.00032 J	14	0.0005 U	9.1	0.062	0.0001 U	0.02	1.8	0.0017 J	0.0005 U	7.7	0.0005 U	0.0005 U	0.045 J
	2016	18	0.00075 U	0.0025	0.011 J	0.0099	0.00032 J	52	0.0025 U	0.049	0.027	82	0.0014	21	0.25	0.0001 U	0.13	3.2	0.0022 J	0.0005 U	9.7	0.0005 U	0.0025 U	0.31
MW-40	2013	0.017 J	0.00052 U	0.00061 U	0.4		0.00027 U	5.6	0.0011 J	0.00012 U	0.0034 J	0.35	0.00024 U	1.1	0.0098	0.000069 J	0.00022 J	1.8	0.0015 U	0.00018 U	240	0.00016 U	0.00049 U	0.0018 U
	2014	0.0083 J	0.001 U	0.001 U	0.32	0.00042 J	0.0005 U	4.5	0.0052 J	0.0005 U	0.0026 J	0.087 J	0.0005 U	0.8	0.0093	0.0001 U	0.007 J	1.3	0.003 J	0.0005 U	210	0.0005 U	0.0005 U	0.0018 J
	2015	0.063	0.001 U	0.001 U	0.32	0.0005 U	0.0005 U	4.7	0.0008 J	0.00038 J	0.00086 J	0.19 J	0.0005 U	0.64	0.016	0.0001 U	0.00082 J	1.2	0.0025 U	0.00042 J	190	0.0005 U	0.0005 U	0.0025 U
	2016	0.018 J	0.00075 U	0.001 U	0.3	0.0005 U	0.0005 U	3.7 J	0.00086 J	0.0005 U	0.0006 J	0.62 U	0.0005 U	0.77 J	0.0048 J	0.0001 U	0.0005 U	1.2 J	0.0025 U	0.0005 U	190	0.0005 U	0.0005 U	0.0049 J
MW-40 (Filtered)	2013	0.014 J	0.00052 U	0.00061 U	0.34	0.00025 U	0.00027 U	4.8	0.0004 J	0.00012 U	0.0029 J	0.052 J	0.00024 U	0.88	0.0082	0.000084 J	0.00058 J	1.5	0.0015 U	0.00037 J	230	0.00016 U	0.00049 U	0.0021 J
	2014	0.0047 J	0.001 U	0.001 U	0.31	0.00026 J	0.0005 U	4.4	0.0027 J	0.0005 U	0.0019 J	0.12 U	0.0005 U	0.75	0.0084	0.0001 U	0.0032 J	1.3	0.0025 U	0.0005 U	160	0.0005 U	0.0013 J	0.0025 U
	2015	0.048 J	0.001 U	0.001 U	0.32	0.0005 U	0.0005 U	4.8	0.0031 J	0.0012 J	0.0007 J	0.14 J	0.0005 U	0.59	0.017	0.0001 U	0.00072 J	1.3	0.0025 U	0.0005 U	190	0.0005 U	0.0008 J	0.0027 J
	2016	0.18 J	0.00075 U	0.001 U	0.29	0.0005 U	0.0005 U	3.6 J	0.0005 U	0.0005 U	0.00062 J	0.62 U	0.0005 U	0.77 J	0.0047 J	0.0001 U	0.0005 U	1.2 J	0.0025 U	0.0005 U	190	0.0005 U	0.0005 U	0.0025 U
MW-44	2015	0.21	0.001 U	0.0013 J	0.036	0.0005 U	0.0005 U	37	0.00052 J	0.0012 J	0.0013 J	0.39	0.00032 J	3.4	0.98	0.0001 U	0.0018 J	3	0.0025 U	0.0005 U	2.3	0.0005 U	0.0008 J	0.0031 J
	2016	0.51	0.00075 U	0.002 U	0.24	0.001 U	0.001 U	52	0.0012 J	0.00043 J	0.0033 J	0.49 J	0.0009 J	9.6	0.19	0.0001 U	0.0034 J	2.2	0.005 U	0.0005 U	10	0.001 U	0.001 U	0.013 J
MW-44 (Filtered)	2015	0.0025 U	0.00056 J	0.001 U	0.1	0.0005 U	0.0005 U	32	0.0017 J	0.0005 U	0.0005 U	0.12 J	0.0005 U	7.1	0.018	0.0001 U	0.00069 J	1.6	0.0025 U	0.0005 U	4.7	0.0005 U	0.0005 U	0.0029 J
	2016	0.23 J	0.0005 J	0.001 U	0.25	0.0005 U	0.0005 U	56	0.0005 U	0.00048 J	0.00051 J	0.62 U	0.0005 U	12	0.2	0.0001 U	0.0031 J	2.5 J	0.0025 U	0.0005 U	13	0.0005 U	0.0005 U	0.013 J
MW-45 (Filtered)	2015	0.0069 J	0.0015 J	0.001 U	0.47	0.0005 U	0.0005 U	91	0.0025 J	0.0012 J	0.0029 J	0.68	0.0005 U	22	0.11	0.0001 U	0.0091 J	9.3	0.0042 J	0.0005 U	120	0.0005 U	0.00072 J	0.0046 J
MW-50 (Filtered)	2016	0.027 J	0.00021 J	0.001 U	0.048	0.0005 U	0.0005 U	130	0.0005 U	0.00072 J	0.003 J	0.62 U	0.0005 U	34	0.058	0.0001 U	0.0074 J	5.7	0.0044 J	0.0005 U	13	0.0005 U	0.0005 U	0.026 J
MW-51	2014	0.087	0.001 U	0.001 U	0.29	0.00044 J	0.0005 U	57	0.0013 J	0.00053 J	0.0032 J	1.1	0.00059 J	12	0.13	0.0001 U	0.0028 J	2.2	0.0019 J	0.0005 U	7.8	0.00018 J	0.00078 J	0.0076 J
	2015	0.0057 J	0.00052 U	0.001 U	0.24	0.0005 U	0.0005 U	60	0.0017 J	0.0005 U	0.0005 U	0.28	0.0005 U	12	0.062	0.0001 U	0.0014 J	2.6	0.0025 U	0.00054 J	7.9	0.0005 U	0.0005 U	0.0018 U
	2016	0.018 J	0.00024 J	0.002 U	0.28	0.001 U	0.001 U	50	0.0015 J	0.001 U	0.003 J	0.44 J	0.00053 J	10	0.096	0.0001 U	0.003 J	1.8	0.005 U	0.0005 U	6.8	0.001 U	0.001 U	0.0074 J
MW-51 (Filtered)	2014	0.0016 J	0.0012 J	0.001 U	0.27	0.00036 J	0.0005 U	54	0.00082 J	0.00034 J	0.00048 J	0.28	0.0005 U	11	0.11	0.0001 U	0.002 J	2.2	0.0025 U	0.00055 J	7.5	0.0002 J	0.00074 J	0.0025 U
	2015	0.0099 J	0.001 U	0.001 U	0.25	0.0005 U	0.0005 U	60	0.0025 J	0.00017 J	0.0005 U	0.28	0.0005 U	14	0.066	0.0001 U	0.0018 J	2.6	0.0025 U	0.0005 U	8.9	0.0005 U	0.0007 J	0.0025 U
	2016	0.036 J	0.00075 U	0.001 U	0.31	0.0005 U	0.0005 U	50	0.0005 U	0.00025 J	0.00093 J	0.39 J	0.0005 U	11	0.094	0.0001 U	0.0027 J	2 J	0.0025 U	0.0005 U	7.1	0.0005 U	0.0005 U	0.019 J
MW-52	2013	0.028 J	0.00052 U	0.00061 U	0.3		0.00027 U	94	0.0039 J	0.00052 J	0.003 J	1.4	0.00036 J	15	0.25	0.000077 J	0.0067 J	2.2	0.0015 U	0.00018 U	3.9	0.00016 U	0.00049 U	0.0035 J
	2014	0.016 J	0.001 U	0.001 U	0.26	0.0005 U	0.0005 U	86	0.00074 J	0.00029 J	0.00041 J	1.1	0.0005 U	14	0.23	0.0001 U	0.0027 J	2	0.0025 U	0.0005 U	3.4	0.0005 U	0.0005 U	0.0087 J
	2015	0.08 J	0.001 U	0.0012 J	0.26	0.00051 J	0.00059 J	77	0.0041 J	0.00087 J	0.00062 J	1.1	0.00061 J	12	0.2	0.0001 U	0.0025 J	2	0.0025 U	0.0005 U	3	0.00054 J	0.00099 J	0.0018 U
MW-52 (Filtered)	2013	0.011 J	0.00052 U	0.00061 U	0.24	0.00025 U	0.00027 U	84	0.0023 J	0.0011 J	0.0015 J	0.95	0.00024 U	13	0.18	0.00012 J	0.0053 J	2.1	0.0017 J	0.00056 J	3.3	0.00016 U	0.00049 U	0.004 J
	2014	0.0025 U	0.001 U	0.001 U	0.25	0.0005 U	0.0005 U	84	0.002 J	0.00031 J	0.0005 U	0.95	0.0005 U	13	0.22	0.0001 U	0.0022 J	2	0.0025 U	0.0005 U	3.4	0.0005 U	0.00085 J	0.0025 U
	2015	0.0025 U	0.001 J	0.001 U	0.28	0.0005 U	0.0005 U	86	0.0031 J	0.00031 J	0.0005 U	1.1	0.0005 U	13	0.23	0.0001 U	0.0021 J	2.2	0.0025 U	0.0005 U	3.4	0.0005 U	0.00077 J	0.0025 U
MW-53	2014	0.27	0.001 U	0.0032	0.17	0.0005 U	0.0005 U	27	0.0047 J	0.0012 J	0.0059	0.99	0.0012	10	0.037	0.0001 U	0.011	51	0.0025 U	0.0005 U	110	0.0005 U	0.0015 J	0.025 J
	2015	0.21 J	0.0011 J	0.00083 J	0.45	0.0005 U	0.0005 U	83	0.003 J	0.00092 J	0.0038 J	0.7	0.00049 J	28	0.072	0.0001 U	0.0058 J	26	0.014	0.00018 U	80	0.0003 J	0.0011 J	0.023 J
	2016	0.27	0.00088 J	0.002 U	0.46	0.001 U	0.001 U	97	0.0059 J	0.00087 J	0.0043 J	0.21 J	0.001 U	30	0.1	0.0001 U	0.0078 J	21	0.008 J	0.0005 U	77	0.001 U	0.001 U	0.015 J
MW-53 (Filtered)	2014	0.15	0.0012 J	0.0042	0.12	0.0005 U	0.0005 U	12	0.0097 J	0.001 J	0.014	0.17 J	0.00045 J	10	0.012	0.0001 U	0.014	80	0.0025 U	0.00021 J	120	0.0005 U	0.0055	0.0077 J
	2015	0.0025 U	0.001 J	0.001 U	0.46	0.0005 U	0.0005 U	95	0.005 J	0.0011 J	0.0015 J	0.24	0.0005 U	29	0.056	0.0001 U	0.0052 J	30	0.012	0.0005 U	86	0.0005 U	0.0014 J	0.021 J
	2016	0.049 J	0.0012 J	0.001 U	0.41	0.0016	0.0023	91	0.0005 U	0.0029	0.0062	0.62 U	0.0011	31	0.047	0.0001 U	0.016	25	0.012	0.0005 U	71	0.0017 J	0.0005 U	0.042 J
MW-59	2013	0.2	0.00058 J	0.00061 U	0.056		0.00038 J	9	0.00098 J	0.018	0.0019 J	1.2	0.00052 J	8	0.73	0.0001 J	0.032	1.2	0.0015 U	0.00018 U	7.1	0.0002 J	0.00049 U	0.044 J
	2014	0.91	0.001 U	0.001 U	0.039	0.00064 J	0.0005 U	12	0.0012 J	0.014	0.0035 J	3.8	0.0005 U	9.4	0.57	0.0001 U	0.033	0.94	0.002 J	0.0005 U	6.1	0.0005 U	0.0005 U	0.056
	2015	0.77	0.001 U	0.001 U	0.047	0.0003 J	0.0005 U	9.3	0.00066 J	0.012	0.00024 U	1.6	0.00032 J	8.6	0.6	0.0001 U	0.022	0.93	0.0025 U	0.00018 U	4.8	0.00021 J	0.00098 J	0.027 J
	2016	0.12 J	0.00084 J	0.0002 U	0.0088	0.0001 J	0.000059 J	6	0.0001 U	0.0018	0.00023 J	0.62 U	0.0001 U	6.2	0.1	0.0001 U	0.0054	0.85 J	0.0005 U	0.0005 U	8.3	0.0001 U	0.0001 U	0.0092 J
MW-59 (Filtered)	2013	0.066	0.00064 J	0.00061 U	0.053	0.00025 U	0.00027 U	9.3	0.0003 U	0.016	0.0013 J	0.84	0.00024 U	7.2	0.61	0.00015 J	0.028	1.1	0.0015 U	0.00018 U	5.9	0.00016 U	0.00049 U	0.049 J
	2014	0.1	0.001 J	0.001 U	0.038	0.00048 J	0.0005 U	8.9	0.00041 J	0.011	0.00074 J	2.1	0.0005 U	7.7	0.51	0.0001 U	0.02	0.88	0.0025 U	0.0005 U	5.4	0.0005 U	0.0005 U	0.024 J
	2015	0.04 J	0.0006 J	0.001 U	0.043	0.00032 J	0.0005 U	9.4	0.00089 J	0.012	0.00027 J	1.7	0.0005 U	8.7	0.62	0.0001 U	0.022	0.68	0.0025 U	0.0005 U	4.8	0.0005 U	0.0005 U	0.028 J
	2016	0.13 J	0.00075 U	0.001 U	0.046	0.00056 J	0.00032 J	6.4	0.0005 U	0.0097	0.0015 J	0.62 U	0.0005 U	6.2	0.54	0.0001 U	0.028	1 J	0.0025 U	0.0005 U	7.5	0.0005 U	0.0005 U	0.054
MW-81	2013	0.0097 J	0.00052 U	0.00061 U	0.098		0.00027 U	30	0.00076 J	0.00025 J	0.00069 J	0.17 J	0.0003 J	6	0.014	0.0001 J	0.0017 J	1.1	0.0015 U	0.00018 U	4.8	0.00022 J	0.00049 U	0.011 J
MW-81 (Filtered)	2013	0.0029 J	0.00052 U	0.00061 U	0.085	0.00025 U	0.00027 U	28	0.00032 J	0.00012 U	0.00054 J	0.048 U	0.00024 U	5.3	0.011	0.00009 J	0.0016 J	0.99	0.0015 U	0.00018 U	4	0.00016 U	0.00049 U	0.019 J
PZ-01	2015	0.022 J	0.001 U	0.001 U	0.11	0.0005 U	0.0005 U	24	0.00032 J	0.0004 J	0.0005 U	0.17 J	0.0005 U	7.7	0.12	0.0001 U	0.0013 J	0.52	0.0025 U	0.0005 U	7.1	0.0005 U	0.0005 U	0.0025 U
	2016	0.017 J	0.00075 U	0.001 U	0.091	0.0025 U	0.0005 U	20	0.0025 U	0.0025 U	0.004 J	0.62 U	0.0005 U	6.8	0.0072 J	0.0001 U	0.0022 J	0.63 J	0.0025 U	0.0005 U	5	0.0005 U	0.0025 U	0.0054 J
PZ-01 (Filtered)	2015	0.0033 J	0.00059 J	0.001 U	0.11	0.0005 U	0.0005 U	24	0.0014 J	0.00034 J	0.0005 U	0.073 J	0.0005 U	7.5	0.12	0.0001 U	0.0011 J	0.52	0.0025 U	0.0005 U	6.7	0.0005 U	0.0005 U	0.0025 U
	2016	0.069 J	0.00075 U	0.001 U	0.092	0.0005 U	0.0005 U	20	0.0005 U	0.0005 U	0.0092	0.62 U	0.0005 U	6.5	0.0039 J	0.0001 U	0.0014 J	0.64 J	0.0025 U	0.0005 U	5.1	0.0005 U	0.0005 U	0.014 J
PZ-09	2013	0.038 J	0.00052 U	0.00061 U	0.19		0.00027 U	13	0.0013 J	0.0005 J	0.00097 J	0.1 J	0.0004 J	7.2	0.017	0.00008 J	0.021	1.3	0.0015 U	0.00018 U	4.5	0.00032 J	0.00049 U	0.01 J
	2014	0.53	0.001 U	0.001 U	0.25	0.00083 J	0.0005 U	15	0.004 J	0.0012 J	0.0015 J	1.5	0.0017	9	0.036	0.0001 U	0.026	1.2	0.0033 J	0.0005 U	6	0.0005 U	0.00074 J	0.017 J
	2015	0.027 J	0.001 U	0.001 U	0.16	0.0005 U	0.0005 U	9.5	0.0012 J	0.00028 J	0.0005 U	0.12 U	0.0005 U	5.7	0.013	0.0001 U	0.015	0.79	0.0025 U	0.0005 U	6.3	0.0005 U	0.0005 U	0.0018 U
	2016	0.035 J	0.00075 U	0.001 U	0.13	0.0005 U	0.0005 U	8.1	0.00086 J	0.00024 J	0.0006 J	0.62 U	0.0005 U	5.7	0.012	0.0001 U	0.015	1 J	0.0025 U	0.0005 U	7.2	0.0005 U	0.0005 U	0.012 J
PZ-09 (Filtered)	2013	0.028 J	0.00052 U	0.00061 U	0.17	0.00025 U	0.00027 U	12	0.00088 J	0.00028 J	0.00054 J	0.048 U	0.00024 U	6.4	0.014	0.000066 U	0.019	1.2	0.0015 U	0.00018 U	3.9	0.00016 U	0.00049 U	0.009 J
	2014	0.035 J	0.001 U	0.001 U	0.21	0.00027 J	0.0005 U	14	0.0013 J	0.00036 J	0.0017 J	0.12 U	0.0005 U	8.3	0.018	0.0001 U	0.025	1.1	0.0025 U	0.0005 U	5.7	0.0005 U	0.00076 J	0.011 J
	2015	0.026 J	0.00062 J	0.001 U	0.17	0.00033 J	0.0005 U	12	0.0021 J	0.00035 J	0.00034 J	0.059 J	0.0005 U	6.3	0.021	0.0001 U	0.017	0.81	0.0016 J	0.0005 U	7	0.0005 U	0.0005 U	0.0084 J
	2016	0.15 J	0.00075 U	0.001 U	0.13	0.0005 U	0.0005 U	8.4	0.00097 J	0.0002 J	0.0015 U	0.62 U	0.0005 U	5.5	0.011	0.0001 U	0.014	1 J	0.0025 U	0.0005 U	7	0.0005 U	0.0005 U	0.0082 J

Table 6. Comprehensive Radionuclide Sampling Results at SLDA

Well	Year	AMERICIUM-241	PLUTONIUM-238	PLUTONIUM-239/240	PLUTONIUM-241	THORIUM-228	THORIUM-230	THORIUM-232	URANIUM-234	URANIUM-235	URANIUM-238	TOTAL URANIUM (UG/L)
Units		pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	ug/L
10L31	2013	0.109 J	0.168	0.066 U	-1.23 U	0.524 U	-0.059 U	-0.007 U	1.39	0.035 U	0.185	0.431
	2014	0.05 U	0.057 U	0.021 U	-0.637 U	0.026 U	-0.024 U	0 U	1.23	0.092 J	0.091 J	0.312 J
	2015	0.005 U	0.15 J	0.046 J	-1.28 U	0.054 U	-0.031 U	-0.041 U	1.8	0.077 J	0.024 U	0.362
	2016	0.093	0.093 U	-0.063 U	-9.35 U	0.513 J	-0.014 U	0 U	0.844	0.045 U	0.193	0.374
10L31 (Filtered)	2013	0.099 J	0.159 J	0.006 U	-1.74 U	0.576 U	-0.065 U	-0.03 U	1.22	0.134 J	0.003 U	0.402
	2014	0.053 J	0.08 U	0.027 U	-0.29 U	0.005 U	0.009 U	0 U	0.907	0 U	0.096 J	0.31 J
	2015	0.03 U	0.089 J	-0.01 U	-0.739 U	-0.027 U	0.011 U	0 U	2.24	0.17	0.126 J	0.407
	2016	-0.034 U	0.07 U	-0.023 U	-6.5 U	0.372 U	-0.079 U	-0.001 U	0.567	0.143 J	0.193	0.392
MW-01	2004	0.834 U		0.683 U	13.5 U			0.379 J	0.379 U	0.204 U	0.282 U	
	2013	0.027 U	0.204 J	0.019 U	3.62 U	0.442 U	-0.04 U	-0.216 U	-0.044 U	-0.059 U	-0.082 U	0.162 J
	2014	0.089 J	0.05 U	0.025 U	1.66 U	-0.151 U	-0.006 U	-0.027 U	0.045 U	0 U	-0.028 U	0.065 J
	2015	0.026 U	0.203	0.056 U	0.78 U	-0.035 U	-0.009 U	-0.009 U	0.071 U	0.021 U	0.043 U	0.07 U
	2016	0 U	0.097 U	0.065 J	-4.3 U	0.618 J	0.027 U	-0.012 U	0.082 J	0.05 U	0.037 J	0.058 U
MW-01 (Filtered)	2013	0.066 U	0.186 J	0.022 U	8.18 J	0.422 U	-0.005 U	-0.022 U	0.075 U	0.013 U	0.029 U	0.163 J
	2014	-0.053 U	0.051 U	-0.032 U	1.8 U	0.014 U	-0.006 U	-0.026 U	0.131 J	-0.023 U	0.001 U	0.067 J
	2015	-0.008 U	0.099 J	0.034 U	-3.62 U	-0.048 U	-0.004 U	0 U	0.066 U	0.019 U	0.052	0.076 U
	2016	0.01 U	0.095 U	0.002 U	-3.39 U	0.429 U	-0.071 U	0.021 J	0.09 J	-0.007 U	0.018 U	0.068 J
MW-02	2004	0.503 U		0.529 U	15.7 U			0.429 U	0.348 U	0.535 U	0.458 U	
	2004	R		0.326 U	11.9 U			0.298 J	0.653 U	0.383 U	0.503 U	
MW-02A	2004	1.46 J		R	11.2 U			0.471 J	0.589 U	0.591 U	0.196 U	
	2013	0.047 U	0.221 J	0.091 J	1.04 U	0.571 J	-0.125 U	-0.021 U	0.019 U	-0.02 U	0.018 U	0.102 J
	2015	0.014 U	0.101 J	0.071 J	0.764 U	-0.025 U	0.056 J	-0.036 U	0.056 J	0.079 J	0.025 U	-0.004 U
	2016	0.025 U	0.08 U	0.065	1.14 U	0.275 U	0.013 U	0.022 U	0.036 U	0.015 U	0.039 J	0.067 U
MW-02A (Filtered)	2013	-0.048 U	0.049 U	0.038 J	-0.092 U	0.41 U	-0.153 U	-0.048 U	-0.148 U	0.026 U	-0.103 U	0.093 J
	2015	0.032 U	0.144 J	0.057 J	1.22 U	-0.088 U	0.061 J	0.01 U	0.049 J	0.021 U	0.058 J	0.02 U
	2016	-0.006 U	0.138 J	-0.043 U	-1.14 U	0.544 J	-0.121 U	0 U	0.073 U	0.02 U	0.074 J	0.062 U
MW-03	2013	0.042 U	0.164 J	0.01 U	-0.122 U	2.42 J	0.056 U	0.369 J	2.91	0.089 J	2.12	3.81
	2014	0.163 J	0.146 U	0 U	10.8 J	1.18	0.054 U	0.181 J	1.15	0.036 U	0.773	1.98
	2015	0.071 J	0 U	0.056 U	5.21 U	0.433	0.138	0.124	1.11	0.022 U	0.656	1.91
	2016	0.06 J	0.09 U	0.045 J	-0.282 U	0.604 J	0.014 U	0.076 J	0.975	0.084	0.497	1.18
MW-03 (Filtered)	2015	0.005 U	0.086 U	0.224	2.35 U	0.591	0.138	0.073	0.876	0.104	0.757	1.86
	2016	0.023 U	0.114 U	-0.065 U	3.02 U	0.437 J	-0.014 U	-0.006 U	0.729	0.021 U	0.572	1.29
MW-05	2004	1.19 J		0.191 U	12.2 U			0.592 J	0.231 U	0.314 U	0.289 U	
	2014	0.069 J	0.152 J	0.062 J	-0.781 U	-0.058 U	0.033 U	-0.041 U	0.06 J	-0.017 U	0.047 U	0.127 U
	2015	0.018 U	0.196	0.041 J	3.51 U	-0.121 U	0.088 J	0.044 U	0.185 J	0.022 U	0.13 J	0.161 J
	2016	0.015 U	0.092 U	0.005 U	-4.8 U	0.53 J	-0.03 U	0.019 U	0.151	0.114 J	0.082 J	0.037 U
MW-05 (Filtered)	2014	0.008 U	0 U	0.04 U	3.04 U	0.012 U	-0.016 U	0.019 U	-0.005 U	0.03 U	0.054 J	0.105 U
	2015	0.012 U	0.057 U	0.029 J	1.1 U	-0.157 U	-0.025 U	0.013 J	0.045 U	-0.009 U	0.04 U	0.153 J
	2016	-0.006 U	0.046 U	-0.013 U	-6.31 U	0.406 U	-0.126 U	-0.016 U	-0.042 U	0.023 U	0.093 J	0.079 J
MW-06	2004	0.822 U		R	8.91 U			0.5 J	0.308 U	0.267 U	0.175 U	
MW-07	2004	0.86 U		0.395 U	11.4 U			0.236 J	0.577 U	0.381 U	0.524 U	
	2013	0.103 J	0.094 J	0.017 U	-4.6 U	0.374 U	-0.008 U	0 U	0.416	-0.001 U	0.099 J	0.241 J
	2014	0.005 U	0.014 U	0.034 U	3.62 U	-0.021 U	-0.022 U	0 U	0.244 J	0.054 U	-0.037 U	0.224 J
	2015	0.053 U	0.117 J	0.002 U	-0.802 U	0.156 J	-0.022 U	0 U	0.191 J	0.016 U	0.116	0.176 J
MW-07 (Filtered)	2013	0.102 J	0.151 J	0.018 U	-2.3 U	0.819 J	-0.039 U	0 U	0.202 J	0.029 U	0.095 J	0.239 J
	2014	0.026 J	0.119 U	0.009 U	7.88 J	-0.012 U	-0.04 U	0 U	0.208 J	-0.012 U	-0.007 U	0.205 J
	2015	-0.02 U	0.104 J	0.051 U	2.89 U	0 U	0.037 U	0.012 U	0.311 J	0.068 J	0.073 J	0.18 J
MW-08	2004	0.667 U		0.125 U	11.6 U			0.557 J	0.287 J	0.339 J	0.287 J	
	2013	-0.028 U	0.184 J	-0.009 U	1.28 U	0.67 J	0.011 U	-0.007 U	-0.159 U	-0.021 U	-0.068 U	0.103 J
	2014	-0.007 U	0.058 U	0.048 U	2.71 U	-0.177 U	-0.088 U	-0.07 U	0.009 U	0.083 J	-0.038 U	0.058 J
	2015	0.07 J	0.103 J	0.007 U	-0.21 U	0.012 U	-0.016 U	-0.018 U	0.06 U	0.022 U	-0.012 U	0.078 U
	2016	0.012 U	0.106 J	-0.011 U	1.24 U	0.384 J	-0.129 U	0 U	-0.193 U	-0.007 U	0.006 U	0.06 U
MW-08 (Filtered)	2013	-0.003 U	0.043 U	0.026 U	-1.74 U	0.15 U	-0.015 U	-0.008 U	-0.003 U	-0.011 U	0.054 U	0.107 J
	2014	0.003 U	0.068 U	0.059 U	3.81 U	-0.08 U	0.028 U	-0.062 U	-0.163 U	-0.022 U	-0.135 U	0.06 J
	2015	-0.01 U	0.015 U	0.023 U	-0.495 U	0.063 U	-0.029 U	0 U	-0.021 U	0.044 U	-0.026 U	0.098 U
	2016	0.026 J	0.128 J	0.006 U	0.772 U	0.527 J	-0.011 U	0.018 U	0.029 U	0.03 U	0.062 J	0.08 U
MW-09A	2004	0.716 U		0.0386 U	9.78 U			0.459 J	0.644 U	0.378 U	0.496 U	
	2013	0.109 U	0.051 U	-0.041 U	5.58 J	0.283 U	-0.027 U	0.037 J	0.023 U	-0.022 U	-0.06 U	0.154 J
	2014	0.017 U	0.01 U	0.079	0.413 U	-0.159 U	-0.177 U	-0.118 U	-0.011 U	0.036 U	0.018 U	0.111 J
	2015	0 U	-0.041 U	0 U	-1.89 U	0.081 U	0.015 U	-0.01 U	0.135	0.016 U	0.105	0.145 J
	2016	0.081 J	0.128 J	0.013 U	-4.11 U	0.475 J	0.054 U	-0.007 U	0.033 U	-0.008 U	0.12	0.129 J
MW-09A (Filtered)	2013	0.141 J	0.205 J	-0.028 U	2.99 U	0.505 U	-0.02 U	0 U	0.143 J	0.013 U	-0.007 U	0.174 J
	2014	0.016 U	0.08 J	0.03 U	-0.108 U	-0.004 U	-0.009 U	0.012 U	0.034 U	-0.024 U	0.001 U	0.116 J
	2015	0.061 J	0.108 J	0.049 J	-2.36 U	-0.042 U	-0.023 U	0 U	0.104 J	-0.01 U	-0.003 U	0.168 J
	2016	0.047 J	0.121 U	-0.094 U	-4.74 U	0.323 U	-0.011 U	-0.006 U	0.16 J	0.078 J	0.065 J	0.144 J
MW-12D	2004	0.593 U		0.595 U	10.2 U			0.774 J	0.664 U	0.297 U	0.349 U	
MW-13	2004	0.612 U		0.715 U	11.7 U			0.328 J	0.514 U	0.482 U	0.335 U	
	2013	0.068 J	0.033 U	0.027 U	-0.274 U	0.252 U	-0.037 U	-0.019 U	0.002 U	-0.014 U	0.001 U	0.137 J
	2014	0.013 U	0.08 U	-0.017 U	-2.35 U	-0.019 U	-0.028 U	0 U	0.106 J	0.022 U	0.034 J	0.123 U
	2015	0.021 U	0.167	0.071 J	4.29 U	0.147 J	0.026 U	-0.013 U	0.065 J	-0.006 U	0.048 U	0.085 J
	2016	0.01 U	0.038 U	-0.039 U	0.492 U	0.591 J	-0.011 U	0 U	0.078 J	0.079 J	0.09 J	0.081 U
MW-13 (Filtered)	2013	0.02 U	0.156 J	0.053 U	-4.75 U	0.457 U	0.06 J	-0.005 U	0.119 J	-0.024 U	0.085 J	0.156 J
	2014	-0.012 U	0.153 J	0.03 U	2.33 U	0.017 U	0.008 U	-0.014 U	0.024 U	0.022 U	0.017 U	0.111 U
	2015	0.064 J	0.031 U	0.029 J	3.08 U	-0.039 U	0.012 U	0.062 J	-0.043 U	0.022 U	-0.029 U	0.082 J
	2016	-0.007 U	0.034 U	0.024 U	3.43 U	0.327 U	-0.082 U	-0.001 U	0.055 U	0.047 U	0.137	0.089 U
MW-14	2004	0.675 U		0.494 U	10.7 U			0.341 J	0.409 U	0.348 U	0.197 U	
	2013	0.057 U	0.1 J	0.1 U	-0.698 U	0.828 J	-0.027 U	0 U	0.02 U	0 U	0.018 U	0.098 J
	2014	0.034 J	-0.011 U	0.043 U	0.602 U	0.128 J	-0.017 U	-0.017 U	-0.077 U	-0.022 U	0.034 U	0.032 U
	2015	-0.099 U	0.388 J	0.053 U	0.847 U	4.15	0.051 U	0.051	-0.131 U	-0.024 U	0.281 J	1.06
	2016	-0.005 U	-0.012 U	-0.058 U	-0.654 U	0.635 J	0.038 J	-0.006 U	0.034 U	0.115 J	0.031 U	0.088 U
MW-14 (Filtered)	2013	0.108 J	0.035 U	0.124 J	-3.51 U	0.886 J	-0.022 U	0 U	0.094 J	-0.007 U	0.041 J	0.099 J
	2014	-0.031 U	0.103 U	0.056 J	2.05 U	-0.098 U	-0.072 U	-0.045 U	-0.006 U	0.001 U	0.077	0.031 U
	2015	-0.031 U	0.081 J	0.052 U	-0.301 U	-0.018 U	0.034 U	-0.025 U	0.05 U	-0.009 U	0.018 U	0.076 U
	2016	0.007 U	0.091 J	-0.024 U	-3.38 U	0.345 J	0.01 U	-0.006 U	0.069 J	-0.007 U	0.059 J	0.069 U
MW-15	2004	0.776 U		0.107 U	12.7 U			0.487 J	0.496 J	0.438 J	0.305 J	
	2013	0.061 U	0.008 U	-0.017 U	4.42 J	0.283 U	0.08 J	-0.035 U	0.078 J	-0.01 U	0.009 U	0.263 J
	2014	0.182 J	0.137 U	-0.107 UJ	-2.97 U	0.17	0.036 J	0 U	0.463	0.142 J	0.179 J	0.064 U
	2015	0.049 J	0.022 U	0.006 U	5.19 J	0.013 U	0.039 U	-0.065 U	0.113 J	0.02 U	0.02 U	0.053 U
	2016	0.02 U	0.045 U	0 U	-5.09 U	0.571 J	-0.078 U	-0.001 U	0.082 J	-0.007 U	0.016 U	0.085 U
MW-15 (Filtered)	2013	0.05 U	0.023 U	0 U	0.708 U	0.557 J	0.032 U	0.023 U	-0.03 U	0.031 U	0.15 J	0.061 U
	2014	-0.055 U	-0.024 U	0 U	1.82 U	-0.045 U	-0.011 U	0 U	0.007 U	-0.007 U	0.021 J	0.051 U
	2015	0.047 U	0.104	0.02 U	0.37 U	0.095 U	0.026 U	0 U	0.077 J	-0.007 U	0.007 U	0.086 J
	2016	0.04 J	0.042 U	0.012 U	-3.35 U	0.628 J	0.002 U	-0.005 U	0.002 U	0.08 J	0.021 J	0.063 U
MW-16BC	2004	0.564 U		0.035 J	12 U			0.468 J	0.525 U	0.491 U	0.342 U	
MW-19	2004	R		R	R			0.459 J	0.352 U	0.353 U	0.0899 U	
MW-20	2013	0.026 U	0.16 J	0.006 U	3.32 U	2.41 J	0.413	0.492	2.09	-0.011 U	0.838	2.47
	2014	-0.017 U	0.029 U	0.011 J	-1.93 U	4.23	1.32	0.66	1.8	0.07 J	1.06	1.61
	2015	-0.014 U	0.116 J	0.012 U	0.741 U	1.62	0.334	0.193 J	1.33	0.061 J	0.554	2.35
MW-20 (Filtered)	2015	0.025 U	0.117 J	0.073 J	9.13 J	1.42	0.298	0.184	1.11	0.052 J	0.587	1.49
MW-22	2004	0.458 U		0.532 U	10.6 U			0.478 J	0.479 J	0.423 J	0.295 J	
	2013	0.106 J	0.152 J	0.093	-0.47 U	0.489 J	-0.055 U	0.003 U	0.075 J	0 U	0.023 U	0.282 J
	2014	0.007 U	0.034 U	0.051 J	1.98 U	0.226 J	0.067 J	0.084	0.233	0.035 U	0.094 J	0.292
	2015	0.015 U	0.171	0.043 U	-1.15 U	-0.051 U	-0.012 U	0 U	0.026 U	0.026 J	-0.037 U	0.116 J
	2016	0.011 U	0.016 U	-0.041 U	0.272 U	0.467 J	0.093 J	0.06 J	-0.013 U	0.021 U	0.042 J	0.265 J
MW-22 (Filtered)	2013	0.026 U	0.075 U	0.031 U	0.184 U	0.643 J	-0.039 U	0 U	0.107 J	0.084 J	0.054 U	0.157 J
	2014	0.197	0.025 U	0.025 U	0.484 U	-0.037 U	-0.025 U	-0.007 U	-0.036 U	0.025 U	0.009 U	0.059 J
	2015	0.044 U	-0.009 U	0.017 U	8.2 J	0.073 U	-0.035 U	0.012 U	0.019 U	-0.006 U	0.032 U	0.095 J
	2016	0.059 J	0.123 J	0 U	-0.187 U	0.663 J	-0.144 U	0.01 U	-0.02 U	0.056 U	0.001 U	0.034 U
MW-23	2004	0.635 J		0.255 U	R			0.561 J	0.676	0.183 U	0.519	
MW-24	2004	0.632 U		0.496 U	10.6 U			0.555 J	0.459 J	R	0.558 J	
MW-25	2004	1.07 J		0.06 U	11.9 U			R	0.619 U	0.277 U	0.326 U	
MW-26	2004	0.732 U	0.815 U	0.537 U	13 U		0.345 U	0.455 J	0.681 J	0.495 J	0.238 J	
MW-29	2004	0.397 U	0.744 U	0.506 U	11.3 U		0.446 U	0.215 U	0.421 U	0.498 J	0.421 J	
MW-30A	2004	0.912 U		0.383 U	R			0.726 J	0.222 U	0.106 U	0.222 U	
MW-31	2004	0.558 U		0.323 U	12 U			0.502 J	0.393	0.479 U	0.422 U	
MW-32	2004	R		0.084 U	12.3 U			0.207 U	0.606 J	0.589 J	0.502 J	
MW-33	2004	0.488 U	0.619 U	0.448 U	11.8 U		0.323 U	0.323 J	0.963 J	0.565 J	0.741 J	
	2013	-0.012 U	-0.055 U	-0.016 U	1.79 U	0.817 J	-0.028 U	0.024 U	0.122 U	0 U	0.024 U	0.448
	2014	0.064 U	0.119 U	0.03 U	1.69 U	0.022 U	0.077 J	-0.009 U	0.242	-0.008 U	0.108 J	0.213 J
	2015	0.053 U	0.103	0.007 U	-0.646 U	0.084 U	0.081 U	0.271	0.254 J	0.068	0.151	0.513 J
	2016	0.018 U	0.094 U	0.037 J	0.82 U	0.329 J	-0.025 U	0.022 J	0.37	0.026 U	0.173	0.663
MW-33 (Filtered)	2013	0.038 U	0.124 U	0.083 J	0.087 U	0.478 U	0.031 J	0 U	0.186 J	-0.03 U	0.056 J	0.295 J
	2014	0.021 U	0.094 U	0.028 U	3.09 U	-0.011 U	-0.031 U	-0.008 U	0.133 J	-0.015 U	0.06 J	0.2 J
	2015	0.023 U	-0.039 U	0.057 U	-0.468 U	0.06 U	-0.035 U	-0.012 U	0.095 J	-0.018 U	0.09 J	0.259 J
	2016	0.003 U	0.073 U	0.035 J	3.3 U	0.326 J	-0.052 U	-0.005 U	0.235	0.018 U	0.02 U	0.28
MW-35	2004	0.882 U		0.101 U	11 U			0.206 J	0.354 U	0.202 U	0.354 U	
MW-36	2004	0.59 U		R	R			0.368 J	0.746	0.324 U	0.239 U	
MW-38	2004	R		0.0625 U	12.1 U			0.509 J	0.518 U	0.52 U	0.172	
MW-39	2004	0.482 U	0.814 U	0.467 U	13.9 U		0.527 J	0.175 U	0.218 U	0.385 U	0.384 U	
	2013	0.003 U	0.074 U	0.012 U	-3.83 U	0.366 U	0.004 U	0 U	0.2	0.056 U	0.214	0.408
	2014	0.02 U	0.069 U	0.026 U	2.28 U	0.039 U	-0.079 U	-0.049 U	0.081 J	-0.01 U	0.057 J	0.143 J
	2015	-0.029 U	0.061 U	0.061	6.9 J	0.415	0.024 U	0.182	0.024 U	0.068 J	0.077 J	0.458
	2016	0.015 U	0.023 U	0.033 J	0 U	0.511 J	-0.248 U	0.011 U	0.377	-0.006 U	0.111	0.504 J
MW-39 (Filtered)	2013	-0.02 U	0.235	0.051 U	-2.47 U	0.309 U	-0.041 U	0 U	0.189 J	0.133 J	0.103 J	0.46
	2014	0.002 U	0.037 U	0.009 U	-1.79 U	0.003 U	0.088 J	0.049 U	0.071 U	-0.014 U	0.073 U	0.181 J
	2015	0.018 U	0 U	0.048 J	5.7 J	-0.092 U	0.011 U	-0.011 U	0.062 J	0 U	0.047 U	0.103 J
	2016	-0.006 U	0.096 J	-0.04 U	-3.5 U	0.542 J	-0.011 U	0.019 U	0.28 J	0.09 J	0.074 J	0.438 J
MW-40	2004	0.681 U		0.185 U	10.3 U			0.245 J	R	0.587 U	0.448 U	
	2013	0.101 U	-0.016 U	0.107 J	1.18 U	0.791 J	-0.003 U	0.036 J	-0.1 U	-0.132 U	0.005 U	0.11 J
	2014	-0.005 U	0.023 U	0 U	6.82 J	0.094 J	0.021 U	0 U	-0.033 U	-0.01 U	-0.006 U	0.042 U
	2015	0.056 U	0.057 U	0.023 U	-0.234 U	0.048 U	-0.007 U	0 U	0.052 U	-0.009 U	0.071 J	0.096 J
	2016	0.034 U	0.099 U	0.006 U	-6.79 U	0.466 U	-0.061 U	-0.006 U	-0.017 U	0.019 U	0.015 U	0.051 U
MW-40 (Filtered)	2013	0.066 U	0.074 U	0.046 U	4.84 J	0.502 U	0.004 U	0 U	0.069 U	-0.027 U	-0.019 U	0.099 J
	2014	0.043 U	0.13 U	0.044 U	7.37 J	-0.085 U	-0.027 U	0 U	-0.002 U	0.002 U	-0.049 U	0.038 U
	2015	-0.034 U	-0.1 U	0.02 U	0.562 U	0.033 U	-0.074 U	0 U	0.063 J	-0.007 U	0.031 U	0.111 J
	2016	0.048 J	0.155 J	-0.057 U	-8.26 U	0.453 U	-0.031 U	-0.006 U	-0.023 U	0 U	0.001 U	0.044 U
MW-41	2004	0.646 U		0.376 U	11.3 U			0.481 J	0.773	0.41 U	0.347 U	
MW-43	2004	0.691 U		0.0715 U	10.7 U			0.228 J	1.49	0.308 U	0.175 U	
MW-44	2015	-0.042 U	0.183 J	0.043 J	6.32 U	0.027 U	0.039	0 U	0.455	0.053 J	0.117 J	0.375
	2016	0.094 J	0.009 U	0.031 J	4.16 U	0.369 J	-0.049 U	-0.005 U	1.03	0.024 U	0.619	1.06
MW-44 (Filtered)	2015	0.096 J	0.148 J	0.053 J	1.44 U	-0.129 U	0.014 U	-0.028 U	0.177 J	-0.009 U	0.083 J	0.369
	2016	0.029 J	0.102 U	0.021 U	-9.23 U	0.465 U	-0.095 U	0 U	0.976	0.054 U	0.435	1.23
MW-45 (Filtered)	2015	0.008 U	0.149 J	0.054 J	1.4 U	0.03 U	0 U	0.015 U	4.31	0.079 J	1.6	5.91
MW-50	2016	0.088	0.1 U	0.024 J	2.44 U	0.392 J	0.007 U	0 U	0.544	0.096	0.591	1.46
MW-50 (Filtered)	2016	0.051 J	0.031 U	0.003 U	1.31 U	0.352 J	-0.081 U	-0.001 U	0.414	0.084 J	0.443	0.811
MW-51	2004	1.01 J		0.0843 U	10.7 U			0.335 J	0.349 U	0.297 J	0.296 J	
	2014	0.03 U	0.104 U	0.016 U	9.72 J	-0.055 U	-0.047 U	0.022 U	-0.114 U	-0.023 U	0.013 U	0.247 J
	2015	0.046 U	0.077 U	0.029 J	-5.33 U	-0.071 U	0.055 U	0.014 U	0.134 J	-0.017 U	0.064 J	0.356
	2016	-0.007 U	0.056 U	0.019 U	0.205 U	0.091 U	-0.143 U	-0.015 U	-0.086 U	0.029 J	0.027 U	0.231
MW-51 (Filtered)	2014	0.032 U	0.153 U	0.029 U	3.89 U	-0.051 U	-0.075 U	0 U	0.087 U	0.074 J	0.096 J	0.234 J
	2015	0.076	0.145 J	0.022 U	-0.83 U	-0.015 U	-0.015 U	-0.015 U	0.112 J	0.059 J	0.063 J	0.362
	2016	-0.034 U	0.001 U	0.012 U	2.71 U	0.49 J	-0.285 U	-0.012 U	0.001 U	0.05 J	0.136 J	0.239
MW-52	2004	0.901 U		0.2 U	11 U			0.487 J	0.52 U	0.553 U	0.339 U	
	2013	0.041 U	0.155 J	0.026 U	-0.098 U	0.437 U	-0.027 U	-0.007 U	0.191	-0.004 U	0.124 J	0.233 J
	2014	0.088 J	0.028 U	0.033 U	2.3 U	0.033 U	-0.011 U	0.027 J	0.154 J	0.084 J	0.033 U	0.216 J
	2015	0.075 J	0.115	-0.042 U	3.45 U	-0.069 U	-0.027 U	0.04 J	0.004 U	-0.031 U	0.115 J	0.506 J
MW-52 (Filtered)	2013	0.088 J	0.136 J	0.035 U	-2.56 U	0.314 U	-0.015 U	-0.007 U	0.205	0.058 U	0.039 J	0.258 J
	2014	0.189 J	0.085 U	-0.003 U	4.09 U	-0.066 U	-0.072 U	0.007 U	0.151 J	0.05 J	0.116 J	0.191 J
	2015	0.077 J	-0.018 U	0.065 U	-6.87 U	0.176 J	0.073 U	0.012 U	0.024 U	0.053 J	0.06 J	0.426 J
MW-53	2014	-0.031 U	0.152	-0.012 U	-0.76 U	0.178 J	-0.039 U	0.052 J	3.1	0.064 U	1.92	7.24
	2015	0.043 J	0.174 J	0.084 J	3.13 U	0.081 U	0.087 J	0 U	2.36	0.22	1.3	3.58
	2016	-0.015 U	0.033 U	0.031 U	5.43 U	0.338 J	0.001 U	-0.006 U	1.53	0.086	1.03	3.29
MW-53 (Filtered)	2014	0.041 U	0.084 J	0.017 U	0 U	0.047 U	-0.024 U	0 U	2.81	0.126 J	2	6.63
	2015	0.09 J	0.174	0.02 U	-2.62 U	-0.112 U	0.015 U	0.092 J	1.94	0.095 J	1.12	3.99
	2016	0.021 U	0.003 U	-0.051 U	3.18 U	0.351 J	-0.117 U	0 U	1.98	0.029 J	1.26	3.37
MW-56	2004	0.742 U		0.418 U	R			0.411 J	0.194 U	0.237 U	0.194 U	
MW-58	2004	0.498 J	0.634 DL	0.193 U	13.8 DL		0.352 U	0.2 J	0.366 U	0.368 U	0.311 U	
MW-59	2004	0.485 U		0.351 U	10.4 U			0.391 J	0.659 U	0.576 U	0.465 U	
	2013	0.097 U	0.26 J	0.097	4.07 U	0.714 J	-0.004 U	-0.02 U	0.133 J	-0.018 U	0.023 U	0.199 J
	2014	-0.012 U	0.091 U	0.038 U	6.26 J	-0.003 U	-0.046 U	0 U	-0.064 U	0.03 U	-0.029 U	0.176 J
	2015	0.045 U	0.086 J	0.058	4.73 U	-0.051 U	-0.037 U	0 U	0.07 J	-0.009 U	0.089 J	0.168 J
	2016	-0.013 U	0.044 U	-0.05 U	2.59 U	0.256 U	-0.005 U	-0.006 U	0.079 J	0.026 J	0.119 J	0.044 U
MW-59 (Filtered)	2013	0.037 U	0.17 J	0.069 J	2.63 U	0.46 U	0.067 U	-0.028 U	0.138 U	-0.019 U	0.068 U	0.191 J
	2014	0.03 U	0.018 U	0.007 U	4.57 J	-0.034 U	-0.023 U	-0.006 U	-0.073 U	0 U	0.145 J	0.057 J
	2015	0.028 U	0.071 U	0.041 J	0.193 U	-0.081 U	-0.039 U	0.013 U	0.07 U	0.07 J	-0.002 U	0.164 J
	2016	0.012 U	0.089 U	-0.031 U	2.96 U	0.388 J	-0.005 U	-0.006 U	0.073 J	0.022 U	0.062 J	0.042 U
MW-64	2004	0.61 U		0.22 U	11.1 U			R	0.329 U	0.435 U	0.187 U	
MW-69	2004	R		0.39 U	11.5 U			0.552 J	0.377 U	0.378 U	0.41 U	
MW-81	2013	0.182 J	0.13 U	0.036 J	-4.34 U	0.053 U	-0.043 U	-0.115 U	3.41	0.191 J	0.23 J	0.645
MW-81 (Filtered)	2013	0.072 J	0.014 U	0.041 J	-2.73 U	0.554 J	-0.054 U	-0.017 U	2.6	0.199	0.269 J	0.67
NWS-01A-02	2004	0.362 U		0.123 U	12.7 U			0.215 J	0.33 J	0.331 J	0.359 J	
NWS-01A-03	2004	0.745 U		0.14 U	12.4 U			0.462 J	0.287 U	0.378 U	0.163 U	
NWS-01A-04	2004	0.826 J		0.11 U	11.7 U			0.161 U	0.405 U	0.635 J	0.566 J	
NWS-03-03	2004	0.623 U		0.0745 U	10.8 U			0.313 J	0.323 U	0.421 J	0.392 J	
NWS-05-04	2004	0.763 U		R	12.4 U			0.483 J	0.487 U	0.461 U	0.353 U	
PZ-01	2015	0.046 J	0.181	0.052 J	-0.699 U	0.027 U	-0.053 U	-0.026 U	0.867	0.174 J	0.457	0.326 J
	2016	0.102 J	0.118 U	-0.043 U	-0.359 U	0.353 J	-0.046 U	0.023 U	0.532	0.062 J	-0.005 U	0.112 J
PZ-01 (Filtered)	2015	-0.036 U	0.016 U	0.049 J	3.28 U	-0.052 U	0 U	0.013 J	0.862	-0.009 U	0.019 U	0.291 J
	2016	0.017 U	0.062 U	-0.083 U	-2.91 U	0.108 U	-0.037 U	0.017 U	0.618	0.161	0.001 U	0.098 J
PZ-09	2013	0.104 U	0.123 U	0.088 J	2.9 U	0.54 J	-0.015 U	-0.006 U	0.05 U	0.064 J	-0.006 U	0.126 J
	2014	0.178 J	0.144 U	0.082 U	5.46 U	0.014 U	0.026 U	0.025 J	0.092 J	-0.01 U	0.025 U	0.167 J
	2015	0.025 U	0.167 J	0.047 U	1.6 U	0.041 U	0.006 U	0 U	0.09 U	0.02 U	0.02 U	0.099 U
	2016	0.017 U	0.003 U	0.053 J	-10.9 U	0.542 J	-0.074 U	-0.001 U	-0.161 U	0.023 U	0.04 J	0.036 U
PZ-09 (Filtered)	2013	0.017 U	0.135 U	0.063 J	0.974 U	0.515 U	0 U	0 U	-0.023 U	0.053 U	0.002 U	0.127 J
	2014	0.166	0.053 U	0.004 U	3.03 U	0.034 U	-0.005 U	-0.007 U	0.104 J	-0.02 U	0.057 U	0.035 U
	2015	0.014 U	0.07 J	0.056 U	1.16 U	-0.012 U	0.022 U	-0.01 U	-0.038 U	-0.009 U	0.069 J	0.087 U
	2016	0.039 J	0.175 J	-0.012 U	-3.51 U	0.517 J	-0.024 U	-0.005 U	-0.001 U	0.025 U	0.011 U	0.032 U

Table 7. Groundwater Sampling Summary of Detections (2003-2016)

Metal	**Number of Samples**	**Number of Detections**	**Minimum**	**Maximum**	**Average**	**USEPA or PADEP Primary or Secondary Drinking Water Standard (1)**
	n	n	UG/L	UG/L	UG/L	
ALUMINUM	182	163	1.6	55000	1917.72	200.0
ANTIMONY	182	44	0.2	3.9	0.92	6.0
ARSENIC	182	44	0.62	120	8.76	10.0
BARIUM	182	182	3.5	1600	223.07	2000.0
BERYLLIUM	182	40	0.1	33	4.81	4.0
CADMIUM	182	15	0.059	4.4	1.04	5.0
CALCIUM	182	182	3600	430000	52477.47	NA
CHROMIUM, TOTAL	182	149	0.31	250	6.79	100.0
COBALT	182	147	0.12	180	9.37	NA
COPPER	182	143	0.23	150	9.60	1000.0
IRON	182	145	52	190000	9862.12	300.0
LEAD	182	54	0.26	11	1.35	15.0
MAGNESIUM	182	182	590	100000	14680.93	NA
MANGANESE	182	180	0.28	4500	296.31	50.0
MERCURY	182	37	0.047	0.15	0.09	2.0
NICKEL	182	180	0.22	680	28.59	100.0
POTASSIUM	182	180	500	80000	3517.61	NA
SELENIUM	182	49	1.5	14	2.99	50.0
SILVER	182	24	0.18	1.2	0.49	100.0
SODIUM	182	182	1500	240000	22020.88	NA
THALLIUM	182	30	0.16	1.7	0.40	2.0
VANADIUM	182	43	0.49	10	1.50	NA
ZINC	182	147	1.8	2400	81.80	5000.0
TOTAL URANIUM	187	157	0.036	7.24	0.56	30
Radionuclide	n	n	pCi/L	pCi/L	pCi/L	
AMERICIUM-241	305	54	0.026	0.197	0.09	15
PLUTONIUM-238	207	89	0.056	0.388	0.14	15
PLUTONIUM-239/240	291	54	0.011	0.224	0.06	300 (2)
PLUTONIUM-241	293	17	4.4	10.8	6.82	15
THORIUM-228	187	81	0.094	4.23	0.64	15
THORIUM-230	201	25	0.031	1.32	0.24	15
THORIUM-232	291	34	0.013	10.7	0.85	15
URANIUM-234	291	130	0.049	7.75	0.84	16.4 (3)
URANIUM-235	305	66	0.021	0.953	0.10	0.2 (3)
URANIUM-238	291	110	0.02	7.55	0.43	10 (3)

NOTES:

(1) - USEPA Maximum Contaminant Levels (MCLs), Secondary MCLs, or Pennsylvania DEP MCLs

(2) - USEPA, Directive #9283.1-14, Use of Uranium Drinking Water Standards under 40 CFR 141 and 40 CFR 192.

(3) - Based on 40 CFR 9, 141, 142, Federal Register, 7 Dec. 2000, Assumes a U234:U238 ratio of 1.6:1.

NA - No Standard Available

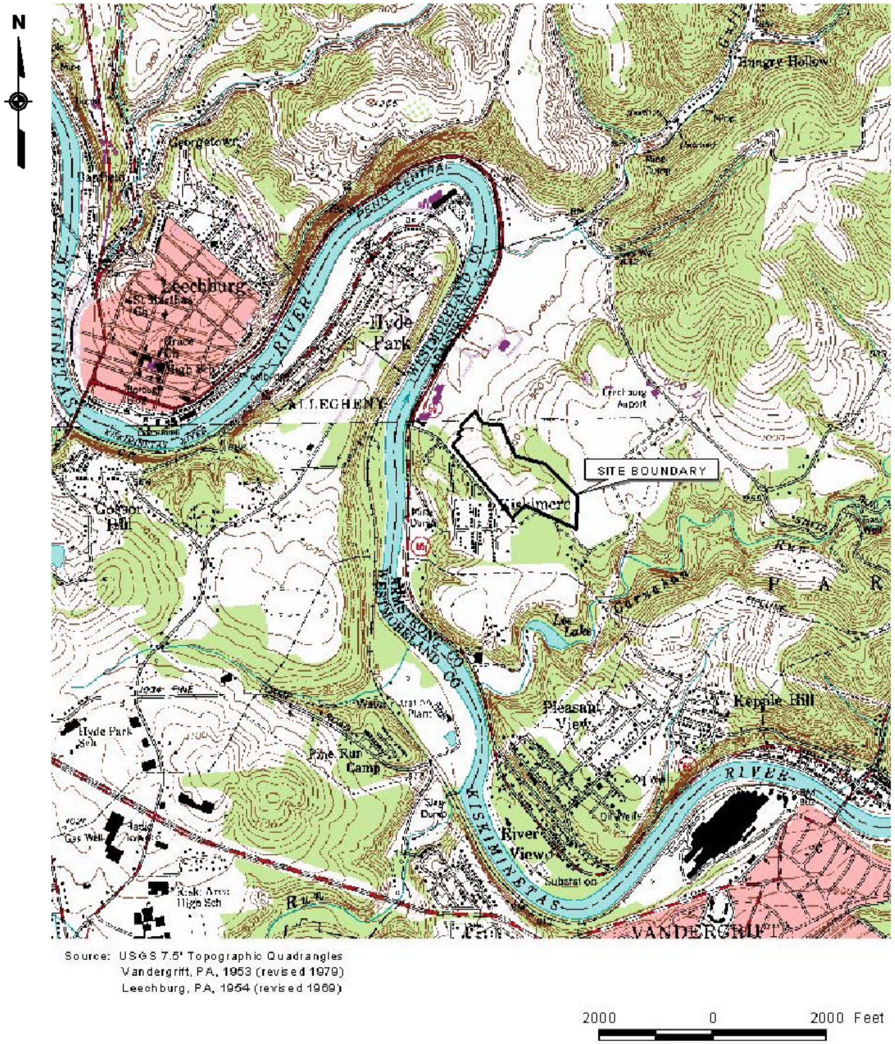
🟨 Average exceeds water quality standard.

NC - Not Calculated for non-FUSRAP consituents of concern

ND - Not Detected

FIGURES

N:\11173327.00000\CAD\DRAFT\ 1=1 /6/12/05-2 RAL



Source: USGS 7.5' Topographic Quadrangles
Vandergrift, PA, 1953 (revised 1979)
Leechburg, PA, 1954 (revised 1969)

SITE LOCATION MAP

STATE KEY MAP

SITE ADDRESS:
1105 MARY STREET
VANDERGRIFT, PA 15690

VICINITY MAP

SHALLOW LAND DISPOSAL AREA
SITE LOCATION MAP

Figure 1

FIGURE 1-1.dwg

Figure 1. Shallow Land Disposal Area (SLDA) Site Location

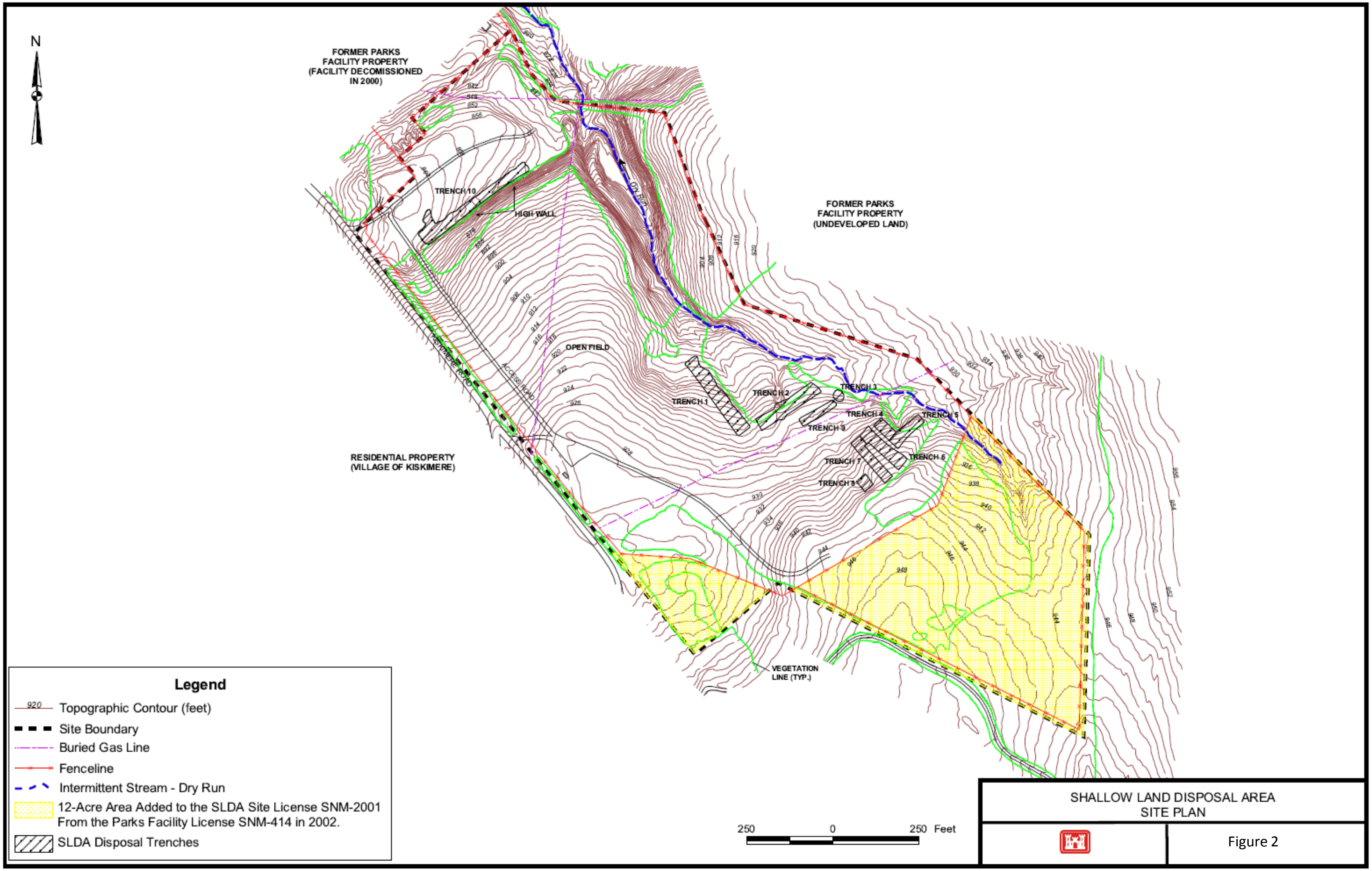


Figure 2. Shallow Land Disposal Area Site Plan

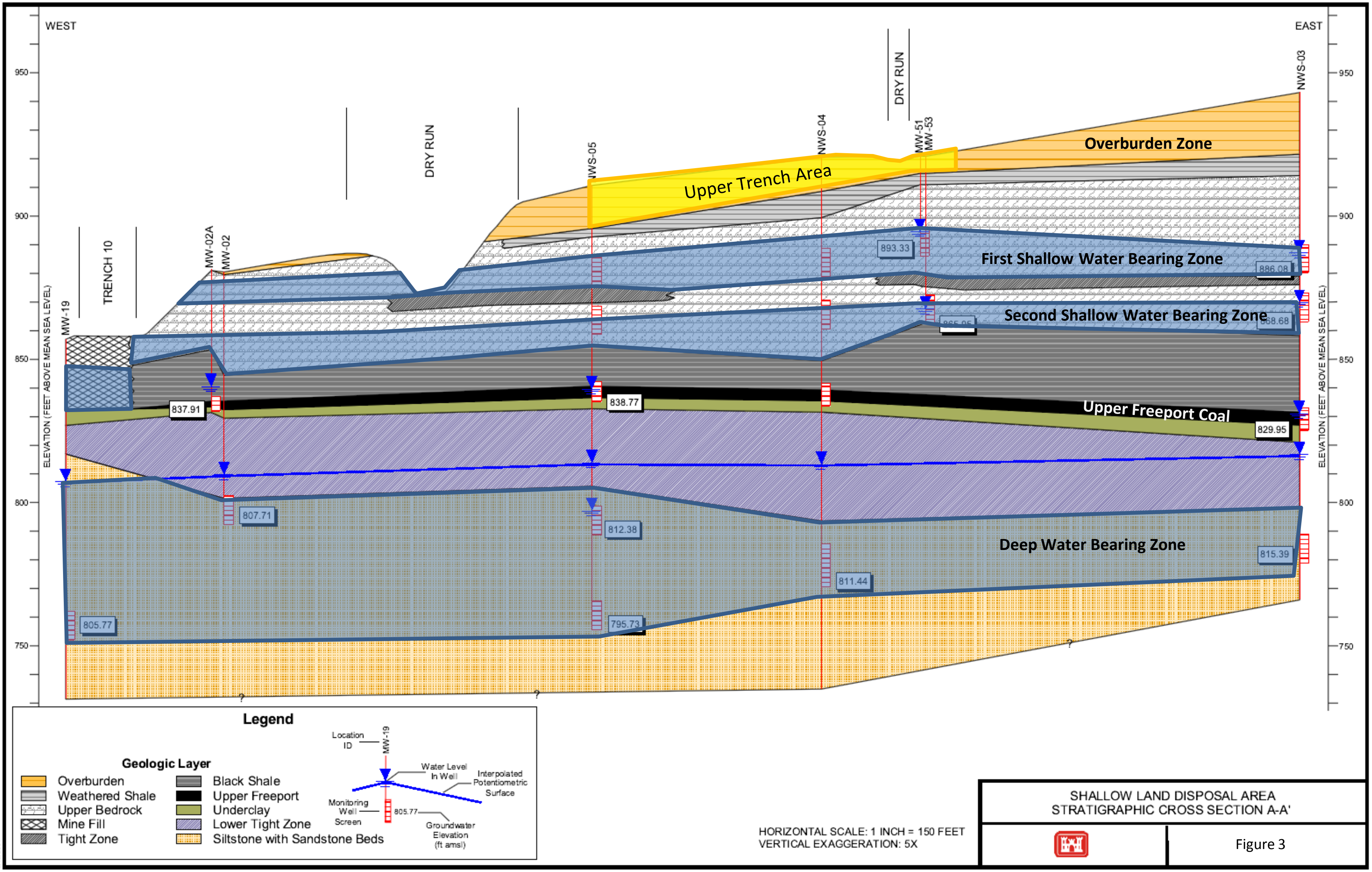


Figure 3. Northwest to Southeast Geologic Cross Section Through SLDA

Legend

- ⊕ Monitoring Well
- ⊕ Piezometer
- △ Temporary Piezometer
- — Groundwater Elevation Contour (ft amsl)
- ⬅ Groundwater Flow Direction
- ⬭ Trench
- Fenceline
- Site Boundary

0 110 220 440
Feet

US Army Corps of Engineers
Buffalo District

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
BUFFALO, NY

GROUNDWATER ELEVATION CONTOUR MAP
OVERBURDEN - JUNE 2016

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SHALLOW LAND DISPOSAL AREA
PARKS TOWNSHIP, PENNSYLVANIA

FIGURE 4

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Legend

- ⊕ Monitoring Well
- ⊕ Piezometer
- △ Temporary Piezometer
- — Groundwater Elevation Contour (ft amsl)
- ⬅ Groundwater Flow Direction
- ⬭ Trench
- ✕ Fenceline
- ◌ Site Boundary

0 110 220 440
Feet

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
BUFFALO, NY

GROUNDWATER ELEVATION CONTOUR MAP
FIRST SHALLOW BEDROCK ZONE - JUNE 2016

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SHALLOW LAND DISPOSAL AREA
PARKS TOWNSHIP, PENNSYLVANIA

FIGURE 5

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Legend

⊕ Monitoring Well	Groundwater Flow Direction
⊕ Piezometer	Trench
△ Temporary Piezometer	Fenceline
Groundwater Elevation Contour (ft amsl)	Site Boundary

0 110 220 440 Feet

US Army Corps of Engineers
Buffalo District

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CORPS OF ENGINEERS
BUFFALO, NY

GROUNDWATER ELEVATION CONTOUR MAP
SECOND SHALLOW BEDROCK ZONE - JUNE 2016

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SHALLOW LAND DISPOSAL AREA
PARKS TOWNSHIP, PENNSYLVANIA

FIGURE 6

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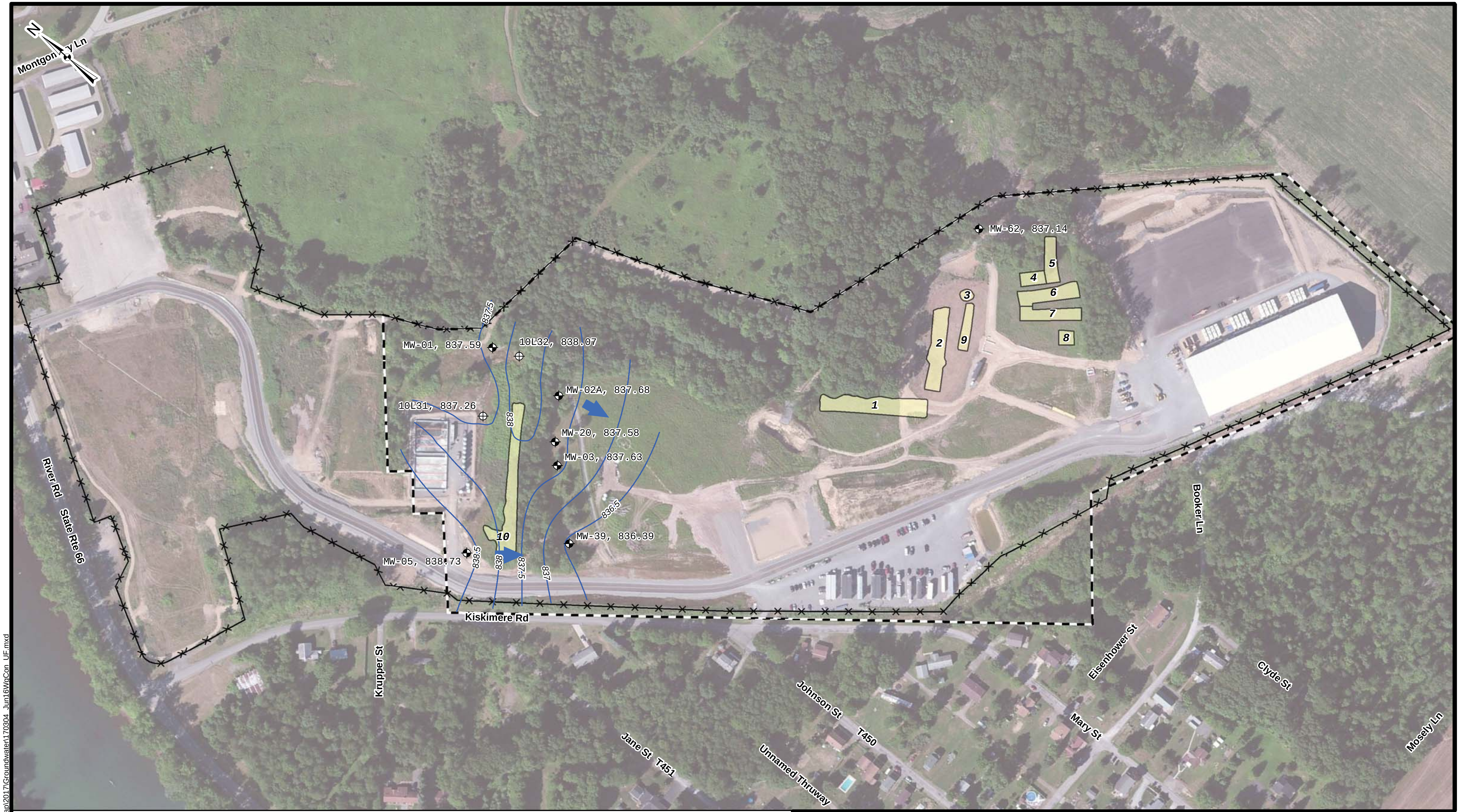

Legend

- ⯐ Monitoring Well
- ⌖ Piezometer
- △ Temporary Piezometer
- — Groundwater Elevation Contour (ft amsl)
- ⬅ Groundwater Flow Direction
- ⬭ Trench
- ✕ Fenceline
- ◌ Site Boundary

0 110 220 440 Feet

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GROUNDWATER ELEVATION CONTOUR MAP
UPPER FREEPORT COAL ZONE - JULY 2015

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SHALLOW LAND DISPOSAL AREA
PARKS TOWNSHIP, PENNSYLVANIA

FIGURE 7

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Legend

⊕ Monitoring Well

⊕ Piezometer

△ Temporary Piezometer

— Groundwater Elevation Contour (ft amsl)

Groundwater Flow Direction

Trench

Fenceline

Site Boundary

US Army Corps of Engineers
Buffalo District

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
BUFFALO, NY

GROUNDWATER ELEVATION CONTOUR MAP
DEEP BEDROCK ZONE - JUNE 2016

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SHALLOW LAND DISPOSAL AREA
PARKS TOWNSHIP, PENNSYLVANIA

FIGURE 8

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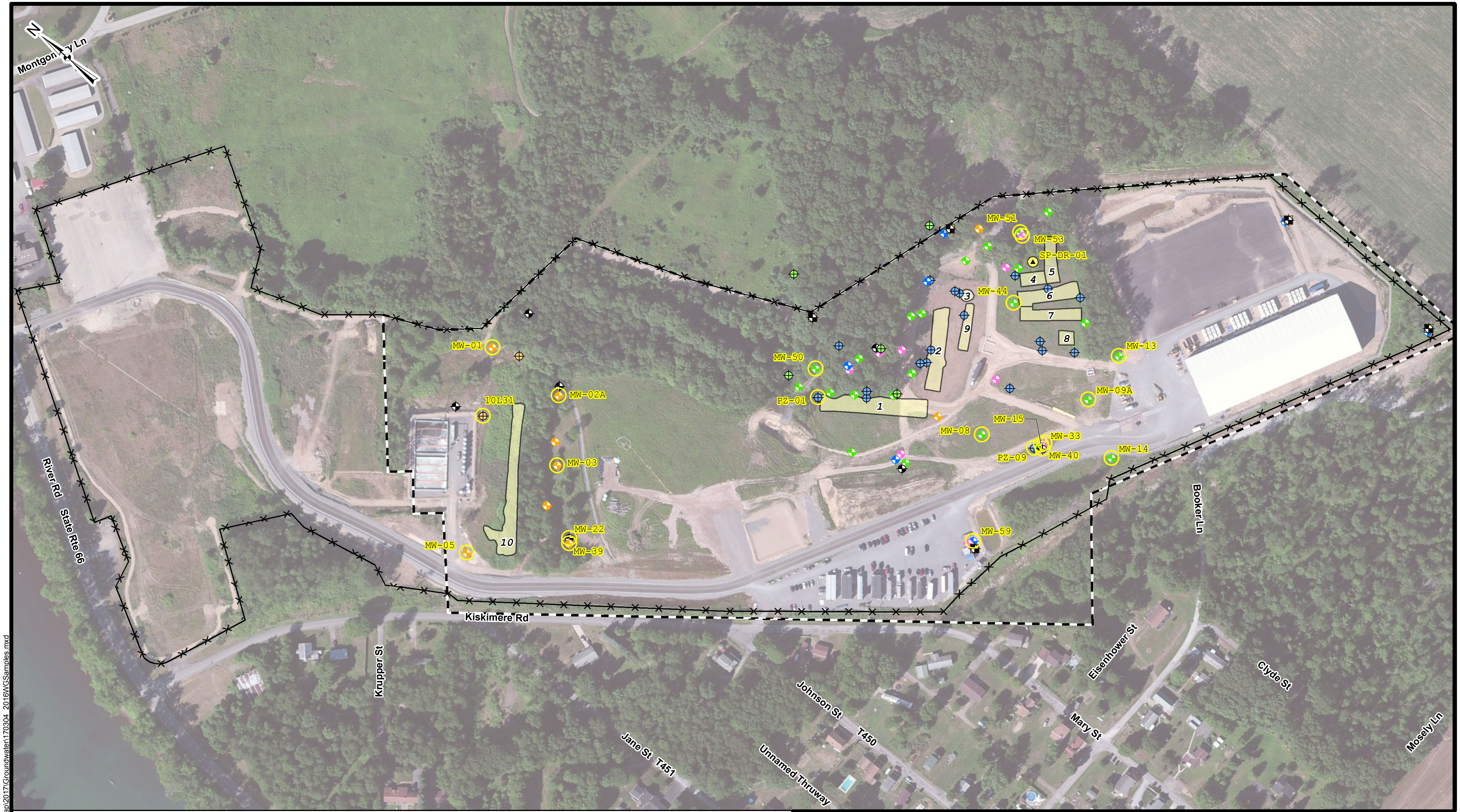

Legend

○ Monitoring Well/Piezometer (Sampled 2016)
▲ Surface Water Location (Sampled 2016)
⊕ Monitoring Well (Overburden)
⊕ Monitoring Well (First Shallow Bedrock)
⊕ Monitoring Well (Second Shallow Bedrock)
⊕ Monitoring Well (Upper Freeport Zone)
⊕ Monitoring Well (Deep Bedrock)
▚ Nested Monitoring Well
⊕ Piezometer (Overburden)
⊕ Piezometer (First Shallow Bedrock)
⊕ Piezometer (Upper Freeport Zone)
⬭ Trench
Fenceline
Boundary

0 110 220 440
Feet

US Army Corps of Engineers
Buffalo District

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
BUFFALO, NY

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GROUNDWATER SAMPLING LOCATIONS
(JUNE 2016)

SHALLOW LAND DISPOSAL AREA
PARKS TOWNSHIP, PENNSYLVANIA

FIGURE 9

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