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MND 1009

Operable Unit 1 Field Demonstration Year Two Status Report Mound, Ohio, Site

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U.S. DEPARTMENT OF ENERGY | Legacy Management

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Abbreviations

BVA	Buried Valley Aquifer
cDCE	*cis*-1,2-dichloroethene
cVOC	chlorinated volatile organic compounds
CY	calendar year
DCE	dichloroethene
DO	dissolved oxygen
DOE	U.S. Department of Energy
EA	enhanced attenuation
EPA	U.S. Environmental Protection Agency
ft	feet/foot
ft/ft	feet per foot
ft msl	feet above mean sea level
MAROS	Monitoring and Remediation Optimization System
MCL	maximum contaminant level
mgd	million gallons per day
µg/L	micrograms per liter
mg/L	milligrams per liter
mL	milliliter
MNA	monitored natural attenuation
mV	millivolts
Ohio EPA	Ohio Environment Protection Agency
ORP	oxidation-reduction potential
OU-1	Operable Unit 1
P&T	pump and treatment
PCE	tetrachloroethene (perchloroethene)
PCR	polymerase chain reaction
qPCR	quantitative polymerase chain reaction
spp	species (plural)
TCE	trichloroethene
TOC	total organic carbon
VC	vinyl chloride
WPS	Westover Pump Station
WRF	Water Reclamation Facility

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1.0 Introduction

At the Mound, Ohio, Site, chlorinated volatile organic compounds (cVOCs) originating from the former landfill have impacted groundwater in Operable Unit 1 (OU-1). The baseline groundwater remedy is groundwater pump and treatment (P&T). Since the source materials have been removed from the former landfill, the Mound Core Team, which consists of the U.S. Department of Energy (DOE), U.S. Environmental Protection Agency (EPA), and Ohio Environmental Protection Agency (Ohio EPA), supported by other stakeholders (e.g., Ohio Department of Health), are assessing the feasibility of switching from the active P&T remedy to a passive-attenuation-based remedy. Toward this end, an enhanced attenuation (EA) strategy based on the creation of structured geochemical zones was developed. This EA strategy addresses the residual areas of elevated cVOCs in soil and groundwater while minimizing the rebound of groundwater concentrations above regulatory targets (e.g., EPA maximum contaminant levels [MCLs]) and avoiding plume expansion while the P&T system is turned off. The EA strategy has improved confidence and reduced risk on the OU-1 groundwater transition path to monitored natural attenuation (MNA).

To better evaluate the EA strategy, DOE is conducting a 3-year field demonstration to evaluate the use of edible oils to enhance the natural attenuation processes. The field demonstration is designed to determine whether structured geochemical zones can be established that expedite the attenuation of cVOCs in groundwater underlying OU-1. The EA approach at OU-1 was designed based on structured geochemical zones and relies on groundwater flow through a succession of anaerobic and aerobic zones.

This report details the results from the second year of monitoring. Interim reports are prepared each year describing the status of the field demonstration and results from the evaluation of data collected for the performance of the attenuation zones as outlined in the *Field Demonstration Work Plan for Using Edible Oils to Achieve Enhanced Attenuation of cVOCs and a Groundwater Exit Strategy for the OU-1 Area, Mound, Ohio* (also called the Field Demonstration Work Plan) (DOE 2014a), *OU-1 Enhanced Attenuation Field Demonstration Edible Oil Deployment Design, Mound, Ohio, Site* (DOE 2014b), and *OU-1 Enhanced Attenuation Field Demonstration Sampling and Analysis Plan, Mound, Ohio, Site* (also called the Sampling and Analysis Plan) (DOE 2014c). The interim reports provide an evaluation of each of the test goals and determine if contingency measures need to be implemented and if the field demonstration should continue.

1.1 Approach

The EA field demonstration at OU-1 was designed based on structured geochemical zones and relies on groundwater flow through a succession of anaerobic and aerobic zones. The anaerobic zones stimulate relatively rapid degradation of the original solvent source compounds (e.g., cVOCs such as PCE and TCE). The surrounding aerobic areas encourage relatively rapid degradation of daughter products (DCE and VC), as well as enhanced cometabolism of TCE resulting from utilization of methane and other reduced hydrocarbons that are formed and released from the anaerobic zones. A key technical-conceptual basis for utilizing structured geochemical zones is the relative rate of degradation of various cVOCs under anaerobic and aerobic conditions (Figure 1).

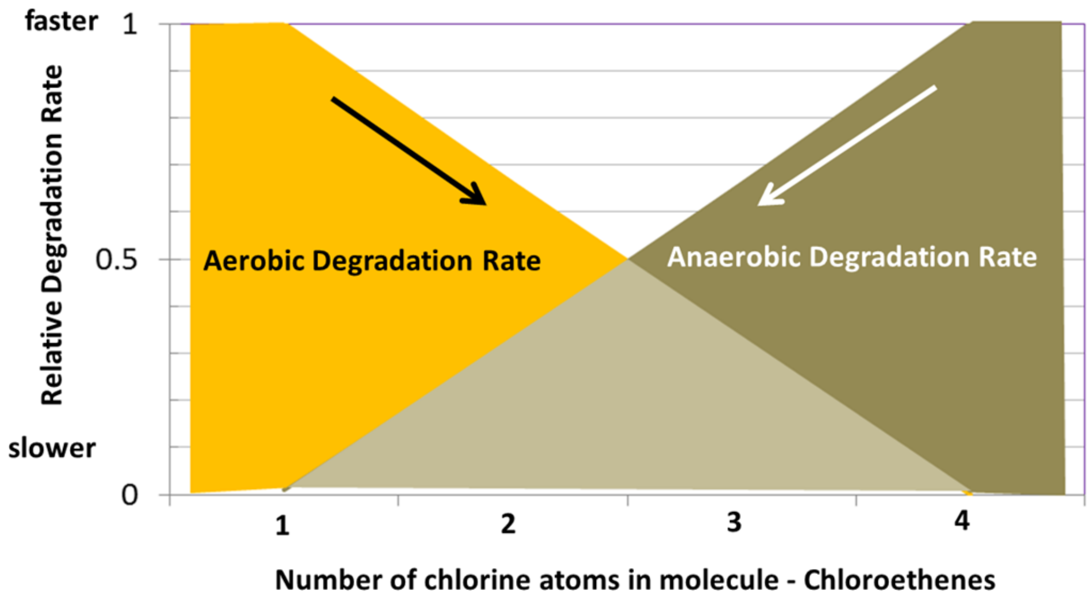


Figure 1. Relative Rates of Chloroethene Degradation Under Anaerobic and Aerobic Conditions (after Hazen 2010)

As shown in Figure 1, aerobic processes are relatively fast for cVOCs with fewer chlorines, such as VC and DCE. The most highly chlorinated ethene, PCE, has been documented as not degrading at a detectible rate under aerobic conditions. Conversely, anaerobic processes are relatively fast for chloroethenes with more chlorines, such as PCE and TCE. Anaerobically, DCE and VC are reduced relatively slowly and require somewhat specific microorganisms to degrade. The hybrid structured geochemical zone approach supports reasonable progress toward remedial goals based on the complementary strengths of the different attenuation and degradation processes that occur in the two redox conditions. The strategy also minimizes adverse collateral impacts that may ensue when converting an aerially extensive region of an aquifer from baseline aerobic conditions to strongly anaerobic conditions. Finally, structured geochemical zones allow the microbial communities to work in sequence in environments to allow the overall degradation to be relatively rapid and robust.

The final deployment design was documented in the *OU-1 Enhanced Attenuation Field Demonstration Edible Oil Deployment Design, Mound, Ohio, Site* (DOE 2014b) and consisted of neat oil injection at 6 locations within the OU-1 landfill footprint and emulsified oil injection at 19 locations throughout the OU-1 area. Injection of emulsified oil was used to form treatment zones to address the aquifer beneath the former landfill area and to address cVOC-impacted groundwater downgradient of the former landfill.

Monitoring wells are divided into different categories based on their location within the treatment area as outlined in the Sampling and Analysis Plan (DOE 2014c). Groundwater is sampled to assess the performance of the deployment strategy for long-term attenuation of cVOCs in the OU-1 area. The goal of the performance monitoring is to collect data to:

- Measure the effects of neat and emulsified oil emplacement within the treatment zones.
- Assess any changes in the size or location of anaerobic areas in the treatment zones.

- Measure cometabolic and abiotic conditions along the lateral and distal portions of the treatment zones.
- Determine if there is any reduction in PCE and TCE concentrations within the treatment zones.

1.2 Objectives

The purpose of the field demonstration is to determine whether discrete treatment zones can be established that expedite the attenuation of cVOCs in the OU-1 groundwater. Edible oils (neat and emulsified) were used to create treatment zones to reduce the concentrations of TCE and PCE in groundwater and enhance attenuation of these parent compounds and degradation (daughter) products. The goal of the field demonstration is to show that these treatment zones can be established and effectively maintained such that cVOC concentrations in groundwater can decrease to MCLs in a reasonable time frame.

The overall objectives of the field demonstration were developed in the Field Demonstration Work Plan (DOE 2014a). The objectives are to:

- Assess the performance and viability of attenuation using structured geochemical zones as a remediation strategy for OU-1 groundwater.
- Stabilize the plume and minimize or mitigate the potential for plume growth.
- Develop the biogeochemical conditions to accelerate progress toward remedial objectives and transition the strategy to MNA.

Enabling objectives for the field demonstration include:

- Monitoring oil and amendment emplacement along with responses in groundwater biogeochemistry.
- Determining cVOC degradation and degradation rates.
- Assessing degradation (daughter) products and their subsequent degradation.
- Assessing degradation pathways (reductive dechlorination, cometabolism, abiotic).
- Assessing the recruitment of appropriate bacteria (i.e., fermentative, dechlorination, and cometabolic) and biomass.
- Assessing the ability of the oil deployment to stabilize and shrink the groundwater plume and to provide a sustainable treatment to meet the cleanup level of 5 micrograms per liter (µg/L) TCE.
- Determine long-term operation, maintenance, and monitoring requirements.

1.3 Results from Year One

The results from the first year of the field demonstration show that the development of the structured geochemical zones is progressing as anticipated. Below is a summary of observations from the first year of the field demonstration:

cVOC Behavior

- Changes observed in the concentrations of parent and daughter cVOCs in OU-1 monitoring wells located in the anaerobic treatment zones and downgradient of those areas during the first year provided clear confirmation of reductive dechlorination in the anaerobic treatment zones. Data from wells within the treatment zones typically had declining concentrations of parent cVOCs and increasing daughter products during the first year. The lack of *cis*-1,2-dichloroethene (cDCE) (or vinyl chloride) in wells downgradient of the treatment zones is consistent with aerobic metabolism or cometabolism.
- Monitoring and Remediation Optimization System (MAROS) plume evaluation analysis showed that the structured geochemical zones were working as designed. Overall, the moment analyses indicated that plume strength was decreasing, the plumes could generally be classified as stable or shrinking, and the plumes were behaving as anticipated as indicated by decreasing total dissolved mass that indicated plume shrinkage, the stable or upgradient direction of movement of the center of mass, the continual transformation by reductive dechlorination, and the generally decreasing concentration trends in a majority of the monitoring wells.
- Concentrations and concentration trends in the downgradient sentinel wells demonstrate that the cVOC plume was not expanding. Concentrations of all constituents remained below the MCL in all samples.
- The volatile organic compound concentrations throughout the plume were projected to be below the target MCL of 2 to 5 µg/L within 5 to 10 years (calendar year [CY] 2019 to CY 2024), which was faster than the original EA design projection of 13 years (CY 2027).

Aquifer Geochemistry

- Aquifer geochemistry changed from an oxidizing to a reducing condition as indicated by oxidation-reduction potential (ORP) and dissolved oxygen (DO) data. Indications of increased microbial activity were observed through increases in metabolic byproducts and methane concentrations in groundwater samples.
- The chemistry of the aquifer at the downgradient wells continued to have higher ORP values and DO concentrations.

Microbial Communities

- All of the microbial counts increased following the EA deployment: total bacteria, chlorinated-solvent-reducing bacteria, aerobic cometabolic bacteria, methanogens, and sulfate reducers. Chlorinated-solvent-reducing bacterial counts showed significant increases in treatment zones.
- The wells in the treatment zones showed significant increases in chlorinated-solvent-reducing bacteria that are capable of degrading TCE and PCE. Side-gradient, intermediate, and downgradient wells also showed increases in chlorinated-solvent-reducing bacteria counts.

A number of items were identified during the first year of the EA field demonstration that provided key information moving forward. The watch list items identified from the first year of the field demonstration and are listed below.

- **Wells with rebound during Year 1:** Isolated areas (notably near well 0305) exhibited rebound (increased concentrations) for TCE and PCE. The concentrations in well 0305 (and other mid-plume wells) are expected to decrease in the future as the upgradient sources attenuate. Documentation of stabilization of concentrations and development of downward concentration (attenuation) trends in these wells is needed for assessment of the longer-term effectiveness of the EA remedy and the refinement of the projected remediation time frames.
- **MAROS statistical trends in the plume spread (uniformity) for TCE:** This trend should stabilize and then decrease in the future following an initial response to the EA deployment, which knocked down the highest concentrations within the baseline plume.
- **Assess significance of cVOCs daughter product formation**: Evaluate cVOC data to assess the occurrence of cDCE stall and VC accumulation. Specifically document whether: (a) cDCE and VC concentrations remain in an acceptable range, (b) the temporal pattern of cDCE and VC concentrations are acceptable (e.g., peak and decline), and (c) total chlorinated solvent (moles) in the plume continue to decrease over time.
- **Geochemical conditions for the anaerobic treatment zones:** Sulfate was moderately high prior to the injections and decreased significantly after injections. There was some sulfate rebound in August 2015. Sulfate and total organic carbon (TOC) concentrations will need to be watched to ensure maintenance of the structured geochemical zones. The overall trends indicate that the structured geochemical zones are still in development due to the slow release of the electron donor from the soybean oil after the fast utilization of the lactate electron donor.
- **Microbial data in mid-plume and distal wells:** The development of microbial communities into transitional and significant ranges (for cometabolic and reductive dechlorination species) should be watched for as the impacts of upgradient injections wash through these areas.

1.4 Effects of Nearby Dewatering During Year Two

In February 2016, the City of Miamisburg started a dewatering project at the Miamisburg Water Reclamation Facility (WRF), which is located southwest of the Mound site. Initially, groundwater was extracted at low rates and little drawdown was measured at the WRF. Starting in April 2016, the groundwater extraction rate was increased to approximately 4 million gallons per day (mgd) and groundwater levels at the WRF began to decline to an approximate elevation of 670 feet above mean sea level (ft msl). As a result of the dewatering, a decline in the water levels in OU-1 was observed in May 2016. During a short period in May and June 2016, a second dewatering project (Westover Pump Station [WPS]) was underway west of the Mound site. Dewatering occurred at rates between 1.5 mgd in May 2016 and 4 mgd in June 2016 at the WPS and resulted in the largest decline in groundwater elevations at OU-1. By mid-June 2016, groundwater elevations in OU-1 were between 674 ft msl and 675 ft msl, which are about 4 to 6 feet below the typical groundwater elevations measured in the OU-1 area. While dewatering was ongoing, the gradient across OU-1 increased to 0.0006 feet per foot (ft/ft), which is about 3 times the typical gradient. The extraction wells at the WPS were turned off in June 2016, and those at the WRF were shut off on September 19, 2016. After the pumps were turned off at the WRF, the gradient measured in OU-1 returned to normal.

During the quarterly groundwater sampling event (early May 2016) for OU-1, well P062 (a downgradient sentinel well) was unable to be sampled because the water level in the wells was too low to purge and collect a sample. Subsequent measurements of the water level in the OU-1 monitoring wells indicated a continued decline. Pumps had to be pulled from several of the wells near P062 for the monthly static water level measurements to be done because the water level was below the top of the pump. Between the April 2016 and May 2016 water level measurements, the groundwater table in the OU-1 area dropped about 5 feet. The differences between the groundwater elevations between the northern and southern wells were larger than typical. There is generally, about 0.2 foot (ft) difference, but in May the difference was almost 0.5 ft. The groundwater flow direction observed in May 2016 was unchanged from what was typical, but the gradient had increased due to the larger differences in groundwater elevations. In June 2016, three monitoring wells were dry and seven others had less than 0.5 ft of water in the screens. There were 10 wells that were unable to be sampled. For a short period in June 2016, groundwater flow shifted to the west due to dewatering activities that were performed at the WPS; the flow returned to its typical southerly direction when dewatering was stopped at the WPS project.

It was recognized that the decline in the water table resulting from the dewatering may have been potentially adversely influencing contaminant migration and altering the plume. The larger gradients may have resulted in some migration further downgradient than anticipated during normal groundwater conditions. The early results of the enhanced attenuation (i.e., generally lowering PCE and TCE concentrations throughout the OU-1 groundwater plume below 10 µg/L in all wells) would limit the significance of plume migration. Another impact of the dewatering would be to expose the deployed vegetable oil to vadose zone conditions (i.e., aerobic). Higher oxygen levels and faster diffusion rates in the vadose zone would support faster oil degradation in the vadose zone; however, the deployed oil included a safety factor so the impact of the dewatering may also be mitigated by the existing robustness of the structured geochemical zones. Thus, while the dewatering activities were not anticipated, the enhanced attenuation performance may withstand the perturbation caused by the lowering of the water table over a period of time. Field demonstration performance monitoring during Year 3 will continue to evaluate impacts (if any) caused by the nearby offsite dewatering projects in Year 2 and any additional dewatering projects in Year 3, if any occur.

2.0 Data Results

The sampling strategy was designed to provide sufficient data to meet the field demonstration objectives as stated in Section 1. Measurements were made in a representative set of wells within and outside of the treatment zones and downgradient of the treatment zones. The protocol for evaluation of the data is outlined in the Field Demonstration Work Plan (DOE 2014a). The data generated from this second year (August 2015 through August 2016) of sampling are used to support the multiple lines of evidence related to EA and the establishment of structured geochemical zones and to provide an initial assessment of progress toward MNA. All data from the second year of monitoring, including validation qualifiers, are summarized in Appendix A.

2.1 Groundwater Quality and Flow

Groundwater samples are collected as part of the post-deployment monitoring program (Table 1) from selected wells in the OU-1 area (Figure 2) in accordance with the Sampling and Analysis Plan (DOE 2014c). Post-deployment monitoring began the first week of November 2014. Groundwater sampling was performed quarterly during the second year of the field demonstration.

Table 1. Monitoring Program During Post-Deployment

<table>
<tr><th>Category</th><th>Well IDs</th><th>Analytes</th><th>Frequency</th></tr>
<tr><td>Treatment Zone</td><td>0410
0419
0451
P054
P056
P059
P060</td><td>VOCs
Indicator/field parameters
Anions
Ammonia
Dissolved iron
Light hydrocarbons
Dissolved gases
TOC</td><td rowspan="4">First 6 months: monthly.

Remainder of the 3-year period: quarterly.</td></tr>
<tr><td>Upgradient/Lateral Area</td><td>0379
0416
0422</td><td>VOCs
Indicator/field parameters
Anions
Dissolved iron</td></tr>
<tr><td>Interior Impact Area</td><td>0418
P057
P058</td><td>VOCs
Indicator/field parameters
Anions
Total organic carbon
Ammonia
Dissolved iron
Light hydrocarbons
Dissolved gases</td></tr>
<tr><td>Downgradient/Sentinel</td><td>0402
P031
P061
P062
P063</td><td>VOCs
Indicator/field parameters
Anions
Ammonia
Dissolved iron
TOC
Dissolved gases</td></tr>
<tr><td>Other Wells</td><td>0305
0417
0423
0424
0425
0452
P015
P027
P053</td><td>VOCs</td><td>Quarterly</td></tr>
</table>

Abbreviation:
VOCs = volatile organic compounds

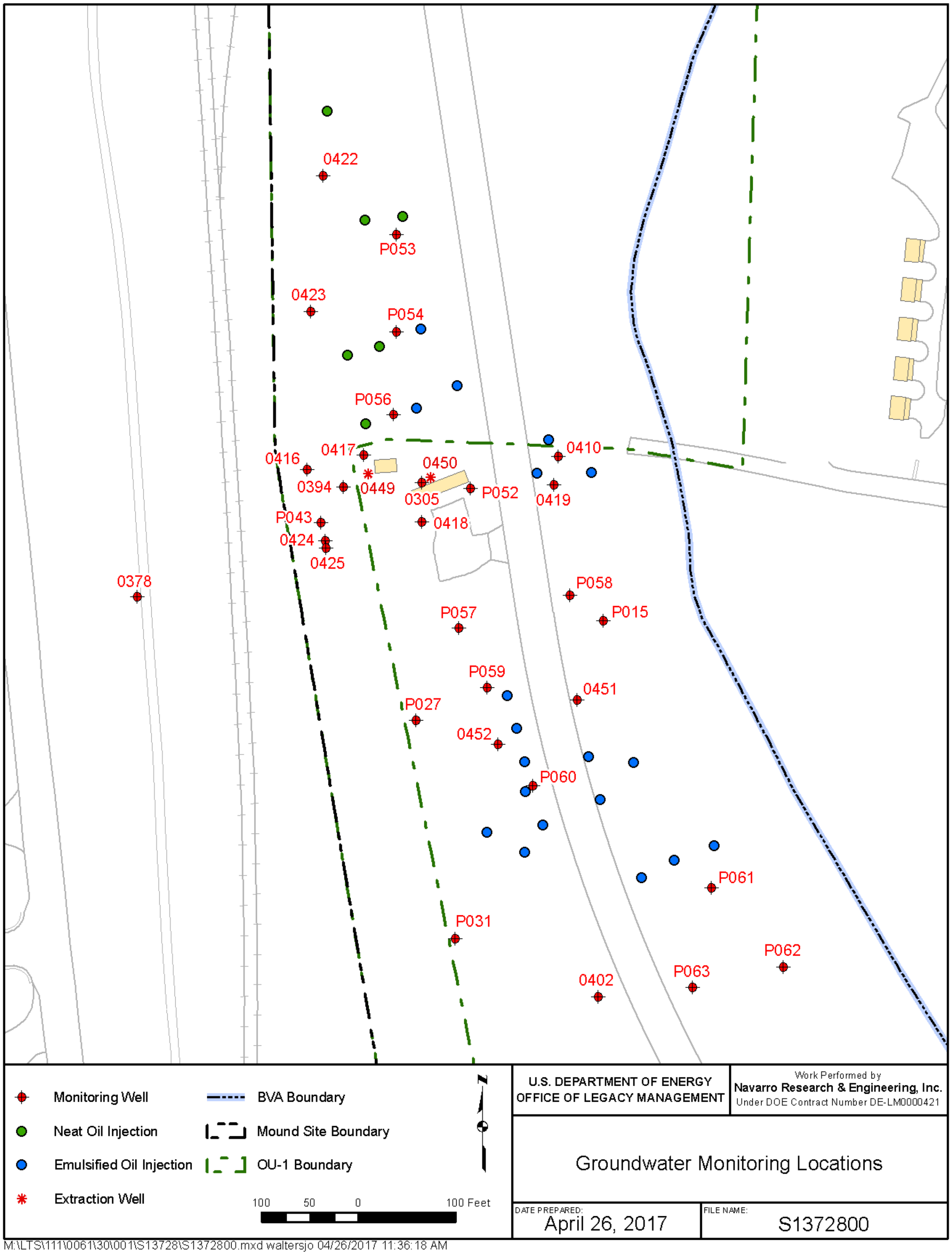


Figure 2. OU-1 Field Demonstration Groundwater Monitoring Locations

2.1.1 cVOC Distribution

Data collected from the wells in August 2016 are used to illustrate the distribution of cVOCs in the groundwater at the end of the second year of the field demonstration (Figure 3 through Figure 6). Overall some lateral spreading of the cVOC plumes was observed in the southern part of OU-1. Low levels of PCE are present throughout the OU-1 area; however, the MCL is exceeded only within the former landfill footprint. Groundwater with TCE impact greater than the MCL is present in three areas and spreading of low-level TCE occurred along the western and southern portions of the plume. The occurrence of cDCE and VC (daughter products of PCE and TCE) was observed in several downgradient wells. None of the values exceeded the MCLs in August 2016, although VC was 2.1 µg/L in well P027 in June.

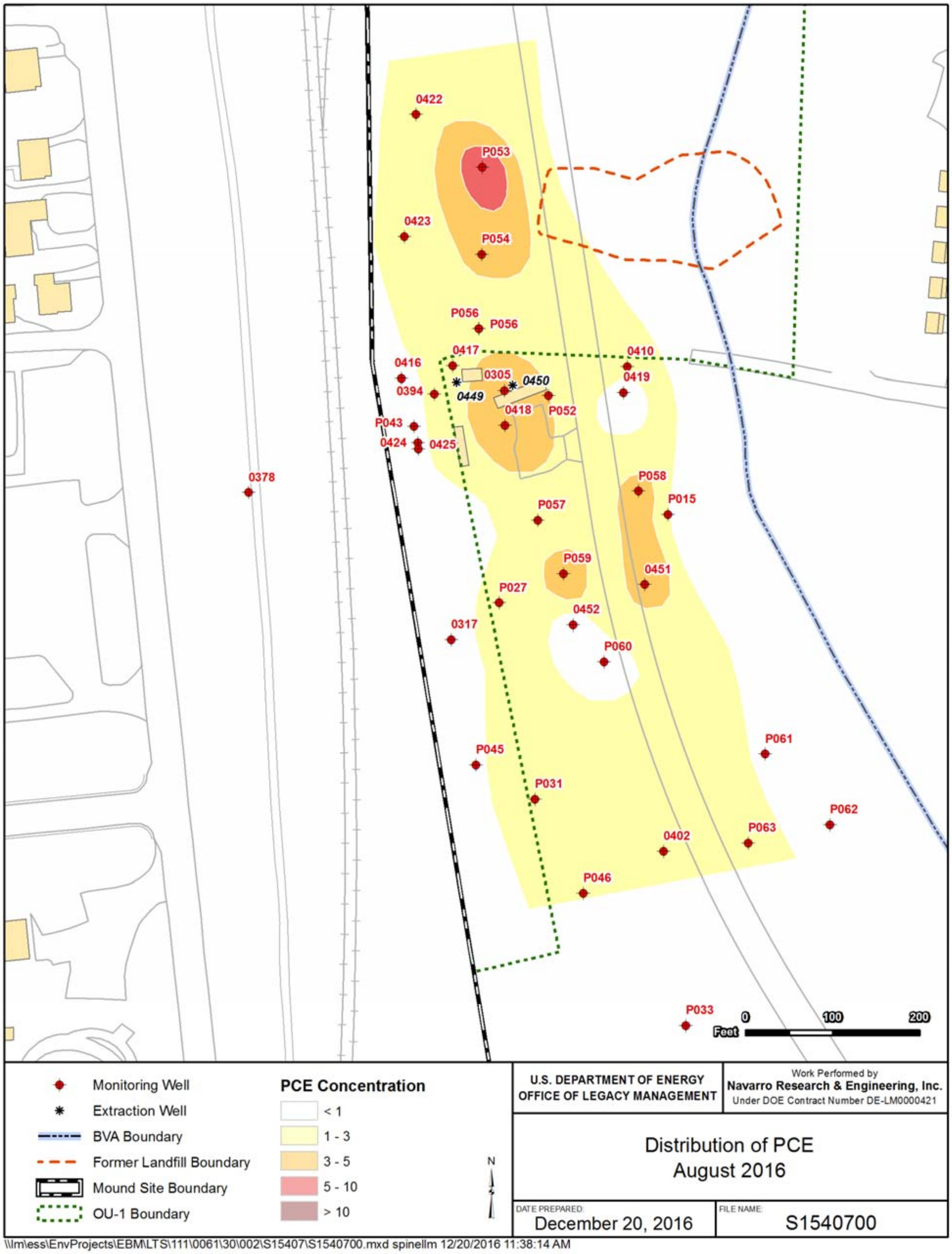


Figure 3. Distribution of PCE, August 2016

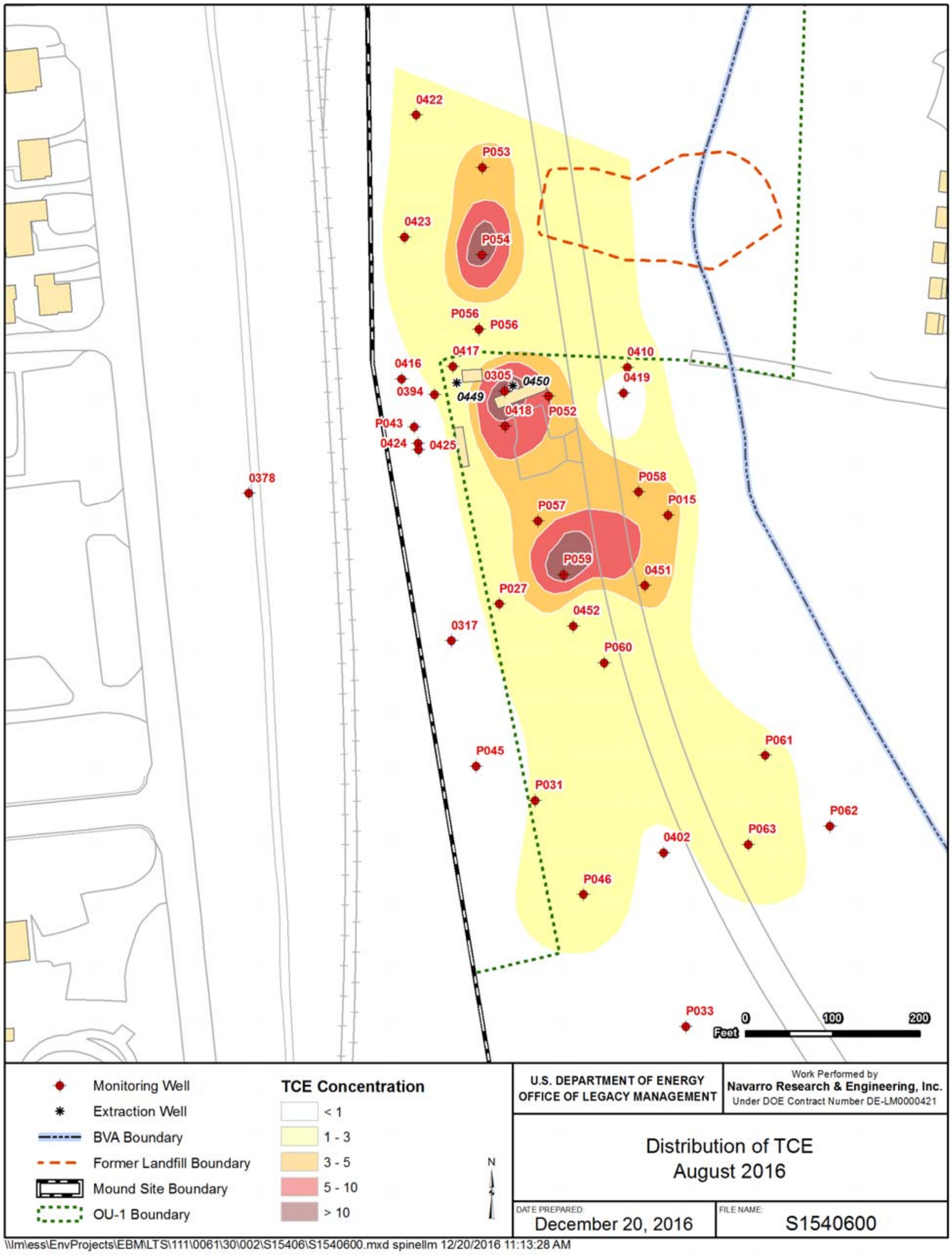


Figure 4. Distribution of TCE, August 2016

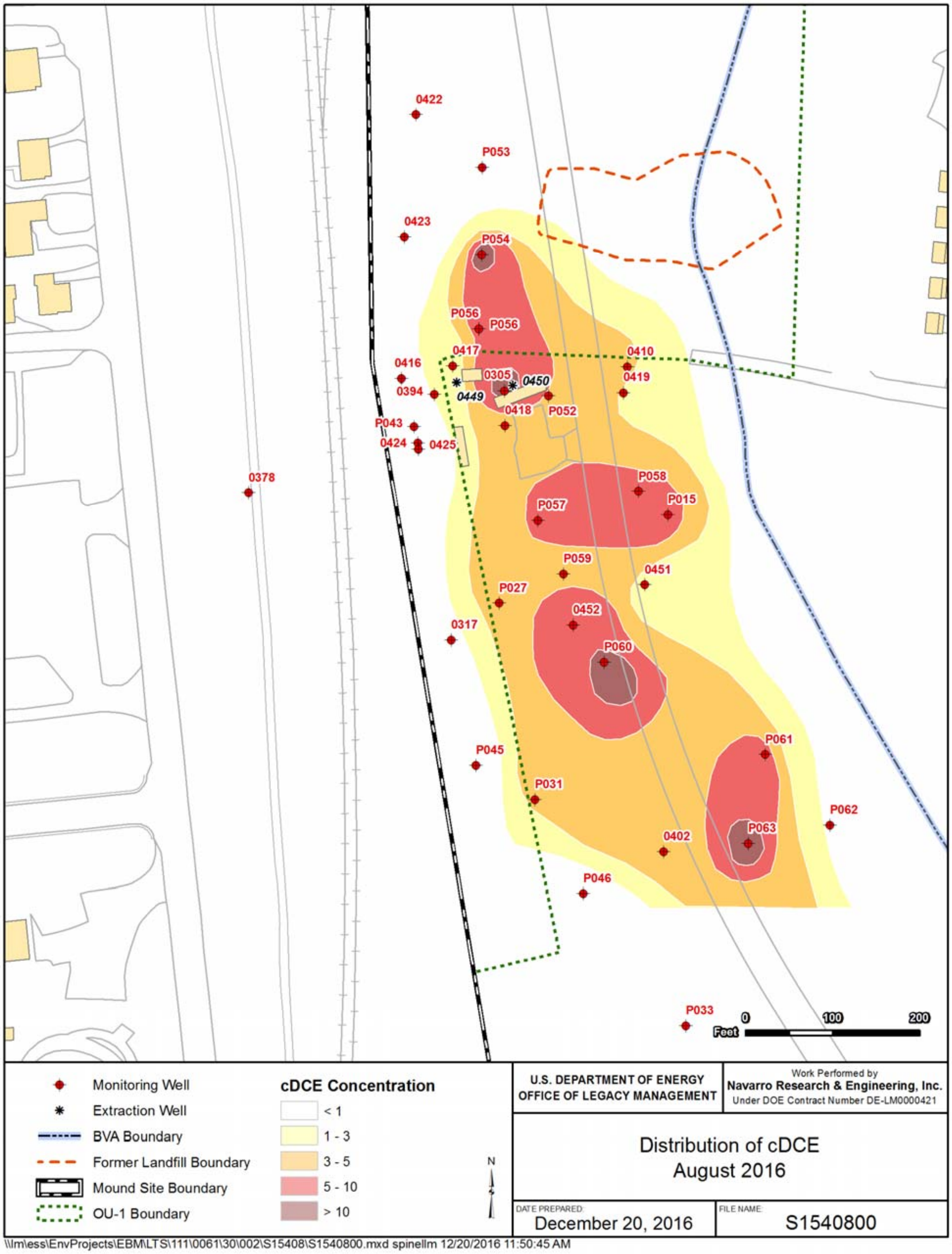


Figure 5. Distribution of cDCE, August 2016

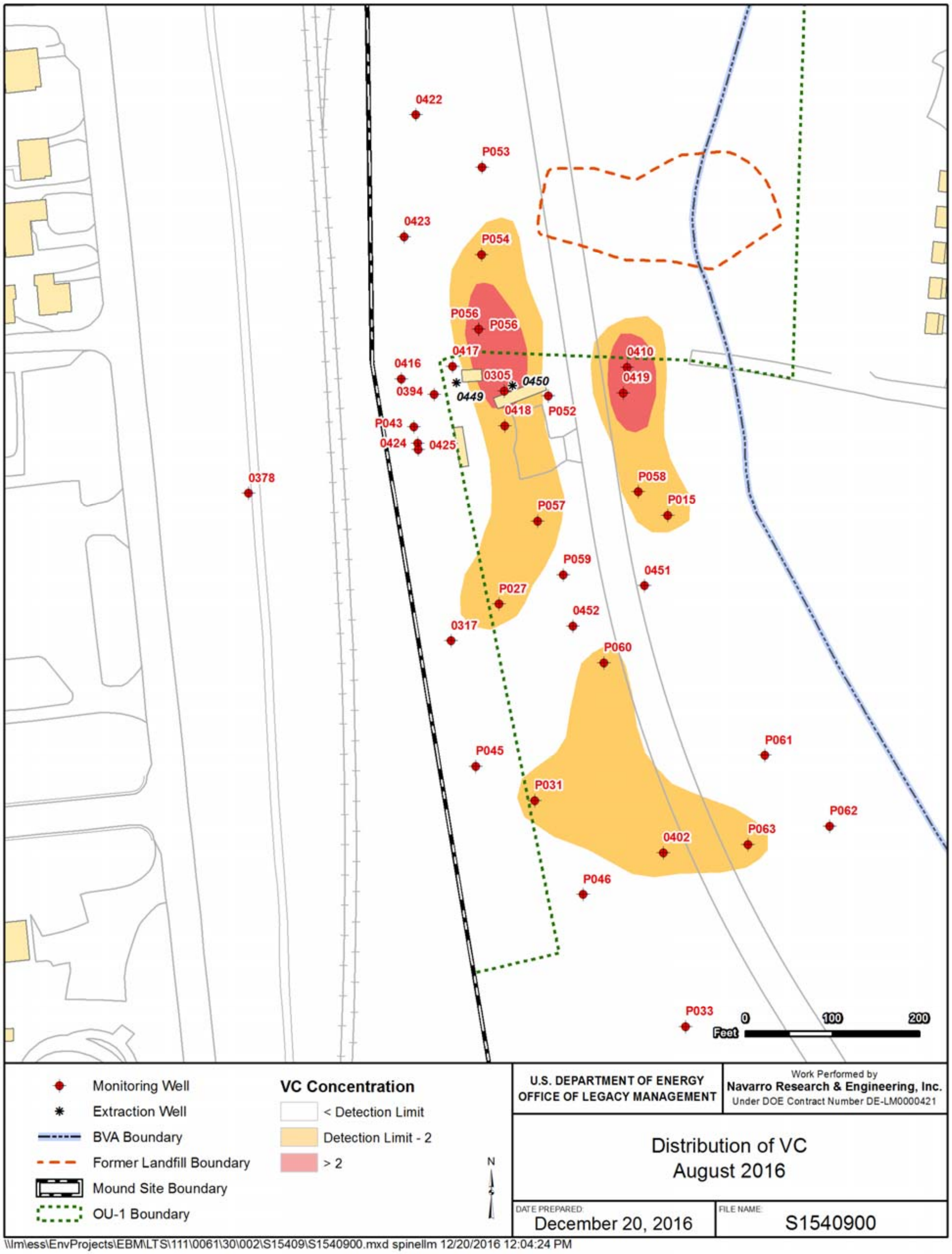


Figure 6. Distribution of VC, August 2016

2.1.2 Groundwater Flow

Water level measurements were taken monthly in OU-1 to monitor the groundwater flow direction and rate. Starting in June 2016, water levels were measured weekly in response to the decrease in groundwater levels observed in OU-1, which were the result of dewatering being performed south of the Mound site, as detailed in Section 1.4. During this time, the groundwater flow direction remained to the south but the gradient increased to approximately 3 times the typical gradient of 0.002 ft/ft. The groundwater flow was to the west for a short period in June 2016 when an additional dewatering project west of the site was being performed. The dewatering wells at the WRF were turned off on September 19, 2016, and groundwater gradients returned to normal and the groundwater flow has remained parallel to the interface of the Buried Valley Aquifer (BVA) with the bedrock to the east (consistent with historical conditions in OU-1). Figure 7 depicts the typical water table observed in OU-1 and was created using data for September 26, 2016. All groundwater elevation data from the second year of the field demonstration are summarized in Appendix B.

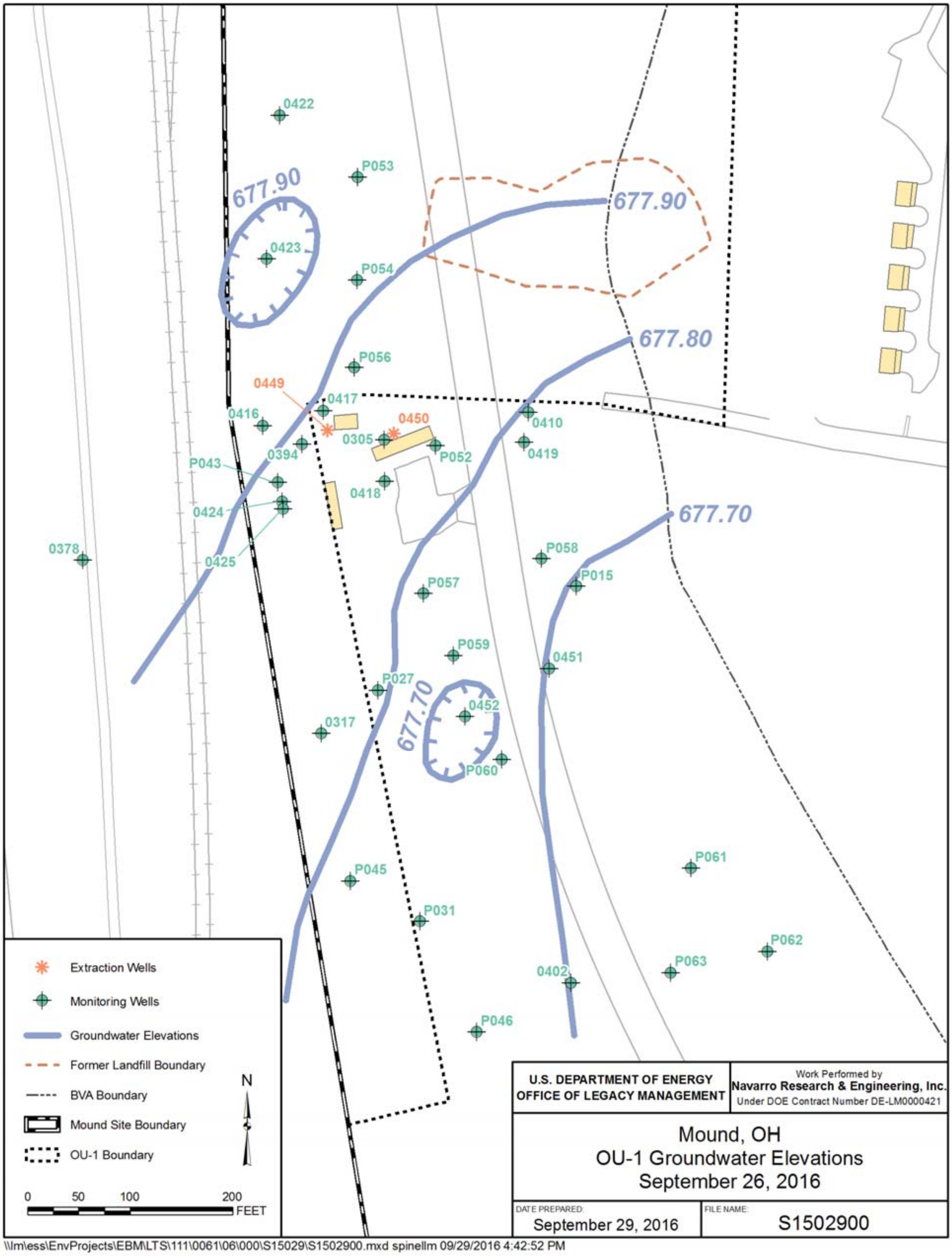


Figure 7. Groundwater Elevations in OU-1, September 26, 2016

2.2 First Line of Evidence—Trends in cVOC Mass and Concentration

The objective of the first line of evidence is to document trends in concentration and mass of cVOCs and daughter products over time and in individual wells. MAROS Version 3.0 was used to evaluate the first line of evidence based on individual well concentration trends and the overall dissolved plume mass trends. Individual well trends rely on linear regression and Mann-Kendall statistics to determine the concentration trend category (increasing, probably increasing, stable, no trend, probably decreasing, or decreasing). For the overall plume, MAROS uses a method of moments analysis to estimate total dissolved mass for each sampling event (zeroth moment), center of mass location (first moment), and plume spread (second moment). To calculate the moments, MAROS integrates the data spatially using a mesh creation method known as Delaunay Triangulation/Voronoi Diagram spatial geometry and accounts for varying concentrations and aquifer thicknesses in different areas of the plume. The trends for each of these overall plume characteristics can be calculated using multiple sampling events. Similar to trending data from the individual wells, Mann-Kendall statistics are used in the moment analysis to determine the trend category. Detailed information about the model is available in the *MAROS User Guide and Technical Manual* (http://www.gsi-net.com/en/software/free-software/monitoring-and-remediation-optimization-systems-maros-version-3-0.html).

2.2.1 Concentration Trends for cVOCs in OU-1 Monitoring Wells

The MAROS evaluation covered the period from August 2014 (starting baseline values established as the first sampling event before oil deployment was initiated in late August 2014) through August 2016. The statistical Mann-Kendall and linear regression results from MAROS for the various contaminants in the OU-1 monitoring wells provide an assessment of cVOC concentration trends in the first and second years of the field demonstration, addressing such questions as:

- Is a contaminant increasing, decreasing, or stable?
- Was a contaminant ever detected in a well?
- How much confidence is there in the trends?

Table 2 summarizes the statistical trends for each cVOC and daughter in each of the 24 OU-1 monitoring wells during the period of August 2014 through August 2016. Wells 0422, 0423, and P031 were considered delineation wells for mass estimates and individual well concentration trends were not calculated. All concentrations from these three wells are below MCLs. In the few cases where the calculated Mann-Kendall and regression method trend results were different, the listed trend is based on the method that had the highest reported confidence.

Table 2. Summary of MAROS Statistical Trends and MCL Exceedances

Well	Analyte	Number of Samples	Number of Detects	08/2016 Concentration (µg/L)	Trend 08/2014–08/2016	Exceedance 08/2014–08/2016	Current Condition
0305	PCE	9	9	4.17	I	Green	Green
0305	TCE	9	9	17.00	I	Red	Red
0305	cDCE	9	8	12.10	I	Green	Green
0305	VC	9	4	2.35	I	Red	Red
0379	PCE	22	22	0.32 J	NT	Green	Green
0379	TCE	22	22	1.49	D	Green	Green
0379	cDCE	22	0	0.16 U	ND	Green	Green
0379	VC	22	0	0.16 U	ND	Green	Green
0402	PCE	25	23	1.15	NT	Green	Green
0402	TCE	25	17	0.94 J	NT	Green	Green
0402	cDCE	25	5	3.92	I	Green	Green
0402	VC	25	2	0.31 J	I	Green	Green
0410	PCE	13	9	0.16 U	D	Green	Green
0410	TCE	13	9	1.30	NT	Green	Green
0410	cDCE	13	11	4.22	PD	Green	Green
0410	VC	13	9	4.15	PI	Red	Red
0416	PCE	13	0	0.16 U	ND	Green	Green
0416	TCE	13	0	0.16 U	ND	Green	Green
0416	cDCE	13	0	0.16 U	ND	Green	Green
0416	VC	13	0	0.16 U	ND	Green	Green
0417	PCE	9	9	2.50	NT	Green	Green
0417	TCE	9	9	2.68	I	Green	Green
0417	cDCE	9	7	2.82	I	Green	Green
0417	VC	9	5	0.16 U	NT	Red	Green
0418	PCE	13	13	4.05	I	Red	Green
0418	TCE	13	13	5.09	I	Red	Red
0418	cDCE	13	11	3.17	I	Green	Green
0418	VC	13	6	0.64 J	I	Green	Green
0419	PCE	13	7	0.16 U	D	Green	Green
0419	TCE	13	7	0.16 U	NT	Red	Green
0419	cDCE	13	12	2.31	S	Green	Green
0419	VC	13	6	2.74	I	Red	Red
0424	PCE	9	6	0.57 J	NT	Green	Green
0424	TCE	9	1	0.45 J	PI	Green	Green
0424	cDCE	9	0	0.16 U	ND	Green	Green
0424	VC	9	0	0.16 U	ND	Green	Green
0425	PCE	9	9	0.78 J	I	Green	Green
0425	TCE	9	7	0.74 J	I	Green	Green
0425	cDCE	9	3	0.16 U	NT	Green	Green

Table 2 (continued). Summary of MAROS Statistical Trends and MCL Exceedances

Well	Analyte	Number of Samples	Number of Detects	08/2016 Concentration (µg/L)	Trend 08/2014–08/2016	Exceedance 08/2014–08/2016	Current Condition
0425	VC	9	0	0.16 U	ND	🟢	🟢
0451	PCE	13	13	4.07	D	🔴	🟢
0451	TCE	13	13	4.18	D	🔴	🟢
0451	cDCE	13	13	2.47	I	🟢	🟢
0451	VC	13	0	0.16 U	ND	🟢	🟢
0452	PCE	12	10	0.16 U	D	🔴	🟢
0452	TCE	12	12	2.53	PD	🔴	🟢
0452	cDCE	12	11	8.61	I	🟢	🟢
0452	VC	12	0	0.16 U	ND	🟢	🟢
P015	PCE	9	9	0.96 J	D	🟢	🟢
P015	TCE	9	9	3.11	S	🟢	🟢
P015	cDCE	9	8	6.13	I	🟢	🟢
P015	VC	9	1	0.70 J	PI	🟢	🟢
P027	PCE	12	12	0.62 J	S	🟢	🟢
P027	TCE	12	8	1.47	I	🟢	🟢
P027	cDCE	12	7	3.69	I	🟢	🟢
P027	VC	12	3	0.62 J	I	🔴	🟢
P053	PCE	9	9	5.90	PD	🔴	🔴
P053	TCE	9	9	3.50	D	🟢	🟢
P053	cDCE	9	6	0.71 J	I	🟢	🟢
P053	VC	9	0	0.16 U	ND	🟢	🟢
P054	PCE	13	13	3.53	D	🔴	🟢
P054	TCE	13	13	25.80	D	🔴	🔴
P054	cDCE	13	12	10.40	I	🟢	🟢
P054	VC	13	5	1.71	I	🔴	🟢
P056	PCE	14	14	2.10	D	🔴	🟢
P056	TCE	14	14	1.42	D	🔴	🟢
P056	cDCE	14	14	7.66	S	🟢	🟢
P056	VC	14	11	2.72	NT	🔴	🔴
P057	PCE	13	13	1.25	I	🟢	🟢
P057	TCE	13	13	4.28	I	🟢	🟢
P057	cDCE	13	11	7.37	I	🟢	🟢
P057	VC	13	3	1.03	I	🟢	🟢
P058	PCE	13	13	4.54	D	🔴	🟢
P058	TCE	13	13	4.53	D	🔴	🟢
P058	cDCE	13	13	6.93	I	🟢	🟢
P058	VC	13	2	0.44 J	I	🟢	🟢
P059	PCE	13	13	4.83	D	🔴	🟢
P059	TCE	13	13	10.30	S	🔴	🔴
P059	cDCE	13	13	4.86	I	🟢	🟢

Table 2 (continued). Summary of MAROS Statistical Trends and MCL Exceedances

Well	Analyte	Number of Samples	Number of Detects	08/2016 Concentration (µg/L)	Trend 08/2014–08/2016	Exceedance 08/2014–08/2016	Current Condition
P059	VC	13	0	0.16 U	ND	green	green
P060	PCE	15	13	0.16 U	D	red	green
P060	TCE	15	15	2.04	D	red	green
P060	cDCE	15	15	43.40	I	green	green
P060	VC	15	2	0.39 J	NT	green	green
P061	PCE	18	18	0.54 J	D	red	green
P061	TCE	18	18	1.66	D	red	green
P061	cDCE	18	11	7.12	I	green	green
P061	VC	18	0	0.16 U	ND	green	green
P062	PCE	17	17	0.51 J	D	green	green
P062	TCE	17	17	0.50 J	D	green	green
P062	cDCE	17	7	0.16 U	PI	green	green
P062	VC	17	0	0.16 U	ND	green	green
P063	PCE	20	20	1.33	D	green	green
P063	TCE	20	20	1.24	D	green	green
P063	cDCE	20	13	10.30	I	green	green
P063	VC	20	1	0.56 J	PI	green	green

Key:

Concentration codes: U= not detected at listed concentration
J = estimated value
red = exceeded MCL in August 2016

Trend codes: D = downward trend
I = increasing trend
ND = not detected
NT = no trend
PD = possible downward trend
PI = possible upward trend
S = stationary
Exceedance: Did the constituent exceed MCL at any time during the period August 2014–August 2015? Green = no, red = yes

Current Condition codes: green = below MCL
red = above MCL

The concentration trend analyses are shown graphically on maps to better illustrate the spatial trends with symbols and color coding (PCE in Figure 8, TCE in Figure 9, cDCE in Figure 10, and VC in Figure 11). The well name is listed in bold for wells with a contaminant concentration that exceeded an MCL in the baseline samples or during any enhanced attenuation sampling period (August 2014–August 2016); non-bold symbols indicate wells in which contaminant concentrations were below the MCL during every sampling period. Well locations circled in green had a concentration below the MCL in the most recent sampling period (August 2016); well locations circled in red had a concentration above the MCL in the most recent sampling period (August 2016). Wells marked with an up arrow had increasing or probably increasing trends; wells marked with a horizontal line had stable concentrations or no trend; wells marked with a down arrow had decreasing or probably decreasing trends; wells marked with a "0" had no detection in any sample.

Figure 12 and Figure 13 show contour plots of the changes in concentration for PCE and TCE prior to injection of the edible oils (August 2014) and at the end of the second year of monitoring (August 2016). In these maps, areas that are negative had a decrease in the contaminant concentration, and areas that are positive had an increase in the contaminant concentration.

Based on the table and figures, the following are key observations for the individual concentration well trends:

- For TCE, the trends identify 7 wells as increasing or probably increasing (same as in Year 1), 11 wells as either decreasing or probably decreasing (15 in 2015), 5 wells as stable or having no trend (same as 2015), and 1 well (2 in 2015) is below the detection limit for TCE in all samples. However, considering the important subset of 10 wells in which TCE was above the MCL in any sample during the August 2014 to August 2016 period, 2 wells were identified as increasing, and 9 wells were identified as decreasing, probably decreasing, or stable or having no trend.
- In the most recent sampling event (August 2016), TCE concentrations were below the MCL in all but four wells. The statistical trends for the PCE data are similar to those for the TCE data with only one well slightly above the MCL.
- The graphical trend plots and the change in concentration contour plots show spatially decreasing well concentrations in most areas of the OU-1 plume. The only area with an observable increasing trend (a trend that altered the contour maps) was near wells 0305 and P054.
- Perturbations from the water table fluctuations due to offsite dewatering projects likely impacted the dissolved cVOC concentrations (lower water table and altered flow directions) and concentrations will need to be watched, but the trends indicate the geochemical zones continue to be maintained through Year 2.

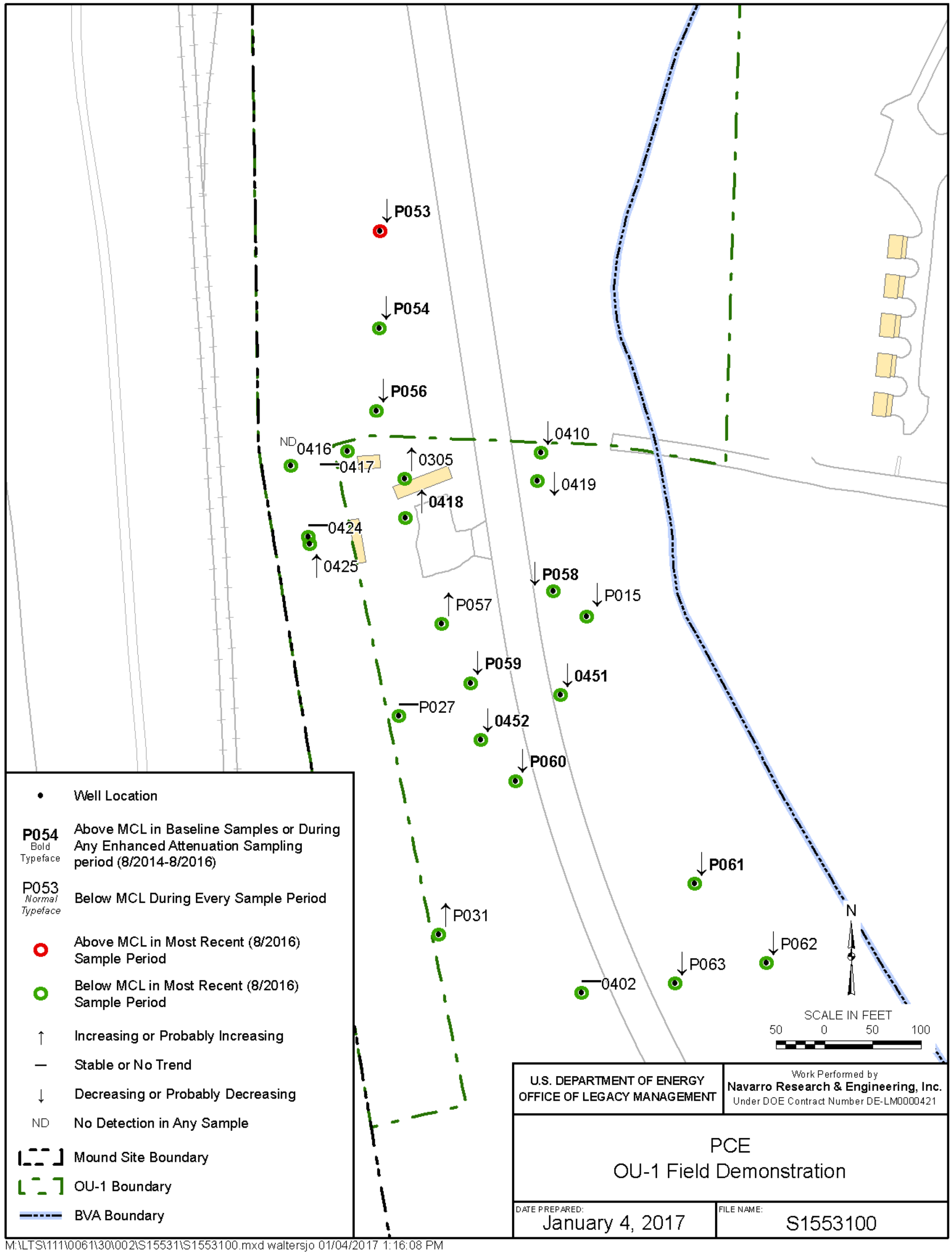


Figure 8. Graphical PCE Well Trends Between August 2014 and August 2016

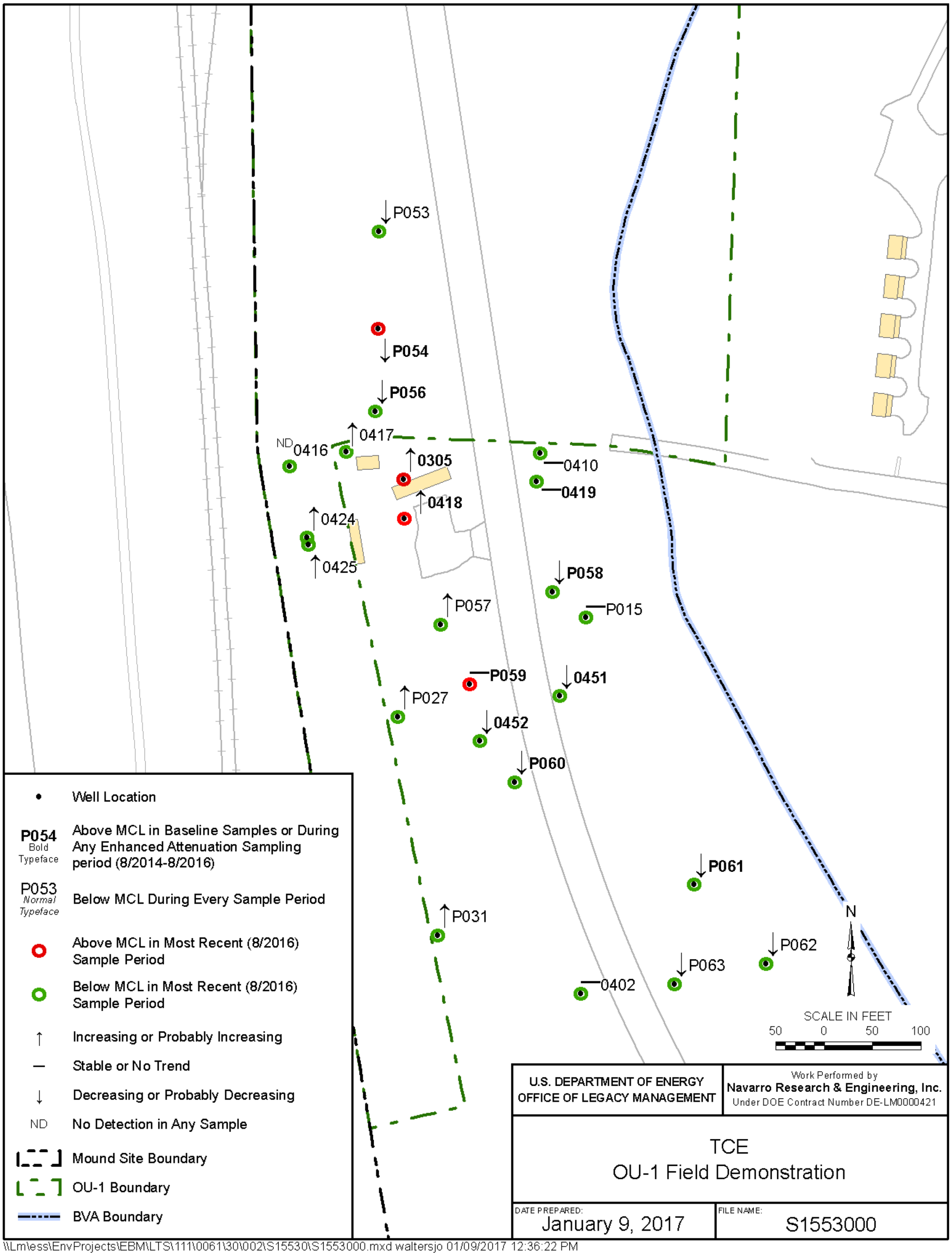


Figure 9. Graphical TCE Well Trends Between August 2014 and August 2016

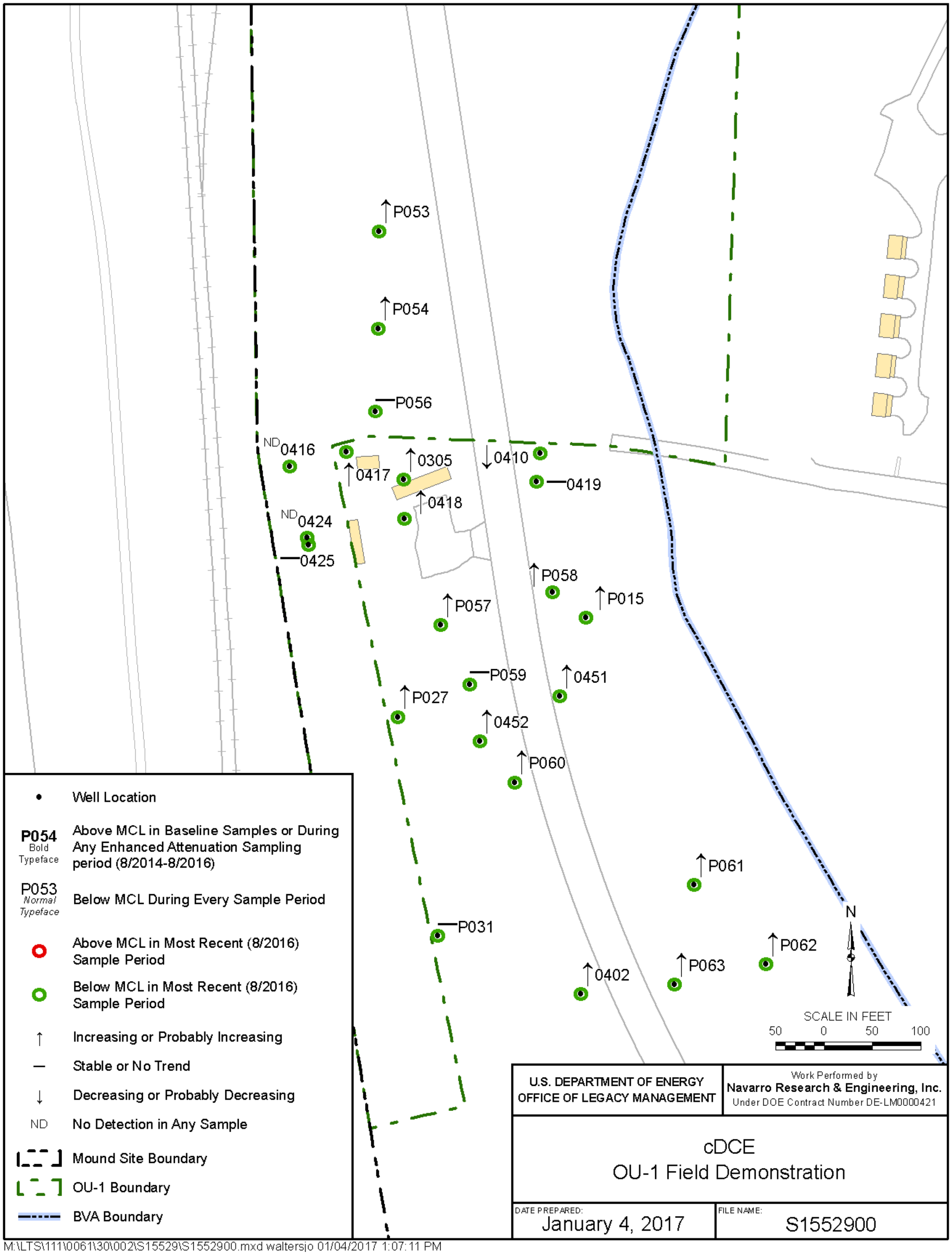


Figure 10. Graphical cDCE Well Trends Between August 2014 and August 2016

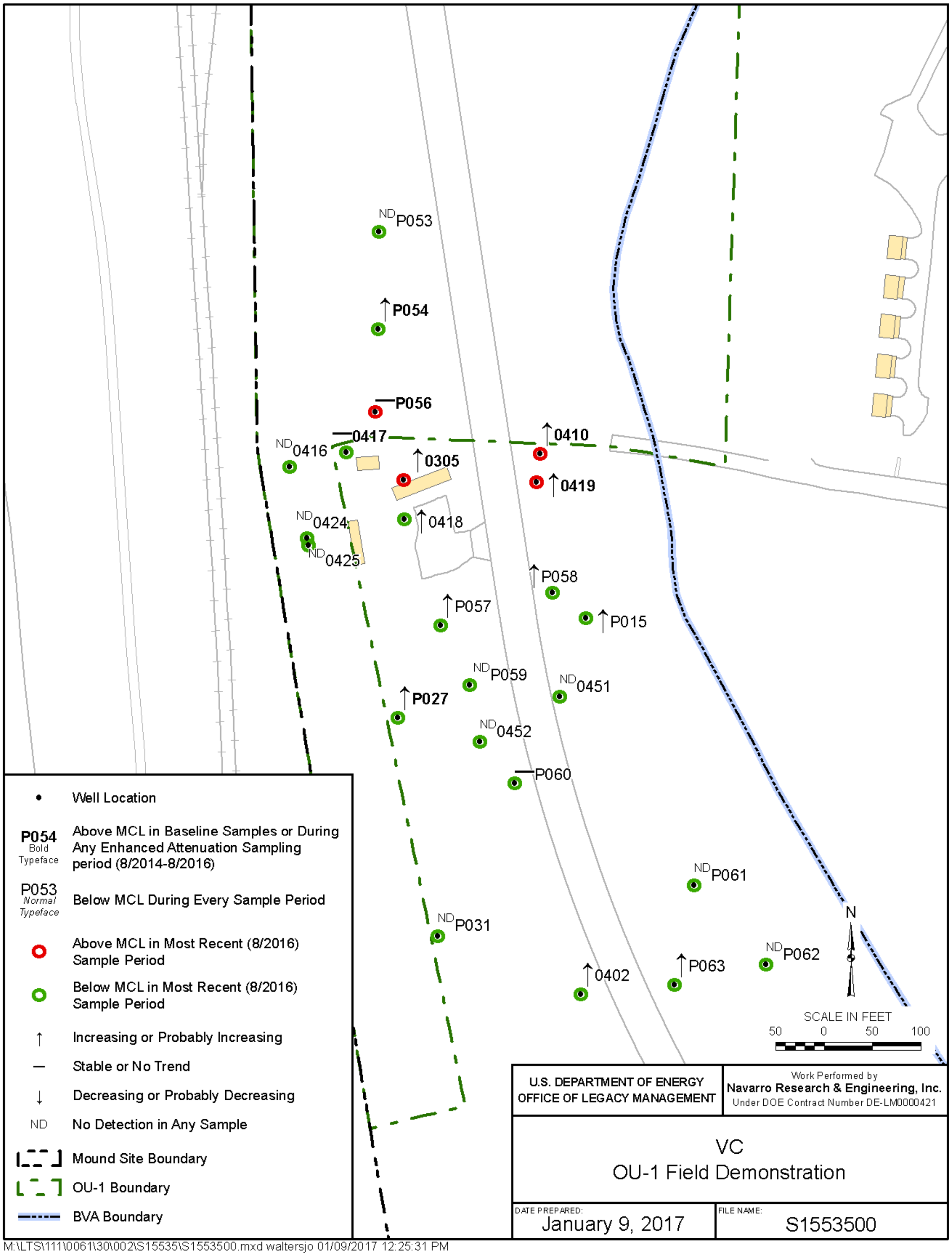
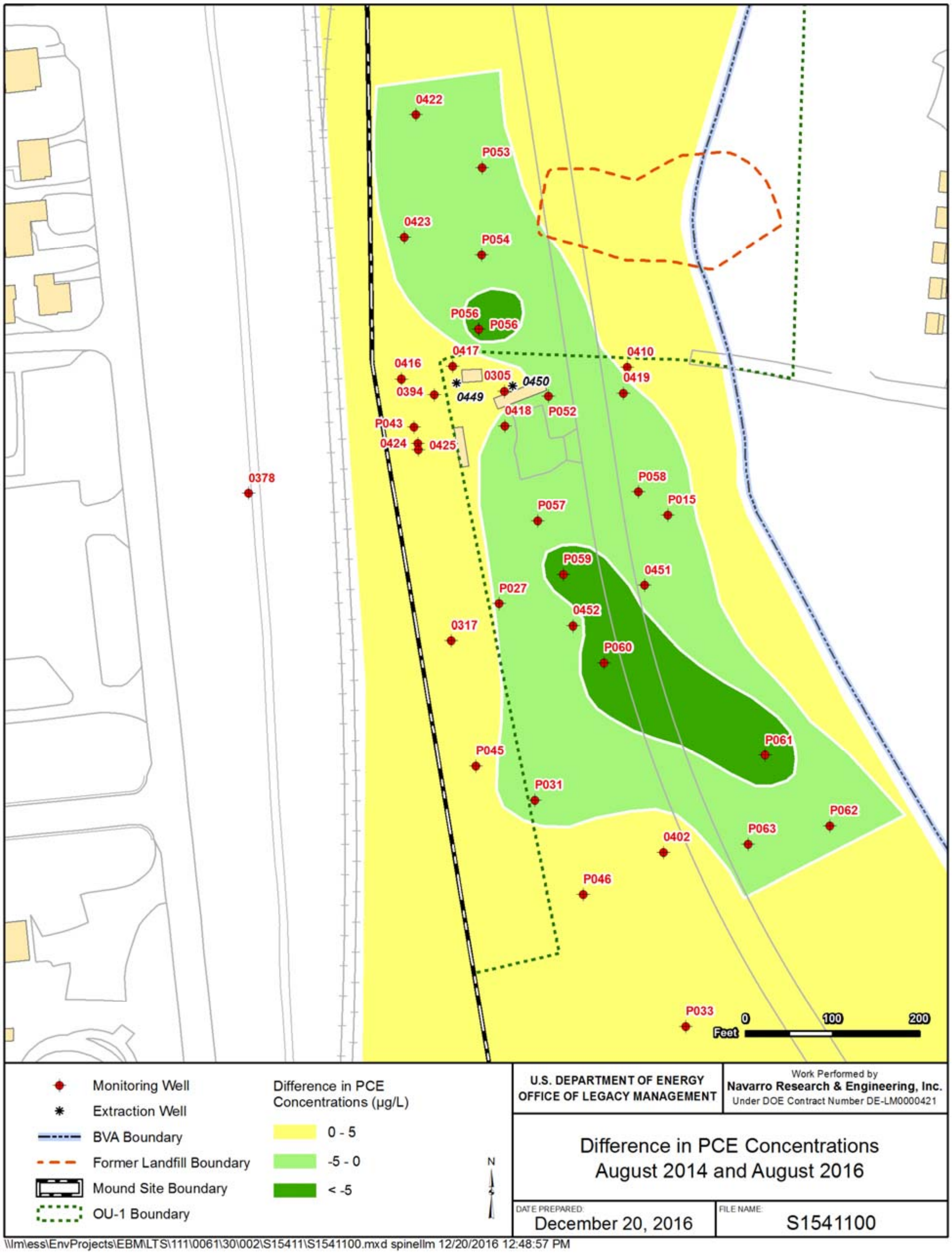
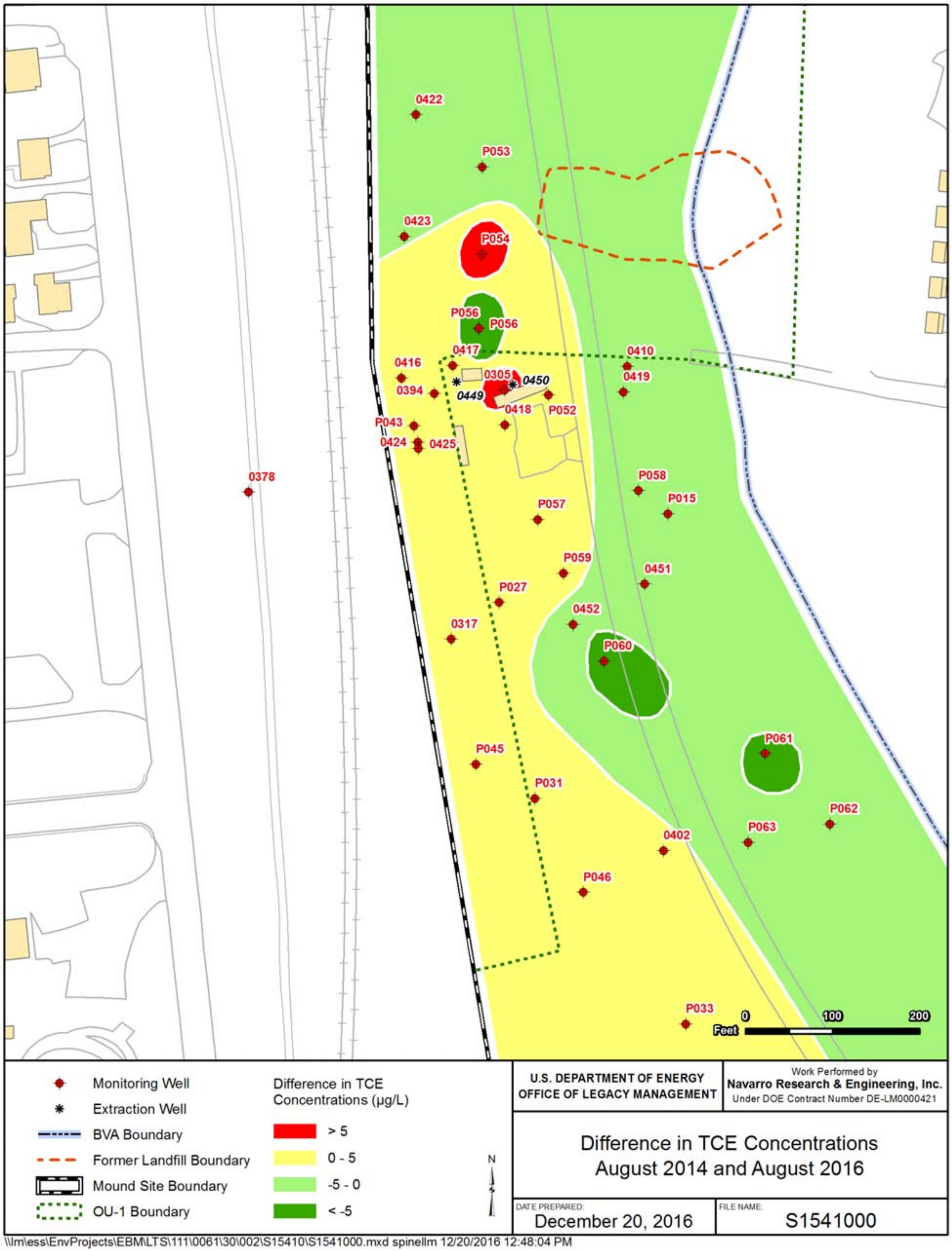


Figure 11. Graphical VC Well Trends Between August 2014 and August 2016



Note: Comparison of data from August 4-7, 2014 and August 1-4, 2016

Figure 12. Change in PCE Concentrations Between August 2014 and August 2016



Note: Comparison of data from August 4-7, 2014 and August 1-4, 2016

Figure 13. Change in TCE Concentrations Between August 2014 and August 2016

2.2.2 Plume Mass Trends for cVOCs in OU-1 Groundwater Plume

The MAROS plume evaluation of the dissolved plume mass covered the period from August 2014 to August 2016. The moment analysis and statistical Mann-Kendall results from MAROS for the various contaminants in the OU-1 plume provide an assessment of cVOC plume stability, addressing such questions as:

- Is the mass increasing, decreasing, or stable?
- Is the center of mass of the plume moving?
- Is the plume expanding or contracting?
- How much confidence is there in the trends?

MAROS was used with site-specific data that included groundwater flow direction to the south-southeast at a rate of 57 ft per year with a porosity of 0.25. The aquifer thickness was estimated for each well. Wells P054 and P056 were considered original source wells, wells 0422, 0423, and P031 were considered delineation wells, and all other wells were considered tail wells (i.e., wells located downgradient of the source zones). Perturbations from the water table fluctuations that occurred from May through September 2016 likely impacted the location of the dissolved cVOCs during some sampling events (lower water table and altered flow directions) and could impact the mass estimates.

MAROS plume analysis uses a method of moments to provide an estimated mass, *x* and *y* coordinates for the center of mass, and the spread (uniformity) of the mass within the plume. Mann-Kendall statistical trends are estimated for these parameters over time. There are three calculated moments from MAROS:

- The *zeroth moment* is an estimate of the total dissolved mass in the plume. MAROS provides a consistent approach for mass estimation that is intended to support assessment of changes over time. A decreasing trend in dissolved mass (zeroth moment) for any particular contaminant is primary evidence that the plume of that contaminant is shrinking.
- The *first moment* estimates the position of the center of mass for each contaminant at each sample event (discussed further below).
- The *second moment* indicates the distribution of each contaminant about the center of mass for each sample event (discussed further below).

Based on the zeroth moment, Figure 14 shows the dissolved plume mass of parent and daughter products over time. Figure 15 shows the same data converted to dissolved plume moles based on molecular weight. Interpretation of data in moles is a good way of looking at the overall distribution of cVOCs undergoing chemical transformations, particularly for stepwise reductive dechlorination processes, since moles relate to the total number of molecules of each constituent. Time zero on these plots indicates the approximate start of the oil injections. The effective sampling dates are August 6, 2014; November 8, 2014; February 1, 2015; May 2, 2015; August 12, 2015; November 3, 2015; February 2, 2016; May 3, 2016; and August 2, 2016. MAROS provides an estimate of the mass and uses one-half the detection limit for non-detected constituents. Figure 16 shows the molar distribution of the parent and daughter products at different time periods and total calculated moles. Table 3 provides the mass output from

MAROS for the individual cVOCs and the calculated moles. The following are key observations of the dissolved plume mass trends from August 2014 to August 2016:

- PCE and TCE masses are decreasing, with an expected increase in daughter product mass (primarily cDCE).
- For individual compounds, PCE mass decreased 71%, TCE mass decreased 36%, and cDCE mass increased 560%. This is consistent with the transformation by reductive dechlorination (PCE ► TCE ► cDCE ► VC) in the anaerobic treatment zones.
- Total cVOC mass increased after the end of Year 2 with corresponding trends in some individual wells, but the overall parent product trend is decreasing. Perturbations from the water table fluctuations during the summer of 2016 likely impacted the location of the dissolved cVOCs during some sampling events (lower water table and flow directions) and could impact the MAROS mass estimates. Variability may be attributed to groundwater level changes, continued source loading, or back diffusion, and possible cDCE stall. The "steady" increase in the mole fraction of cDCE in the pie charts in Figure 16 demonstrates that significant reductive attenuation processes in the anaerobic treatment zones have developed and are continuing during the first 2 years of the EA field demonstration.
- TCE mass increased in the last sampling event (August 2016), while PCE decreased and cDCE increased, indicating reductive dechlorination is continuing. This is particularly evident in the molar distributions in Figure 16.

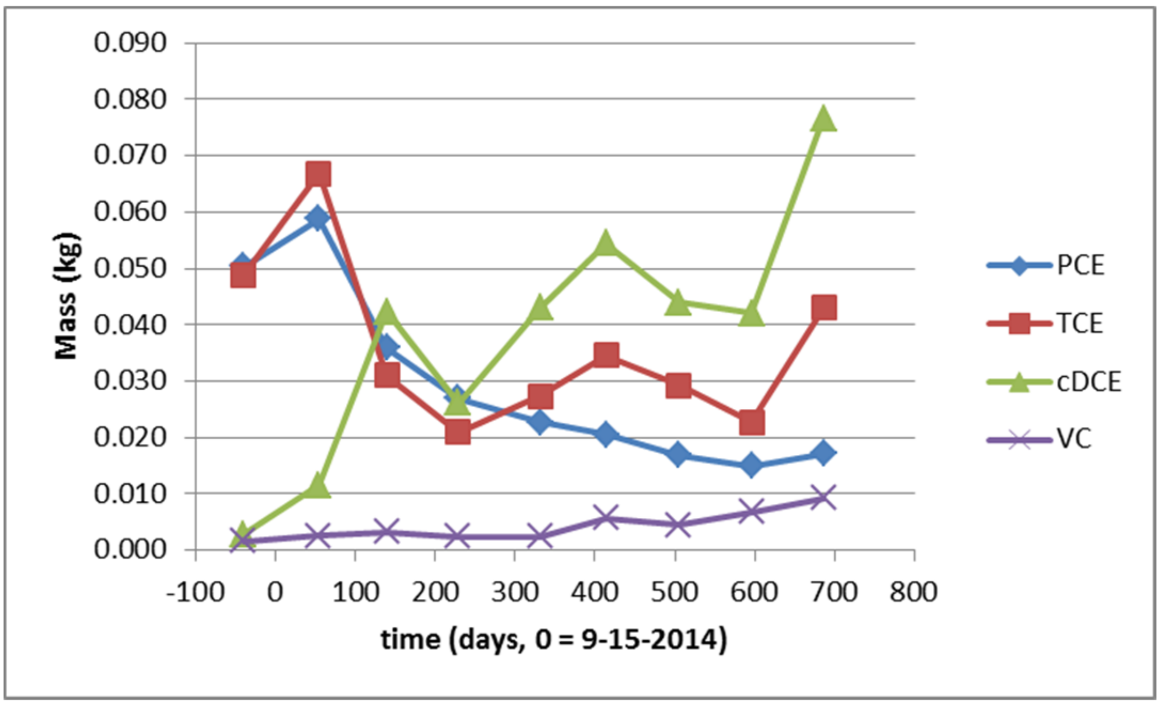


Figure 14. Estimated Dissolved Plume Mass over Time

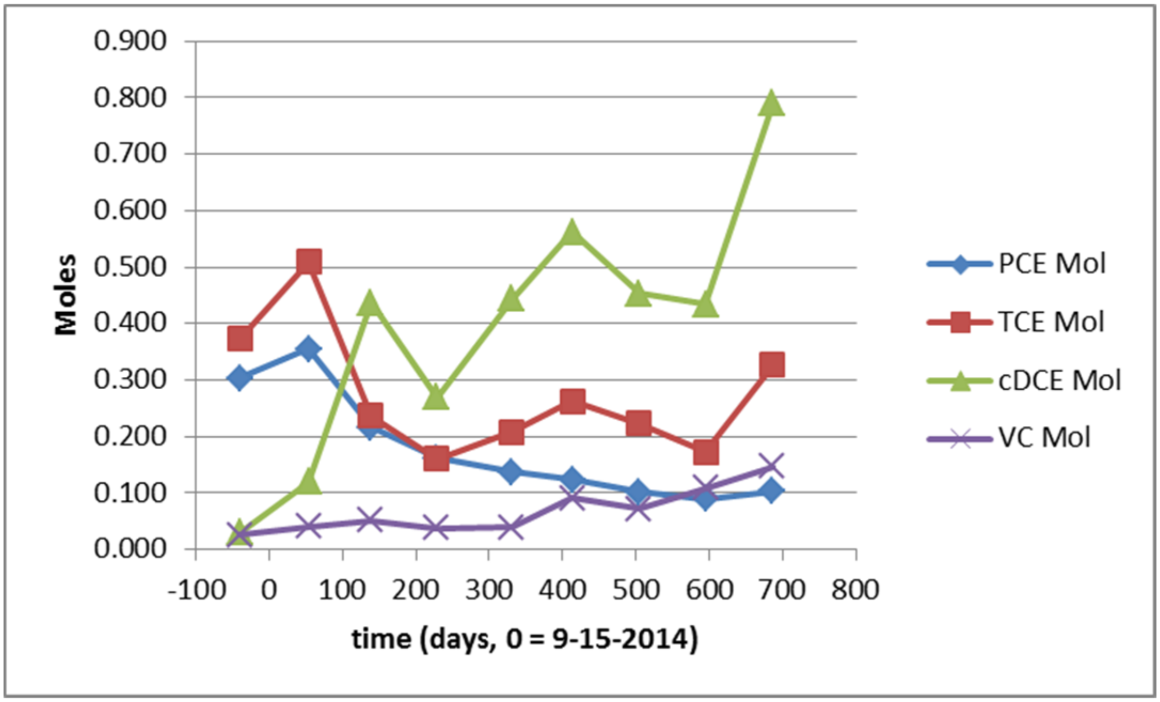


Figure 15. Estimated Dissolved Plume Mass (in moles) over Time

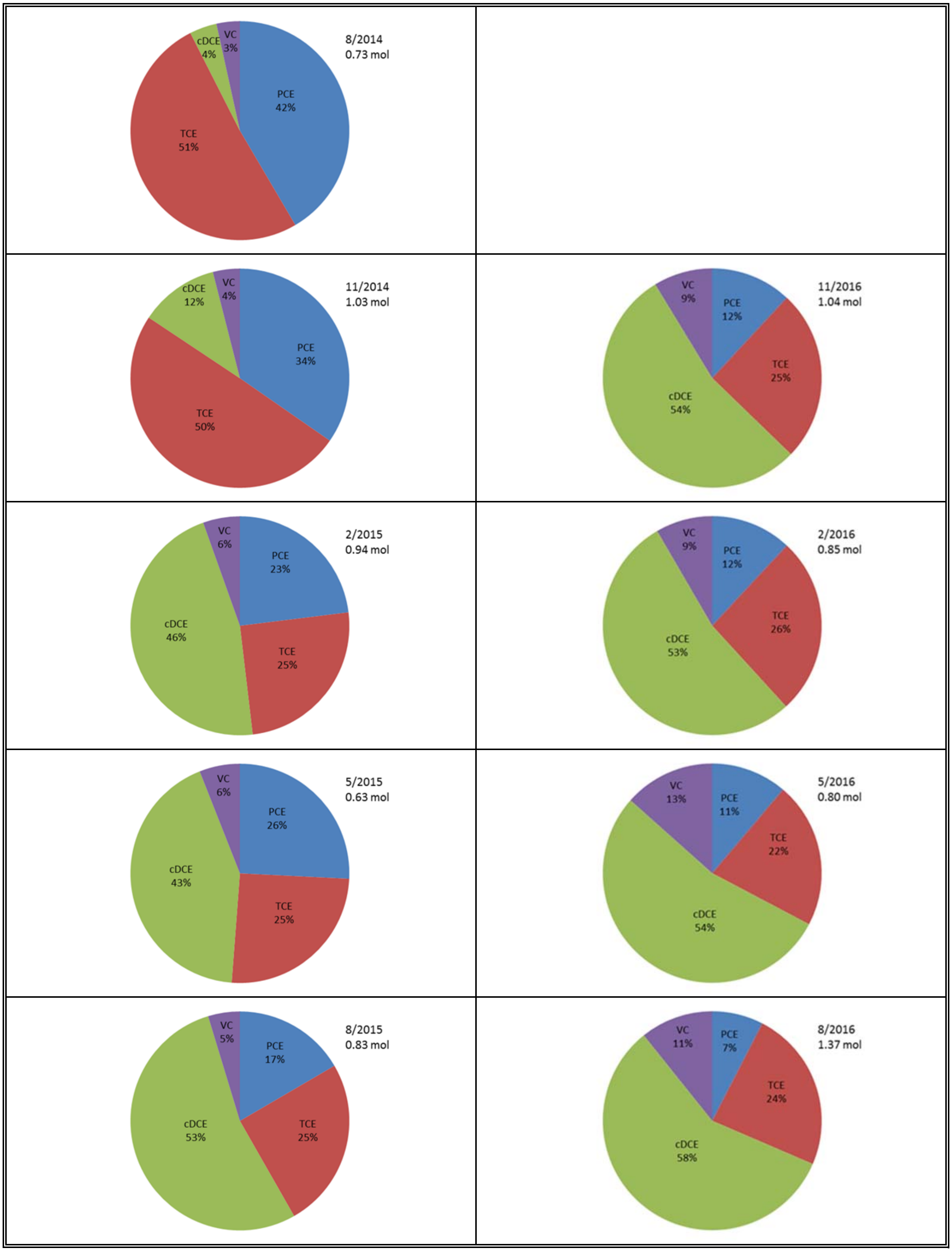


Figure 16. Molar Distribution of cVOCs over Time

Table 3. MAROS Output for cVOCs During Years 1 and 2

Effective Sampling Date	Day	Mass (kg)					Moles				
		PCE	TCE	cDCE	VC	Total	PCE	TCE	cDCE	VC	Total
8/6/2014	-40	0.050	0.049	0.003	0.002	0.104	0.303	0.372	0.029	0.025	0.730
11/8/2014	54	0.059	0.067	0.012	0.003	0.140	0.355	0.509	0.120	0.041	1.024
2/1/2015	139	0.036	0.031	0.042	0.003	0.113	0.217	0.236	0.437	0.051	0.941
5/2/2015	229	0.027	0.021	0.026	0.002	0.076	0.162	0.160	0.269	0.038	0.628
8/12/2015	331	0.023	0.027	0.043	0.002	0.095	0.137	0.208	0.443	0.039	0.827
11/3/2015	414	0.021	0.035	0.054	0.006	0.115	0.124	0.263	0.562	0.091	1.040
2/2/2016	505	0.017	0.029	0.044	0.004	0.094	0.101	0.223	0.453	0.071	0.848
5/3/2016	596	0.015	0.023	0.042	0.007	0.086	0.090	0.173	0.434	0.108	0.805
8/2/2016	687	0.017	0.043	0.077	0.009	0.146	0.103	0.327	0.790	0.147	1.367

Abbreviation:
kg = kilograms

As noted above, MAROS employs a method of moments and calculates three different statistical moments for each sampling event.

- The *zeroth moment* estimates the total dissolved mass in the plume (trends in plume mass are a primary metric of plume status, as discussed above).
- The *first moment* estimates the center of mass for each sample event and cVOC. The changing center of mass locations indicate the movement of the center of mass over time, with the *x*-axis representing its major migration direction (i.e., groundwater flow direction). The calculation is based on the original source location, so a positive trend indicates that the center of mass is moving downgradient, and a negative trend indicates that the center of mass is moving back toward the source.
- The *second moment* represents the spread of the contaminants within the plume in the *x* and *y* directions, with the x-axis representing its major migration direction (i.e., groundwater flow direction) and the y-axis representing lateral expansion. The trend over time is influenced by the location and strength of the center of mass and the uniformity of contaminants within the plume.

Table 4 summarizes the plume moment analysis for each cVOC with the trend and confidence level in the trend (the *x* direction is the groundwater flow direction). The following are key observations from the moment analysis.

- The mass (*zeroth moment*) of PCE is decreasing, TCE is stable, and cDCE is increasing. VC mass is increasing although concentrations are low. The trends in mass for PCE and TCE are primary evidence that the plumes of these parent compounds are shrinking. Similarly, the plume of cDCE would be classified as expanding (as it is being formed as a daughter product in the anaerobic treatment zones), and the "plume" of VC would be classified as expanding (as it is being formed as a daughter product) based on the trends in estimated mass. As noted, MAROS uses one-half the detection limits for non-detections that can influence the trends for locations with low concentrations. Only four wells are slightly above MCLs for VC.

- The center of the plume mass (*first moment*) is decreasing for PCE, TCE, and VC in the *x* direction, indicating that the center of mass for TCE is moving upgradient toward the original source. However, the center of the plume mass is increasing for PCE and probably increasing for TCE, indicating movement lateral from the groundwater flow direction. The center of the plume mass is probably increasing for cDCE in the x direction, indicating downgradient movement, which was anticipated.
- The plume spread (*second moment*) for PCE, TCE, and VC are stable or decreasing in the *x* and *y* direction, indicating the plume is not spreading. There is no trend for the plume spread for cDCE in either the *x* or *y* direction although other parameters (e.g., mass increase) would indicate the plume is spreading, although degradation could be impeding the spread.
- The calculated increase in the lateral movement of the plume needs to be watched but is likely a result of the water table fluctuations (i.e., migration of water toward nearby dewatering operations). Taken in context with the decreasing mass (primary metric of plume shrinkage), the upgradient direction of movement of the center of mass, the continual transformation by reductive dechlorination, and the generally decreasing concentration trends in a majority of the monitoring wells, the data suggest that the EA remedy has stabilized the plume and minimized the contaminant migration toward the dewatering operations. Overall the data suggest reasonable progress during the first 2 years of the EA field demonstration. The structured geochemical zones with anaerobic and aerobic treatment areas will continue to influence the moment analysis, and further monitoring and longer-term trends will likely refine the analysis.
- Overall, the moment analysis indicates that plume strength is decreasing, and the plumes can be classified as stable or shrinking.

Table 4. Summary of MAROS Plume Moment Analysis

cVOC	Moment Type	Confidence in Trend	Trend	Description
PCE	Zero Moment	100.00%	D	Dissolved Mass
	First Moment *X*	100.00%	D	Δ Center of Mass (*X*)
	First Moment *Y*	99.70%	I	Δ Center of Mass (*Y*)
	Second Moment *X*	46.00%	S	Plume Spread (*X*)
	Second Moment *Y*	99.90%	D	Plume Spread (*Y*)
TCE	Zero Moment	76.20%	S	Dissolved Mass
	First Moment *X*	99.90%	D	Δ Center of Mass (*X*)
	First Moment *Y*	94.00%	PI	Δ Center of Mass (*Y*)
	Second Moment *X*	46.00%	S	Plume Spread (*X*)
	Second Moment *Y*	87.00%	S	Plume Spread (*Y*)
cDCE	Zero Moment	99.40%	I	Dissolved Mass
	First Moment *X*	91.00%	PI	Δ Center of Mass (*X*)
	First Moment *Y*	82.10%	S	Δ Center of Mass (*Y*)
	Second Moment *X*	69.40%	NT	Plume Spread (*X*)
	Second Moment *Y*	61.90%	NT	Plume Spread (*Y*)
VC	Zero Moment	99.70%	I	Dissolved Mass
	First Moment *X*	96.20%	D	Δ Center of Mass (*X*)
	First Moment *Y*	82.10%	NT	Δ Center of Mass (*Y*)
	Second Moment *X*	99.40%	D	Plume Spread (*X*)
	Second Moment *Y*	99.40%	D	Plume Spread (*Y*)

Notes:
D = Downward trend
I = Increasing trend
NT = No trend
PI = Possible increasing trend
S = Stationary
Δ = delta (change in)

In summary, the trends in individual well concentrations for the parent products (PCE and TCE) are generally decreasing except in well 0305 and P054, where TCE remains above 5 µg/L. cDCE is generally increasing in the treatment zones, indicating reductive dechlorination of the parent products. The trends in mass for PCE and TCE are primary evidence that the plumes of these compounds are shrinking. Similarly, the plume of cDCE would be classified as expanding (as it is being formed as a daughter product in the anaerobic treatment zones), and the "plume" of VC would be classified as expanding based on the trends in estimated mass although 10 of 34 wells are non-detect and only 4 wells are slightly above MCLs and the statistical analysis indicates the plume spread is decreasing. Dissolved PCE mass decreased 71%, TCE mass decreased 36%, and cDCE mass increased 560% during the first 2 years. This is consistent with the transformation by reductive dechlorination in the anaerobic treatment zones. Overall, the concentration and mass trend analyses suggest that the structured geochemical zones are working as designed. Perturbations from the water table fluctuations likely impacted the dissolved cVOC concentrations (lower water table and flow directions) and concentrations will need to be watched.

2.3 Second Line of Evidence—Geochemical Footprint

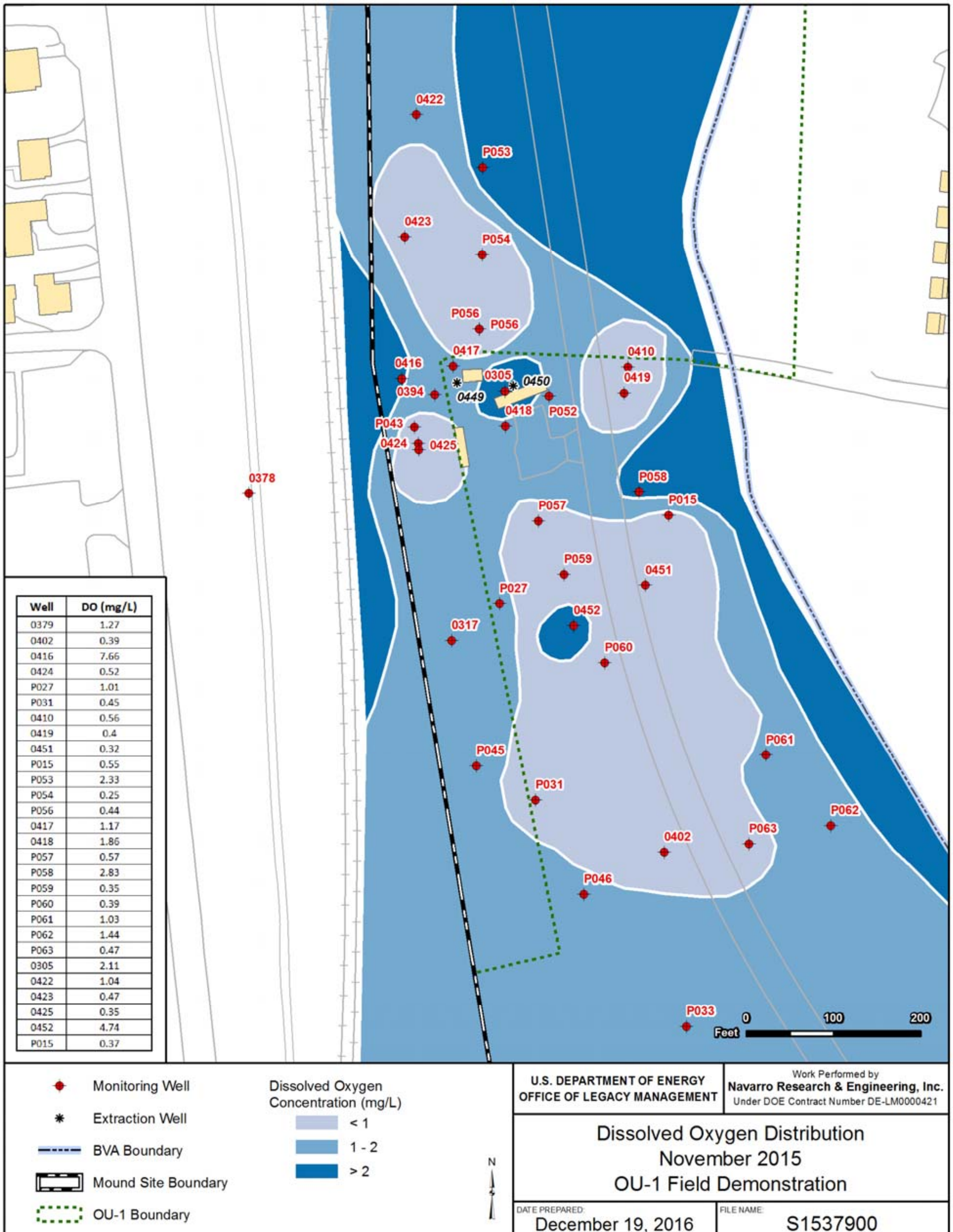
The objective of the second line of evidence is to evaluate geochemical data that can be used to demonstrate indirectly the types of attenuation processes in different areas as the structured geochemical zones are developed at the site.

Example analytes include attenuation conditions (e.g., oxygen, ORP, pH, TOC), competing electron acceptors (compounds that receive electrons instead of cVOCs in attenuation reactions) in anaerobic zones (e.g., oxygen, sulfate, and nitrate), and diagnostic indicators (e.g., methane and iron). The geochemistry was manipulated by the addition of the emulsified soybean oil amendment. The product has both fast and slow release electron donors. Lactate (fast release) increases microbial growth while rapidly creating anaerobic conditions in the treatment zones. Soybean oil droplets are retained on the aquifer materials and slowly ferment to provide electron donors to maintain reducing conditions.

2.3.1 Attenuation Conditions

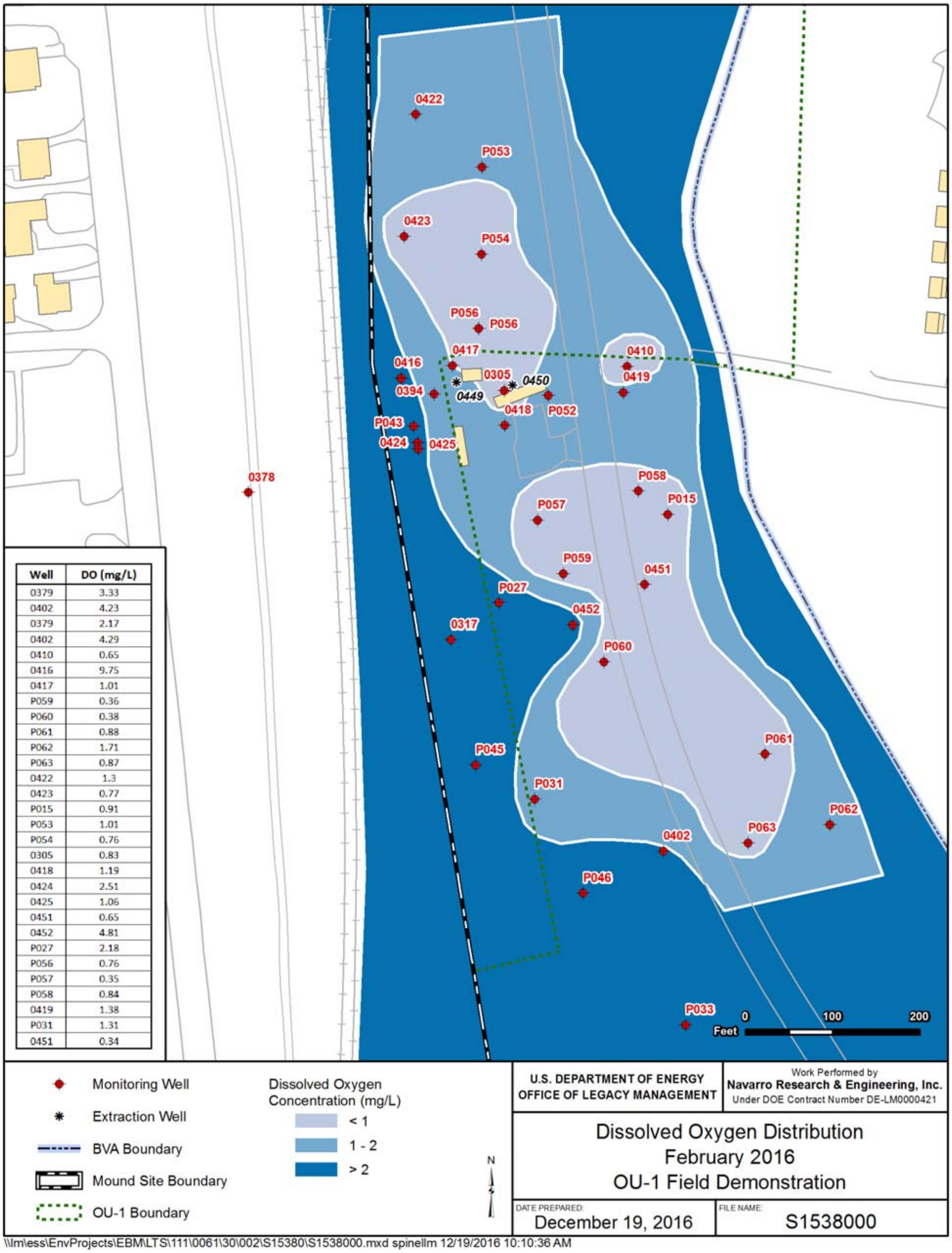
The attenuation condition parameters of DO, ORP, TOC, and pH aid in defining and evaluating the structured geochemical zones for anaerobic and aerobic degradation processes. Figure 17 through Figure 20 present the data and the contour plots of DO. Figure 21 through Figure 24 present the data and the contour plots of ORP. Figure 25 through Figure 28 present the data and the contour plots of TOC. The following are key observations of the attenuation condition parameters during the second year:

- DO remained less than 1 milligram per liter (mg/L) in the treatment zones and was in the range to support anaerobic reductive dechlorination. DO was above 1 mg/L outside the treatment zones; wells that are between and downgradient of the treatment zones had sufficient DO to support aerobic degradation processes.
- ORP (in millivolts [mV]) remained negative in the treatment zones to support reductive dechlorination.
- TOC remained elevated above 2 mg/L in the treatment zones, which is low for strongly reducing conditions. The likely scenario is that the oil continues to be adsorbed to the aquifer materials and is providing a long-lived carbon source, since the DO and ORP in the treatment zones indicate that reducing conditions have been maintained.
- The pH remained around 7 and is ideal for both anaerobic and aerobic microbial processes. Alkalinity averaged around 400 mg/L and is supporting the neutral pH.
- Overall, the structured geochemical zones were created and maintained and are favorable for both anaerobic and aerobic degradation processes. The data showed measureable influence from the nearby dewatering (e.g., increased in DO during May and August 2016) resulting from the increased hydrologic gradient. Nonetheless, the geochemistry in the treatment zones (i.e., DO less than 1 mg/L) remained in a range that is conducive to reductive dechlorination.



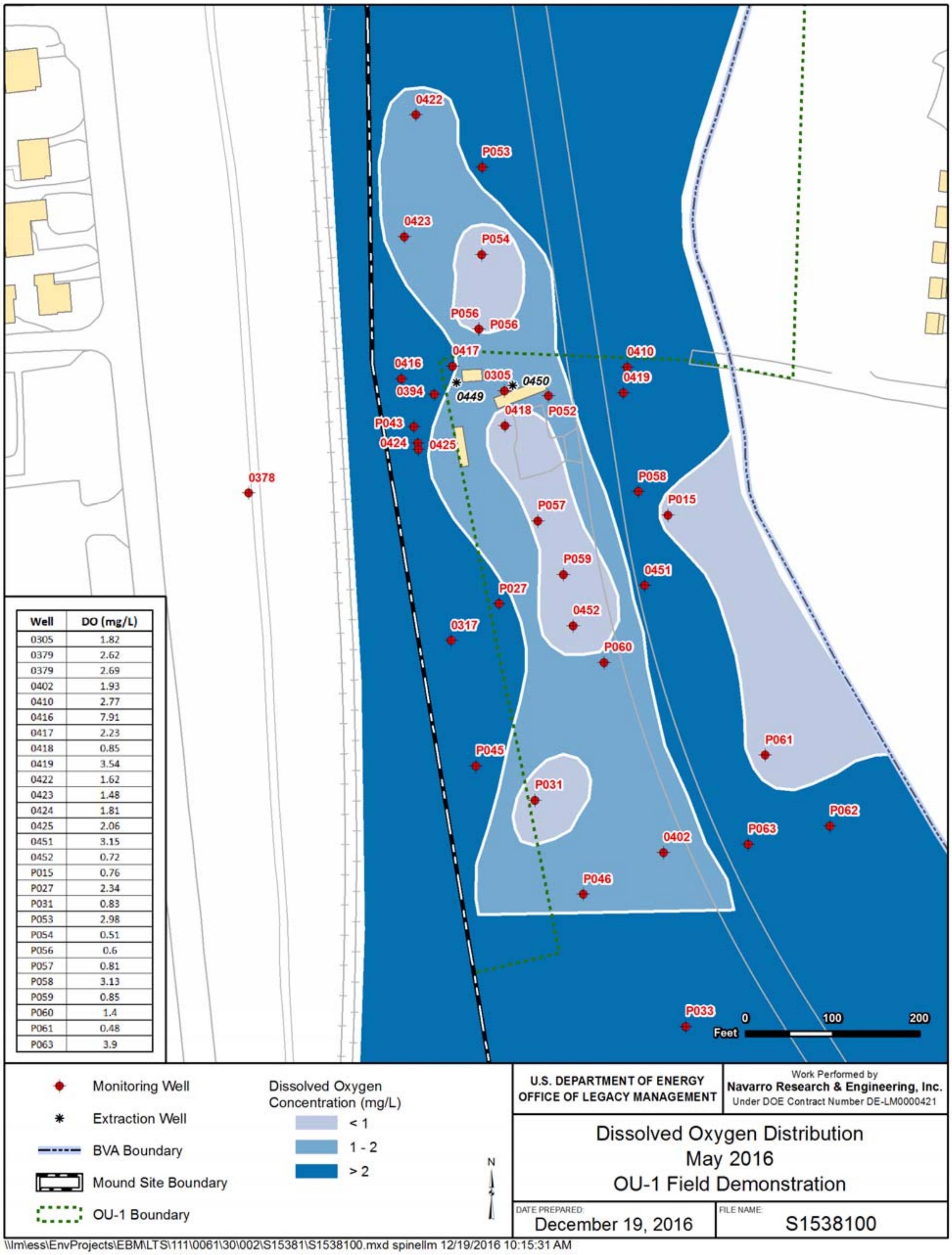
Well	DO (mg/L)
0379	1.27
0402	0.39
0416	7.66
0424	0.52
P027	1.01
P031	0.45
0410	0.56
0419	0.4
0451	0.32
P015	0.55
P053	2.33
P054	0.25
P056	0.44
0417	1.17
0418	1.86
P057	0.57
P058	2.83
P059	0.35
P060	0.39
P061	1.03
P062	1.44
P063	0.47
0305	2.11
0422	1.04
0423	0.47
0425	0.35
0452	4.74
P015	0.37

Figure 17. Dissolved Oxygen Distribution, November 2015



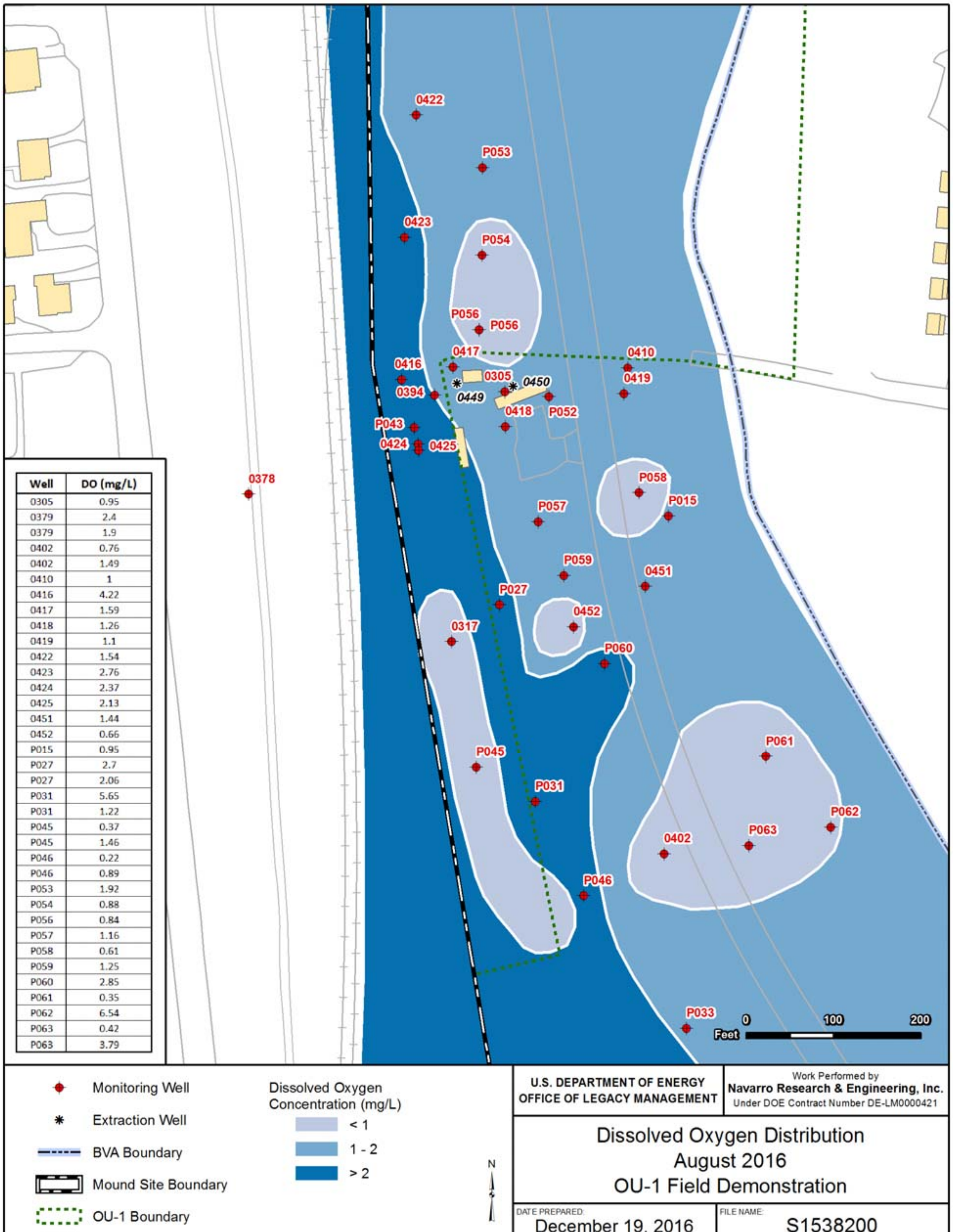
Well	DO (mg/L)
0379	3.33
0402	4.23
0379	2.17
0402	4.29
0410	0.65
0416	9.75
0417	1.01
P059	0.36
P060	0.38
P061	0.88
P062	1.71
P063	0.87
0422	1.3
0423	0.77
P015	0.91
P053	1.01
P054	0.76
0305	0.83
0418	1.19
0424	2.51
0425	1.06
0451	0.65
0452	4.81
P027	2.18
P056	0.76
P057	0.35
P058	0.84
0419	1.38
P031	1.31
0451	0.34

Figure 18. Dissolved Oxygen Distribution, February 2016



Well	DO (mg/L)
0305	1.82
0379	2.62
0379	2.69
0402	1.93
0410	2.77
0416	7.91
0417	2.23
0418	0.85
0419	3.54
0422	1.62
0423	1.48
0424	1.81
0425	2.06
0451	3.15
0452	0.72
P015	0.76
P027	2.34
P031	0.83
P053	2.98
P054	0.51
P056	0.6
P057	0.81
P058	3.13
P059	0.85
P060	1.4
P061	0.48
P063	3.9

Figure 19. Dissolved Oxygen Distribution, May 2016



Well	DO (mg/L)
0305	0.95
0379	2.4
0379	1.9
0402	0.76
0402	1.49
0410	1
0416	4.22
0417	1.59
0418	1.26
0419	1.1
0422	1.54
0423	2.76
0424	2.37
0425	2.13
0451	1.44
0452	0.66
P015	0.95
P027	2.7
P027	2.06
P031	5.65
P031	1.22
P045	0.37
P045	1.46
P046	0.22
P046	0.89
P053	1.92
P054	0.88
P056	0.84
P057	1.16
P058	0.61
P059	1.25
P060	2.85
P061	0.35
P062	6.54
P063	0.42
P063	3.79

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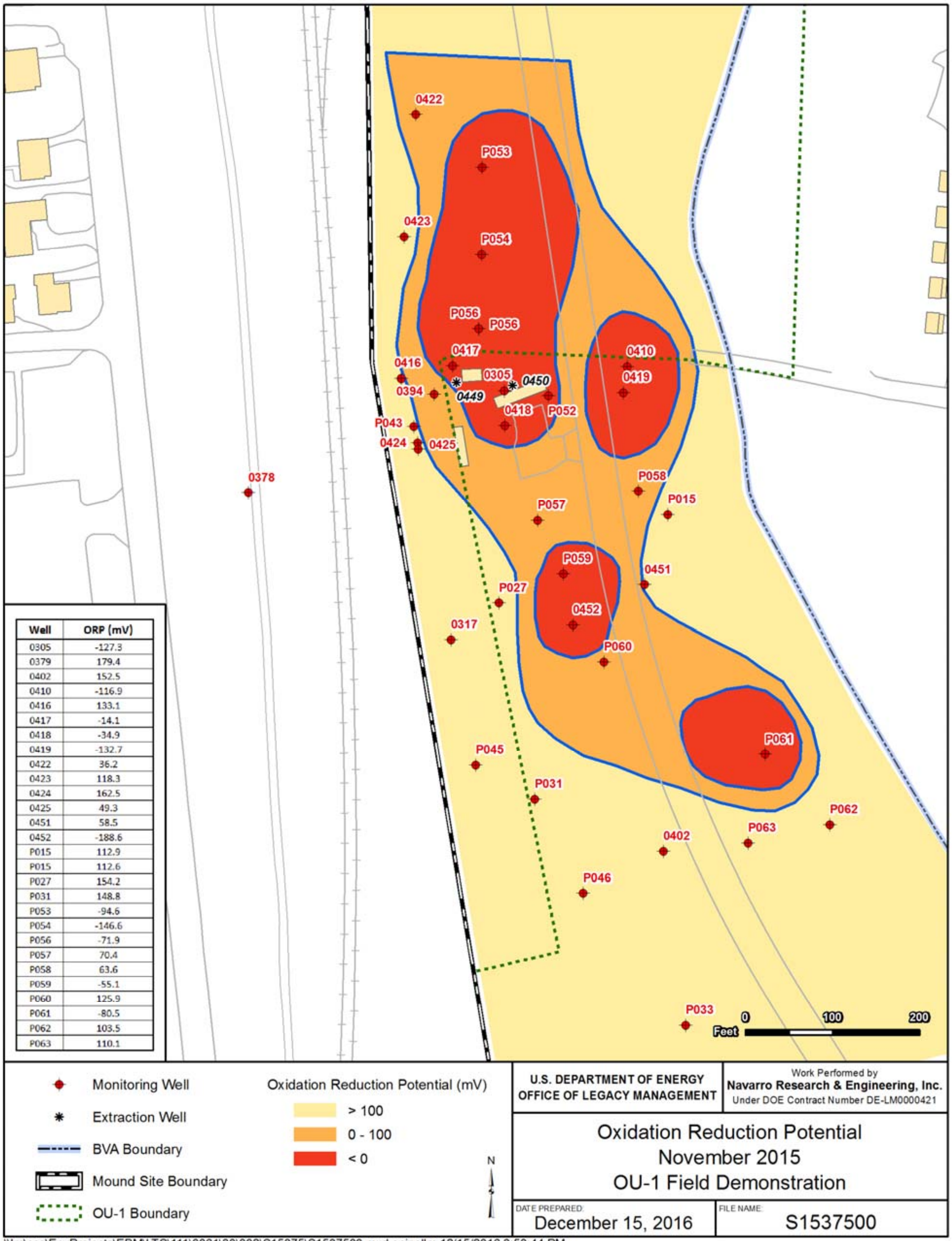
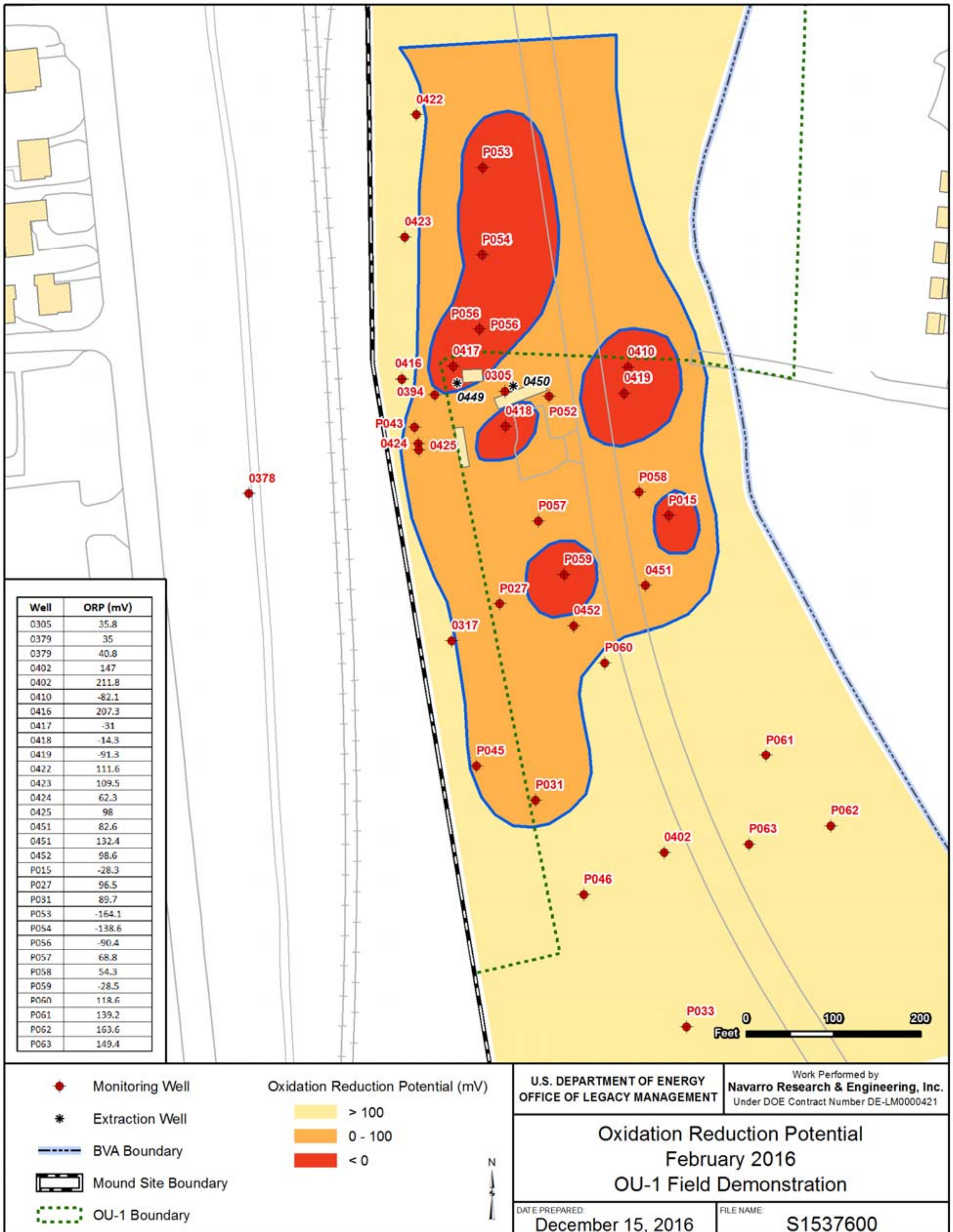
Figure 20. Dissolved Oxygen Distribution, August 2016



Well	ORP (mV)
0305	-127.3
0379	179.4
0402	152.5
0410	-116.9
0416	133.1
0417	-14.1
0418	-34.9
0419	-132.7
0422	36.2
0423	118.3
0424	162.5
0425	49.3
0451	58.5
0452	-188.6
P015	112.9
P015	112.6
P027	154.2
P031	148.8
P053	-94.6
P054	-146.6
P056	-71.9
P057	70.4
P058	63.6
P059	-55.1
P060	125.9
P061	-80.5
P062	103.5
P063	110.1

Figure 21. Oxidation-Reduction Potential, November 2015



Well	ORP (mV)
0305	35.8
0379	35
0379	40.8
0402	147
0402	211.8
0410	-82.1
0416	207.3
0417	-31
0418	-14.3
0419	-91.3
0422	111.6
0423	109.5
0424	62.3
0425	98
0451	82.6
0451	132.4
0452	98.6
P015	-28.3
P027	96.5
P031	89.7
P053	-164.1
P054	-138.6
P056	-90.4
P057	68.8
P058	54.3
P059	-28.5
P060	118.6
P061	139.2
P062	163.6
P063	149.4

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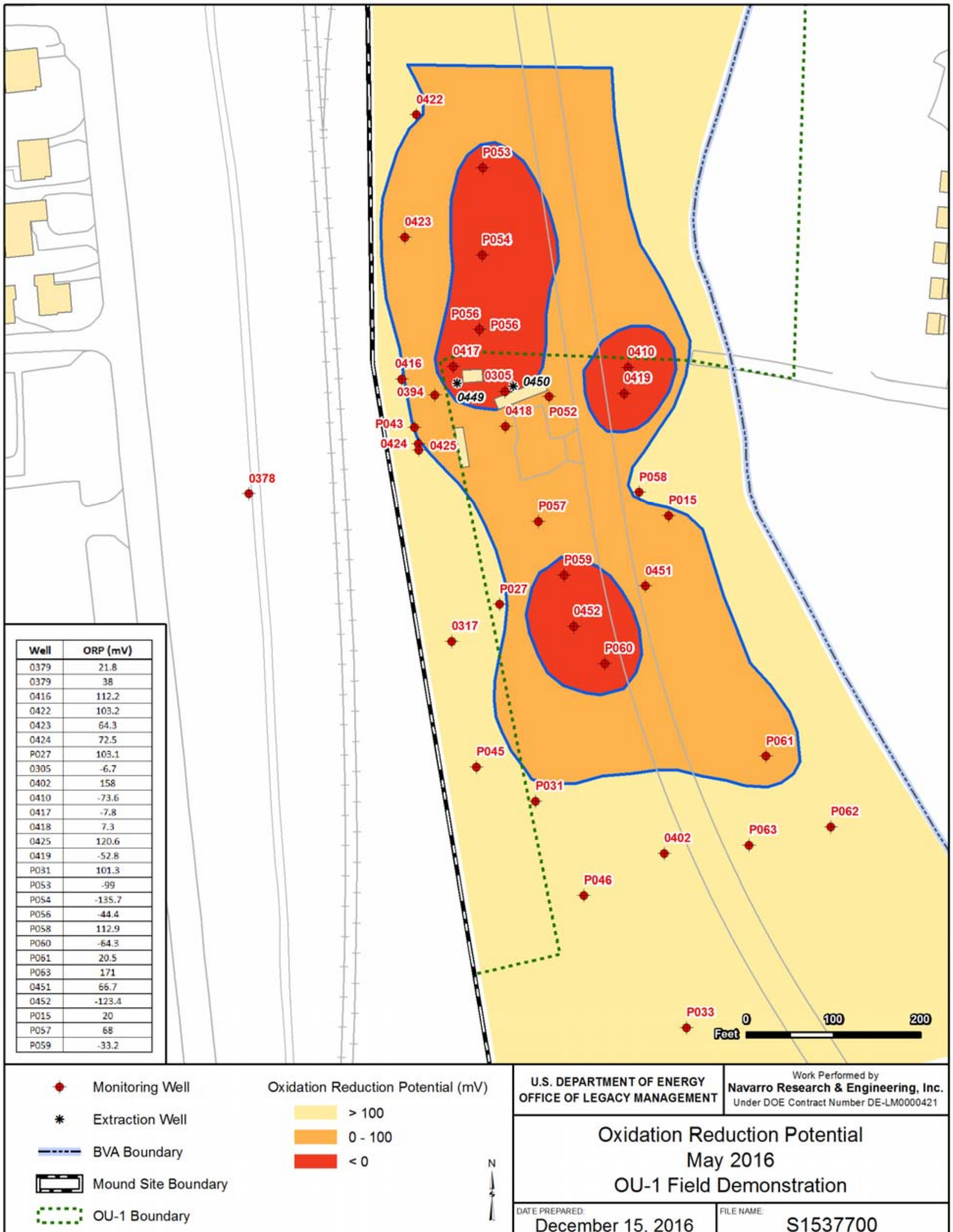
Figure 22. Oxidation-Reduction Potential, February 2016



Well	ORP (mV)
0379	21.8
0379	38
0416	112.2
0422	103.2
0423	64.3
0424	72.5
P027	103.1
0305	-6.7
0402	158
0410	-73.6
0417	-7.8
0418	7.3
0425	120.6
0419	-52.8
P031	101.3
P053	-99
P054	-135.7
P056	-44.4
P058	112.9
P060	-64.3
P061	20.5
P063	171
0451	66.7
0452	-123.4
P015	20
P057	68
P059	-33.2

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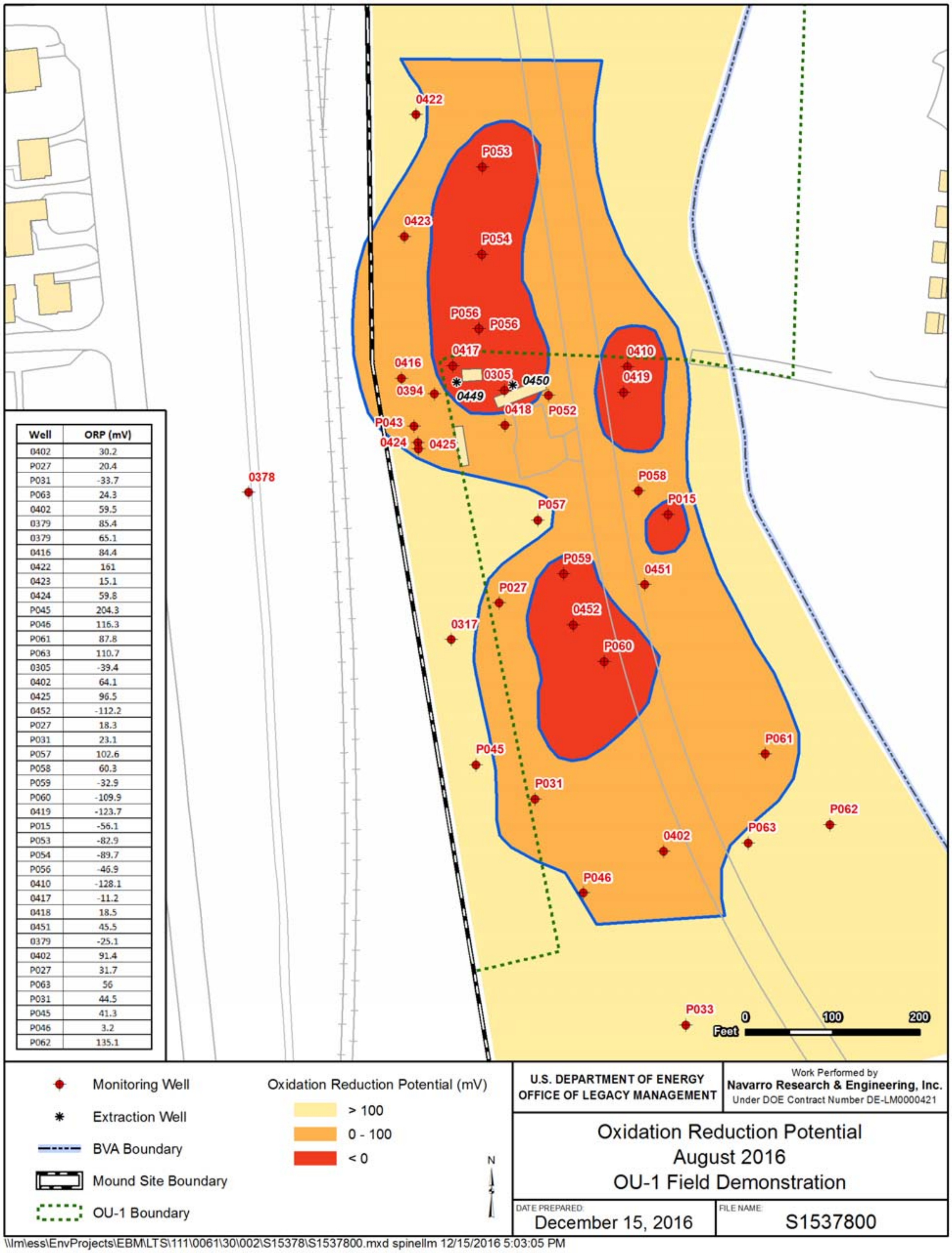
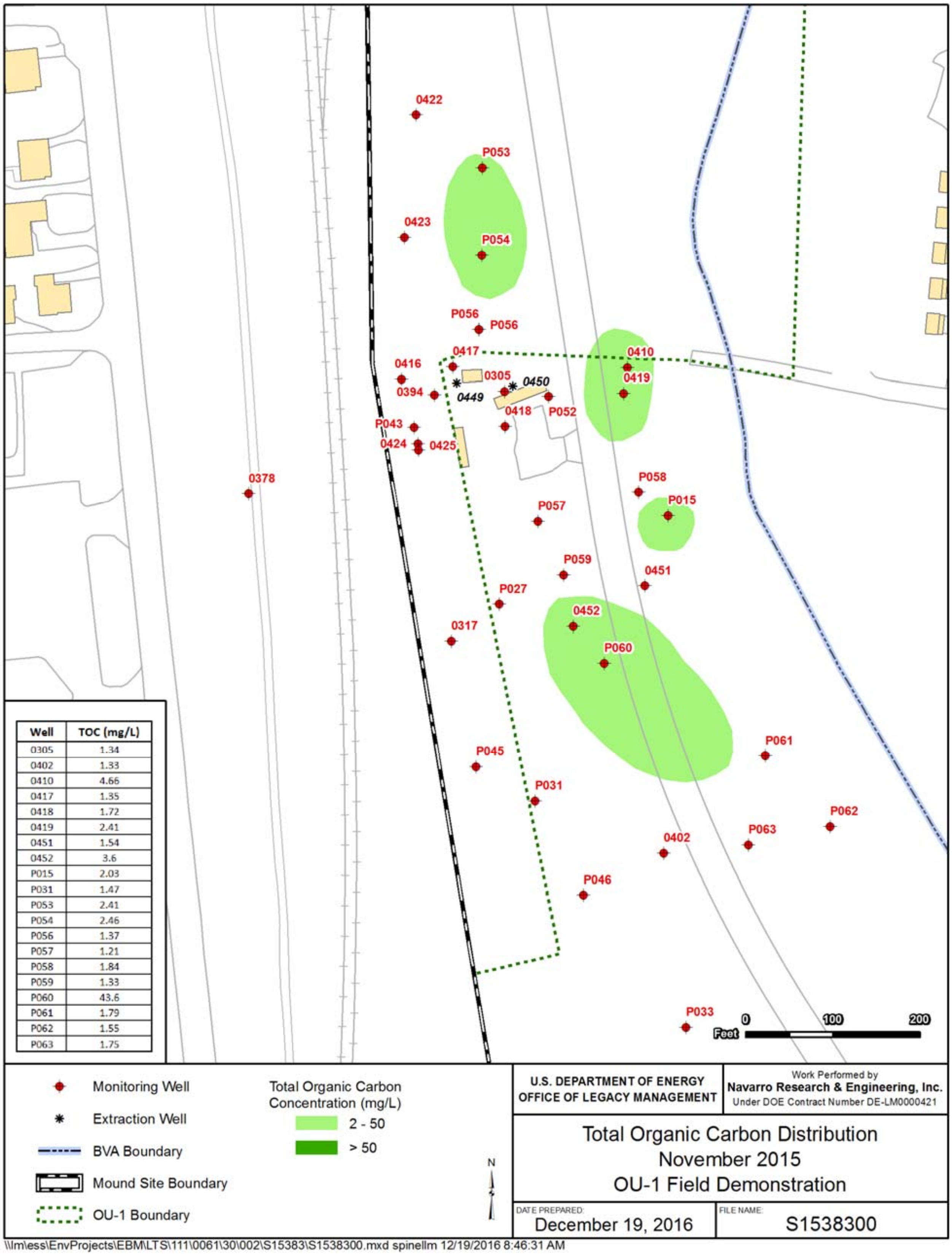
Figure 23. Oxidation-Reduction Potential, May 2016



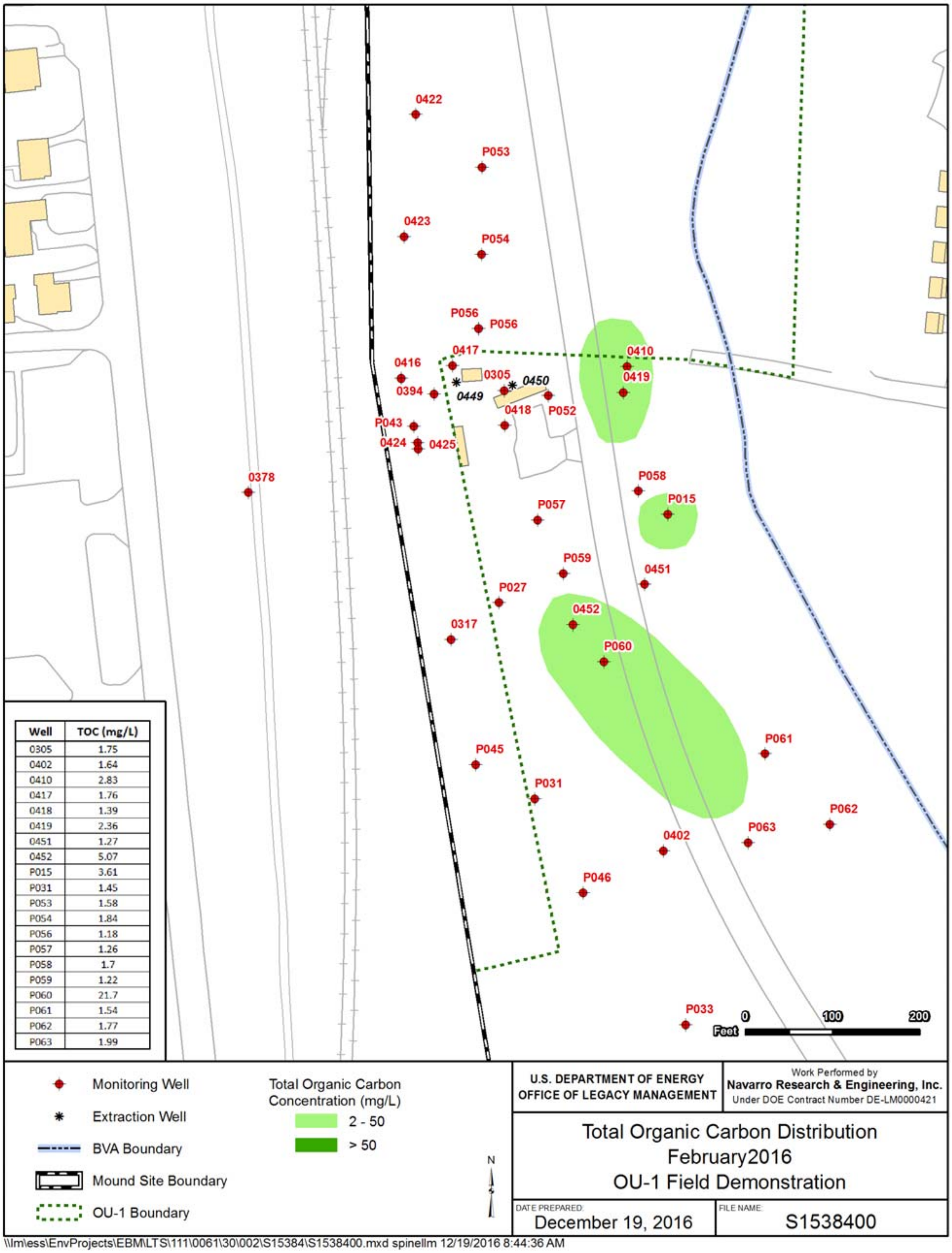
Well	ORP (mV)
0402	30.2
P027	20.4
P031	-33.7
P063	24.3
0402	59.5
0379	85.4
0379	65.1
0416	84.4
0422	161
0423	15.1
0424	59.8
P045	204.3
P046	116.3
P061	87.8
P063	110.7
0305	-39.4
0402	64.1
0425	96.5
0452	-112.2
P027	18.3
P031	23.1
P057	102.6
P058	60.3
P059	-32.9
P060	-109.9
0419	-123.7
P015	-56.1
P053	-82.9
P054	-89.7
P056	-46.9
0410	-128.1
0417	-11.2
0418	18.5
0451	45.5
0379	-25.1
0402	91.4
P027	31.7
P063	56
P031	44.5
P045	41.3
P046	3.2
P062	135.1

Figure 24. Oxidation-Reduction Potential, August 2016



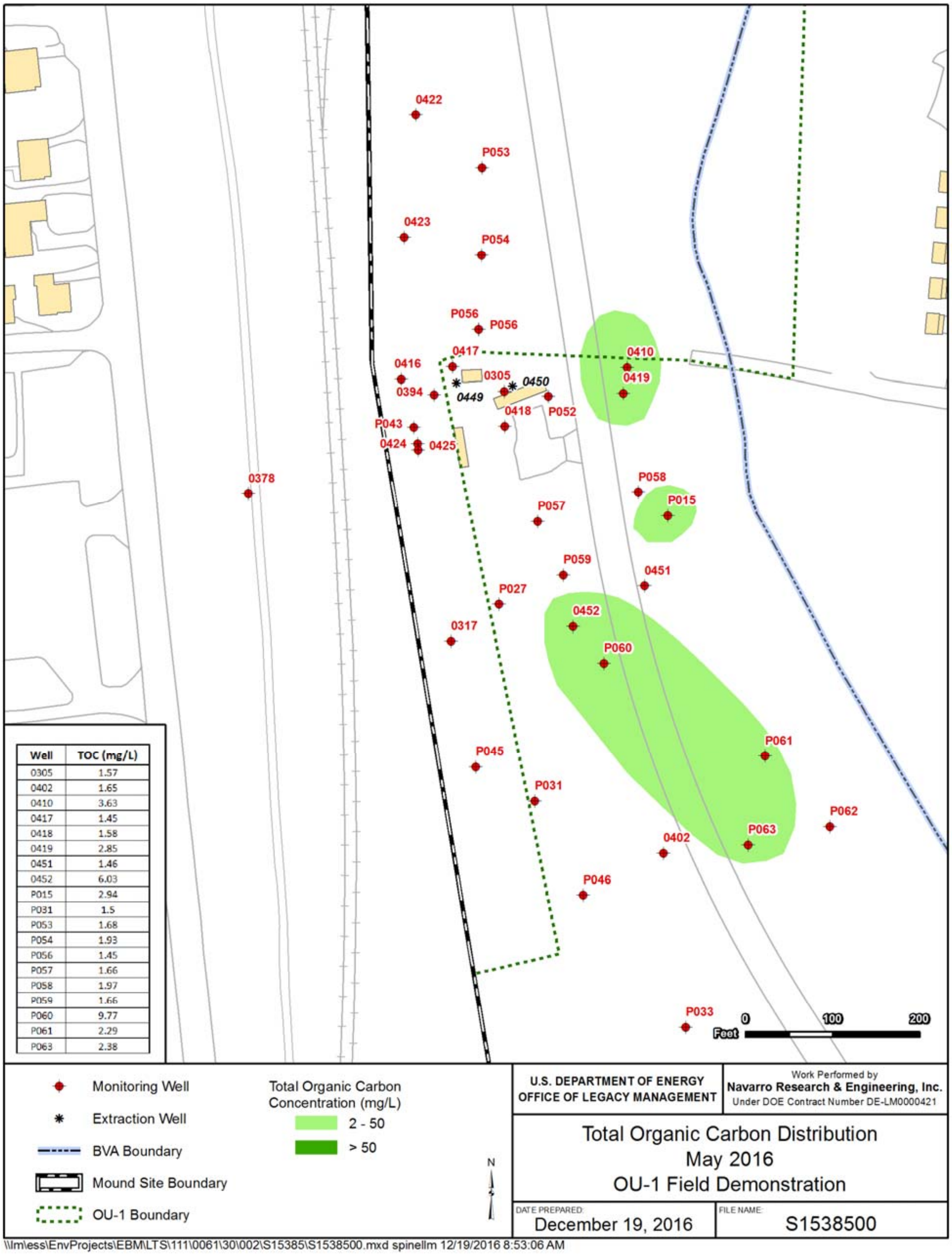
Well	TOC (mg/L)
0305	1.34
0402	1.33
0410	4.66
0417	1.35
0418	1.72
0419	2.41
0451	1.54
0452	3.6
P015	2.03
P031	1.47
P053	2.41
P054	2.46
P056	1.37
P057	1.21
P058	1.84
P059	1.33
P060	43.6
P061	1.79
P062	1.55
P063	1.75

Figure 25. Total Organic Carbon Distribution, November 2015



Well	TOC (mg/L)
0305	1.75
0402	1.64
0410	2.83
0417	1.76
0418	1.39
0419	2.36
0451	1.27
0452	5.07
P015	3.61
P031	1.45
P053	1.58
P054	1.84
P056	1.18
P057	1.26
P058	1.7
P059	1.22
P060	21.7
P061	1.54
P062	1.77
P063	1.99

Figure 26. Total Organic Carbon Distribution, February 2016



Well	TOC (mg/L)
0305	1.57
0402	1.65
0410	3.63
0417	1.45
0418	1.58
0419	2.85
0451	1.46
0452	6.03
P015	2.94
P031	1.5
P053	1.68
P054	1.93
P056	1.45
P057	1.66
P058	1.97
P059	1.66
P060	9.77
P061	2.29
P063	2.38

Figure 27. Total Organic Carbon Distribution, May 2016

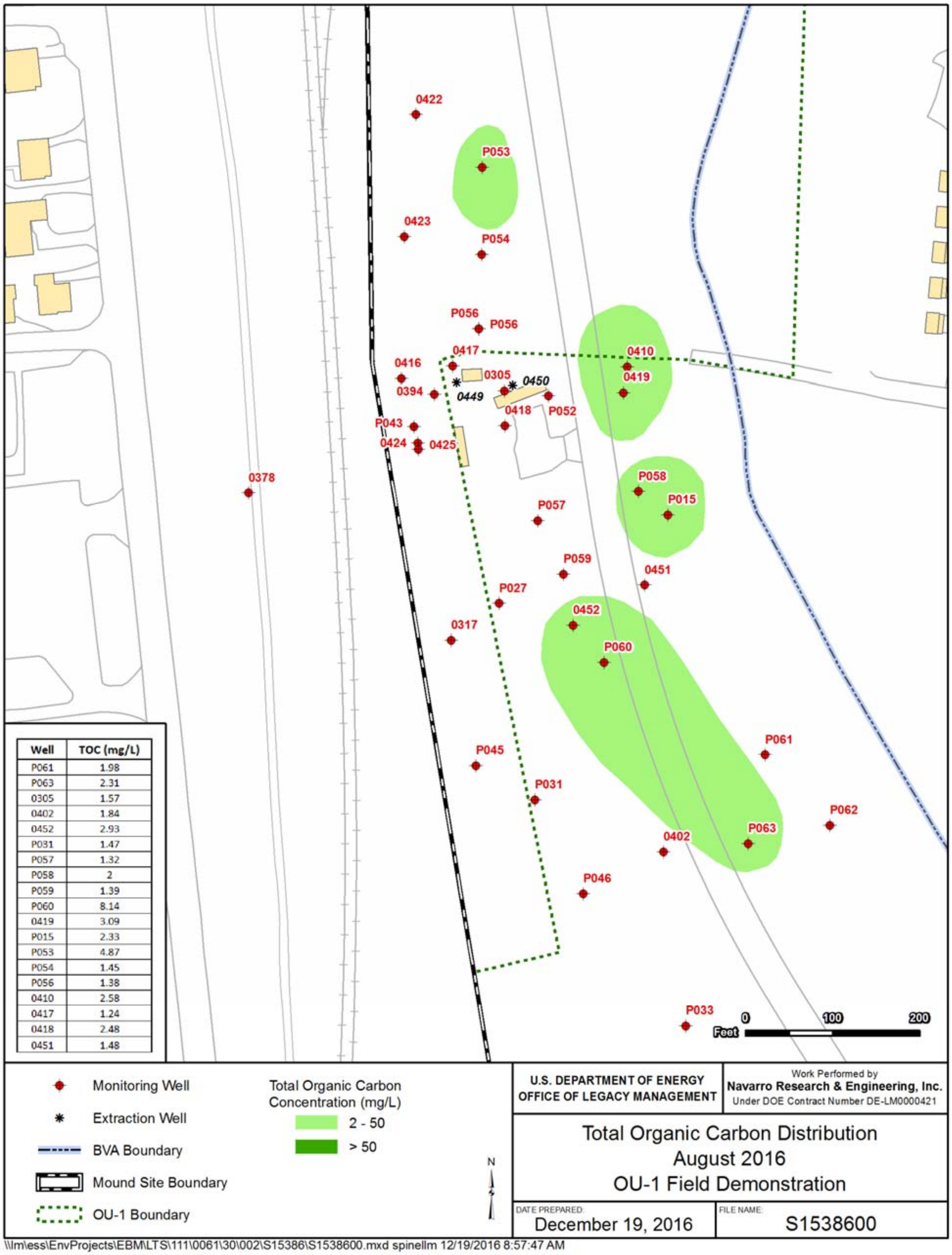


Figure 28. Total Organic Carbon Distribution, August 2016

2.3.2 Competing Electron Acceptors

Competing electron acceptors in anaerobic zones can reduce the effectiveness of reductive dechlorination of cVOCs by consuming the organic amendments. DO, sulfate, and nitrate are the primary competing electron acceptors. The following are key observations of the competing electron acceptors during the second year.

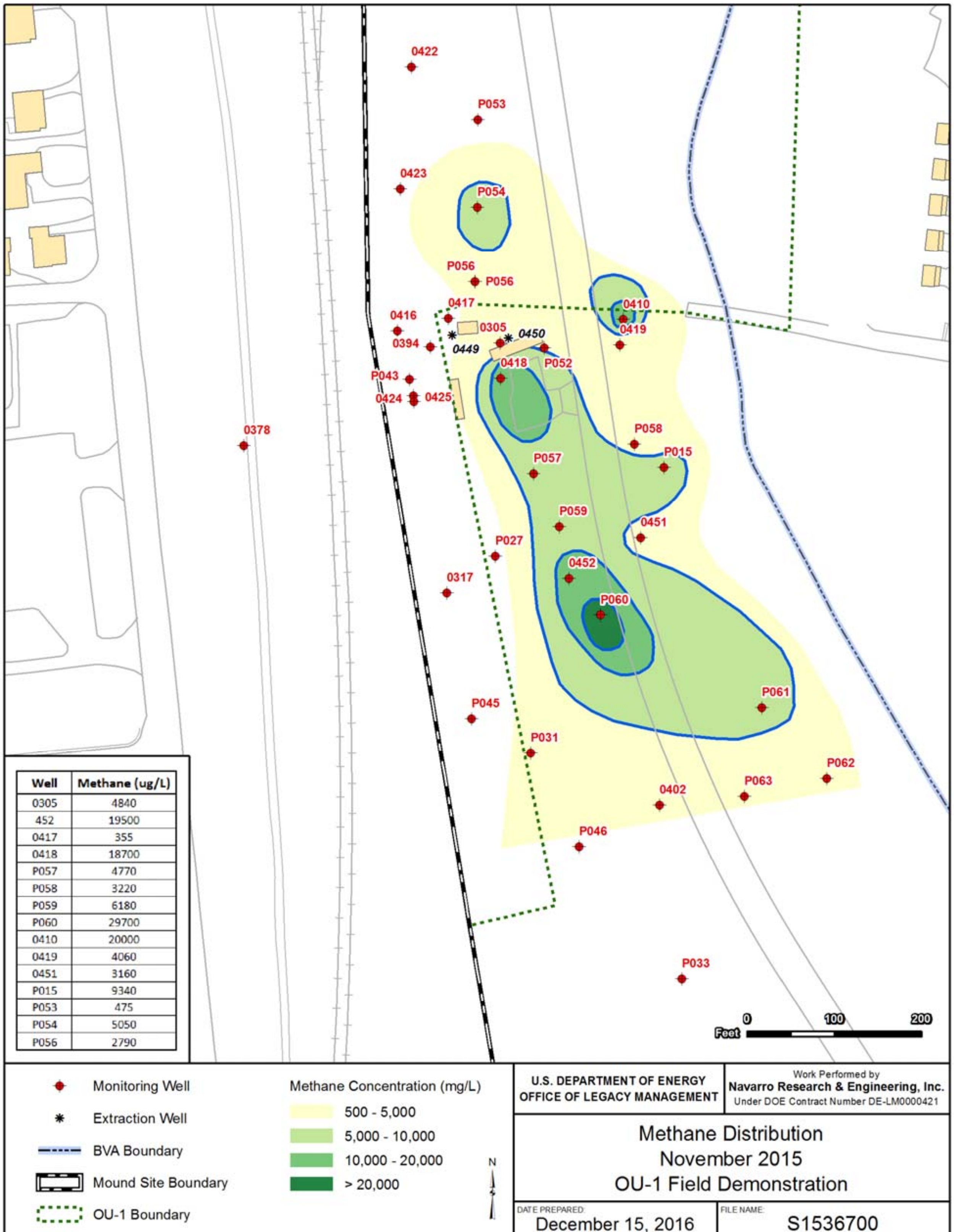
- DO was less than 1 mg/L over time in the treatment zones and remained in the range to support anaerobic reductive dechlorination and is not a concern at this time.
- Sulfate concentrations were similar to those measured at the end of the first year. In general, following the deployment of carbon electron donor, the sulfate present in the aquifer decreased due to the activity of sulfate reducers. As noted below, sulfate increased in a number of wells after dewatering occurring in Year 2 and water levels recovered, bringing groundwater with fresh sulfate into the treatment zones. Sulfate concentrations at several locations (0410, 0419, 0452, P054, P056, and P057) rebounded to near baseline levels in August 2016, likely as a result of the introduction of groundwater from the bedrock, which typically has higher sulfate concentrations. Based on the microbial ecology of the system, it is anticipated that sulfate levels will decrease. The observed sulfate rebound warrants watching in conjunction with the other geochemical parameters to make sure the structured geochemical zones are maintained. The rebound did not alter the distribution of sulfate significantly and therefore is not plotted.
- Nitrate averaged 2 mg/L during the year; it is not a concern and therefore is not plotted.

2.3.3 Diagnostic Indicators

Diagnostic indicators are used to support the other geochemical parameters to evaluate the reducing conditions to support reductive dechlorination. Figure 29 through Figure 32 show contour plots of methane, and Figure 33 through Figure 36 show contour plots of dissolved iron during the second year. The following are key observations of the diagnostic indicators during the second year.

- Methane continued to be measured in the treatment zones, indicating strong reducing conditions and methanogenesis (anaerobic respiration). Methane can also be used in the aerobic zones for the co-metabolism of TCE.
- Dissolved iron, an indicator of reducing conditions, remained elevated in the treatment zones.
- The parameters continue to support the conditions favorable for reductive dechlorination.

In summary, the structured geochemical zones continue to be maintained and are favorable for both anaerobic and aerobic degradation processes. The competing electron acceptors (DO, sulfate, and nitrate) and diagnostic indicator parameters (methane and iron) remain in the range to support reductive dechlorination in the treatment zones. TOC and sulfate concentrations will need to be watched to verify maintenance of the structured geochemical zones.



Well	Methane (ug/L)
0305	4840
452	19500
0417	355
0418	18700
P057	4770
P058	3220
P059	6180
P060	29700
0410	20000
0419	4060
0451	3160
P015	9340
P053	475
P054	5050
P056	2790

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Figure 29. Methane Distribution, November 2015

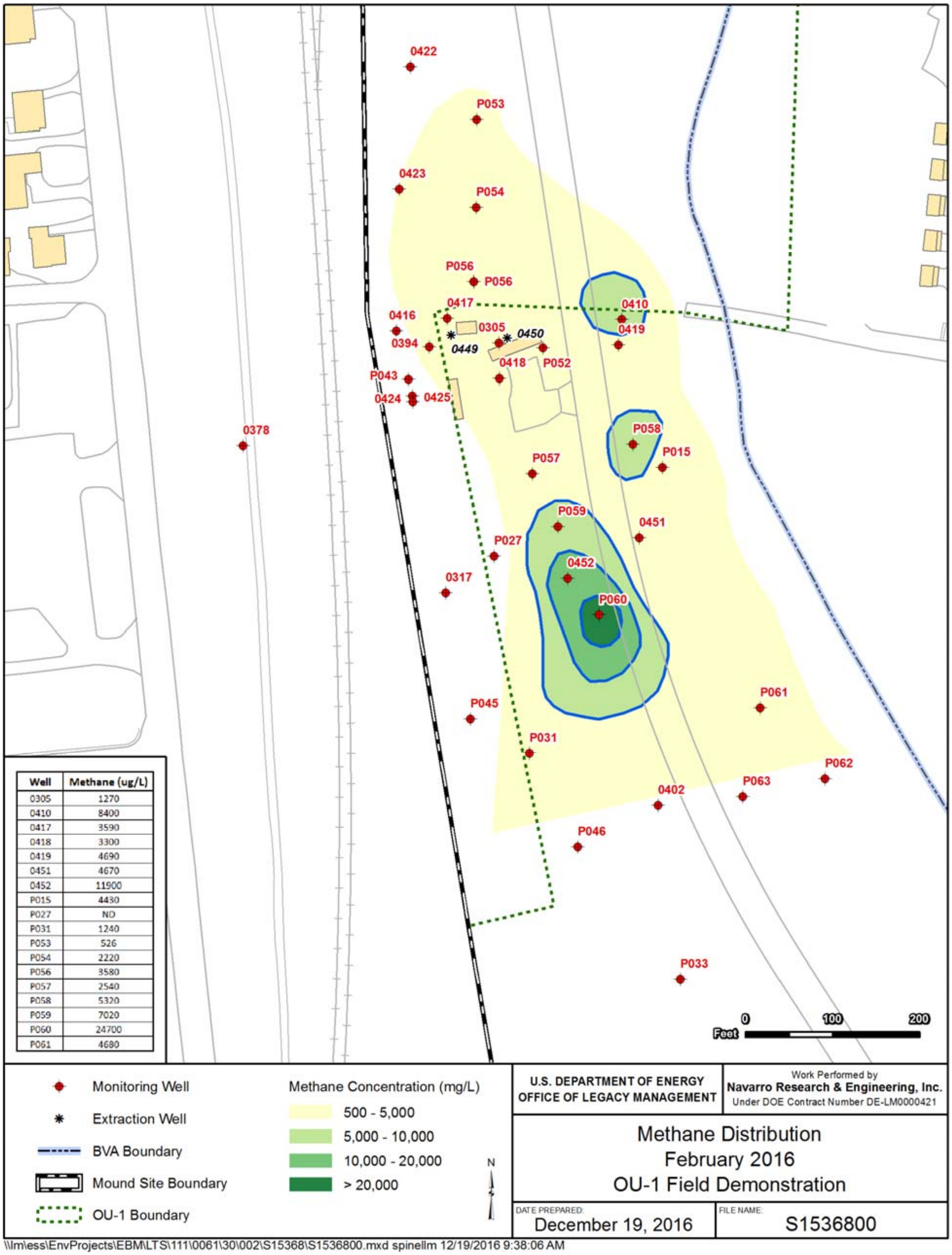
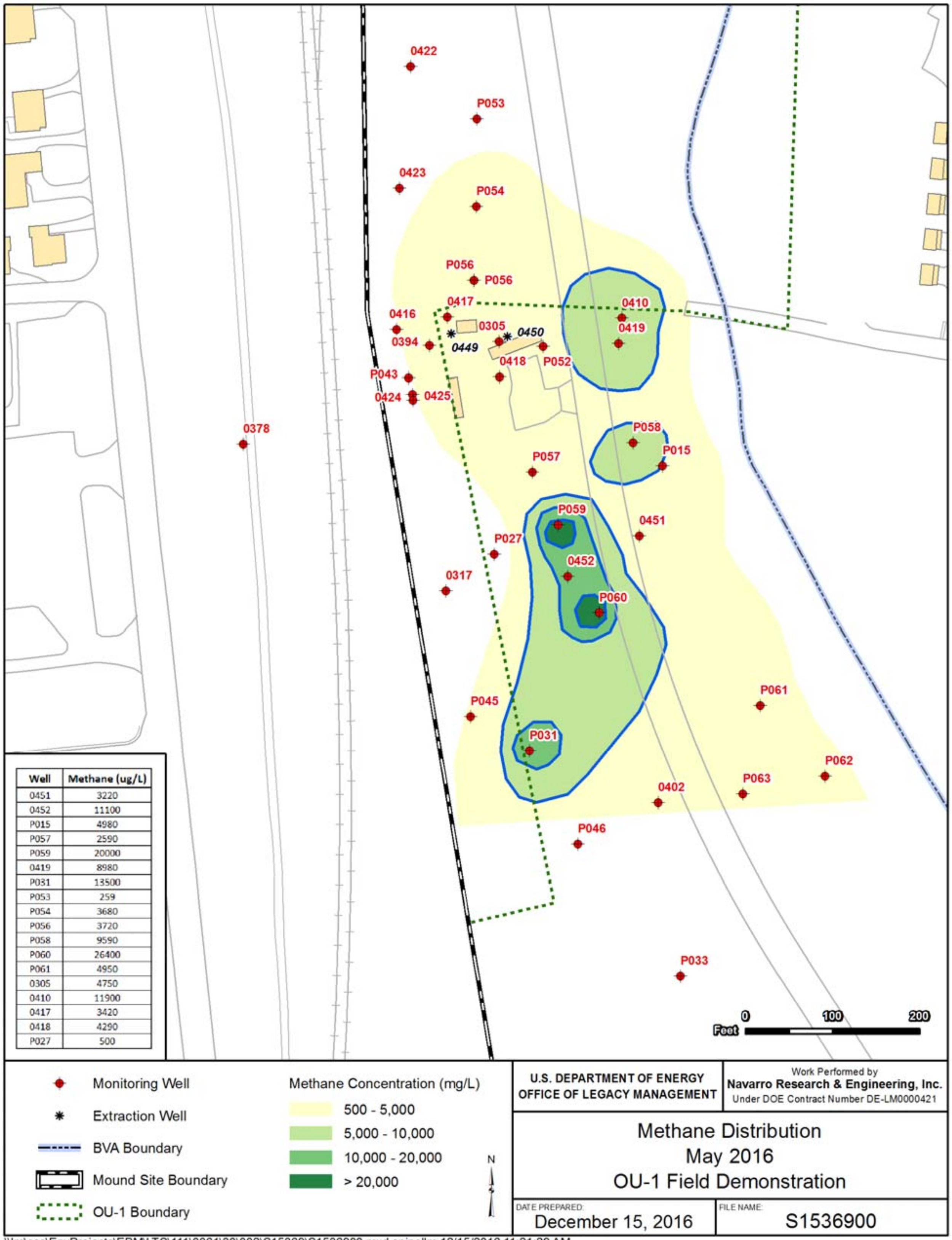


Figure 30. Methane Distribution, February 2016



Well	Methane (ug/L)
0451	3220
0452	11100
P015	4980
P057	2590
P059	20000
0419	8980
P031	13500
P053	259
P054	3680
P056	3720
P058	9590
P060	26400
P061	4950
0305	4750
0410	11900
0417	3420
0418	4290
P027	500

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Figure 31. Methane Distribution, May 2016

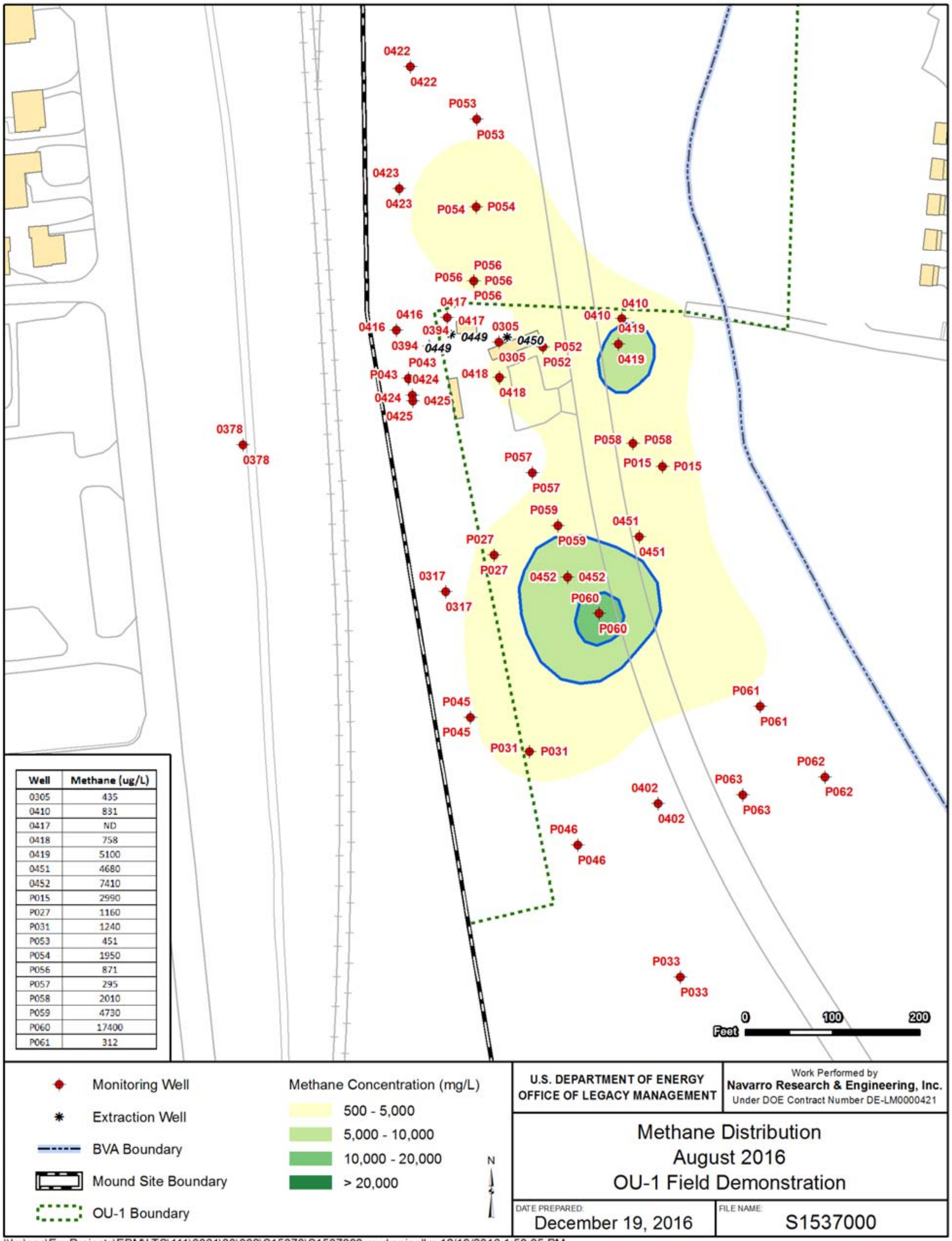

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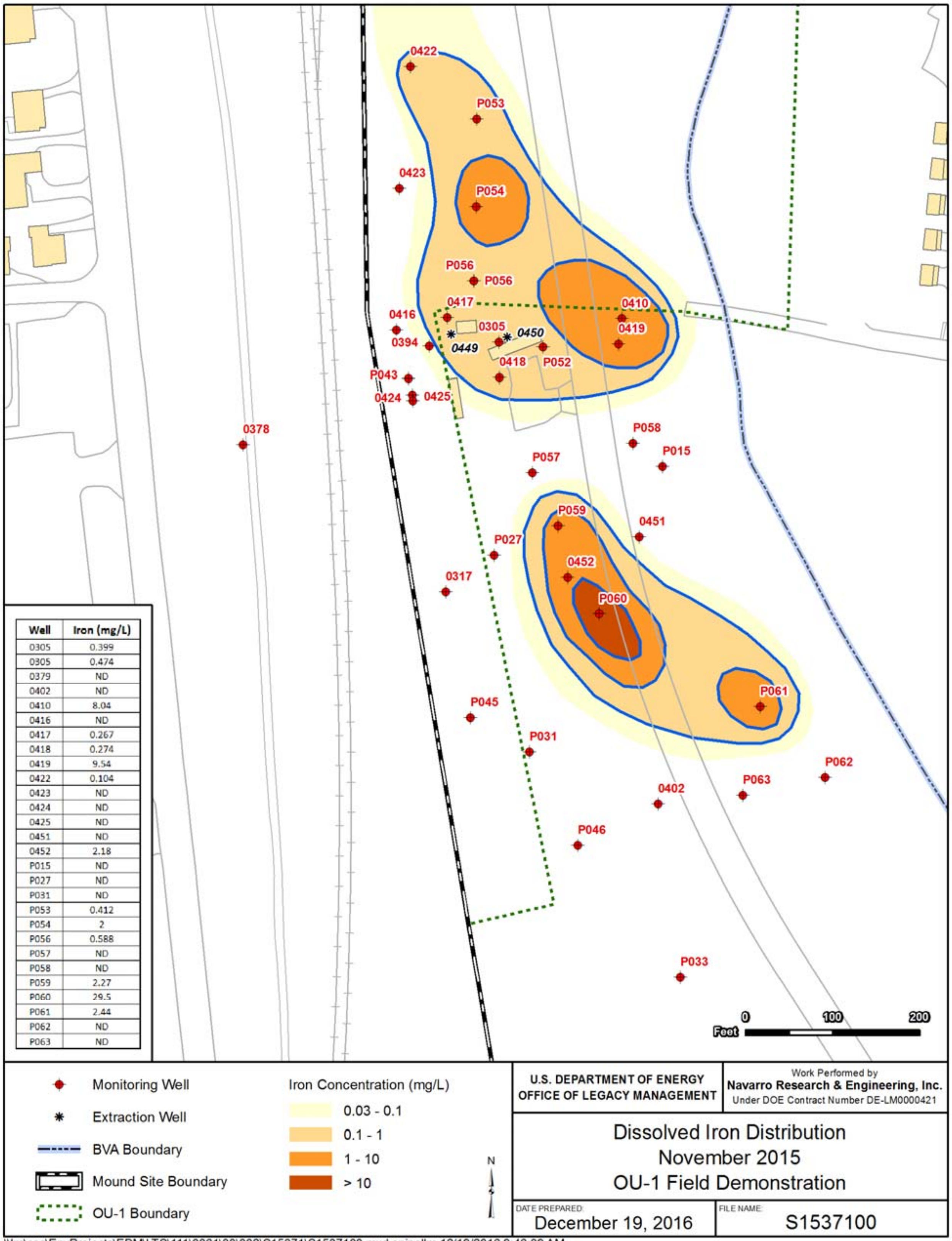
Figure 32. Methane Distribution, August 2016



Well	Iron (mg/L)
0305	0.399
0305	0.474
0379	ND
0402	ND
0410	8.04
0416	ND
0417	0.267
0418	0.274
0419	9.54
0422	0.104
0423	ND
0424	ND
0425	ND
0451	ND
0452	2.18
P015	ND
P027	ND
P031	ND
P053	0.412
P054	2
P056	0.588
P057	ND
P058	ND
P059	2.27
P060	29.5
P061	2.44
P062	ND
P063	ND

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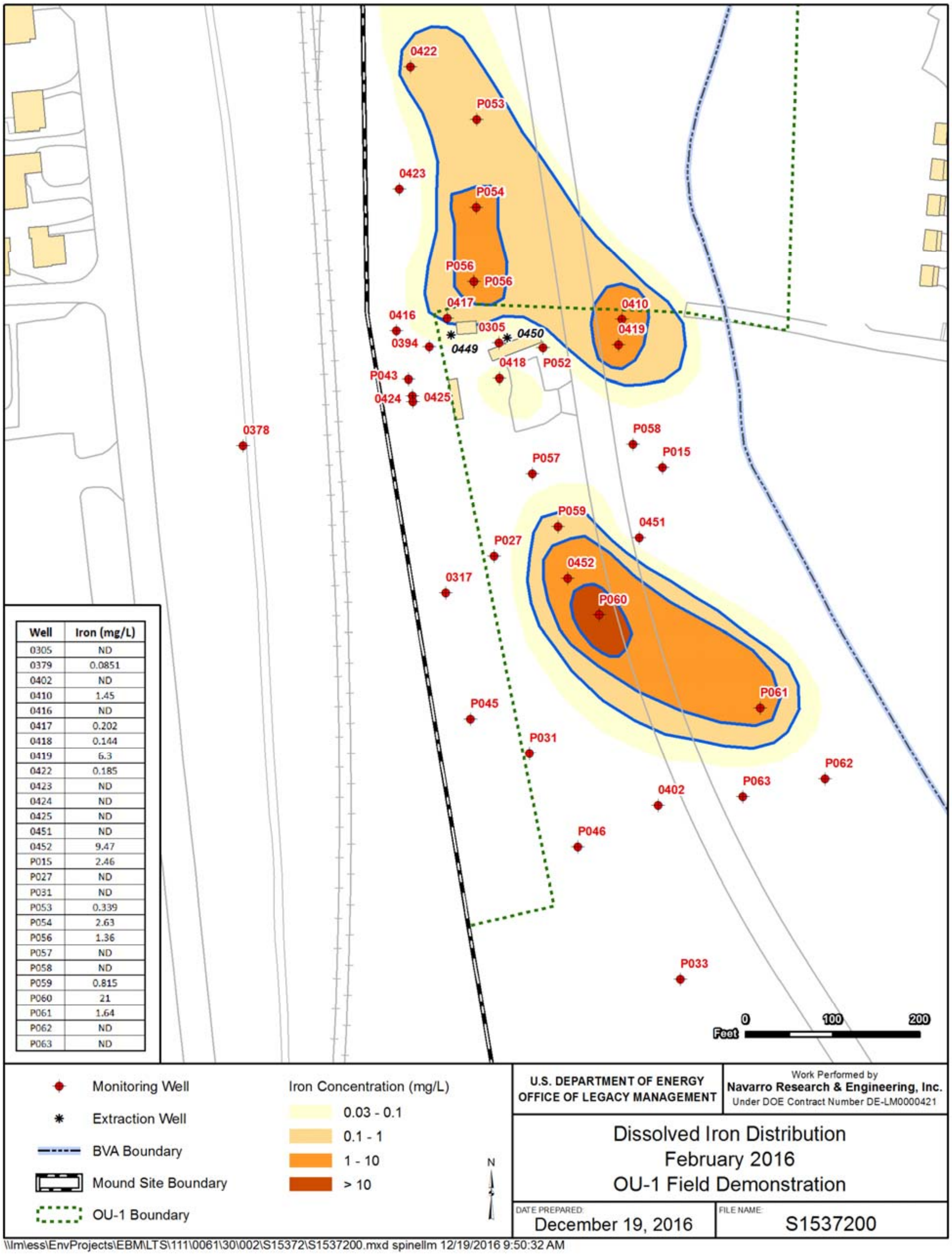
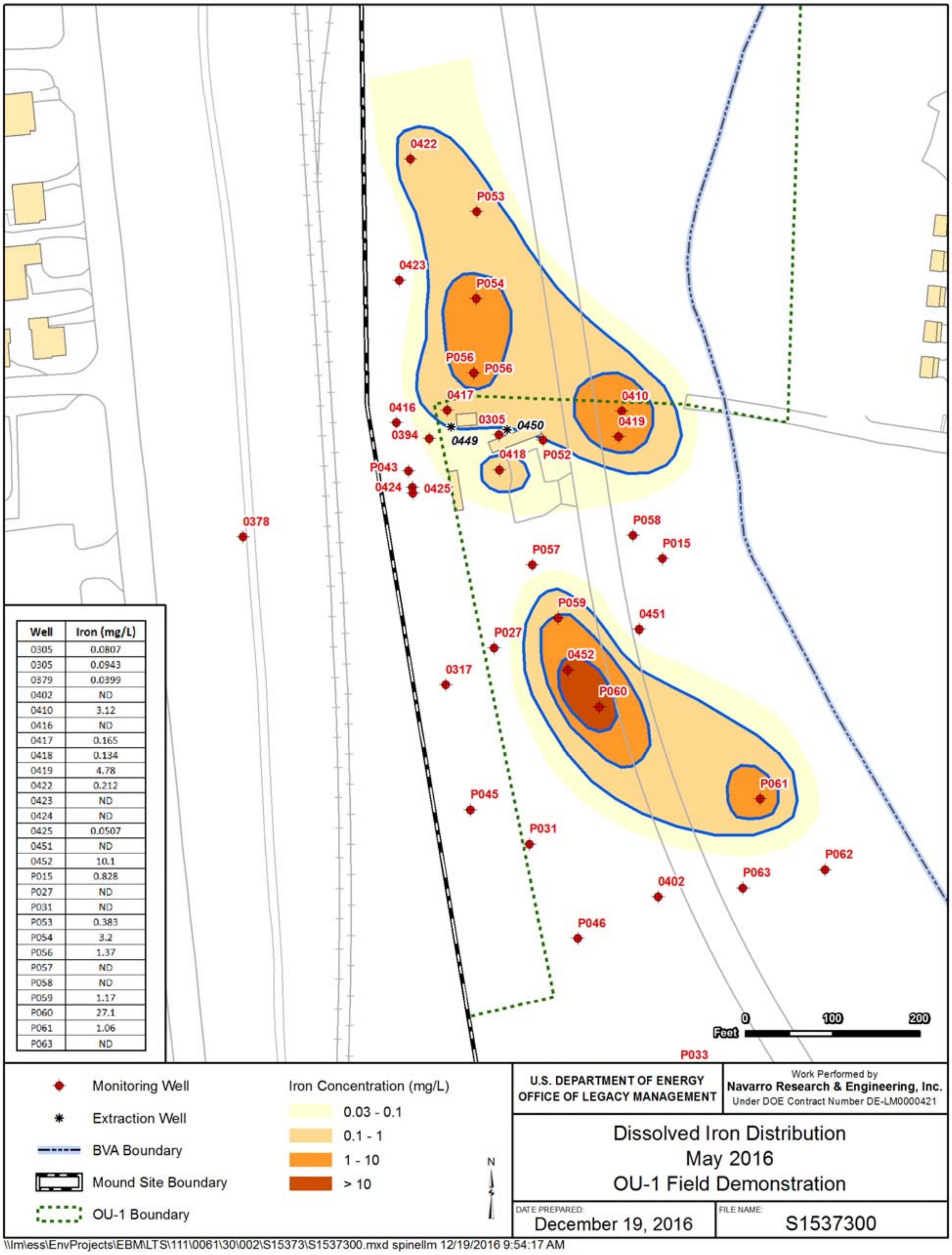
Figure 33. Dissolved Iron Distribution, November 2015



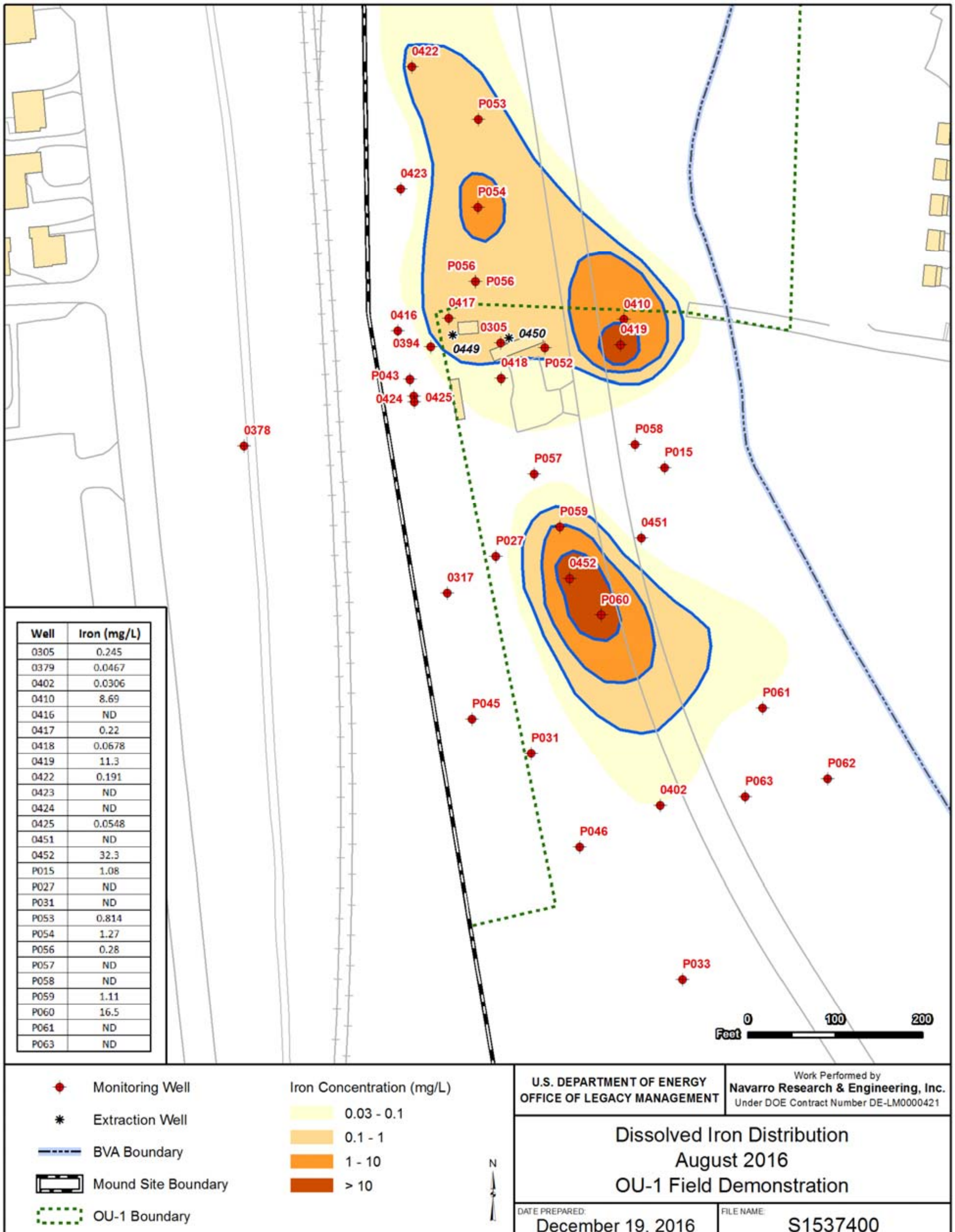
Well	Iron (mg/L)
0305	ND
0379	0.0851
0402	ND
0410	1.45
0416	ND
0417	0.202
0418	0.144
0419	6.3
0422	0.185
0423	ND
0424	ND
0425	ND
0451	ND
0452	9.47
P015	2.46
P027	ND
P031	ND
P053	0.339
P054	2.63
P056	1.36
P057	ND
P058	ND
P059	0.815
P060	21
P061	1.64
P062	ND
P063	ND

Figure 34. Dissolved Iron Distribution, February 2016



Well	Iron (mg/L)
0305	0.0807
0305	0.0943
0379	0.0399
0402	ND
0410	3.12
0416	ND
0417	0.165
0418	0.134
0419	4.78
0422	0.212
0423	ND
0424	ND
0425	0.0507
0451	ND
0452	10.1
P015	0.828
P027	ND
P031	ND
P053	0.383
P054	3.2
P056	1.37
P057	ND
P058	ND
P059	1.17
P060	27.1
P061	1.06
P063	ND

Figure 35. Dissolved Iron Distribution, May 2016



Well	Iron (mg/L)
0305	0.245
0379	0.0467
0402	0.0306
0410	8.69
0416	ND
0417	0.22
0418	0.0678
0419	11.3
0422	0.191
0423	ND
0424	ND
0425	0.0548
0451	ND
0452	32.3
P015	1.08
P027	ND
P031	ND
P053	0.814
P054	1.27
P056	0.28
P057	ND
P058	ND
P059	1.11
P060	16.5
P061	ND
P063	ND

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Figure 36. Dissolved Iron Distribution, August 2016

2.4 Third Line of Evidence—Assessment of Enhanced Attenuation Microbial Community Data: 2015–2016

The objective of the third line of evidence is to document that one or more recognized attenuation mechanisms are occurring at the site. In the case of Mound OU-1, the site-specific documentation of attenuation mechanisms needs to focus on the design basis of structured geochemical zones and how the attenuation will be manifested in observable patterns of contaminant concentrations and changes in the microbial community. Thus, the two subtopics supporting the third line of evidence are (1) the presence and pattern of daughter products and (2) the subsurface microbial response to the EA deployment. In both subtopics, the data should demonstrate that the expected anaerobic and aerobic attenuation mechanisms are operating in the target areas. In the anaerobic treatment zones, the EA strategy would be validated by the presence and sequential appearance or disappearance of daughter products via reductive dechlorination, and by the presence of significant populations of organisms that have been documented to attenuate cVOCs under anaerobic conditions. In the surrounding near-field aerobic zones, the EA strategy would be validated by low concentrations of reductive dechlorination daughters (due to aerobic degradation of these compounds) and by the presence of significant populations of organisms that have genetic markers for known cometabolic enzymes. Collection of the supporting data for the third line of evidence, and from both anaerobic and aerobic areas, provides a robust approach to determine if recognized attenuation mechanisms are in place in the Mound OU-1 groundwater. These data, combined with the geochemistry and other lines of evidence, will assist DOE, regulators, and stakeholders in assessing the performance of the EA field demonstration.

2.4.1 Presence and Pattern of Daughter Products

The following graphs depict the concentration of parent and daughter cVOCs in key OU-1 monitoring wells. The wells included in these graphs are those identified in the Field Demonstration Work Plan (DOE 2014a) (well 0305 was also included in these graphs because concentrations in this monitoring well increased, that is, rebounded following the EA deployment and P&T system turnoff).

These graphs are organized according to their assigned setting (anaerobic treatment zone, plume interior, sentinel wells) for evaluation and discussion. In general, the data provide confirmation of reductive dechlorination in the anaerobic treatment zones. The relatively low levels of DCE and VC in downgradient wells are consistent with aerobic metabolism or cometabolism. The low concentrations in the sentinel wells provide field confirmation that the plume has not expanded downgradient during the monitoring period. The wells identified in the work plan (with the addition of 0305) effectively document the groundwater and contaminant responses and are representative of the data from the entire well network.

2.4.1.1 Anaerobic Treatment Zone

Figure 37 through Figure 42 show the concentrations of parent and daughter cVOCs over time for wells assigned to the anaerobic treatment zones. The following are key observations for the anaerobic treatment zone wells:

- Parent concentrations in all anaerobic treatment zone wells except P054 decreased during the 2 years of the EA field demonstration. Well P054 decreased during Year 1 but rebounded near the end of Year 2 (TCE increased to 25.8 µg/L at the end of Year 2 and PCE increased to 3.5 µg/L). Due to this observed rebound, well P054 will be added to the monitoring watch list moving forward and is addressed in more detail in a later section of the report.

- Daughter products (DCE in all wells and VC in most wells) were observed in anaerobic treatment zone wells (Figure 37 through Figure 42).
- In all wells, the pattern of daughter products over time was a reasonable variant of the patterns observed in the scientific literature for bioremediation or biostimulation sites. In particular, the cVOC concentrations in wells P056, 0410, 0419, and P059 (Figure 37, Figure 39, Figure 41, and Figure 42) exhibit a "classic" pattern in which the daughters form and degrade in sequence. In wells P056, 0410, 0419, and P059, the measured DCE concentrations were 5 to 10 µg/L at the end of Year 2.
- A number of wells exhibit some degree of DCE stall, a condition in which DCE degradation is relatively slow and DCE levels build up (see data on wells P060 and P054 in Figure 38 and Figure 40). DCE was below its MCL in these wells throughout the Year 1 and Year 2 monitoring period. In general, the DCE concentrations in these wells stabilized and decreased during Year 2. In wells P060 and P054, the measured DCE concentrations were 10 to 40 µg/L at the end of Year 2.
- VC was detected in all of the assigned anaerobic treatment zone wells except P059 during the Year 1 and Year 2 monitoring period. In the remaining anaerobic treatment zone wells, the VC concentrations ranged from 0.39 to 4.3 µg/L at the end of Year 2. Wells P056, 0410, and 0419 were above the MCL (2 µg/L) at the end of Year 2. These wells are in upgradient zones of the OU-1 plume and the VC is subject to degradation in the downgradient structured geochemical zones.

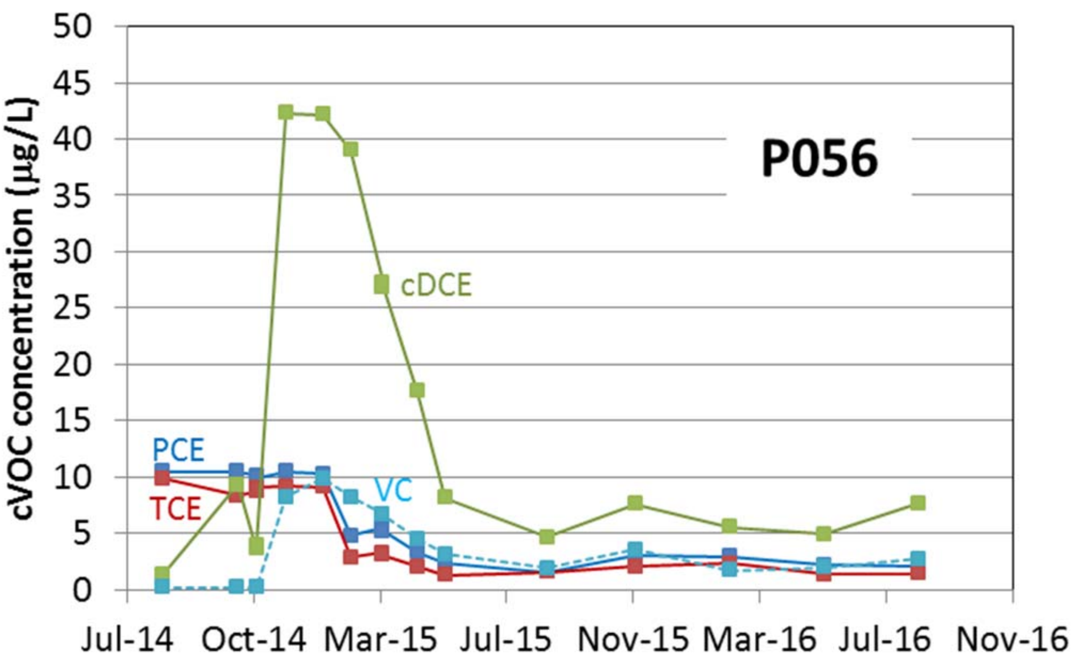


Figure 37. Data for Chlorinated Ethenes in Well P056 for Samples Collected During Year 1 and Year 2 of the Enhanced Attenuation Field Demonstration

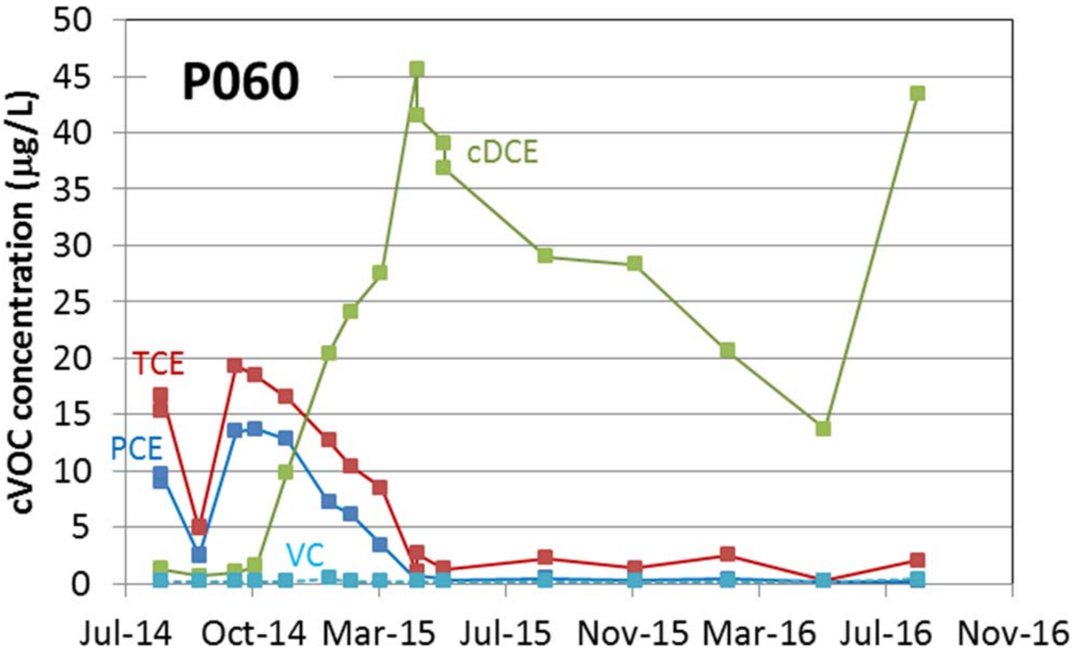


Figure 38. Data for Chlorinated Ethenes in Well P060 for Samples Collected During Year 1 and Year 2 of the Enhanced Attenuation Field Demonstration

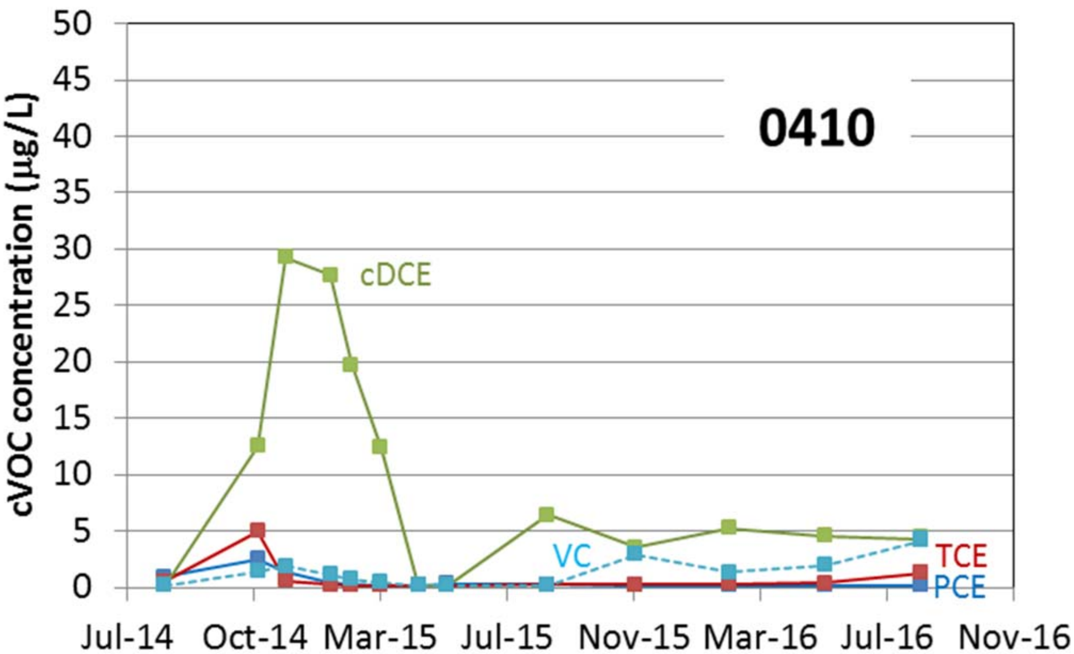


Figure 39. Data for Chlorinated Ethenes in Well 0410 for Samples Collected During Year 1 and Year 2 of the Enhanced Attenuation Field Demonstration

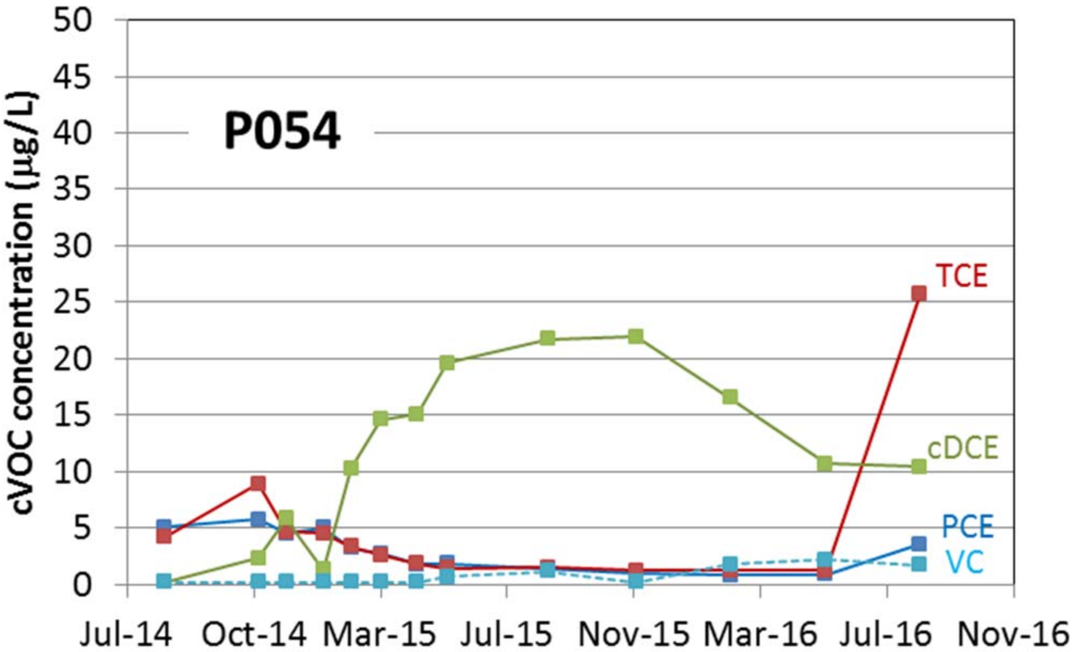


Figure 40. Data for Chlorinated Ethenes in Well P054 for Samples Collected During Year 1 and Year 2 of the Enhanced Attenuation Field Demonstration

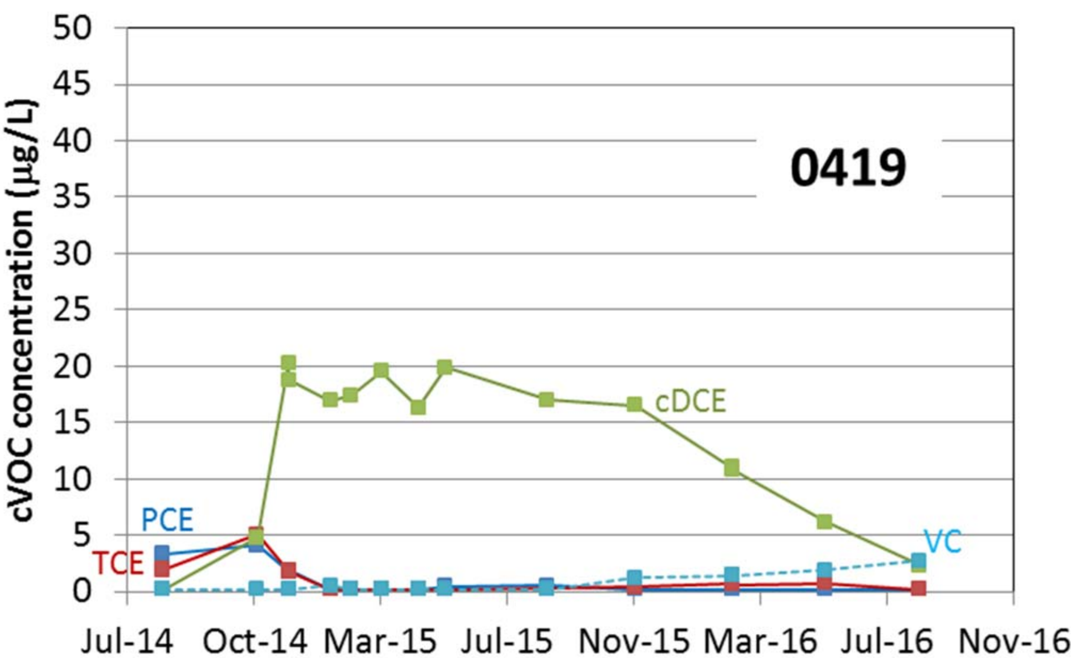


Figure 41. Data for Chlorinated Ethenes in Well 0419 for Samples Collected During Year 1 and Year 2 of the Enhanced Attenuation Field Demonstration

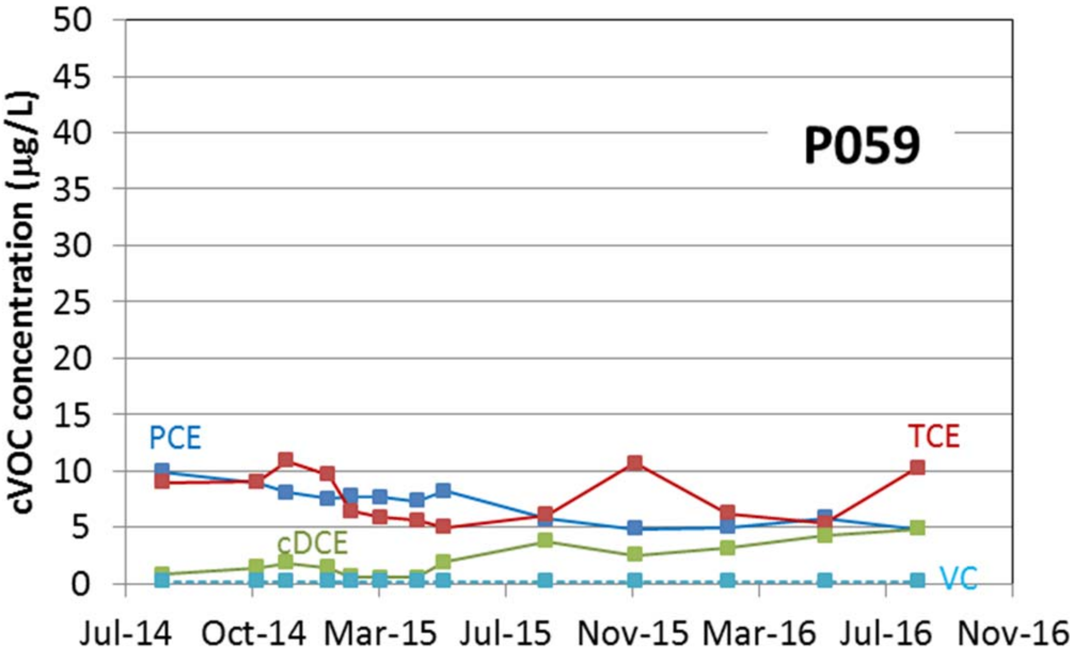


Figure 42. Data for Chlorinated Ethenes in Well P059 for Samples Collected During Year 1 and Year 2 of the Enhanced Attenuation Field Demonstration

2.4.1.2 Plume Interior

Figure 43 through Figure 46 show the concentrations of parent and daughter cVOCs over time for wells in the plume interior. The following are key observations for the plume interior wells:

- Daughter products were detected in several plume interior wells. In wells 0305, P058, 0451, and 0417 (Figure 43, Figure 44, Figure 45, and Figure 46, respectively), cDCE increased to low levels (e.g., 2 to 12 µg/L). VC was observed (below MCLs) in wells P058 and 0417 (Figure 44 and Figure 46). VC was measured at 2.35 µg/L (above MCL) in well 0305 (Figure 43). The daughter products in the assigned plume interior wells are relatively low compared to the anaerobic treatment zone wells. This pattern is consistent with attenuation of the cVOC daughter products in aerobic conditions. The daughter products would be expected to degrade as water flows out of anaerobic treatment zones and into and through the plume interior where DO levels are above 1 to 2 mg/L.
- Parent cVOCs (PCE and TCE) increased in well 0305 (Figure 43). This monitoring well is roughly collocated with the original P&T recovery wells and is immediately downgradient of the former landfill source. As noted in the Field Demonstration Work Plan (DOE 2014a), some rebound was expected in this area following the EA deployment and turnoff of the P&T system. The observed rebound appears to have stabilized below 20 µg/L. The magnitude of rebound is substantially less than previously observed (during previous rebound testing and periods of P&T shutdown), suggesting that the vadose zone oil deployment is reducing the contaminant flux from the former landfill area.
- Except for well 0305, parent cVOC concentrations in the assigned plume interior wells appear to be stable or decreasing over Year 1 and Year 2 of the EA field demonstration (Figure 44, Figure 45, and Figure 46).

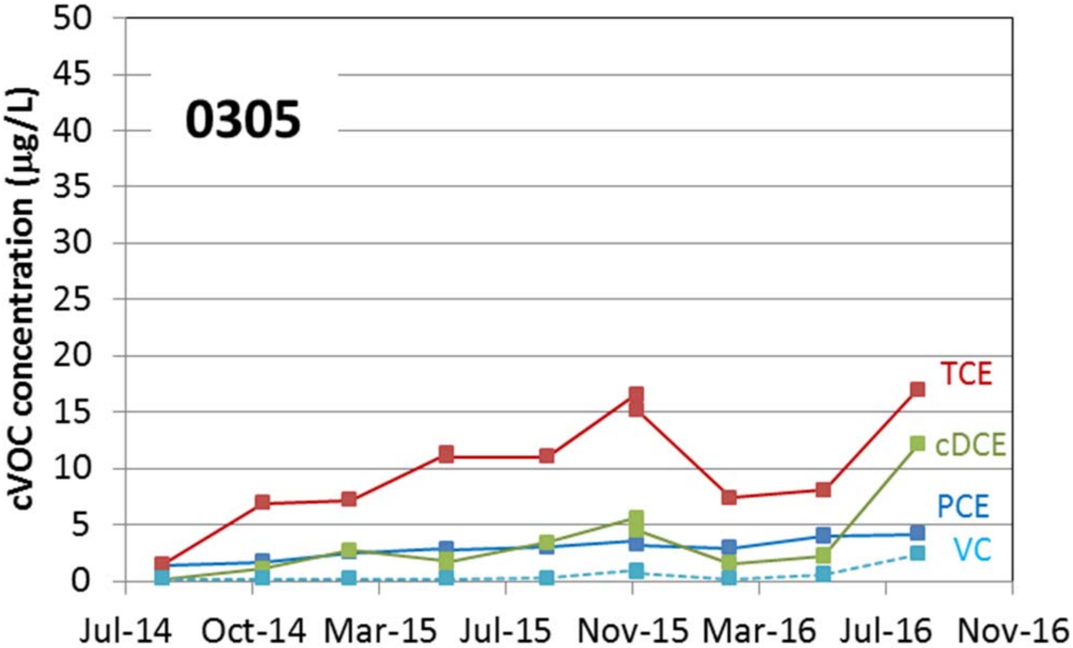


Figure 43. Data for Chlorinated Ethenes in Well 0305 for Samples Collected During Year 1 and Year 2 of the Enhanced Attenuation Field Demonstration

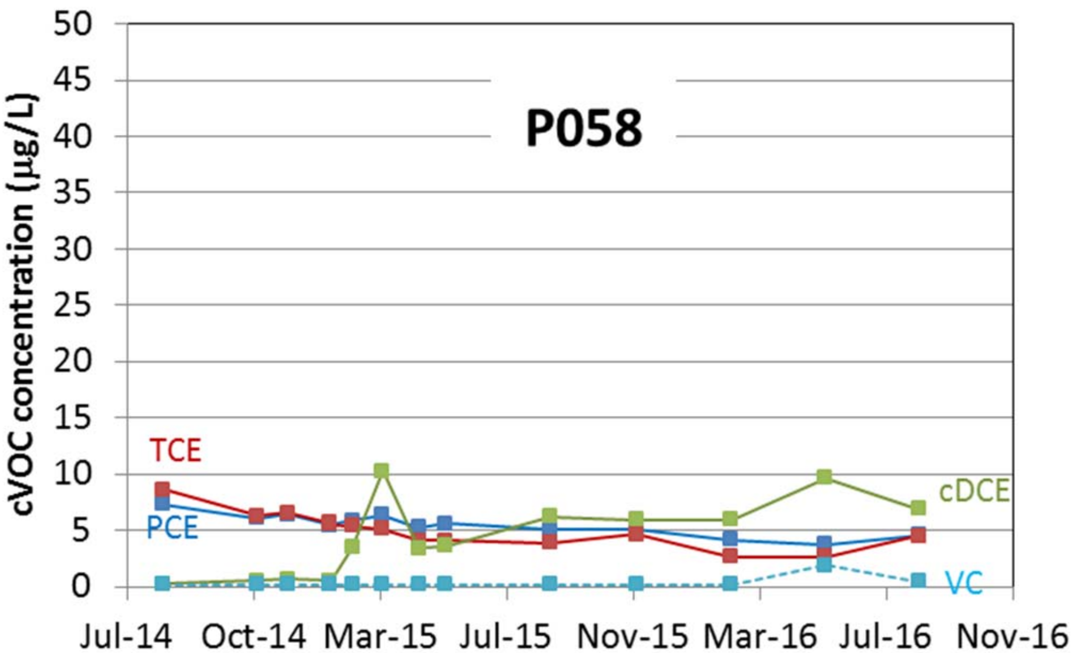


Figure 44. Data for Chlorinated Ethenes in Well P058 for Samples Collected During Year 1 and Year 2 of the Enhanced Attenuation Field Demonstration

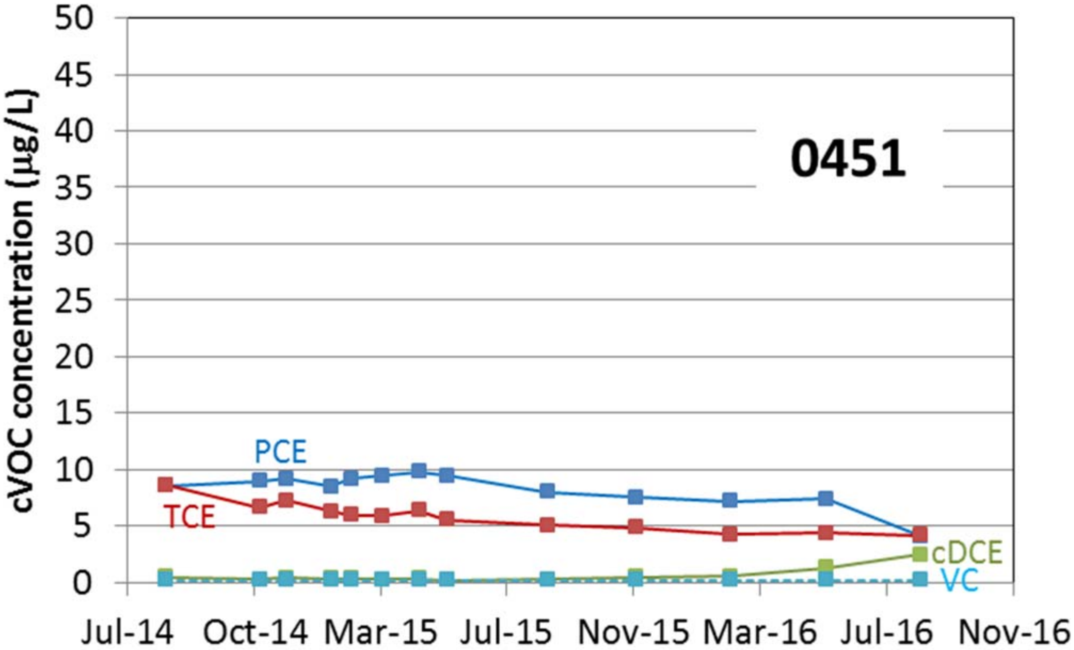


Figure 45. Data for Chlorinated Ethenes in Well 0451 for Samples Collected During Year 1 and Year 2 of the Enhanced Attenuation Field Demonstration

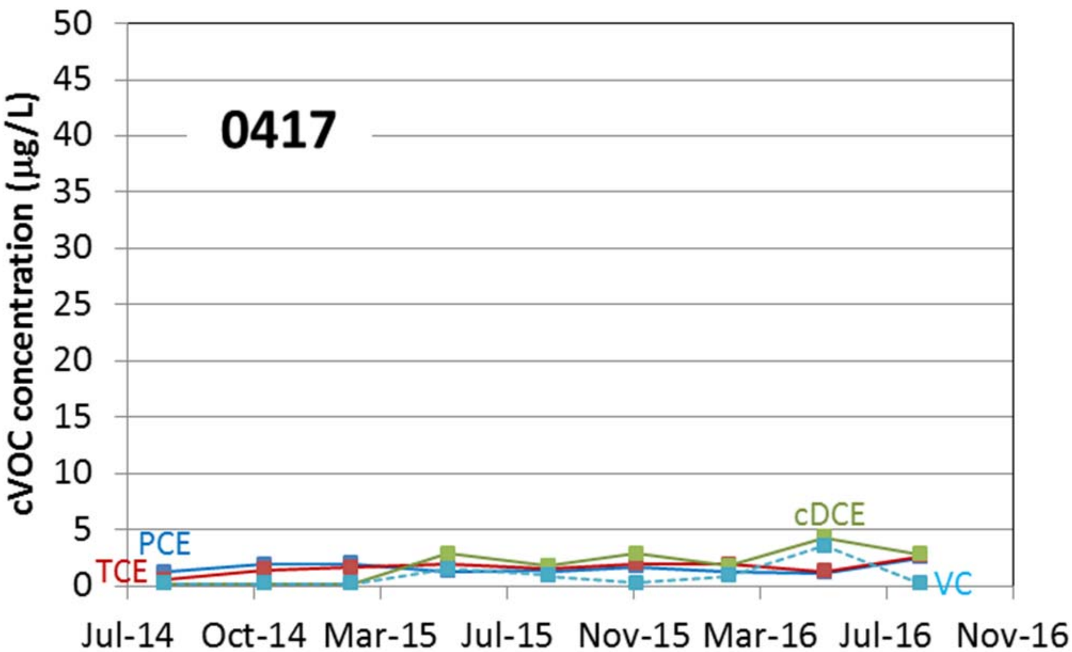


Figure 46. Data for Chlorinated Ethenes in Well 0417 for Samples Collected During Year 1 and Year 2 of the Enhanced Attenuation Field Demonstration

2.4.1.3 Sentinel Wells

Figure 47 through Figure 49 show the concentrations of parent and daughter cVOCs over time for sentinel wells near the distal edge of the plume. The following are key observations for the assigned sentinel wells:

- Daughter products were detected in the sentinel wells. cDCE increased to low levels (e.g., 2 to 18 µg/L) (Figure 47 through Figure 49). VC was below 1 µg/L in all sentinel wells. Note that anaerobic treatment zones were located just upgradient of some of the sentinel wells. Thus, the similarity of the cVOC patterns in the sentinel wells to those in the plume interior wells is reasonable and expected. As with the plume interior wells, the low concentrations of daughter products observed in the sentinel wells is consistent with attenuation of cVOC daughter products in aerobic conditions. Daughter products would be expected to degrade as water flows out of anaerobic treatment zones and into the sentinel area where DO levels are above 1 to 2 mg/L.
- Parent cVOC concentrations in the sentinel wells appear to be stable or decreasing over Year 1 and Year 2 of the EA field demonstration (Figure 47 through Figure 49).

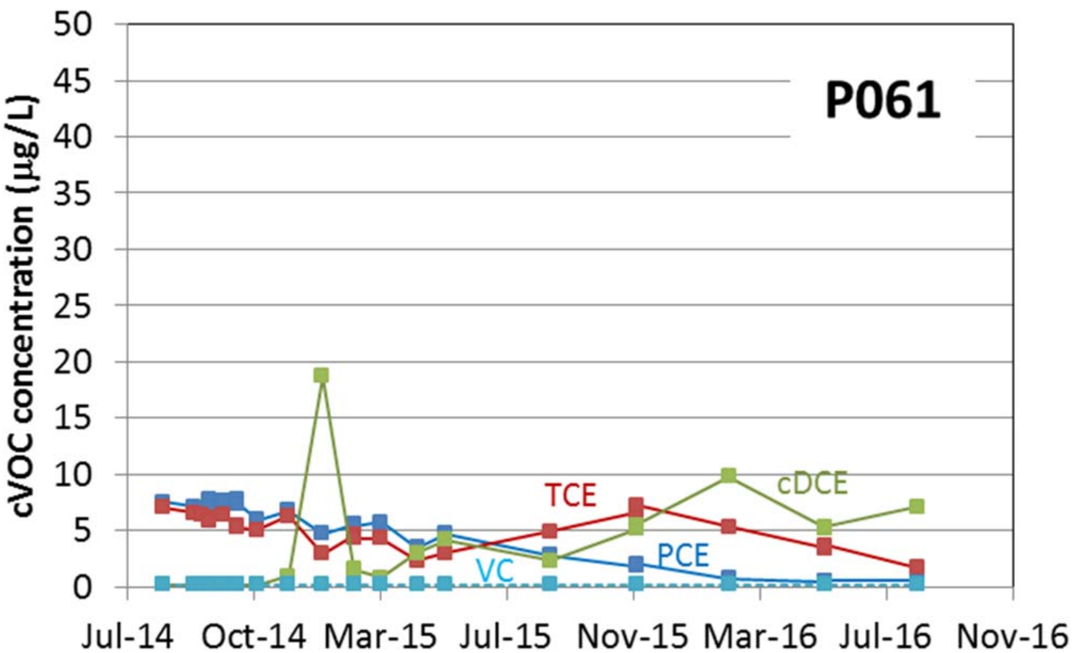


Figure 47. Data for Chlorinated Ethenes in Well P061 for Samples Collected During Year 1 and Year 2 of the Enhanced Attenuation Field Demonstration

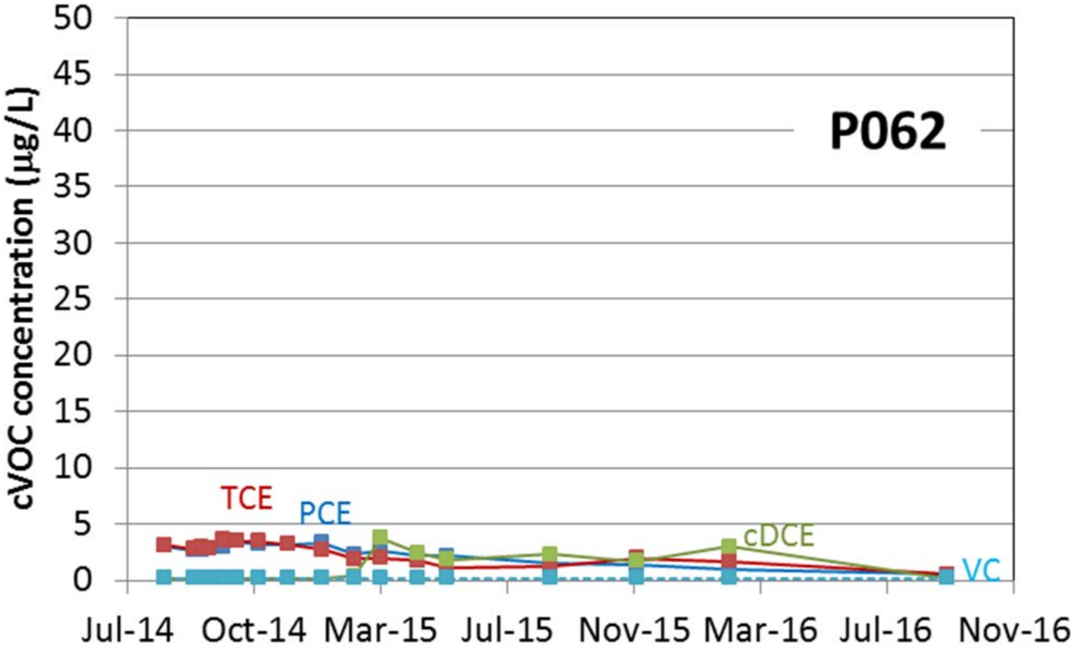


Figure 48. Data for Chlorinated Ethenes in Well P062 for Samples Collected During Year 1 and Year 2 of the Enhanced Attenuation Field Demonstration

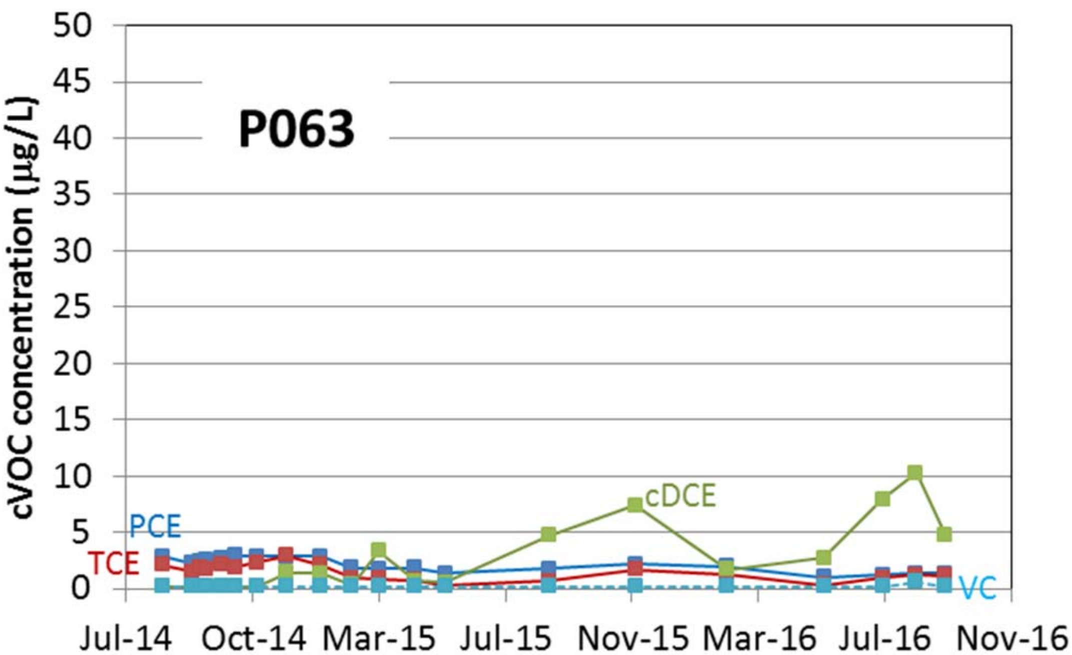


Figure 49. Data for Chlorinated Ethenes in Well P063 for Samples Collected During Year 1 and Year 2 of the Enhanced Attenuation Field Demonstration

2.4.2 Subsurface Microbial Community Response to EA Deployment

To assess the biological response of the subsurface in representative areas of the OU-1 BVA, quantitative polymerase chain reaction (qPCR) measurements of microbial community DNA isolated from groundwater samples were performed. Samples were collected in August 2014 (baseline), November 2014, May 2015, May 2016, and November 2016 (all of the samples were taken after the baseline were taken after EA reagent injections were completed). The sampling in November 2016 was not in the original work plan, but was added to assess the potential impact of the unanticipated dewatering that resulted from nearby offsite construction activities. The water levels had generally recovered by November so that a sampling would provide information to support an assessment of the state of the microbial community in the structured geochemical zones (i.e., the impact of dewatering and re-inundating the sediments near the water table, whether the types and numbers of desired microbes were still in place, what any changes in the community suggest about the groundwater system).

Six wells that represent different biogeochemical settings were sampled to provide information on changes within and downgradient of the reductive treatment zones, as well as provide insights on changes near the original source and in the distal portion of the plume (Figure 50). As shown, the wells generally represent the different target biogeochemical regimes—anaerobic treatment zones (0419, P056, P060), plume interior (P058), and the distal area (P031). Well P061 is a sentinel well, but it is located immediately downgradient of a set of injection wells, so it would be expected to behave similarly to an anaerobic treatment zone well or plume interior well. The selected wells provide site-specific information about the impact of the EA deployment on the microbial community; the changes in these wells should generally represent the expected changes in similar settings throughout the Mound OU-1 groundwater over the course of the field demonstration.

Evaluation of the microbial community was performed by Microbial Insights in Knoxville, Tennessee, using QuantArray-Chlor, a hybrid technology platform combining parallel detection on DNA microarrays with quantification by qPCR. Water samples were filtered upon collection using Sterivex filters. Filters were packaged and shipped in a cooler with Blue Ice for next-day delivery to the laboratory. Upon receipt, DNA was extracted using the MO BIO Laboratories (Carlsbad, California) PowerSoil extraction kit following the manufacturer's recommended protocol. Real-time polymerase chain reaction (PCR) was performed on each sample using oligonucleotides that are designed to target each specific group of microorganisms or target DNA sequence. The PCR reactions were carried out in an Applied Biosystems QuantStudio Real-Time PCR system (Applied Biosystems is based out of Foster City, California). For each oligonucleotide, a calibration curve was obtained by using a serial dilution of a known concentration of positive control DNA. The cycle threshold values that are obtained from each sample were compared with the standard curve, collected water volume, and dilutions to determine the original sample DNA concentration.

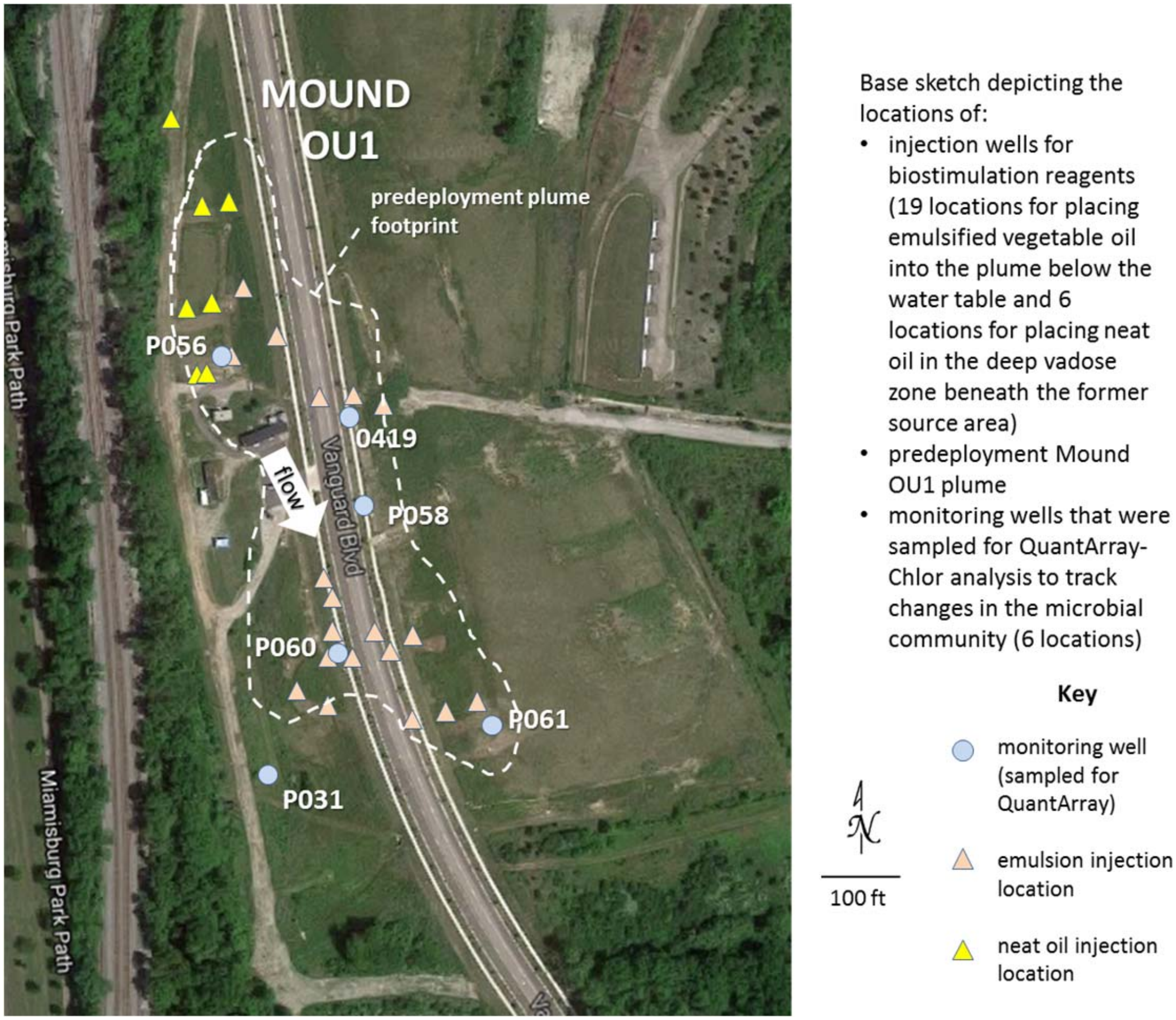


Figure 50. Microbial Community Characterization Sampling Locations

QuantArray-Chlor uses nucleic acid extracted from water samples (or other media) to provide quantitative estimates of target organisms or genes, specifically:

- Total number of organisms and information on organisms that signify potentially competing and interacting biological processes.
- Halorespiring bacteria (e.g., *Dehalococcoides*, *Dehalobacter*, *Dehalogenimonas*, *Desulfitobacterium*) and associated functional genes involved in reductive dechlorination of chlorinated ethenes, chlorinated ethanes, and related compounds.
- Functional genes involved in aerobic (co)metabolic pathways for biodegradation of chlorinated solvents and various daughter compounds.

The QuantArray has a number of limitations that are typical of all techniques that characterize subsurface microbial communities based on water samples collected from monitoring wells. Notably, the fraction of subsurface microorganisms present in the water phase is relatively small (i.e., the majority of the microbial community is generally associated with surfaces of the aquifer matrix). The quantity of organisms in a water sample, and the relationship of organisms in water samples to the bulk community, is influenced by the sampling protocol (monitoring well design; flow rate; well purging procedures; and local hydrochemical, biochemical, and geochemical conditions). Despite these limitations, the scientific literature provides a reasonable basis for assessing a site's microbial ecology and the potential for supporting natural attenuation based on quantifying and characterizing organisms in water samples (e.g., LeBrón et al. 2011; Lu et al. 2006; Lee et al. 2008). This is possible primarily because a microbial data range over several orders of magnitude and reasonable target ranges can be defined that typifies particular key biogeochemical regimes and the potential for significant microbial contributions to contaminant attenuation. The "order-of-magnitude" differences in the numbers and types of organisms associated with the resulting "bins" substantively offsets uncertainties that result from variability associated with water sampling. The data evaluation below summarizes the QuantArray results for OU-1 and, based on the microbial community in water samples, provides assessments for the type and potential significance of natural attenuation in each of the sampled areas.

As indicated above, the QuantArray-Chlor results provide three complementary classes of microbial data based on the target nucleic acid sequences measured in the microbial community sampled from site groundwater: (1) total microbial counts and information on community structure, (2) counts of organisms and functional genes contributing to cVOC reduction, and (3) counts of functional genes contributing to cVOC oxidation or cometabolism. Data for each of these classes of data will be presented sequentially below. Table 5 presents the bins to aid in interpreting the data. These bins are based on information in the following journal articles and technical reports: Amos et al. 2008, 2009; Brow 2011; Cápiro et al. 2014, 2015; Chiang et al. 2012; Courbet et al. 2011; DugatBony et al. 2012; Duhamel et al. 2004; Guan et al. 2013; Hatt and Löffler 2012; He et al. 2003, 2010; Hendrickson et al. 2002; ITRC 2011; Lebrón et al. 2011; Lee et al. 2008; Löffler et al. 2000, 2013; Lu et al. 2006; Mattes et al. 2013; Matturra et al. 2012; Müller et al. 2004; Ni et al. 2014; Révész et al. 2014; Ritalahti et al. 2009, 2010; Röling 2007; Da Silva and Alvarez 2008; Stroo et al. 2006.

Table 5 suggests reasonable target QuantArray-Chlor results for classes of organisms and individual organisms to support the structured geochemical zones paradigm at low-concentration cVOC sites. For example, in the anaerobic treatment zones, target values of total eubacteria would be approximately 10^6 cells per milliliter (mL), sulfate reducers and methanotrophs would each be in the range of 10^5 cells/mL, the sum of reductive dechlorination species (spp [plural]), would be on the order of 10^4 cells/mL (with a significant presence of spp that target the subject cVOCs). Similarly, in the surrounding aerobic areas, total eubacteria, sulfate reducers, and methanogens would be lower, and the estimated cometabolic spp would be on the order of 10^3 to $>10^4$ cells/mL (with a significant presence of spp that have functional enzymes that cometabolize the subject cVOCs). The microbial community data complement site geochemistry information and cVOC trends and provide site-specific confirmation that the microbial community has the target capabilities to support EA.

Table 5. Screening Bins for Interpreting the QuantArray Results

Characterization Objective Parameter	Order-of-Magnitude Bins (cells/mL)[a]
Geochemical Regime	
Total eubacteria[b]	Anaerobic (>10^6) Transition (10^5 to 10^6) Aerobic (<10^5)
Sulfate reducers[b]	Anaerobic (>10^5) Transition (10^4 to 10^5) Aerobic (<10^4)
Methanogens[b]	Strongly Anaerobic (>10^5) Transition (10^4 to 10^5) Aerobic (<10^4)
Projected Attenuation Processes (Type of Attenuation and Potential Significance)	
Σ Reductive dechlorination spp[c]	Reductive dechlorination … Significant (>10^4) Transitional (10^3 to 10^4) Unfavorable (<10^3)
Estimated cometabolic spp[c]	Aerobic cometabolism … Significant (>10^4) Transitional (10^3 to 10^4) Unfavorable (<10^3)
Individual reductive dechlorination spp	Reductive dechlorination … Significant (>10^4) Transitional (10^3 to 10^4) Unfavorable (<10^3)
Individual cometabolic spp	Aerobic cometabolism … Significant (>10^4) Transitional (10^3 to 10^4) Unfavorable (<10^3)

Abbreviations:
Σ = summation of
mL = milliliter
spp = species (plural)

Notes:
[a] All values are estimated cells per mL as provided by Microbial Insights. For individual species, the estimates are based on species-specific nucleic acid marker sequences (e.g., 16s rRNA). For functional enzymes, the qPCR data are converted to approximate cells per mL based on the average number of nucleic acid sequence copies per cell that have been documented in the literature (if available). The Σ reductive dechlorination spp is the sum of the individual measured spp that contribute to reductive dechlorination/attenuation. Individual cometabolic spp were not measured. The “estimated cometabolic spp” is an approximate value, and the calculation accounts for the fact that organisms may have multiple types and copies of cometabolic functional enzyme sequences in their DNA; the estimated cometabolic spp were calculated as the average of (1) maximum value for estimated cells per mL associated with any of the individual cometabolic primers and (2) the sum of the estimated cells per mL for all of the measured cometabolic primers.
[b] Typical ranges for permeable aquifers assuming that aerobic aquifers are oligotrophic (carbon and nutrient limited) and that, due to low oxygen solubility in water, metabolic activity in systems with eubacteria counts above 10^6 cells per mL would fully utilize the available oxygen flux. Anaerobic settings with lower eubacteria counts would occur in low-permeability silts and clays. Significant occurrence of sulfate reducers and methanogens within a microbial community are indicators of anaerobic and strongly anaerobic conditions, respectively.
[c] Typical ranges based on sufficient organisms to contribute to measurable contaminant attenuation. “Significant” correlates to attenuation half-life of 2 to 5 years, “transition” to attenuation half-life of 5 to 15 years, and “unfavorable” to attenuation half-life >15 years. Individual spp typically attenuate different subsets of the cVOCs.

Figure 51, Figure 52, and Figure 53 summarize the QuantArray data for total eubacteria, sulfate reducers and methanogens, and reductive dechlorination and cometabolic spp, respectively. The various summary parameters and how these changed over time in the Mound OU-1 groundwater after the EA deployment are presented on site maps. The color coding of the backgrounds of the bar charts corresponds to the bins in Table 5. The following are key observations for the population summary parameters:

- In the baseline sampling, total eubacteria were significantly below 10^6 cells/mL (Figure 51), and sulfate reducers and methanogens were both below 10^5 cells/mL at all locations (Figure 52). This suggests that that the baseline conditions for the bulk OU-1 aquifer system was aerobic. Following the injection of the electron donor, these parameters increased to target levels in nearby wells (0419, P056, P060, and P061), indicating effective formation of the anaerobic treatment zones. The total eubacteria, sulfate reducers, and methanogens increased in the mid-plume (P058) and distal (P031) area, but the cell counts were at levels that indicate aerobic and transition conditions, consistent with the objectives of structured geochemical zones.

- In most wells, the counts for sulfate reducers increased before methanogens (Figure 52), consistent with expected trends for the transition of the local environments toward anaerobic conditions. In general, following the deployment of carbon electron donor, the numbers of sulfate reducers tracked the pattern of sulfate concentrations in groundwater. The sulfate reducer initially peaked as the original sulfate present in the aquifer was transformed. Numbers of sulfate reducers generally decreased throughout Year 1 and then peaked again after the dewatering was stopped and groundwater levels recovered, bringing groundwater with fresh sulfate into the treatment zones. Based on the microbial ecology of the system, it is anticipated that a similar community response of decreases in sulfate reducers will occur if the water table remains stable and increases after dewatering and reinundation events.
- The microbial counts indicated that the baseline reductive dechlorination and aerobic cometabolism status was either unfavorable or transitional in all locations before the field test (Figure 53). Following deployment, reductive dechlorination spp increased to significant levels in all anaerobic treatment zone wells, as well as in several mid-plume and distal locations. Cometabolic spp increased to significant levels in the anaerobic treatment zone wells. Cometabolic spp in the plume interior and sentinel wells generally increased to transitional levels during the Year 1 and Year 2 monitoring period.
- Following reinundation of the water table sediments after offsite dewatering in 2016, the qPCR data indicate that the overall microbial community was relatively stable (or recovered) and that the structured geochemical zones remained in pace. The community structure did show some interesting dynamics, particularly related to sulfate reducers and methanogens—sulfate reducers were generally stimulated by lowering the water levels and reinundation (likely due to fresh sulfate inputs upon rewetting) and methanogens were generally depressed (likely due to exposure of the water table sediments to vadose zone conditions). Continued monitoring of the microbial community is planned to document that the structured geochemical zones remain in place.

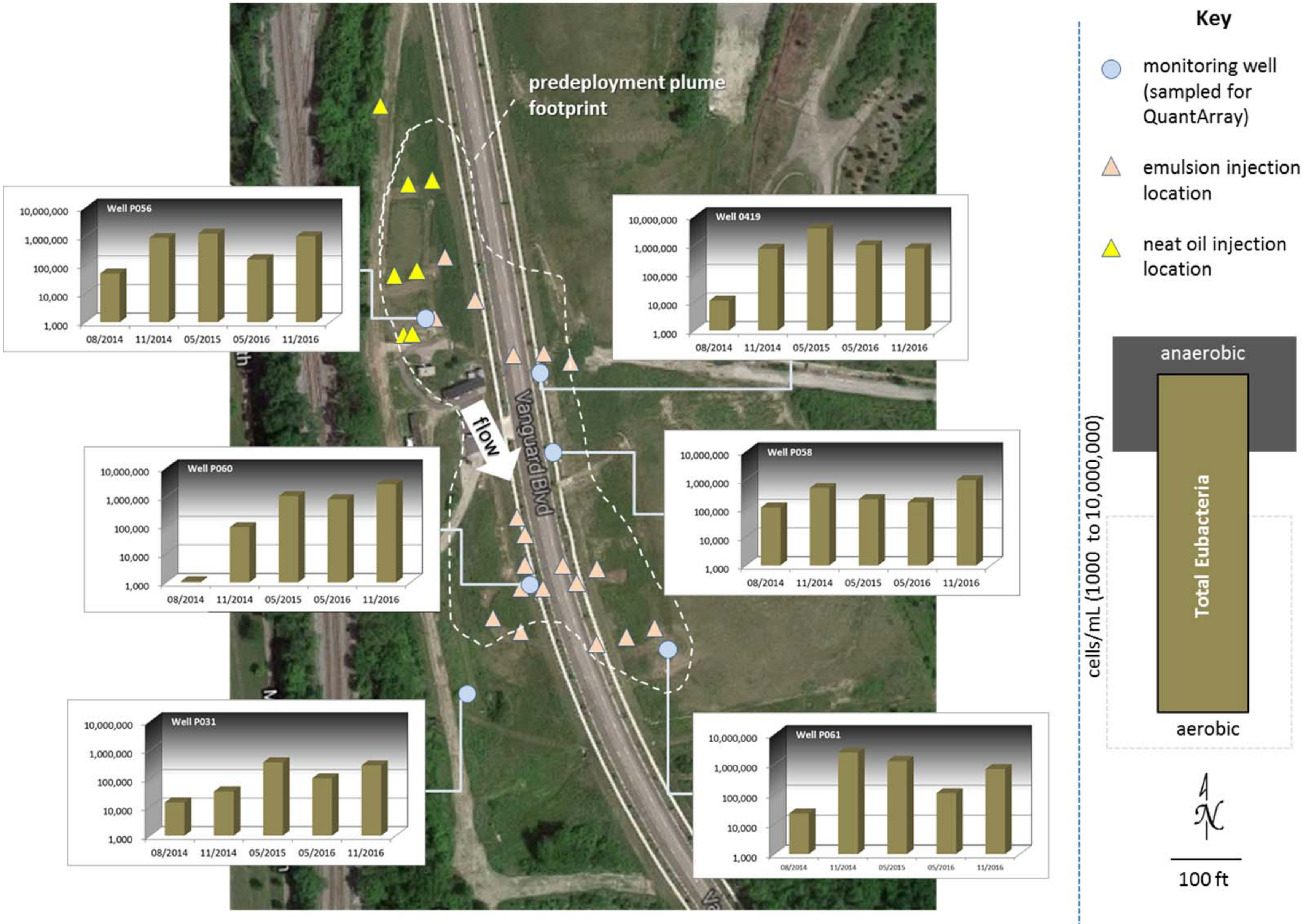


Figure 51. Changes in Total Eubacteria in Mound OU-1 Groundwater During the EA Field Demonstration (Year 1 and Year 2)

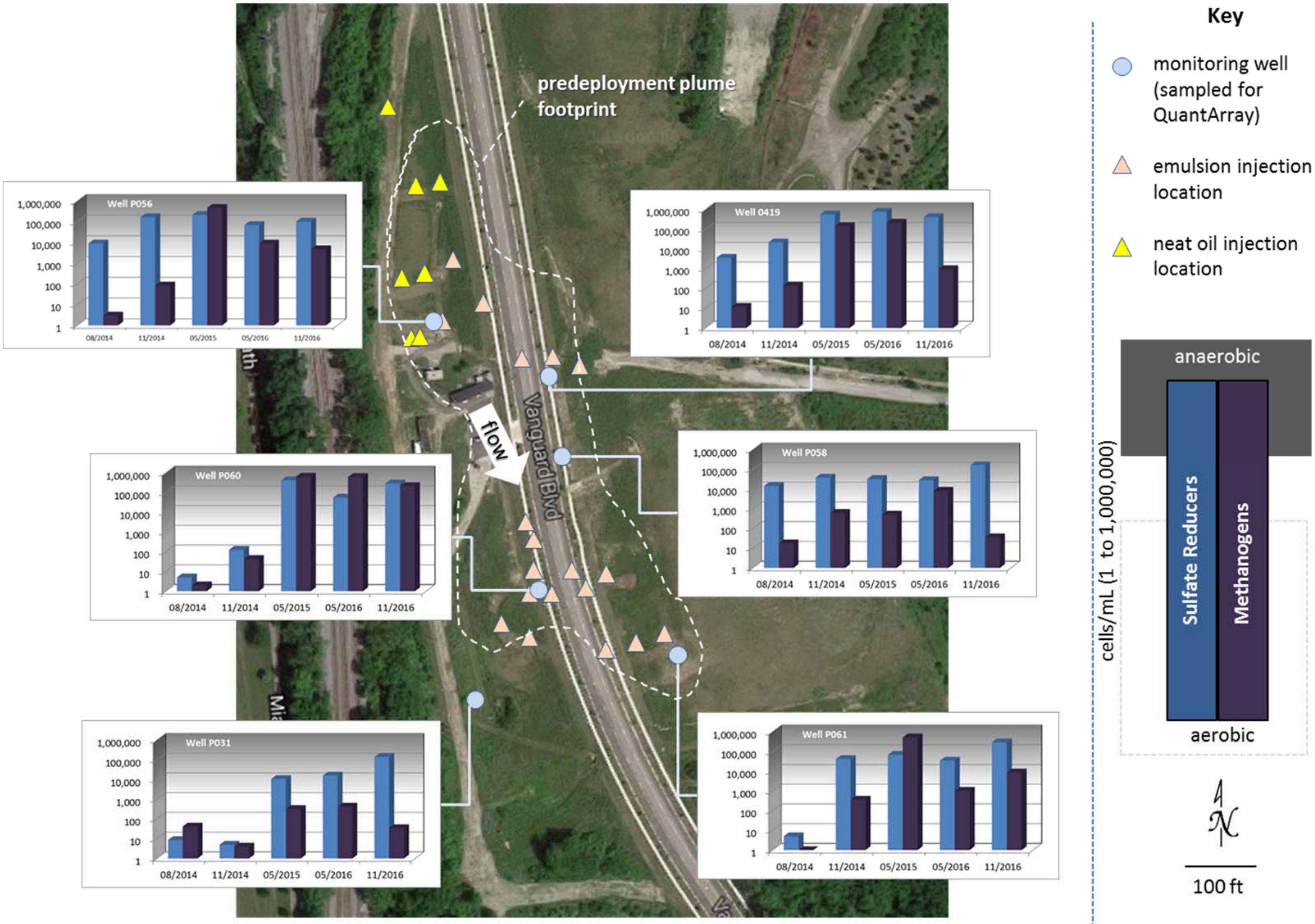


Figure 52. Changes in Sulfate Reducers and Methanogens in Mound OU-1 Groundwater During the EA Field Demonstration (Year 1 and Year 2)

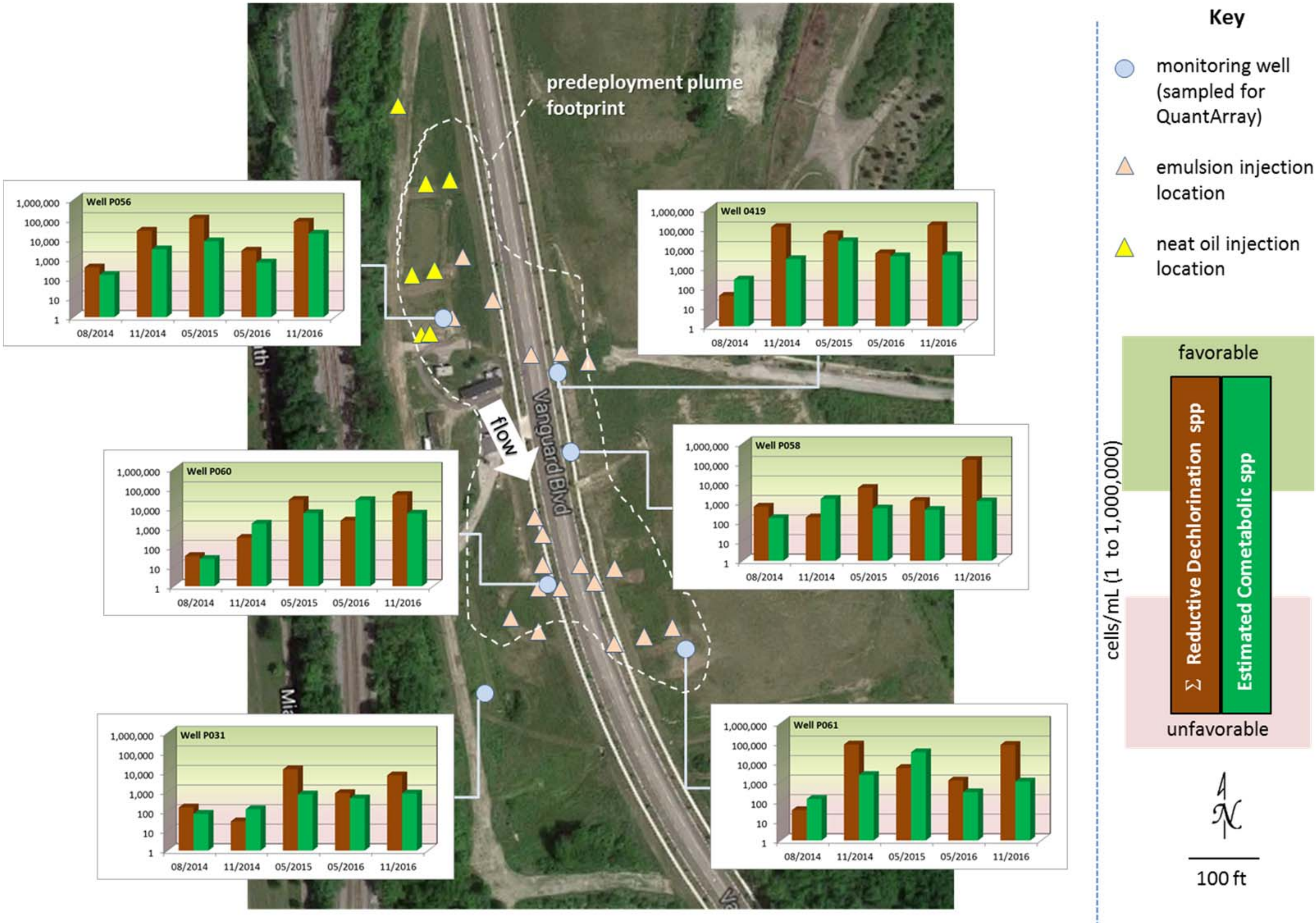


Figure 53. Changes in Reductive Dechlorination spp and Estimated Cometabolic spp in Mound OU-1 Groundwater During the EA Field Demonstration (Year 1 and Year 2)

Detailed QuantArray information on the structure of the microbial communities sampled in individual wells over time confirms the general conclusions described above. In the detailed data, enumeration of particular organisms and enzyme-specific nucleic acid sequences provide key supplementary information. Table 6 summarizes the roles of the measured organisms and enzyme markers in supporting contaminant attenuation. For anaerobic attenuation, QuantArray enumerated seven classes of organisms and six enzyme markers (four of the enzyme markers were detected during the monitoring period). For aerobic attenuation, QuantArray enumerated nine enzyme markers. The presence of significant populations of particular organisms (or organisms with particular functional enzymes) that contribute to known attenuation processes for the localized geochemical conditions provides an added level of confidence in the conceptual understanding of contaminant behavior at the site. For example, in groundwater zones with anaerobic geochemical conditions and detectable PCE, TCE, DCE, or VC, the presence of target levels of *Dehalococcoides* (DHC), *Dehalobacter* (DHB), *Desulfitobacterium* (DSB), or *Desulfuromonas* spp (DSM) validate that reductive dechlorination and related attenuation processes are occurring at sufficient rates to contribute to site remediation objectives.

Figure 54 through Figure 59 provide detailed QuantArray results for all of the tested wells. The data provide a snapshot of the microbial ecology and how it changes in different portions of the Mound OU-1 groundwater during Year 1 of the EA field demonstration. Each figure provides the estimated numbers (cells/mL) for organisms that contribute to anaerobic and aerobic attenuation as well as the numbers of total eubacteria and other key organism classes. For each parameter, three bars are presented that represent the pretest conditions and the two post-deployment sampling events. The color coding of the backgrounds of the bar charts corresponds to the bins in Table 5.

The following are key observations for the detailed QuantArray data from the individual wells:

- For wells near the injection of the electron donor—0419 (Figure 54), P056 (Figure 56), P060 (Figure 58), and P061 (Figure 59)—the levels of several classes of organisms that contribute to anaerobic attenuation increased. In most cases, *Dehalococcoides* levels in these wells increased to levels near 10^3 cells/mL. The most significant increases were observed for other organisms that contribute to attenuation of TCE and PCE (*Dehalobacter*, *Desulfitobacterium*, and *Desulfuromonas*). Notably, the most significant increases occurred in *Dehalogenimonas* (a species that is not generally recognized in the literature as contributing to the attenuation of chlorinated ethenes such as PCE and TCE). In several wells, this species was the most abundant of the measured anaerobic attenuation organisms in the final sampling period. Since halo-respiring organisms such as *Dehalogenimonas* require the presence of a target cVOC (to act as an electron acceptor), the data suggest that the *Dehalogenimonas* strain present in the groundwater at Mound has the ability to degrade chlorinated ethenes (since these are the only cVOC contaminants that are present in significant levels in the groundwater). *Dehalogenimonas* was also present in the baseline samples, suggesting that this organism is native to the site, and the ability of the Mound strain to degrade chlorinated ethenes under the site-specific conditions developed during the several decades of exposure to contamination from the former landfill. Relatively high counts of the anaerobic organisms listed above were generally maintained in the wells near the injection of the electron donor. As seen in the composite data, sulfate reducers spiked after the initial electron donor injection and again after the water levels recovered following the nearby dewatering operations.

- Also for wells near the injection of the electron donor—0419 (Figure 54), P056 (Figure 56), P060 (Figure 57), and P061 (Figure 59)—the levels of several classes of organisms that contribute to aerobic (co)metabolism increased. In all cases, increases were observed for organisms with markers for methane monooxygenase functional genes as well as a variety of aromatic oxygenases. The counts of organisms that contribute to aerobic (co)metabolism were in the transition to a significant level in the injection location wells throughout the Year 1 and Year 2 monitoring period.
- For the mid-plume well—P058 (Figure 57)—the levels of *Dehalogenimonas* and *Desulfuromonas* increased to the transitional category. Organisms that contain markers for (co)metabolic functional genes ranged between the unfavorable and transition ranges throughout the Year 1 and Year 2 monitoring period. Monitoring the microbial community in the mid-plume area would be an appropriate "watch item" during Year 3.
- For the distal sentinel well area—P031 (Figure 55)—the levels of *Dehalogenimonas* increased to the transitional category. Organisms that contain markers for (co)metabolic functional genes increased significantly but remained below 1000 cell/mL through the Year 1 and Year 2 monitoring period. Monitoring the microbial community in the distal area would be an appropriate "watch item" during Year 3.

Table 6. Summary of the Roles of Selected Organisms and Enzymes in cVOC Attenuation

	Reductive Dechlorination and related Attenuation Processes											Aerobic (co)Metabolism								
	organisms							enzymes				Enzymes								
	Dehalococcoides spp. (DHC)	Dehalobacter spp. (DHBt)	Dehalobacter DCM (DCM)	Dehalogenimonas spp. (DHG)	Desulfitobacterium spp. (DSB)	Dehalobium chlorocoercia (DECO)	Desulfuromonas spp. (DSM)	tceA Reductase (TCE)	BAVi Vinyl Chloride Reductase (BVC)	Vinyl Chloride Reductase (VCR)	Chloroform reductase (CFR)	Soluble Methane Monooxygenase (SMMO)	Particulate Methane Monooxygenase (PMMO)	Tolune Dioxygenase (TOD)	Phenol Hydroxylase (PHE)	Tricholorobenzene Dioxygenase (TCBO)	Toluene Monooxygenase 2 (RDEG)	Toluene Monooxygenase (RMO)	Ethene Monooxygenase (EtnC)	Epoxyalkane transferase (EtnE)
Chlorinated Ethenes																				
PCE	+	+	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
TCE	+	+	-	-	+	-	+	-	-	-	-	+	+	+	+	+	+	+	-	-
cDCE	+	-	-	-	-	-	-	-	+	+	-	+	+	+	+	+	+	+	-	-
VC	+	-	-	-	-	-	-	-	+	+	-	+	+	+	+	+	+	+	+	+
other cVOCs / Notes	1	2	2	3	4	5	6	7	7	7	8	9	9	9	9	9	9	9	9	9

Notes:

0 "+" = confirmed contributor to attenuation of the listed contaminant; "-" = does not contribute to attenuation of listed contaminant (or no data available in the literature). The organisms and enzyme markers in the chart were detected in one or more samples during the monitoring period.

1 Dehalococcoides (DHC) is confirmed to reductively degrade most classes of cVOCs, including chorinated ethenes, ethanes, methanes, phenols, benzenes and propanes.

2 Dehalobacter spp (DHBt) are confirmed to reductively degrade several classes of cVOCs, including chorinated ethenes, ethanes, methanes, and benzenes. Dehalobacter DCM (DCM) is confirmed to reductively degrade chloroform.

3 Dehalogenimonas (DHG) is confirmed to reductively degrade chorinated ethanes and propanes. Attenuation of chlorinated ethenes (e.g., PCE and TCE) has not been documented in the literature.

4 Desulfitobacterium spp. (DSB) are confirmed to reductively degrade several classes of cVOCs, including chorinated ethenes, ethanes, phenols, and propanes.

5 Dehalobium chlorocoercia (DECO) is confirmed to reductively degrade chlorinated benzenes.

6 Desulfuromonas spp. (DSM) are confirmed to reductively degrade PCE and TCE.

7 These enzymes that are associated with DHC spp and the reductive degradation of chlorinated ethanes (tceA Reductase (TCE)) or chlorinated ethene daughter products such as DCE and VC (BAVi Vinyl Chloride Reductase (BVC) and Vinyl Chloride Reductase (VCR))

8 Chloroform reductase (CFR) is an enzyme associated with reductive degradation of chloroform. Two enzyme sequences (1,1 DCA Reductase (DCA) and 1,2 DCE reductase (DCAR)) are not listed in the table because they were not detected in the groundwater at Mound OU1.

9 These enzymes are associated with the cometabolism or metabolism of a wide range of cVOCs.

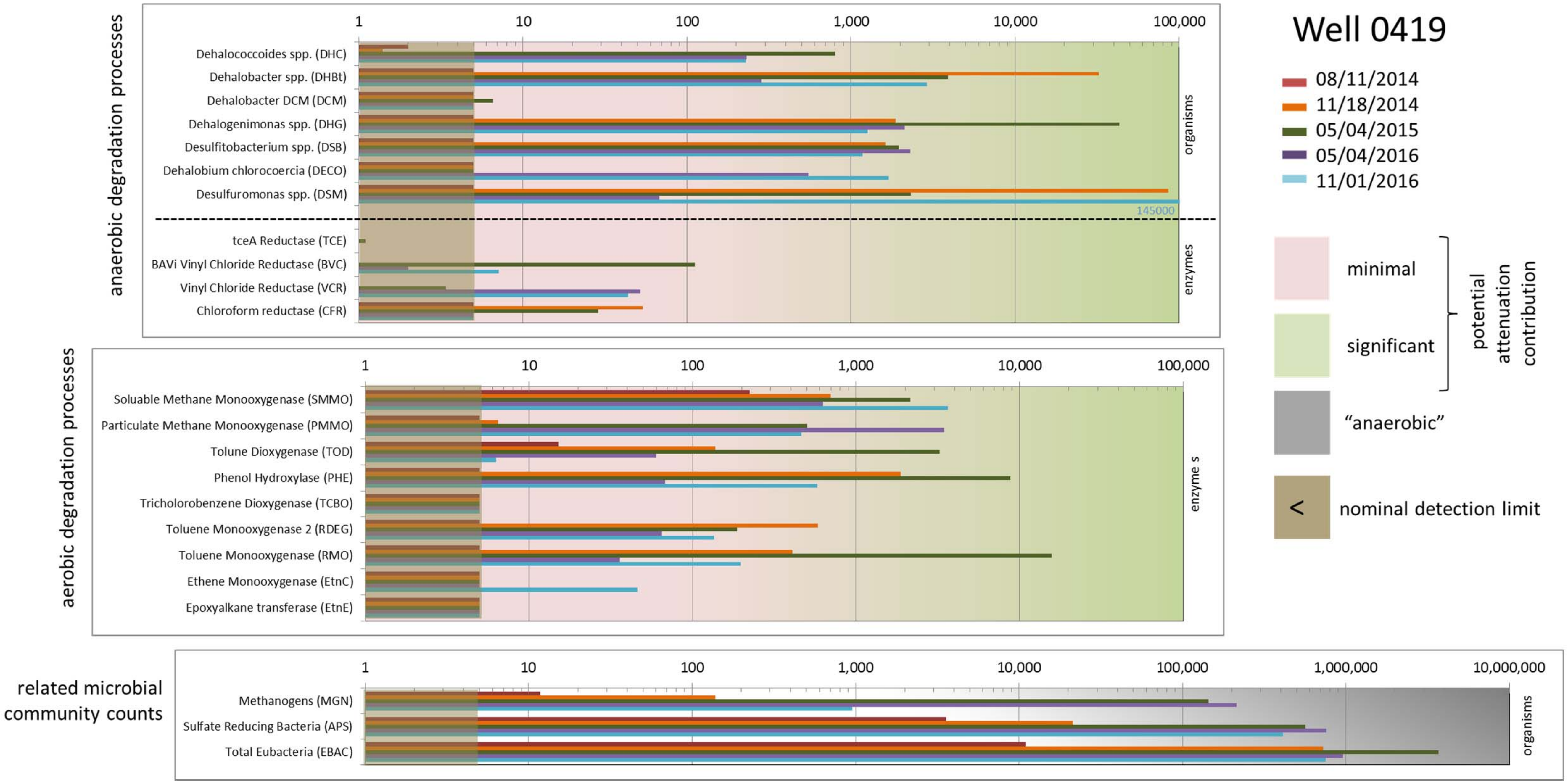


Figure 54. QuantArray Results for Well 0419

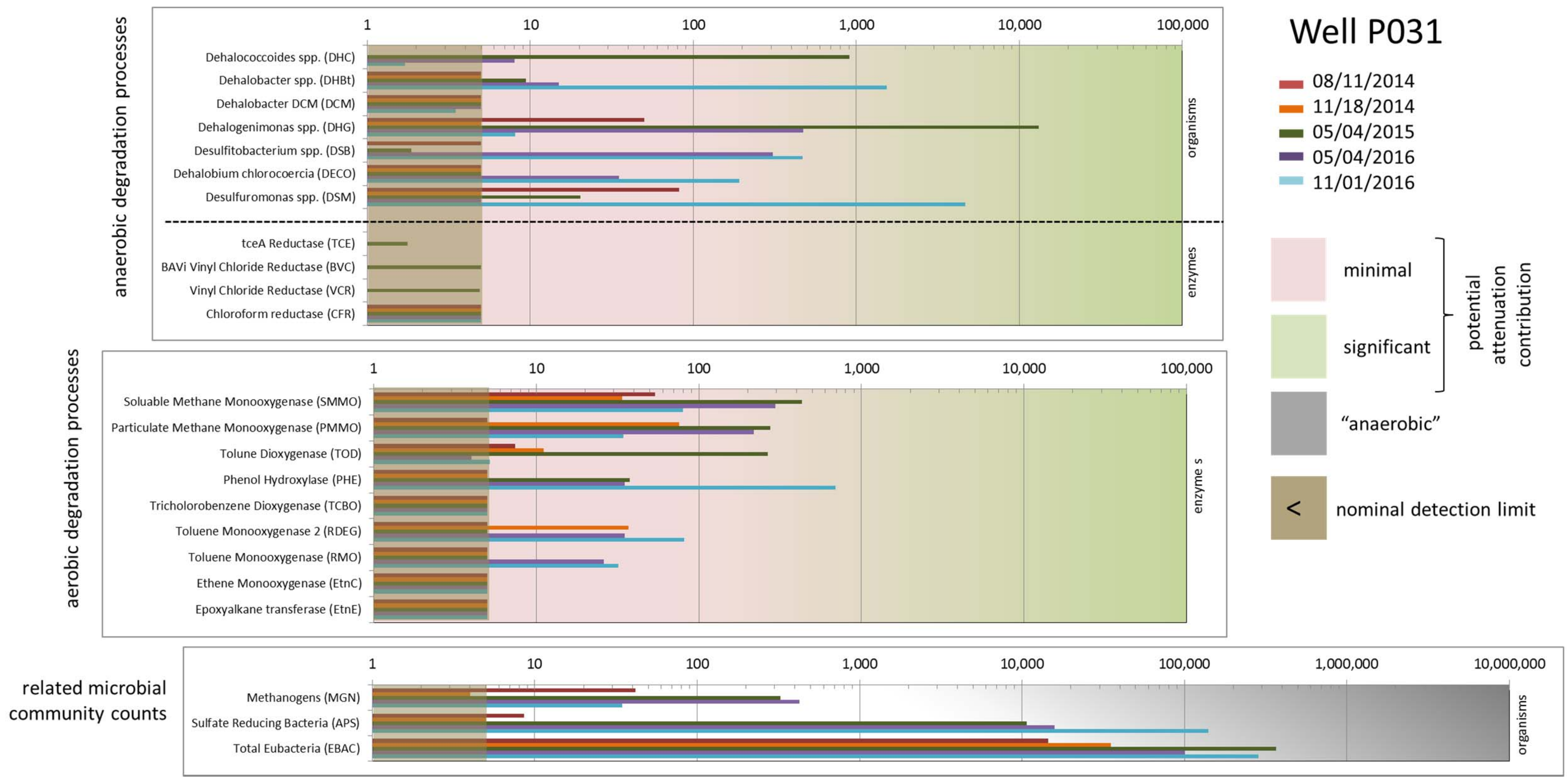


Figure 55. QuantArray Results for Well P031

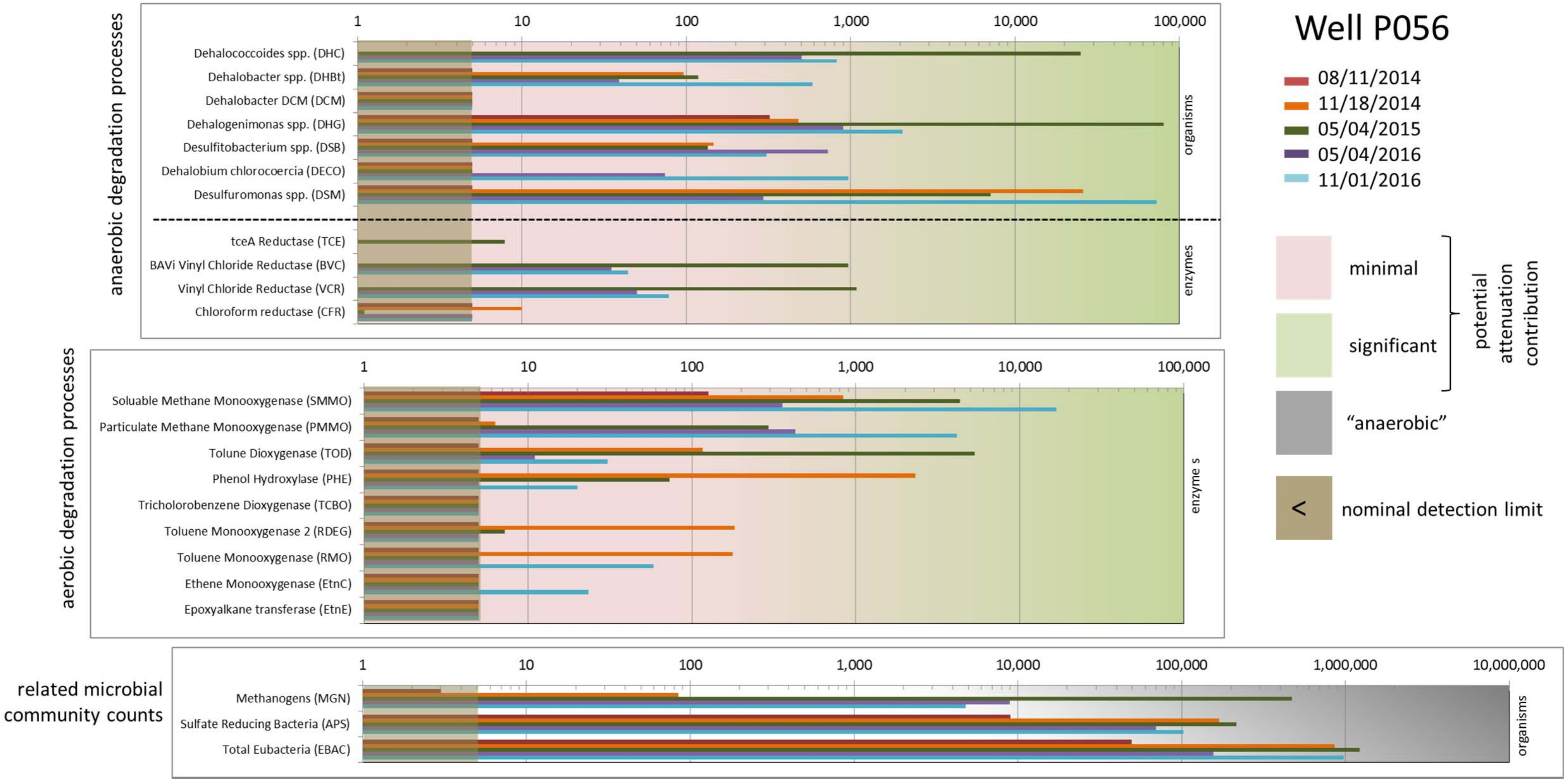


Figure 56. QuantArray Results for Well P056

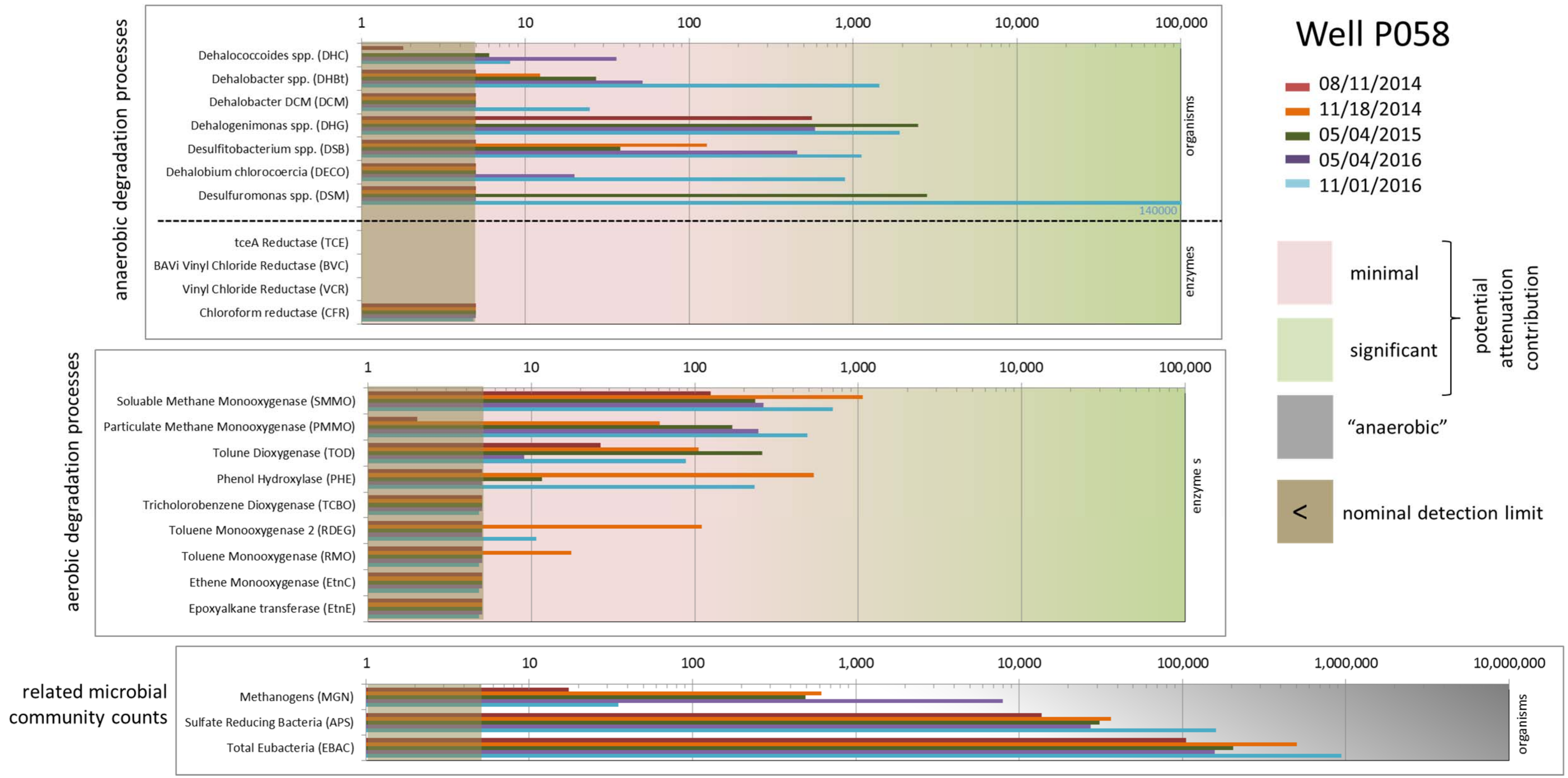


Figure 57. QuantArray Results for Well P058

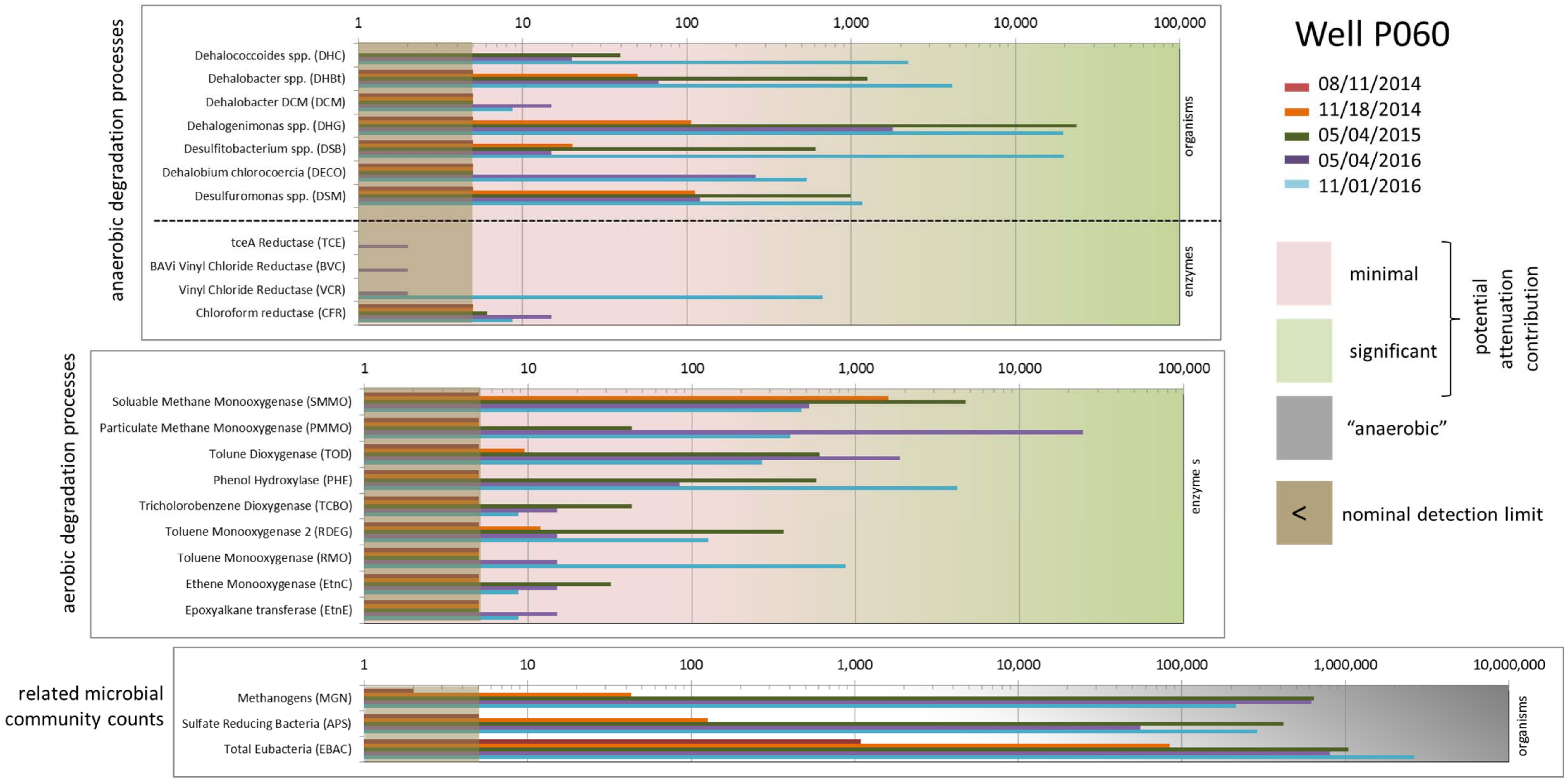


Figure 58. QuantArray Results for Well P060

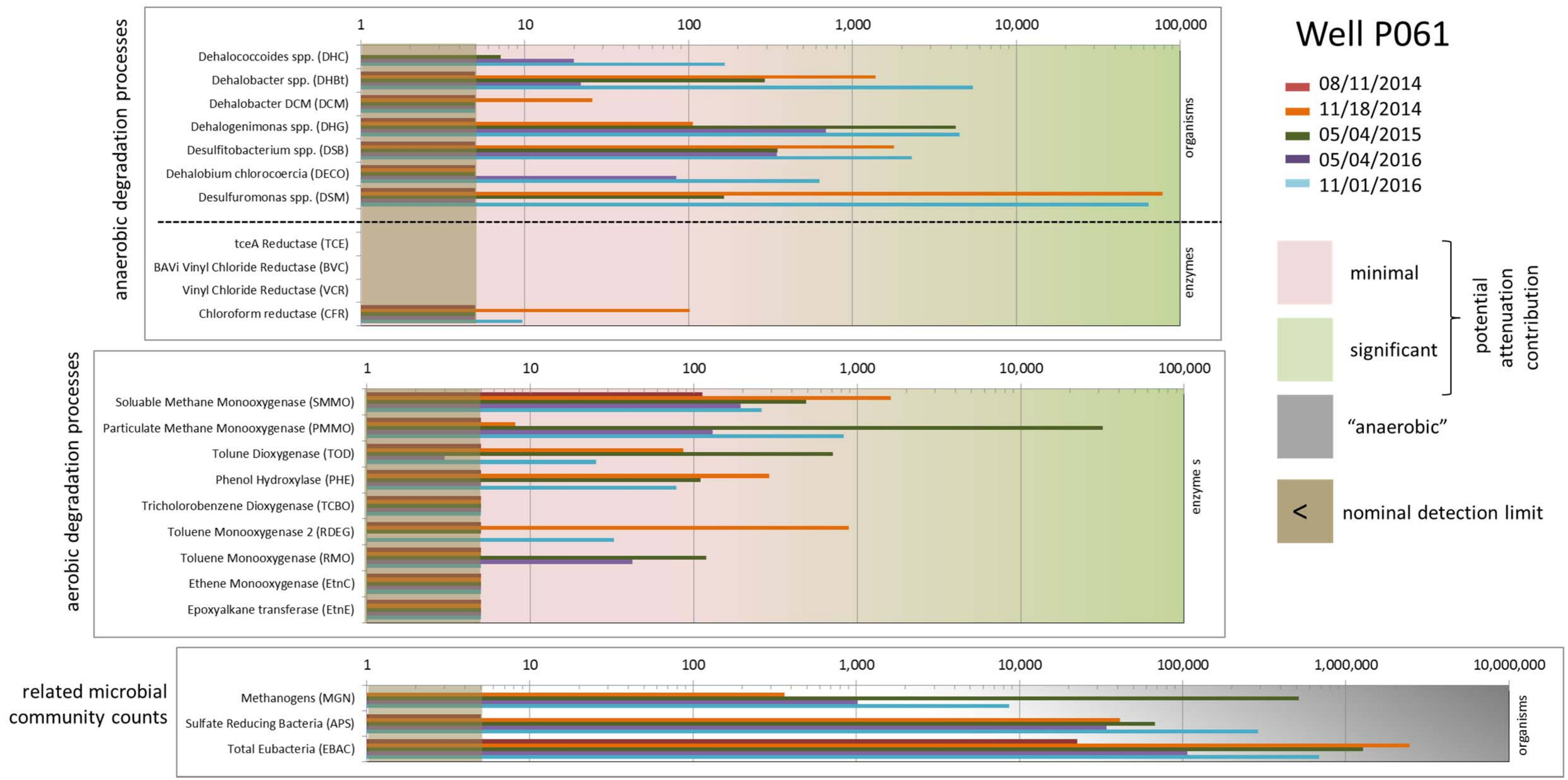


Figure 59. QuantArray Results for Well P061

3.0 Degradation Rates

Estimation of attenuation and degradation rates assists in evaluating progress toward remediation goals and projecting the remediation time frame. Thus, the overall objective of the attenuation rate evaluation is to (1) examine the trends in individual wells and in changes in overall contaminant mass in the plume to determine reasonable quantitative estimates of degradation rate constants for the real-world field conditions in the plume, (2) examine the patterns of concentration along transects to develop similar quantitative estimates, and (3) examine concentrations in downgradient sentinel wells to provide field confirmation that the plume is not expanding.

3.1 Concentration or Mass Versus Time Attenuation Rates

Typically the concentration or mass data are fit to an exponential function dC/dt = kt (or $C/C_0 = e^{kt}$), and the key output of the analysis is the first-order degradation coefficient (k). The units of k are $time^{-1}$; specifically, the values calculated below for OU-1 are presented in units of (1/day). A contaminant half-life (the approximate time frame for the concentration or mass to decrease to half, i.e., $C/C_0 = 0.5$) is a useful supplementary calculation. For first-order exponential decay, the half-life is calculated using the equation: $t_{½} = -0.693/k$.

Concentration-versus-time trends in individual wells provide a point estimate of attenuation rate (k_{point}) for the period of monitoring. Table 7 and Figure 60 summarize the k_{point} values for the wells identified in the Field Demonstration Work Plan (DOE 2014a) (well 0305 was added to the list of evaluated wells because of the observed rebound). The composite data are presented in box-and-whiskers format. For PCE and TCE, the markings indicate the median value, the first and third quartiles (box) and the minimum and maximum values (whiskers). The *y* axis provides the calculated k_{point} values (1/day), where negative values (green background) represent degradation or attenuation during the first 2 years of the field demonstration, 0 represents no change, and positive values (red background) represent rebound. The following are key observations for the composite k_{point} rates observed in OU-1 monitoring wells:

- The median first-order degradation coefficients for TCE and PCE were approximately −0.0008 and −0.0023 day^{-1}, respectively, at the end of Year 2. The estimated sitewide median degradation rates were slower than those calculated after Year 1 (estimated median degradation rates in Year 1 were -0.005 day^{-1} for both TCE and PCE). Based on the technical literature, degradation rates immediately following electron donor deployment are relatively high, and moderation of degradation rates is typically observed over time. This behavior was anticipated and previously discussed in the Year 1 progress report.
- The estimated degradation rates for most of the wells were negative, indicating active cVOC degradation and attenuation throughout much of the OU-1 plume.
- Isolated areas (notably near wells 0305 and well P054) exhibited rebound. In well 0305, the k_{point} values were +0.0005 day^{-1} (TCE) and +0.001 day^{-1} (PCE); in well P054, the k_{point} values remained negative at the end of the Year 2 monitoring period, but the observed rebound was in the last quarter—continued rebound would result in a positive calculated k_{point} value in Year 3. Concentrations in well 0305 (and other wells downgradient of suppressed or degraded sources) are expected to decrease in the future as the cVOC sources attenuate. The increase of concentration in well P054 will require focused attention to assure that this upgradient source has been adequately addressed. Calculation of attenuation

coefficients in the rebound wells and improved or refined time frames for attenuation of the overall plume can be performed after a downward trend is established. Documenting stabilization of concentrations and development of downward concentration (attenuation) trends in the Year 1 and Year 2 rebound wells is included in the key monitoring watch list.

- Well 0410 had a calculated positive k_{point} estimate for TCE (TCE and PCE in this well are below the MCLs for all cVOCs in this well).
- The median k_{point} rate constants and associated ranges in Figure 60 (based on concentration trends in a number of individual monitoring wells) compare favorably to the first-order rate coefficient calculated from the trend for overall contaminant mass in the OU-1 plume (see the zeroth moment in Section 2.2). This suggests that the wells identified in the Field Demonstration Work Plan (DOE 2014a) for inclusion in the k_{point} degradation rate evaluation are providing a representative assessment of overall remediation progress and providing additional information related to the spatial variation in attenuation rates throughout the OU-1 plume in response to the structured geochemical zone deployment.
- Assuming that degradation rates will continue to be moderate over time, a range of degradation rate values based on the median to the third quartile provides a reasonable basis for projecting remediation time frames: −0.0008 to −0.00014 day^{-1} (TCE) and −0.0020 to −0.0009 day^{-1} (PCE). These ranges correlate with half-lives of less than 2.5 years to 13 years (TCE) and less than 1 year to 2.1 years (PCE), respectively. The actual median and quartile degradation rates for TCE would be anticipated to be somewhat faster than those presented because PCE is currently being degraded into "new" TCE in the anaerobic treatment zones.

Table 7. Calculated k_{point} Values for Wells Identified in the Work Plan

	k_{point} values			
well	TCE		PCE	
P060	-0.0041	day^{-1}	-0.0063	day^{-1}
well 0410	0.0007	day^{-1}	-0.0027	day^{-1}
well 0419	-0.0013	day^{-1}	-0.0032	day^{-1}
P054	-0.0002	day^{-1}	-0.0020	day^{-1}
P059	-0.0001	day^{-1}	-0.0009	day^{-1}
well 0305	0.0005	day^{-1}	0.0012	day^{-1}
P061	-0.0008	day^{-1}	-0.0042	day^{-1}
well 0451	-0.0008	day^{-1}	-0.0009	day^{-1}
well 0452	-0.0002	day^{-1}	-0.0066	day^{-1}
P056	-0.0029	day^{-1}	-0.0026	day^{-1}
P058	-0.0012	day^{-1}	-0.0007	day^{-1}
P061	-0.0022	day^{-1}	-0.0023	day^{-1}
P062	-0.0011	day^{-1}	-0.0010	day^{-1}

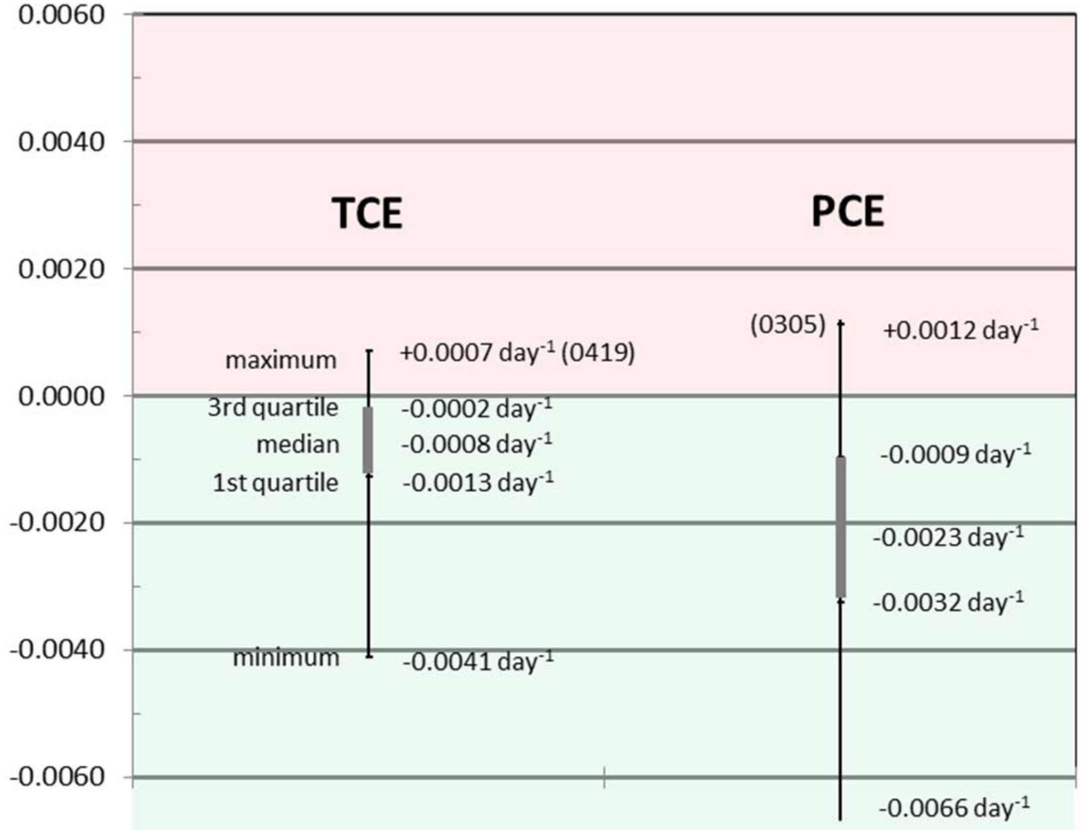


Figure 60. Distribution of k_{point} Values for PCE and TCE Calculated from Mound OU-1 Monitoring Wells During Year 1 and Year 2 of the EA Field Demonstration

3.2 Concentration Versus Distance Attenuation Rates

For plumes that have stabilized, concentration versus distance longsects (concentration profiles along the plume flow direction) provide a bulk ("plume-scale") estimate of attenuation rate (k_{long}). The two longsects to be used in the evaluation were defined in the EA Field Demonstration Work Plan (Figure 61). The plotted longsects (Figure 62 and Figure 63) include the wells listed in the work plan—well 0305 was added to longsect A-A′ (Figure 62) because this well is located near the path of A-A′, and well 0305 exhibited notable rebound. Longsect B-B′ was extended to include well P063. On the graphs, the baseline (August 2014), Year 1 (August 2015) and Year 2 (August 2016) longsects are depicted. The approximate locations of the anaerobic treatment zones along the longsect path are shaded, and the individual wells used to draw the longsect are labeled. The following are key observations for the longsect plots of OU-1 monitoring wells:

- The longsects document that the concentrations of parent cVOCs have generally decreased in wells that are in (or near) the anaerobic treatment zones.
- PCE in the wells that are in the internal plume area is generally decreasing. TCE has remained stable or rebounded slightly in the internal plume zone. This rebound was not

unexpected, as additional TCE can result from the reductive dechlorination in upgradient treatment zones.

- Well 0305 exhibited rebound (Figure 62) following the EA deployment and shutoff of the P&T system. TCE in well P054 exhibited significant rebound at the end of Year 2 (up to 25 μg/L). This is an important change and is addressed in a separate section of the Year 2 report.
- Because the system is still equilibrating, no attenuation rate can be calculated from the concentration-versus-distance data at this time. After the plume re-equilibrates (additional time and several plume pore volumes of flow are needed), the longsects may provide confirmatory estimates of degradation rates.

3.3 Downgradient Water Quality

Concentrations and concentration trends in the downgradient sentinel wells are important metrics related to potential plume status (i.e., whether the plume is expanding, stable, or shrinking). Data for the downgradient sentinel wells are shown in Figure 64 through Figure 68 for wells 0402, P031, P061, P062, and P063, respectively. The stable or downward trends in these wells provide field-scale evidence that attenuation rates in the contaminant plume are sufficient to degrade the mass fluxes from former primary and secondary source zones during Year 1 and Year 2 of the EA field demonstration. The following are key observations for the concentrations and trends in OU-1 downgradient sentinel monitoring wells during this period:

- The concentrations of both PCE and TCE in well P061 have decreased since the EA deployment; both constituents were above the MCL in the baseline (August 2014) sampling event and decreased below the MCL during Year 1 and Year 2.
- In the other distal downgradient sentinel wells, concentrations of all constituents have remained below the MCL in all samples. At the end of Year 2, all constituents were below their MCLs in all sentinel monitoring wells.
- The concentrations and trends in these graphs demonstrate that the OU-1 plume is not expanding and that attenuation rates in the plume were sufficient to mitigate the potential for plume expansion during this monitoring period—even with the P&T system turned off.
- The observed stability of concentrations (below MCLs) in the sentinel wells during the period of downgradient dewatering operations suggests that the EA remedy is operating relatively effectively in attenuating cVOCs throughout the bulk of the cVOC plume in OU-1. The observed increase in cVOCs in wells 0402 and P031 may be related to the dewatering pumping, but the observed increases were relatively small (< 1 or 2 μg/L), concentrations remained below MCLs, and concentrations appear to be stabilizing or decreasing at the end of Year 2 (following cessation of the dewatering operation).

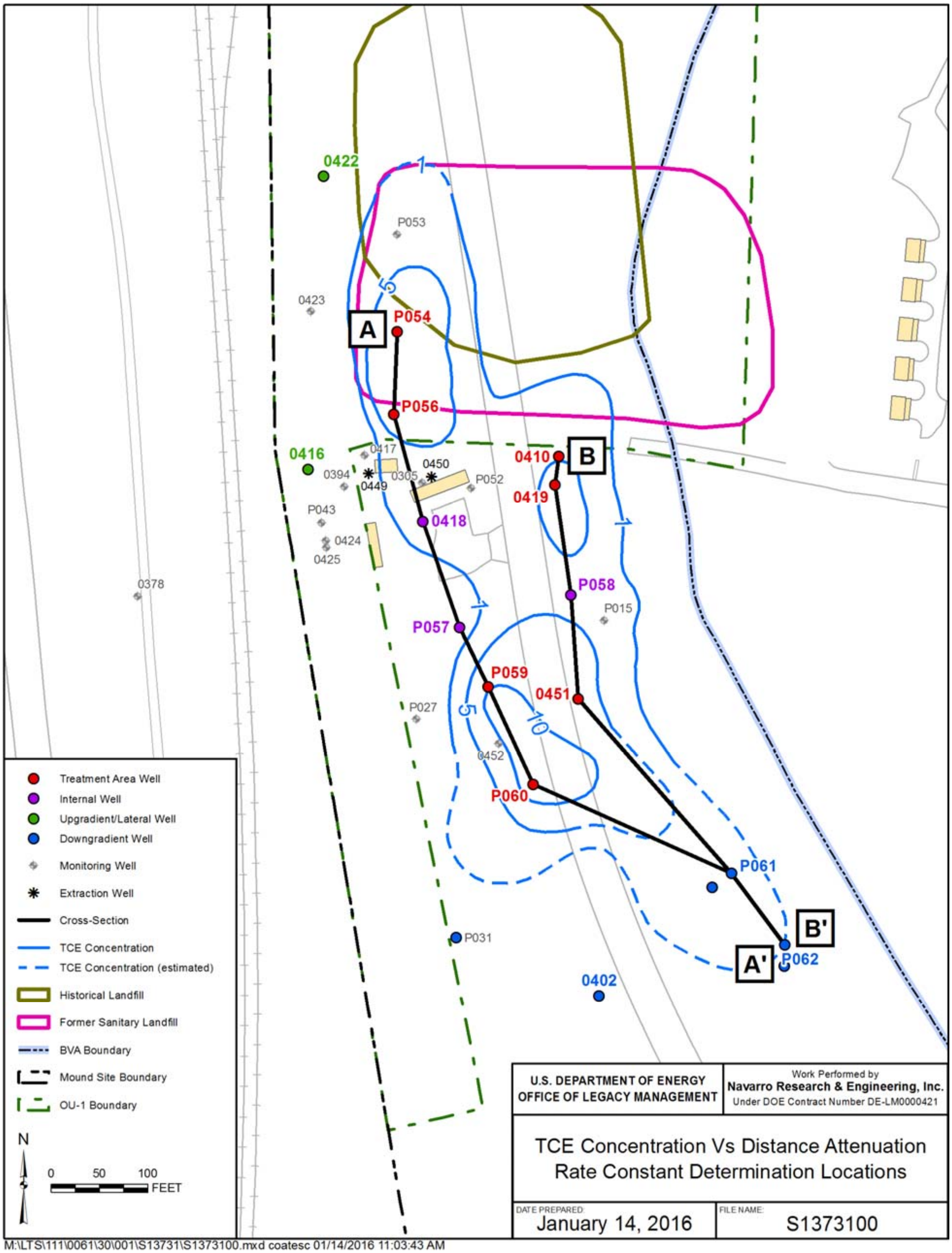


Figure 61. TCE Concentrations Versus Distance Attenuation Rate Constant Determination Locations

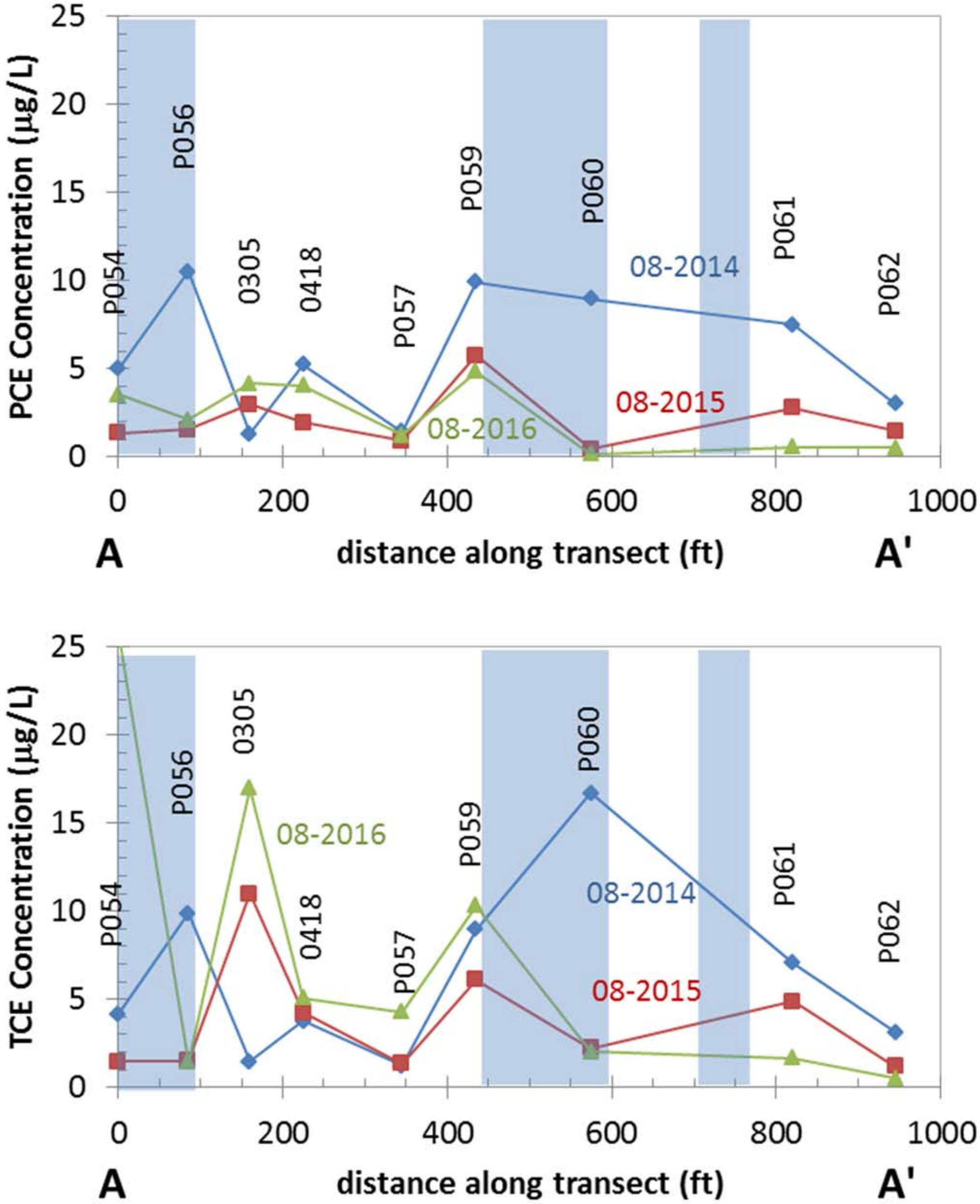
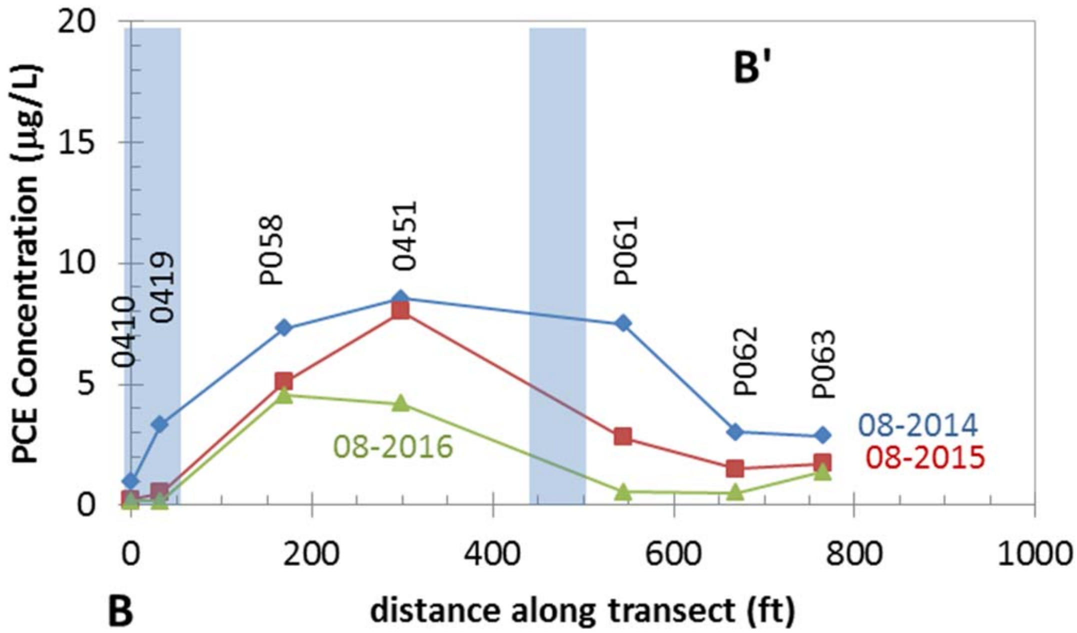


Figure 62. PCE and TCE Distribution for Longsect A-A' for Baseline Conditions (August 2014),Year 1 (August 2015), and Year 2 (August 2016)



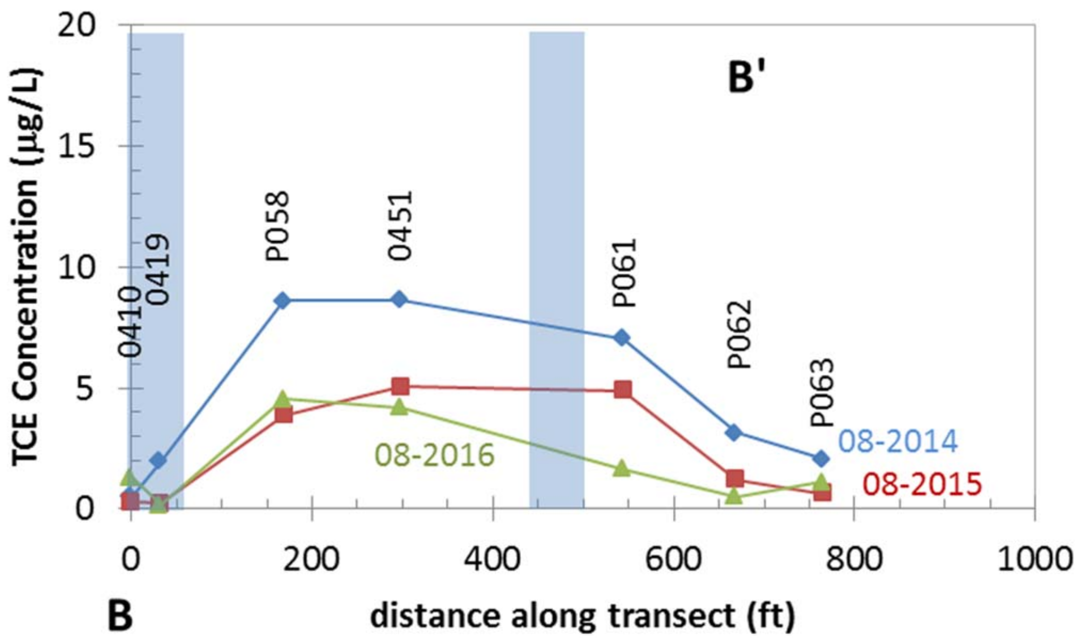


Figure 63. PCE and TCE Distribution for Longsect B-B' for Baseline Conditions (August 2014),Year 1 (August 2015), and Year 2 (August 2016)

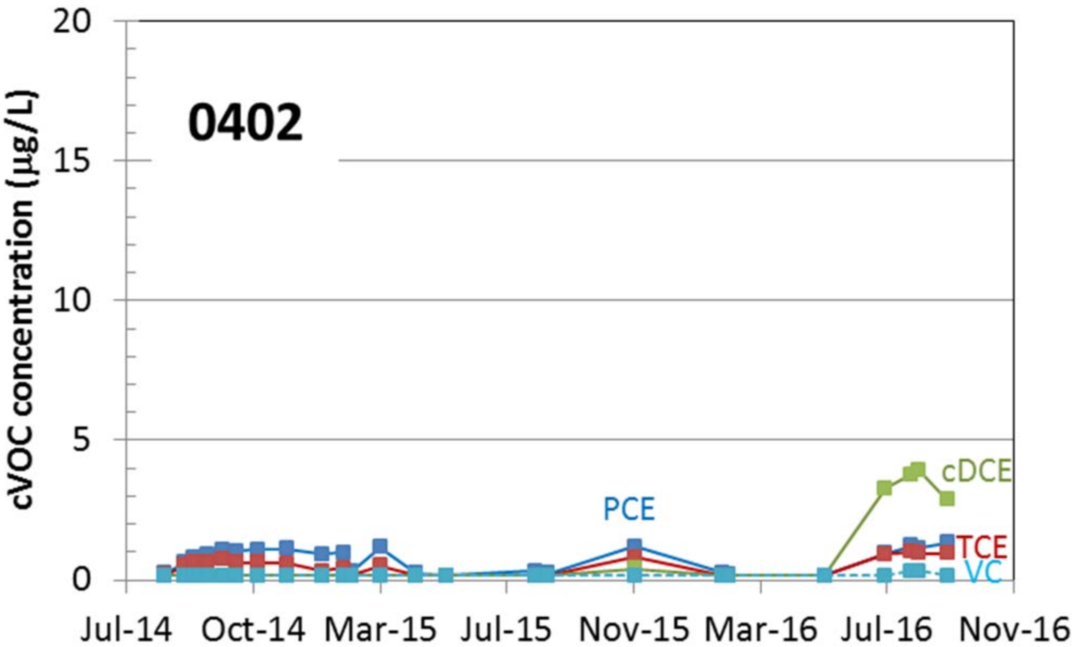


Figure 64. Concentrations for PCE and TCE in OU-1 Monitoring Well 0402 During Year 1 and Year 2 of the EA Field Demonstration

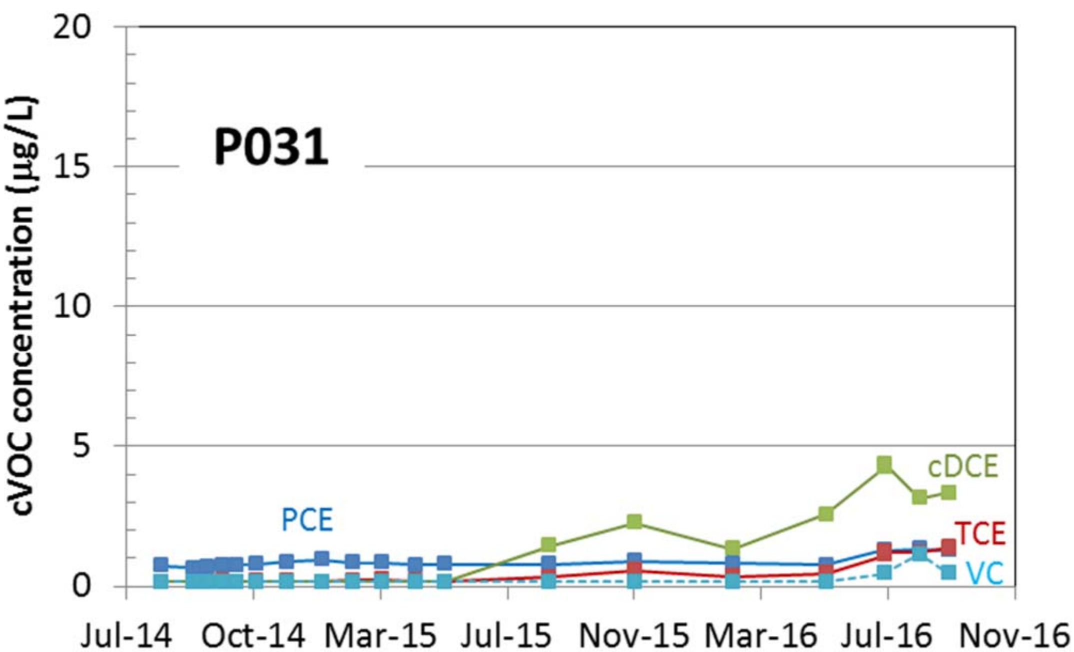


Figure 65. Concentrations for PCE and TCE in OU-1 Monitoring Well P031 During Year 1 and Year 2 of the EA Field Demonstration

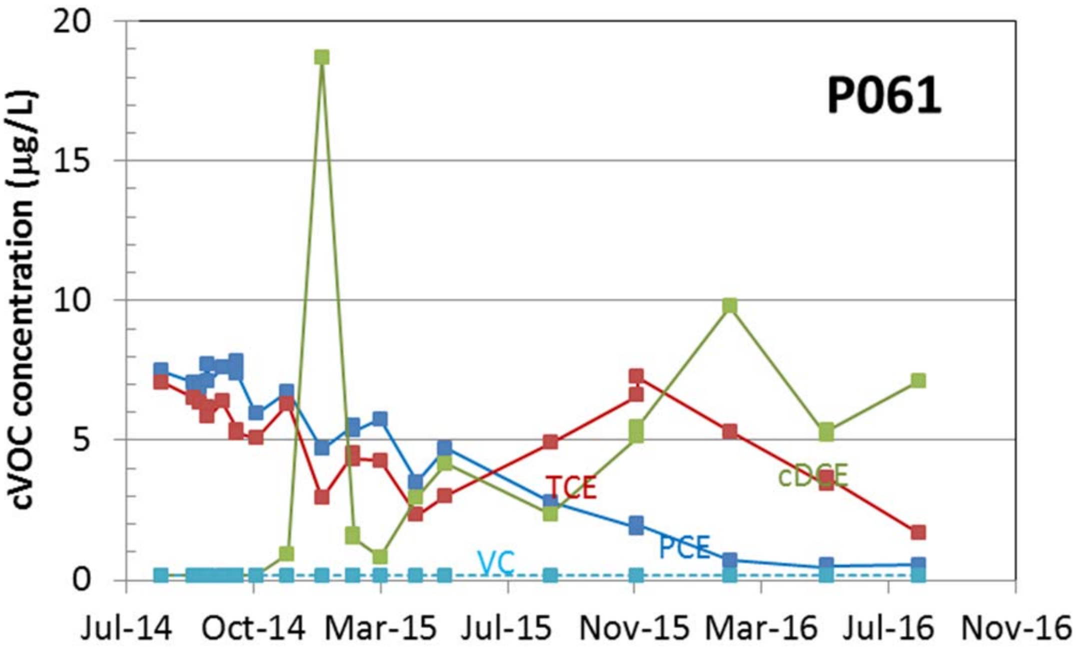


Figure 66. Concentrations for PCE and TCE in OU-1 Monitoring Well P061 During Year 1 and Year 2 of the EA Field Demonstration

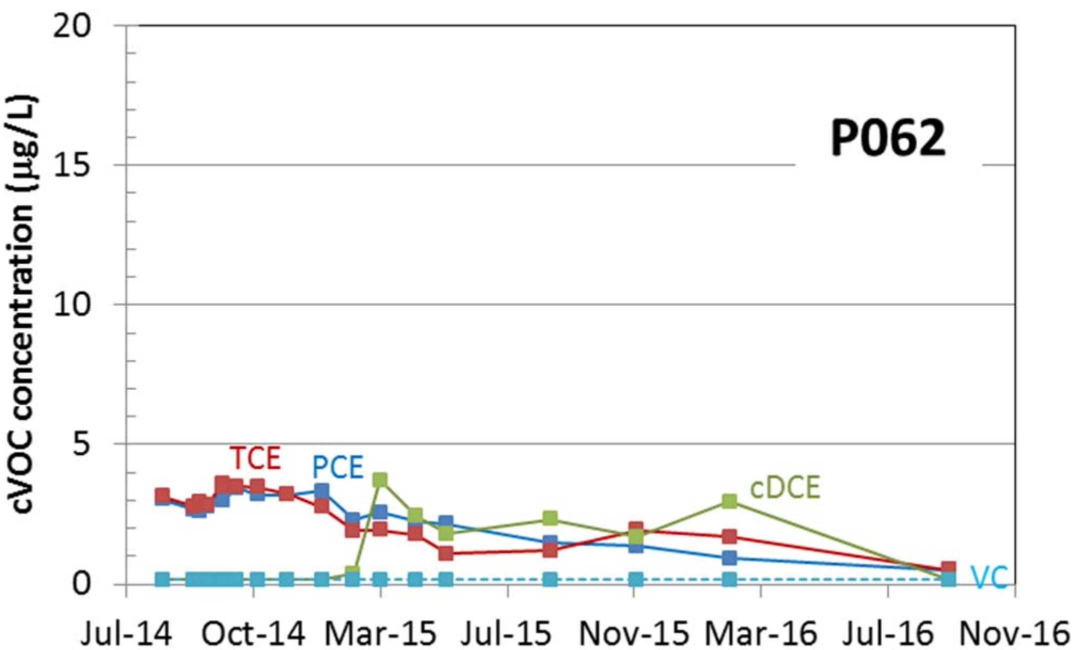


Figure 67. Concentrations for PCE and TCE in OU-1 Monitoring Well P062 During Year 1 and Year 2 of the EA Field Demonstration

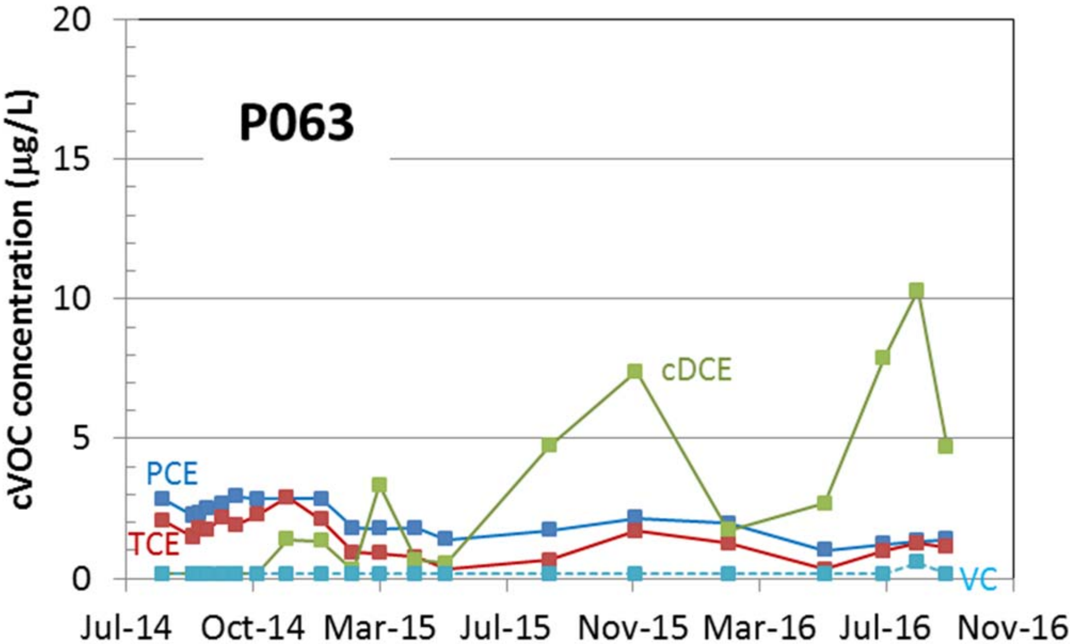


Figure 68. Concentrations for PCE and TCE in OU-1 Monitoring Well P063 During Year 1 and Year 2 of the EA Field Demonstration

4.0 Summary

In 2013, a core team that included DOE, EPA, Ohio EPA, and technical support organizations evaluated remedial options for OU-1. During the evaluation, DOE projected a cleanup time frame for the baseline P&T system of 26 years and a cleanup time frame for the EA remedy of 13 years. On the basis of that evaluation, DOE initiated this field demonstration, which required shutting down the P&T system. The combination of technologies implemented for the OU-1 EA included (1) neat vegetable oil in the vadose zone in the former landfill and (2) emulsified vegetable oil within the footprint of the groundwater plume.

Results from Year 2 of the field demonstration indicate that the dissolved PCE and TCE plumes continue to decrease in size and mass. Statistical tests indicate that the concentrations of the parent constituents in the majority of the source-area wells continue to decrease, with the exception of wells 0305 and P054 near the former landfill. The concentrations of PCE are projected to be below the target MCL of 5 µg/L within 3 to 4 years. Concentrations of TCE in wells throughout the plume are projected to be below the MCL of 5 µg/L within 6 to 21 years and generally fall within the designed projection of 13 years. The biogeochemistry and microbial community within the structured geochemical zones are consistent with the design and appear to be stable. At OU-1, EA continues to accelerate progress toward the remedial action objectives and reduce costs. Ongoing monitoring will determine whether the EA field demonstration has transitioned the site into MNA status and whether the EA will continue to be effective, timely, and sustainable.

4.1 Attenuation Mechanisms and Effectiveness

The following are key observations related to sitewide geochemistry and attenuation mechanisms during Year 1 and Year 2:

- Prior to the EA field demonstration deployment, the entire site was predominantly aerobic. Following deployment, predominantly anaerobic zones developed near and downgradient of electron donor injection.
- Prior to the EA field demonstration deployment, attenuation conditions over the entire site were at "slow" baseline conditions. Following deployment, enhanced cVOC reduction zones developed near and downgradient of electron donor injection. These zones also exhibited enhanced aerobic cometabolism in a number of areas.
- Enhanced (co)metabolism (oxidation) is expected to continue to develop downgradient of the injection zones. The data indicate shifts of geochemistry and microbial populations toward (co)metabolic conditions in the plume interior and sentinel well areas.
- Post-deployment, the patterns of anaerobic and aerobic conditions and the enhanced attenuation processes are consistent with the structured geochemical zone design basis. The sequence of anaerobic and aerobic conditions along the flow path of OU-1 groundwater provides conditions that maximize the degradation opportunities of parent (PCE and TCE) and daughter (DCE and VC) chlorinated ethenes and mitigates the potential for excessive buildup of VC.

4.2 Remediation Time Frame

An approximation of the remediation time frame can be developed based on the upper range of concentrations observed in the OU-1 plume and the observed attenuation rates during Year 1 and Year 2 of monitoring for the EA field demonstration. Assuming a maximum PCE concentration of 10 µg/L and a maximum TCE concentration of 20 µg/L (in August 2016), and attenuation rates of −0.0023 to −0.0009 day^{-1} (PCE) and −0.0002 to −0.0008 day^{-1} (TCE), the approximate total time frame (starting from the deployment in September 2014) for the site concentrations to reach the MCL can be estimated. This time frame would be 3 to 4 years (if not less than 3 years) for PCE and 6 to 21 years (if not less than 6 years) for TCE. These rates are generally consistent with the original design basis of 13 years.

The current remediation time frame estimate for TCE is highly uncertain because PCE source material is currently being degraded into TCE (resulting in artificially low estimates of TCE degradation rates) and because preliminary cVOC data from Year 3 (November 2016) indicate that TCE concentrations in well P054 have spiked above 100 µg/L. As monitoring continues into the third year of the field demonstration, it is likely that the estimated attenuation rates will stabilize and allow more effective projections of remediation time frame.

4.3 Status of EA Performance – Year Two

The purpose of the field demonstration is to determine whether discrete treatment zones can be established that expedite the attenuation of cVOCs in the OU-1 groundwater. There were several areas in the OU-1 area where elevated concentrations of cVOCs were present in groundwater and soil. To better evaluate a transition to MNA, DOE is conducting a 3-year field demonstration to evaluate the use of edible oils to enhance natural attenuation processes.

4.3.1 Evaluation of Objectives

The overall goal of the field demonstration is to show that the treatment zones can be established and effectively maintained such that cVOC concentrations in groundwater can decrease to MCLs in a reasonable time frame. The following objectives were established for the field demonstration:

- **Assess the performance and viability of attenuation using structured geochemical zones as a remediation strategy for OU-1 groundwater.**

During Year 1 and Year 2 of the EA field demonstration, changes in the concentrations of parent and daughter cVOCs in OU-1 monitoring wells located in the anaerobic treatment zones and downgradient of those areas provide confirmation of reductive dechlorination. The chemistry of the aquifer at the downgradient wells continues to have higher ORP values and measurable DO concentrations.

The results from Year 1 and Year 2 of the field demonstration indicate that the dissolved PCE and TCE plumes have decreased in size and mass. The concentrations of PCE and TCE throughout the plume are projected to be below the target MCL of 5 µg/L within the original design projection of 13 years (CY 2027).

- **Stabilize the plume and minimize and mitigate the potential for plume growth.**

MAROS plume evaluation analysis shows that the structured geochemical zones are working as designed. Overall, the moment analyses indicate that plume strength of the parent constituents is decreasing, the plumes can generally be classified as stable or shrinking, and the plumes are behaving as anticipated as indicated by decreasing total dissolved mass that indicates plume shrinkage, the stable or upgradient direction of movement of the center of mass, the continual transformation by reductive dechlorination, and the generally decreasing concentration trends in a majority of the monitoring wells. Key observations for each analyte are given.

- PCE: The total dissolved mass of PCE in the OU-1 area has decreased. The plume has remained relatively stable during Year 2 of the study with no downgradient movement of the center of mass or spread of the plume.
- TCE: The total dissolved mass of TCE in the OU-1 area has decreased. The center of the TCE mass has receded, indicating the center of the plume mass is not moving downgradient. The TCE plume may be spreading (becoming more uniform in concentration) in the direction of groundwater flow; however, this may be a result of the overall decrease in concentrations within the plume that makes the distribution seem more uniform or influences of the dewatering projects that temporarily affected groundwater flow and direction.
- cDCE: The total dissolved mass of cDCE in the OU-1 area has increased, which was anticipated. The center of the plume mass has shown some downgradient movement, although there was little spreading observed over that which occurred during Year 1. The lack of cDCE spread is likely the result of degradation processes impeding spread.
- VC: The total dissolved mass of VC in the OU-1 area has increased, which was anticipated. The center of the VC mass has moved in the direction of groundwater flow and has shown some spread both laterally and downgradient.

Concentrations and concentration trends in the downgradient sentinel wells are an important metric related to potential plume expansion. The concentrations and trends in these wells demonstrate that the cVOC plume is not expanding. The observed stability of concentrations (below MCLs) in the sentinel wells during the period of downgradient dewatering operations suggests that EA is operating relatively effectively in attenuating cVOCs throughout the bulk of the cVOC plume in OU-1. The observed increase in cVOCs in wells 0402 and P031 may be related to the dewatering pumping, but the observed increases were relatively small (< 1 or 2 µg/L), concentrations remained below MCLs, and concentrations appear to be stabilizing or decreasing at the end of Year 2 (following cessation of the dewatering operation).

- **Develop the biogeochemical conditions to accelerate progress to remedial objectives and transition the strategy to MNA.**

The results from Year 1 and Year 2 of the field demonstration show that the structured geochemical zones have been sustained. In and near the anaerobic treatment zones, aquifer geochemistry changed from an oxidizing to a reducing condition as indicated by ORP and DO data and indications of increased microbial activity continue to be observed through the presence of increased metabolic byproducts and methane concentrations in groundwater samples. Chlorinated-solvent-reducing bacterial counts showed significant increases in treatment zones. Within these structured geochemical zones, the dissolved TCE plume has decreased in size, and statistical tests indicate the cVOC concentrations in the majority of the source-area wells are decreasing.

All of the microbial counts (total bacteria, chlorinated-solvent-reducing bacteria, aerobic cometabolic bacteria, methanogens, and sulfate reducers) increased following the EA deployment and have been sustained through Year 2. The wells in the treatment zones have shown significant increases in chlorinated-solvent-reducing bacteria that are capable of degrading TCE and PCE. Side-gradient, intermediate, and downgradient wells have also shown increases in chlorinated-solvent-reducing bacteria counts. Total eubacteria, sulfate reducers, and methanogens increased in the mid-plume and distal areas and are at levels that indicate aerobic and transitional conditions, consistent with the objectives of structured geochemical zones. Following recovery of the aquifer after the effects of the dewatering projects, the overall microbial community remained relatively stable and structured geochemical zones remained in place.

4.3.2 Evaluation of Significant Rebound in Well P054

The observed increase in cVOC concentrations (rebound) in well P054 during the last sampling event in Year 2 has been identified as an important watch item by the technical team. As an initial and proactive endeavor, the technical team added preliminary November cVOC data (Year 3) for this well to assist in developing a path forward, similar to the inclusion of the November data in the evaluation of the microbial ecology to address possible impacts of nearby offsite dewatering activities. The resulting cVOC data for well P054 are presented in Figure 69. The data are plotted through the end of the EA Year 2 monitoring period in Figure 38 and the plotting period is extended to include the preliminary November data in Figure 69. The data indicate that cVOC concentrations in P054 increased significantly between August and November 2016 with TCE, cDCE, and VC above MCLs. Well P054 was installed in 2009. For historical perspective, cVOC data from 2009 through 2016 are shown in Figure 70.

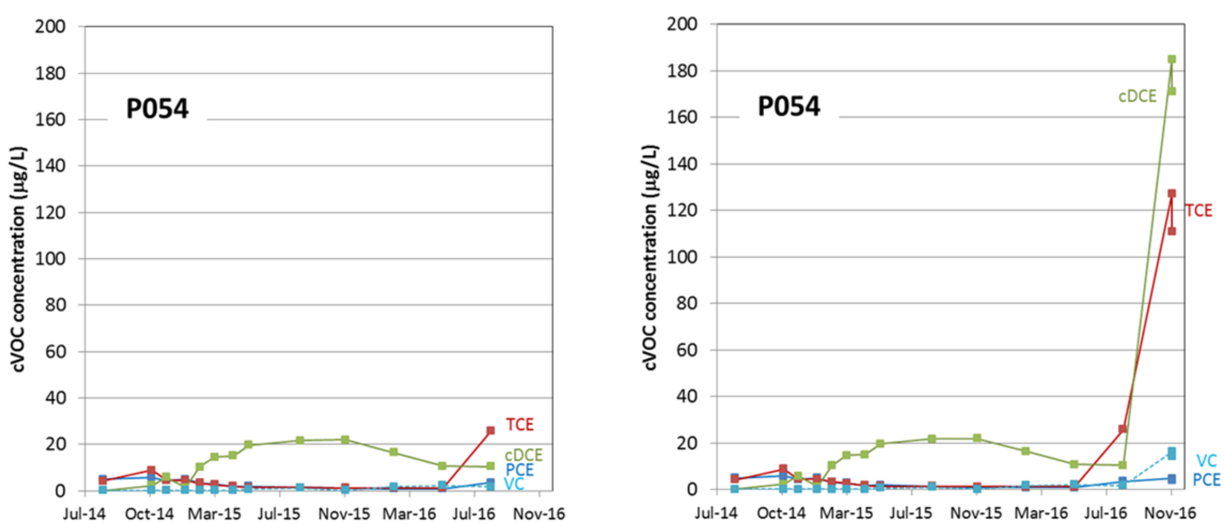


Figure 69. cVOC Concentrations in Well P054: (a) at the End of the Year 2 Monitoring Period (August 2016) and (b) with the Plot Extended to Include the Preliminary Data from the Sampling in November 2016

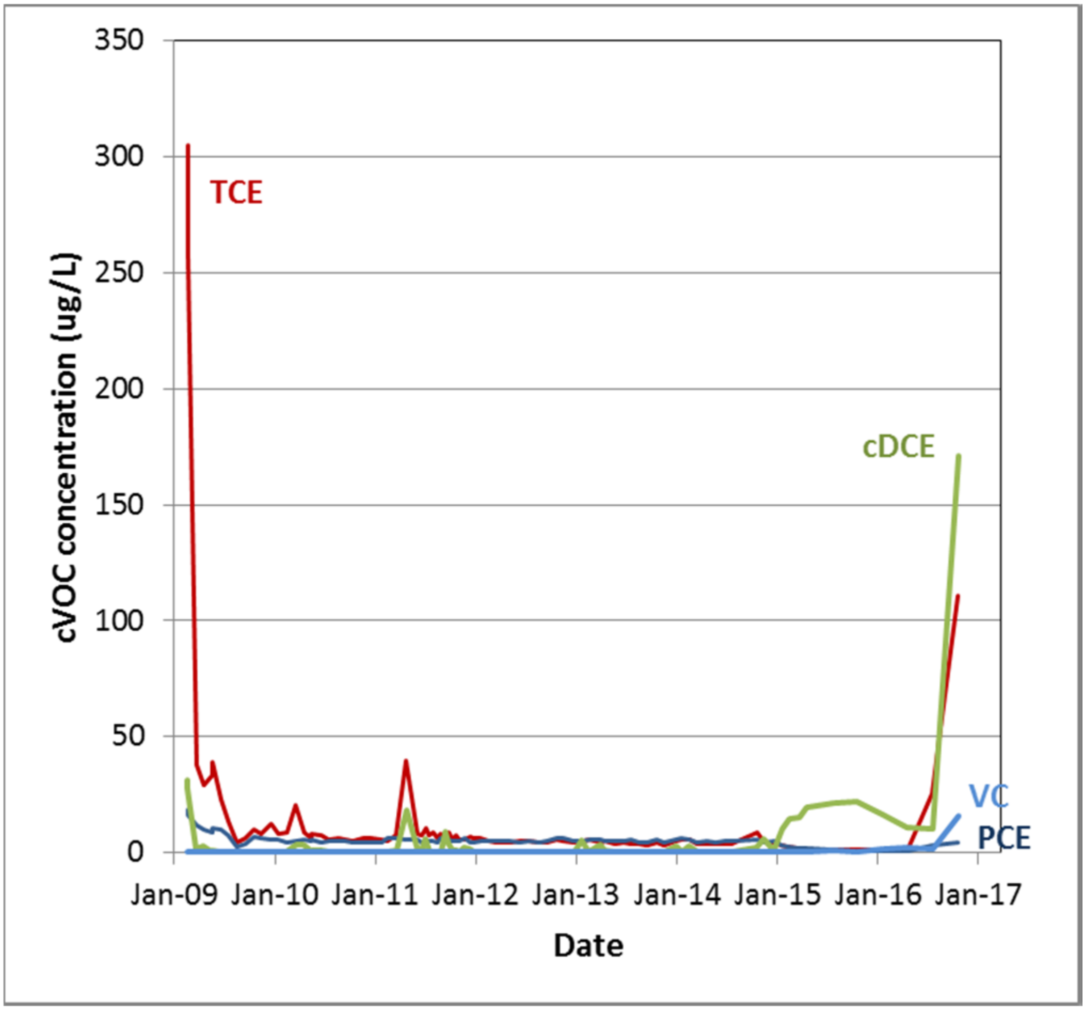


Figure 70. Historical cVOC Concentrations for Well P054

Note that P054 is in the upgradient portion of the OU-1 plume in the original source area and the substantive presence of daughter products indicates that active attenuation is occurring in this area. There are a number of possible explanations for the observed concentration increases:

- Mobilization of source material due to the large groundwater fluctuations (3 to 5 ft) during the offsite dewatering projects during 2016
- Loading of the neat oil due to insufficient deployment quantities
- Resoluabilization of VOCs from neat oil that smeared onto the vadose zone due to large water level changes
- Introduction of small amount of neat oil containing VOCs into the groundwater sample

The current data are not sufficient to determine the cause or future course of the concentration trend, the ability of the local degradation to treat the spike in a reasonable time frame, nor the capacity of the EA zones to mitigate the concentrations as groundwater moves through the length of the OU-1 plume. This increase is considered significant by the technical team and will be added to the watch list to determine the cause for this increase and assure that this upgradient source area has been adequately addressed.

4.3.3 Evaluation of Contingency and Core Team Decision Criteria

A number of indicators of acceptable and unacceptable performance were developed in the Field Demonstration Work Plan (DOE 2014a). The indicators related to three categories:

- Development of structured geochemical zones (Table 8)
- cVOC concentrations and trends in intermediate sentinel wells (Table 9)
- cVOC concentrations and trends in terminal sentinel wells (Table 10)

The work plan indicated that the Core Team would determine performance in each category based on a preponderance of the indicators. The resulting performance determinations in each category helped the Core Team to assess whether the overall performance is acceptable and to determine the potential type and need of contingency action. As summarized in Table 8 through Table 10, the monitoring data from Year 2 shows that the performance was well within the acceptable classification, suggesting that no contingency action is needed. The system is on track for continued monitoring. The summary presentations in Table 8 through Table 10 list the original indicator parameters and metrics. If the monitoring data strongly support acceptable performance of an indicator parameter, the acceptable cell is colored green; if a preponderance of the data suggests either acceptable or unacceptable performance of an indicator parameter, the appropriate cell is colored yellow; if the data strongly support unacceptable performance of an indicator parameter, the unacceptable cell is colored red.

In general, the indicator parameters were in the acceptable range (with items marked in yellow included in the Year 3 watch list. The rebound in well P054 is an exception to this finding (and is marked red in the unacceptable column). The technical team recommends specific and focused activities to address the P054 well area.

Table 8. Performance Criteria: Development of Structured Geochemical Zones

Acceptable Performance	Unacceptable Performance
Reducing conditions at injection points	Lack of reducing conditions at injection points
Aerobic conditions along downgradient and lateral fringes	Lack of aerobic conditions along downgradient and lateral fringes
Decrease in cVOC concentrations	No change in cVOC concentrations or increase in cVOC concentrations (P054)
Increase in cVOC daughter products	Lack of cVOC daughter products
Stability or shrinking of the plume	Expansion of the plume

Table 9. Performance Criteria: cVOC Concentrations and Trends in Intermediate Sentinel Wells

Acceptable Performance	Unacceptable Performance
Stable or decreasing cVOC concentrations	Upward trends in cVOC concentrations
Concentration below 2× MCL for TCE and PCE	Sustained exceedance of 2× MCL for TCE or PCE
Aerobic conditions	Indication of geochemical change to anaerobic
Low concentrations of cVOC daughter products	Appearance of significant (above MCL) cVOC daughter products

Table 10. Performance Criteria: cVOC Concentrations and Trends in Terminal Sentinel Wells

Acceptable Performance	Unacceptable Performance
cVOCs below MCL	Sustained exceedance of MCL
Stable or decreasing cVOC concentrations	Upward trends in cVOC concentrations
Aerobic conditions	Indication of geochemical change to anaerobic
Low concentrations of cVOC daughter products	Appearance of significant (above MCL) cVOC daughter products

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5.0 Path Forward

5.1 Monitoring

No changes to the monitoring are warranted based on the data gathered during the second year of the field demonstration. Sampling will continue to be performed quarterly as outlined in the Sampling and Analysis Plan (DOE 2014c).

5.2 Monitoring Watch List

A number of items have been identified from the EA field demonstration that will provide key information moving forward. These items were consolidated into a monitoring watch list. Future reports will highlight the data from this list:

- **Wells with rebound during Year 1 and Year 2:** Isolated areas (notably near wells 0305 and P054) exhibited rebound (increased concentrations) for TCE and PCE at the end of Year 2. The increase in concentration in well P054 will require focused attention to determine the cause for this increase and assure that this upgradient source area has been adequately addressed. The concentrations in well 0305 (and other mid-plume wells) are expected to decrease in the future as the upgradient sources attenuate. Documenting stabilization of concentrations and development of downward concentration (attenuation) trends in these wells is needed to assess the longer-term effectiveness of the EA remedy and refine the projected remediation time frames.
- **Geochemical conditions for the anaerobic treatment zones:** Sulfate was moderately high prior to the injections and decreased significantly after injections. Some rebound water was observed at the end of Year 1. Sulfate concentrations remained elevated after Year 1 and rebounded to baseline levels at several locations at the end of Year 2. This increase is likely the influence of recovery of the water table after the offsite dewatering projects in 2016 were completed. Sulfate and TOC concentrations will need to be watched to ensure maintenance of the structured geochemical zones.
- **Microbial data in mid-plume and distal wells:** The progress of microbial communities into transitional and significant ranges (for cometabolic and reductive dechlorination species) should be watched as groundwater from upgradient treatment zones continues to move through these areas.

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Appendix A

Groundwater Quality Data

Year 2

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Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0305	Ammonia Total as N	11/5/2015	0.192	0.017			mg/L	D
0305	Ammonia Total as N	11/5/2015	0.114	0.017			mg/L	F
0305	Ammonia Total as N	2/3/2016	0.0826	0.017	J	UF	mg/L	F
0305	Ammonia Total as N	5/3/2016	0.14	0.017		F	mg/L	D
0305	Ammonia Total as N	5/3/2016	0.0627	0.017	J	UF	mg/L	F
0305	Ammonia Total as N	8/2/2016	0.142	0.017			mg/L	F
0305	Chloride	11/5/2015	203	2.68			mg/L	D
0305	Chloride	11/5/2015	202	2.68			mg/L	F
0305	Chloride	2/3/2016	140	1.34		F	mg/L	F
0305	Chloride	5/3/2016	169	1.68		JF	mg/L	D
0305	Chloride	5/3/2016	160	1.68		JF	mg/L	F
0305	Chloride	8/2/2016	228	3.35			mg/L	F
0305	Dissolved Oxygen	11/5/2015	2.11				mg/L	F
0305	Dissolved Oxygen	2/3/2016	0.83			F	mg/L	F
0305	Dissolved Oxygen	5/3/2016	1.82			F	mg/L	F
0305	Dissolved Oxygen	8/2/2016	0.95				mg/L	F
0305	Ethane	11/5/2015	10	10	U		µg/L	D
0305	Ethane	11/5/2015	10	10	U		µg/L	F
0305	Ethane	2/3/2016	500	500	U	F	µg/L	F
0305	Ethane	5/3/2016	500	500	U	F	µg/L	D
0305	Ethane	5/3/2016	500	500	U	F	µg/L	F
0305	Ethane	8/2/2016	10	10	U		µg/L	F
0305	Ethene	11/5/2015	10	10	U		µg/L	D
0305	Ethene	11/5/2015	10	10	U		µg/L	F
0305	Ethene	2/3/2016	500	500	U	F	µg/L	F
0305	Ethene	5/3/2016	500	500	U	F	µg/L	D
0305	Ethene	5/3/2016	500	500	U	F	µg/L	F
0305	Ethene	8/2/2016	10	10	U		µg/L	F
0305	Iron	11/5/2015	0.399	0.03			mg/L	D
0305	Iron	11/5/2015	0.474	0.03			mg/L	F
0305	Iron	2/3/2016	0.03	0.03	U	F	mg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0305	Iron	5/3/2016	0.0807	0.03	B	F	mg/L	D
0305	Iron	5/3/2016	0.0943	0.03	B	F	mg/L	F
0305	Iron	8/2/2016	0.245	0.03			mg/L	F
0305	Methane	11/5/2015	2900	200			µg/L	D
0305	Methane	11/5/2015	4840	500			µg/L	F
0305	Methane	2/3/2016	1270	500		F	µg/L	F
0305	Methane	5/3/2016	5230	500		F	µg/L	D
0305	Methane	5/3/2016	4750	500		F	µg/L	F
0305	Methane	8/2/2016	435	20			µg/L	F
0305	Nitrate as Nitrogen	11/5/2015	0.244	0.165	J		mg/L	D
0305	Nitrate as Nitrogen	11/5/2015	0.274	0.165	J		mg/L	F
0305	Nitrate as Nitrogen	2/3/2016	0.291	0.132	J	F	mg/L	F
0305	Nitrate as Nitrogen	5/3/2016	0.119	0.066	HJ	JF	mg/L	D
0305	Nitrate as Nitrogen	5/3/2016	0.127	0.066	HJ	JF	mg/L	F
0305	Nitrate as Nitrogen	8/2/2016	0.116	0.066	J		mg/L	F
0305	Oxidation Reduction Potential	11/5/2015	-127.3				mV	F
0305	Oxidation Reduction Potential	2/3/2016	35.8			F	mV	F
0305	Oxidation Reduction Potential	5/3/2016	-6.7			F	mV	F
0305	Oxidation Reduction Potential	8/2/2016	-39.4				mV	F
0305	Specific Conductance	11/5/2015	1520				umhos/cm	F
0305	Specific Conductance	2/3/2016	1440			F	umhos/cm	F
0305	Specific Conductance	5/3/2016	1480			F	umhos/cm	F
0305	Specific Conductance	8/2/2016	1580				umhos/cm	F
0305	Sulfate	11/5/2015	97.6	5.32			mg/L	D
0305	Sulfate	11/5/2015	98.3	5.32			mg/L	F
0305	Sulfate	2/3/2016	156	2.66		F	mg/L	F
0305	Sulfate	5/3/2016	140	3.33		JF	mg/L	D
0305	Sulfate	5/3/2016	138	3.33		JF	mg/L	F
0305	Sulfate	8/2/2016	134	6.65			mg/L	F
0305	Temperature	11/5/2015	14.1				C	F
0305	Temperature	2/3/2016	14.1			F	C	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0305	Temperature	5/3/2016	13.7			F	C	F
0305	Temperature	8/2/2016	19.6				C	F
0305	Tetrachloroethene	11/5/2015	3.54	0.16			µg/L	D
0305	Tetrachloroethene	11/5/2015	3.21	0.16			µg/L	F
0305	Tetrachloroethene	2/3/2016	2.91	0.16		F	µg/L	F
0305	Tetrachloroethene	5/3/2016	4.01	0.16		F	µg/L	D
0305	Tetrachloroethene	5/3/2016	3.96	0.16		F	µg/L	F
0305	Tetrachloroethene	8/2/2016	4.17	0.16			µg/L	F
0305	Total Organic Carbon	11/5/2015	1.36	0.33			mg/L	D
0305	Total Organic Carbon	11/5/2015	1.34	0.33			mg/L	F
0305	Total Organic Carbon	2/3/2016	1.75	0.33		F	mg/L	F
0305	Total Organic Carbon	5/3/2016	1.62	0.33		F	mg/L	D
0305	Total Organic Carbon	5/3/2016	1.57	0.33		F	mg/L	F
0305	Total Organic Carbon	8/2/2016	1.57	0.33			mg/L	F
0305	Trichloroethene	11/5/2015	16.6	0.16			µg/L	D
0305	Trichloroethene	11/5/2015	15.2	0.16			µg/L	F
0305	Trichloroethene	2/3/2016	7.41	0.16		F	µg/L	F
0305	Trichloroethene	5/3/2016	8.09	0.16		F	µg/L	D
0305	Trichloroethene	5/3/2016	7.97	0.16		F	µg/L	F
0305	Trichloroethene	8/2/2016	17	0.16			µg/L	F
0305	Turbidity	11/5/2015	2.35				NTU	F
0305	Turbidity	2/3/2016	0.46			F	NTU	F
0305	Turbidity	5/3/2016	9.8			F	NTU	F
0305	Turbidity	8/2/2016	1.63				NTU	F
0305	Vinyl Chloride	11/5/2015	0.93	0.16	J		µg/L	D
0305	Vinyl Chloride	11/5/2015	0.76	0.16	J		µg/L	F
0305	Vinyl Chloride	2/3/2016	0.16	0.16	U	F	µg/L	F
0305	Vinyl Chloride	5/3/2016	0.56	0.16	J	F	µg/L	D
0305	Vinyl Chloride	5/3/2016	0.51	0.16	J	F	µg/L	F
0305	Vinyl Chloride	8/2/2016	2.35	0.16			µg/L	F
0305	cis-1,2-Dichloroethene	11/5/2015	5.6	0.16		J	µg/L	D

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0305	cis-1,2-Dichloroethene	11/5/2015	4.5	0.16		J	µg/L	F
0305	cis-1,2-Dichloroethene	2/3/2016	1.55	0.16		F	µg/L	F
0305	cis-1,2-Dichloroethene	5/3/2016	2.27	0.16		F	µg/L	D
0305	cis-1,2-Dichloroethene	5/3/2016	2.2	0.16		F	µg/L	F
0305	cis-1,2-Dichloroethene	8/2/2016	12.1	0.16			µg/L	F
0305	pH	11/5/2015	7.06				s.u.	F
0305	pH	2/3/2016	6.94			F	s.u.	F
0305	pH	5/3/2016	6.78			F	s.u.	F
0305	pH	8/2/2016	6.95				s.u.	F
0305	trans-1,2-Dichloroethene	11/5/2015	0.18	0.16	J		µg/L	D
0305	trans-1,2-Dichloroethene	11/5/2015	0.17	0.16	J		µg/L	F
0305	trans-1,2-Dichloroethene	2/3/2016	0.16	0.16	U	F	µg/L	F
0305	trans-1,2-Dichloroethene	5/3/2016	0.16	0.16	U	F	µg/L	D
0305	trans-1,2-Dichloroethene	5/3/2016	0.16	0.16	U	F	µg/L	F
0305	trans-1,2-Dichloroethene	8/2/2016	0.16	0.16	U		µg/L	F
0317	Dissolved Oxygen	8/1/2016	0.76				mg/L	F
0317	Dissolved Oxygen	8/29/2016	4.31			F	mg/L	F
0317	Oxidation Reduction Potential	8/1/2016	193.4				mV	F
0317	Oxidation Reduction Potential	8/29/2016	48.5			F	mV	F
0317	Specific Conductance	8/1/2016	1420				umhos/cm	F
0317	Specific Conductance	8/29/2016	1430			F	umhos/cm	F
0317	Temperature	8/1/2016	15.1				C	F
0317	Temperature	8/29/2016	14.2			F	C	F
0317	Tetrachloroethene	8/1/2016	0.16	0.16	U		µg/L	F
0317	Tetrachloroethene	8/29/2016	0.16	0.16	U	F	µg/L	F
0317	Trichloroethene	8/1/2016	0.16	0.16	U		µg/L	F
0317	Trichloroethene	8/29/2016	0.16	0.16	U	F	µg/L	F
0317	Turbidity	8/1/2016	17.4				NTU	F
0317	Turbidity	8/29/2016	40.6			F	NTU	F
0317	Vinyl Chloride	8/1/2016	0.16	0.16	U		µg/L	F
0317	Vinyl Chloride	8/29/2016	0.16	0.16	U	F	µg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0317	cis-1,2-Dichloroethene	8/1/2016	0.16	0.16	U		µg/L	F
0317	cis-1,2-Dichloroethene	8/29/2016	0.16	0.16	U	F	µg/L	F
0317	pH	8/1/2016	6.85				s.u.	F
0317	pH	8/29/2016	7.02			F	s.u.	F
0317	trans-1,2-Dichloroethene	8/1/2016	0.16	0.16	U		µg/L	F
0317	trans-1,2-Dichloroethene	8/29/2016	0.16	0.16	U	F	µg/L	F
0379	Chloride	11/2/2015	299	3.35			mg/L	F
0379	Chloride	2/1/2016	270	3.35		F	mg/L	F
0379	Chloride	5/2/2016	203	3.35		F	mg/L	F
0379	Chloride	8/1/2016	268	3.35			mg/L	F
0379	Dissolved Oxygen	11/2/2015	1.27				mg/L	F
0379	Dissolved Oxygen	2/1/2016	2.17			F	mg/L	F
0379	Dissolved Oxygen	5/2/2016	2.69			F	mg/L	F
0379	Dissolved Oxygen	8/1/2016	2.4				mg/L	F
0379	Iron	11/2/2015	0.03	0.03	U		mg/L	F
0379	Iron	2/1/2016	0.0851	0.03	B	F	mg/L	F
0379	Iron	5/2/2016	0.0399	0.03	B	F	mg/L	F
0379	Iron	8/1/2016	0.0467	0.03	B		mg/L	F
0379	Nitrate as Nitrogen	11/2/2015	0.356	0.165	J		mg/L	F
0379	Nitrate as Nitrogen	2/1/2016	0.435	0.33	J	F	mg/L	F
0379	Nitrate as Nitrogen	5/2/2016	0.502	0.165		F	mg/L	F
0379	Nitrate as Nitrogen	8/1/2016	0.411	0.165	J		mg/L	F
0379	Oxidation Reduction Potential	11/2/2015	179.4				mV	F
0379	Oxidation Reduction Potential	2/1/2016	40.8			F	mV	F
0379	Oxidation Reduction Potential	5/2/2016	38			F	mV	F
0379	Oxidation Reduction Potential	8/1/2016	65.1				mV	F
0379	Specific Conductance	11/2/2015	1750				umhos/cm	F
0379	Specific Conductance	2/1/2016	1650			F	umhos/cm	F
0379	Specific Conductance	5/2/2016	1480			F	umhos/cm	F
0379	Specific Conductance	8/1/2016	1670				umhos/cm	F
0379	Sulfate	11/2/2015	57.1	0.665			mg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0379	Sulfate	2/1/2016	62.6	0.665		F	mg/L	F
0379	Sulfate	5/2/2016	67.8	0.665		F	mg/L	F
0379	Sulfate	8/1/2016	57.6	0.665			mg/L	F
0379	Temperature	11/2/2015	14.4				C	F
0379	Temperature	2/1/2016	13.6			F	C	F
0379	Temperature	5/2/2016	14.3			F	C	F
0379	Temperature	8/1/2016	19.5				C	F
0379	Tetrachloroethene	11/2/2015	0.4	0.16	J		µg/L	F
0379	Tetrachloroethene	2/1/2016	0.29	0.16	J	F	µg/L	F
0379	Tetrachloroethene	5/2/2016	0.26	0.16	J	F	µg/L	F
0379	Tetrachloroethene	8/1/2016	0.32	0.16	J		µg/L	F
0379	Trichloroethene	11/2/2015	1.7	0.16			µg/L	F
0379	Trichloroethene	2/1/2016	1.65	0.16		F	µg/L	F
0379	Trichloroethene	5/2/2016	1.27	0.16		F	µg/L	F
0379	Trichloroethene	8/1/2016	1.49	0.16			µg/L	F
0379	Turbidity	11/2/2015	3.57				NTU	F
0379	Turbidity	2/1/2016	9.98			F	NTU	F
0379	Turbidity	5/2/2016	85.8			F	NTU	F
0379	Turbidity	8/1/2016	14.2				NTU	F
0379	Vinyl Chloride	11/2/2015	0.16	0.16	U		µg/L	F
0379	Vinyl Chloride	2/1/2016	0.16	0.16	U	F	µg/L	F
0379	Vinyl Chloride	5/2/2016	0.16	0.16	U	F	µg/L	F
0379	Vinyl Chloride	8/1/2016	0.16	0.16	U		µg/L	F
0379	cis-1,2-Dichloroethene	11/2/2015	0.16	0.16	U		µg/L	F
0379	cis-1,2-Dichloroethene	2/1/2016	0.16	0.16	U	F	µg/L	F
0379	cis-1,2-Dichloroethene	5/2/2016	0.16	0.16	U	F	µg/L	F
0379	cis-1,2-Dichloroethene	8/1/2016	0.16	0.16	U		µg/L	F
0379	pH	11/2/2015	7.12				s.u.	F
0379	pH	2/1/2016	7.08			F	s.u.	F
0379	pH	5/2/2016	6.88			F	s.u.	F
0379	pH	8/1/2016	6.77				s.u.	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0379	trans-1,2-Dichloroethene	11/2/2015	0.16	0.16	U		µg/L	F
0379	trans-1,2-Dichloroethene	2/1/2016	0.16	0.16	U	F	µg/L	F
0379	trans-1,2-Dichloroethene	5/2/2016	0.16	0.16	U	F	µg/L	F
0379	trans-1,2-Dichloroethene	8/1/2016	0.16	0.16	U		µg/L	F
0402	Ammonia Total as N	11/2/2015	0.0469	0.017	J		mg/L	F
0402	Ammonia Total as N	2/1/2016	0.0436	0.017	J	UF	mg/L	F
0402	Ammonia Total as N	5/3/2016	0.0518	0.017	J	UF	mg/L	F
0402	Ammonia Total as N	8/2/2016	0.0751	0.017	J		mg/L	F
0402	Chloride	11/2/2015	128	1.34			mg/L	F
0402	Chloride	2/1/2016	88.5	0.67		F	mg/L	F
0402	Chloride	5/3/2016	60.5	0.67		F	mg/L	F
0402	Chloride	8/2/2016	158	3.35			mg/L	F
0402	Dissolved Oxygen	11/2/2015	0.39				mg/L	F
0402	Dissolved Oxygen	2/1/2016	4.29			F	mg/L	F
0402	Dissolved Oxygen	5/3/2016	1.93			F	mg/L	F
0402	Dissolved Oxygen	6/30/2016	1.41				mg/L	F
0402	Dissolved Oxygen	7/25/2016	1.53			F	mg/L	F
0402	Dissolved Oxygen	8/2/2016	0.76				mg/L	F
0402	Iron	11/2/2015	0.03	0.03	U		mg/L	F
0402	Iron	2/1/2016	0.03	0.03	U	F	mg/L	F
0402	Iron	5/3/2016	0.03	0.03	U	F	mg/L	F
0402	Iron	8/2/2016	0.0306	0.03	B		mg/L	F
0402	Nitrate as Nitrogen	11/2/2015	1.07	0.165			mg/L	F
0402	Nitrate as Nitrogen	2/1/2016	2.94	0.33		F	mg/L	F
0402	Nitrate as Nitrogen	5/3/2016	0.221	0.066		F	mg/L	F
0402	Nitrate as Nitrogen	8/2/2016	0.0772	0.066	J		mg/L	F
0402	Oxidation Reduction Potential	11/2/2015	152.5				mV	F
0402	Oxidation Reduction Potential	2/1/2016	211.8			F	mV	F
0402	Oxidation Reduction Potential	5/3/2016	158			F	mV	F
0402	Oxidation Reduction Potential	6/30/2016	30.2				mV	F
0402	Oxidation Reduction Potential	7/25/2016	59.5			F	mV	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0402	Oxidation Reduction Potential	8/2/2016	64.1				mV	F
0402	Specific Conductance	11/2/2015	1360				umhos/cm	F
0402	Specific Conductance	2/1/2016	1370			F	umhos/cm	F
0402	Specific Conductance	5/3/2016	1120			F	umhos/cm	F
0402	Specific Conductance	7/25/2016	1410			F	umhos/cm	F
0402	Specific Conductance	8/2/2016	1420				umhos/cm	F
0402	Specific Conductance	8/29/2016	1460			F	umhos/cm	F
0402	Sulfate	11/2/2015	112	2.66			mg/L	F
0402	Sulfate	2/1/2016	174	1.33		F	mg/L	F
0402	Sulfate	5/3/2016	161	1.33		F	mg/L	F
0402	Sulfate	8/2/2016	122	6.65			mg/L	F
0402	Temperature	11/2/2015	14				C	F
0402	Temperature	2/1/2016	12.9			F	C	F
0402	Temperature	5/3/2016	12.9			F	C	F
0402	Temperature	7/25/2016	16.9			F	C	F
0402	Temperature	8/2/2016	16.4				C	F
0402	Temperature	8/29/2016	16.8			F	C	F
0402	Tetrachloroethene	11/2/2015	1.21	0.16			µg/L	F
0402	Tetrachloroethene	2/1/2016	0.17	0.16	J	F	µg/L	F
0402	Tetrachloroethene	5/3/2016	0.16	0.16	U	F	µg/L	F
0402	Tetrachloroethene	7/25/2016	1.22	0.16		F	µg/L	F
0402	Tetrachloroethene	8/2/2016	1.15	0.16			µg/L	F
0402	Tetrachloroethene	8/29/2016	1.33	0.16		F	µg/L	F
0402	Total Organic Carbon	11/2/2015	1.33	0.33			mg/L	F
0402	Total Organic Carbon	2/1/2016	1.64	0.33		F	mg/L	F
0402	Total Organic Carbon	5/3/2016	1.65	0.33		F	mg/L	F
0402	Total Organic Carbon	8/2/2016	1.84	0.33			mg/L	F
0402	Trichloroethene	11/2/2015	0.81	0.16	J		µg/L	F
0402	Trichloroethene	2/1/2016	0.16	0.16	U	F	µg/L	F
0402	Trichloroethene	5/3/2016	0.16	0.16	U	F	µg/L	F
0402	Trichloroethene	7/25/2016	1.01	0.16		F	µg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0402	Trichloroethene	8/2/2016	0.94	0.16	J		µg/L	F
0402	Trichloroethene	8/29/2016	0.94	0.16	J	F	µg/L	F
0402	Turbidity	11/2/2015	1.55				NTU	F
0402	Turbidity	2/1/2016	0.68			F	NTU	F
0402	Turbidity	5/3/2016	0.87			F	NTU	F
0402	Turbidity	7/25/2016	3.26			F	NTU	F
0402	Turbidity	8/2/2016	1.35				NTU	F
0402	Turbidity	8/29/2016	6.28			F	NTU	F
0402	Vinyl Chloride	11/2/2015	0.16	0.16	U		µg/L	F
0402	Vinyl Chloride	2/1/2016	0.16	0.16	U	F	µg/L	F
0402	Vinyl Chloride	5/3/2016	0.16	0.16	U	F	µg/L	F
0402	Vinyl Chloride	7/25/2016	0.31	0.16	J	UF	µg/L	F
0402	Vinyl Chloride	8/2/2016	0.31	0.16	J		µg/L	F
0402	Vinyl Chloride	8/29/2016	0.16	0.16	U	F	µg/L	F
0402	cis-1,2-Dichloroethene	11/2/2015	0.4	0.16	J		µg/L	F
0402	cis-1,2-Dichloroethene	2/1/2016	0.16	0.16	U	F	µg/L	F
0402	cis-1,2-Dichloroethene	5/3/2016	0.16	0.16	U	F	µg/L	F
0402	cis-1,2-Dichloroethene	7/25/2016	3.78	0.16		F	µg/L	F
0402	cis-1,2-Dichloroethene	8/2/2016	3.92	0.16			µg/L	F
0402	pH	11/2/2015	7.04				s.u.	F
0402	pH	1/25/2016	6.81			F	s.u.	F
0402	pH	2/1/2016	6.29			F	s.u.	F
0402	pH	5/3/2016	6.09			F	s.u.	F
0402	pH	7/25/2016	6.68			F	s.u.	F
0402	pH	8/2/2016	6.65				s.u.	F
0402	trans-1,2-Dichloroethene	11/2/2015	0.16	0.16	U		µg/L	F
0402	trans-1,2-Dichloroethene	1/25/2016	0.16	0.16	U	F	µg/L	F
0402	trans-1,2-Dichloroethene	2/1/2016	0.16	0.16	U	F	µg/L	F
0402	trans-1,2-Dichloroethene	5/3/2016	0.16	0.16	U	F	µg/L	F
0402	trans-1,2-Dichloroethene	7/25/2016	0.16	0.16	U	F	µg/L	F
0402	trans-1,2-Dichloroethene	8/2/2016	0.16	0.16	U		µg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0410	Ammonia Total as N	11/3/2015	0.298	0.017			mg/L	F
0410	Ammonia Total as N	2/1/2016	0.144	0.017		F	mg/L	F
0410	Ammonia Total as N	5/3/2016	0.257	0.017		F	mg/L	F
0410	Ammonia Total as N	8/4/2016	0.326	0.017			mg/L	F
0410	Ammonia Total as N	8/4/2016	0.364	0.017			mg/L	D
0410	Chloride	11/3/2015	188	2.68			mg/L	F
0410	Chloride	2/1/2016	161	2.68		F	mg/L	F
0410	Chloride	5/3/2016	160	3.35		F	mg/L	F
0410	Chloride	8/4/2016	169	3.35			mg/L	F
0410	Chloride	8/4/2016	162	3.35			mg/L	D
0410	Dissolved Oxygen	11/3/2015	0.56				mg/L	F
0410	Dissolved Oxygen	2/1/2016	0.65			F	mg/L	F
0410	Dissolved Oxygen	5/3/2016	2.77			F	mg/L	F
0410	Dissolved Oxygen	8/4/2016	1				mg/L	F
0410	Ethane	11/3/2015	10	10	U		µg/L	F
0410	Ethane	2/1/2016	500	500	U	F	µg/L	F
0410	Ethane	5/3/2016	500	500	U	F	µg/L	F
0410	Ethane	8/4/2016	10	10	U		µg/L	F
0410	Ethane	8/4/2016	10	10	U		µg/L	D
0410	Ethene	11/3/2015	10	10	U		µg/L	F
0410	Ethene	2/1/2016	500	500	U	F	µg/L	F
0410	Ethene	5/3/2016	500	500	U	F	µg/L	F
0410	Ethene	8/4/2016	10	10	U		µg/L	F
0410	Ethene	8/4/2016	10	10	U		µg/L	D
0410	Iron	11/3/2015	8.04	0.03			mg/L	F
0410	Iron	2/1/2016	1.45	0.03		F	mg/L	F
0410	Iron	5/3/2016	3.12	0.03		F	mg/L	F
0410	Iron	8/4/2016	8.69	0.03			mg/L	F
0410	Iron	8/4/2016	8.66	0.03			mg/L	D
0410	Methane	11/3/2015	20000	1000			µg/L	F
0410	Methane	2/1/2016	8400	500		F	µg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0410	Methane	5/3/2016	11900	500		F	µg/L	F
0410	Methane	8/4/2016	831	50			µg/L	F
0410	Methane	8/4/2016	864	50			µg/L	D
0410	Nitrate as Nitrogen	11/3/2015	0.165	0.165	U		mg/L	F
0410	Nitrate as Nitrogen	2/1/2016	0.165	0.165	U	F	mg/L	F
0410	Nitrate as Nitrogen	5/3/2016	0.066	0.066	U	F	mg/L	F
0410	Nitrate as Nitrogen	8/4/2016	0.165	0.165	U		mg/L	F
0410	Nitrate as Nitrogen	8/4/2016	0.165	0.165	U		mg/L	D
0410	Oxidation Reduction Potential	11/3/2015	-116.9				mV	F
0410	Oxidation Reduction Potential	2/1/2016	-82.1			F	mV	F
0410	Oxidation Reduction Potential	5/3/2016	-73.6			F	mV	F
0410	Oxidation Reduction Potential	8/4/2016	-128.1				mV	F
0410	Specific Conductance	11/3/2015	1560				umhos/cm	F
0410	Specific Conductance	2/1/2016	1510			F	umhos/cm	F
0410	Specific Conductance	5/3/2016	1520			F	umhos/cm	F
0410	Specific Conductance	8/4/2016	1830				umhos/cm	F
0410	Sulfate	11/3/2015	91	0.665			mg/L	F
0410	Sulfate	2/1/2016	121	5.32		F	mg/L	F
0410	Sulfate	5/3/2016	152	6.65		F	mg/L	F
0410	Sulfate	8/4/2016	332	6.65			mg/L	F
0410	Sulfate	8/4/2016	318	6.65			mg/L	D
0410	Temperature	11/3/2015	14.6				C	F
0410	Temperature	2/1/2016	13.8			F	C	F
0410	Temperature	5/3/2016	14.2			F	C	F
0410	Temperature	8/4/2016	16.4				C	F
0410	Tetrachloroethene	11/3/2015	0.16	0.16	U		µg/L	F
0410	Tetrachloroethene	2/1/2016	0.16	0.16	U	F	µg/L	F
0410	Tetrachloroethene	5/3/2016	0.16	0.16	U	F	µg/L	F
0410	Tetrachloroethene	8/4/2016	0.16	0.16	U		µg/L	F
0410	Tetrachloroethene	8/4/2016	0.16	0.16	U		µg/L	D
0410	Total Organic Carbon	11/3/2015	4.66	0.33			mg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0410	Total Organic Carbon	2/1/2016	2.83	0.33		F	mg/L	F
0410	Total Organic Carbon	5/3/2016	3.63	0.33		F	mg/L	F
0410	Total Organic Carbon	8/4/2016	2.58	0.33			mg/L	F
0410	Total Organic Carbon	8/4/2016	2.54	0.33			mg/L	D
0410	Trichloroethene	11/3/2015	0.22	0.16	J		µg/L	F
0410	Trichloroethene	2/1/2016	0.34	0.16	J	F	µg/L	F
0410	Trichloroethene	5/3/2016	0.4	0.16	J	F	µg/L	F
0410	Trichloroethene	8/4/2016	1.3	0.16			µg/L	F
0410	Trichloroethene	8/4/2016	1.32	0.16			µg/L	D
0410	Turbidity	11/3/2015	6.77				NTU	F
0410	Turbidity	2/1/2016	1.6			F	NTU	F
0410	Turbidity	5/3/2016	2.85			F	NTU	F
0410	Turbidity	8/4/2016	12.2				NTU	F
0410	Vinyl Chloride	11/3/2015	2.9	0.16			µg/L	F
0410	Vinyl Chloride	2/1/2016	1.35	0.16		F	µg/L	F
0410	Vinyl Chloride	5/3/2016	1.97	0.16		F	µg/L	F
0410	Vinyl Chloride	8/4/2016	4.15	0.16			µg/L	F
0410	Vinyl Chloride	8/4/2016	4.31	0.16			µg/L	D
0410	cis-1,2-Dichloroethene	11/3/2015	3.55	0.16			µg/L	F
0410	cis-1,2-Dichloroethene	2/1/2016	5.27	0.16		F	µg/L	F
0410	cis-1,2-Dichloroethene	5/3/2016	4.55	0.16		F	µg/L	F
0410	cis-1,2-Dichloroethene	8/4/2016	4.22	0.16			µg/L	F
0410	cis-1,2-Dichloroethene	8/4/2016	4.51	0.16			µg/L	D
0410	pH	11/3/2015	7.2				s.u.	F
0410	pH	2/1/2016	7.09			F	s.u.	F
0410	pH	5/3/2016	7.04			F	s.u.	F
0410	pH	8/4/2016	6.96				s.u.	F
0410	trans-1,2-Dichloroethene	11/3/2015	0.85	0.16	J		µg/L	F
0410	trans-1,2-Dichloroethene	2/1/2016	0.42	0.16	J	F	µg/L	F
0410	trans-1,2-Dichloroethene	5/3/2016	0.47	0.16	J	F	µg/L	F
0410	trans-1,2-Dichloroethene	8/4/2016	0.71	0.16	J		µg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0410	trans-1,2-Dichloroethene	8/4/2016	0.69	0.16	J		µg/L	D
0416	Chloride	11/2/2015	133	1.34			mg/L	F
0416	Chloride	2/1/2016	160	2.68		F	mg/L	F
0416	Chloride	5/2/2016	91	1.34		F	mg/L	F
0416	Chloride	8/1/2016	217	3.35			mg/L	F
0416	Dissolved Oxygen	11/2/2015	7.66				mg/L	F
0416	Dissolved Oxygen	2/1/2016	9.75			JF	mg/L	F
0416	Dissolved Oxygen	5/2/2016	7.91			F	mg/L	F
0416	Dissolved Oxygen	8/1/2016	4.22				mg/L	F
0416	Iron	11/2/2015	0.03	0.03	U		mg/L	F
0416	Iron	2/1/2016	0.03	0.03	U	F	mg/L	F
0416	Iron	5/2/2016	0.03	0.03	U	F	mg/L	F
0416	Iron	8/1/2016	0.03	0.03	U		mg/L	F
0416	Nitrate as Nitrogen	11/2/2015	0.736	0.165			mg/L	F
0416	Nitrate as Nitrogen	2/1/2016	0.388	0.165	J	F	mg/L	F
0416	Nitrate as Nitrogen	5/2/2016	0.377	0.066		F	mg/L	F
0416	Nitrate as Nitrogen	8/1/2016	0.363	0.165	J		mg/L	F
0416	Oxidation Reduction Potential	11/2/2015	133.1				mV	F
0416	Oxidation Reduction Potential	2/1/2016	207.3			JF	mV	F
0416	Oxidation Reduction Potential	5/2/2016	112.2			F	mV	F
0416	Oxidation Reduction Potential	8/1/2016	84.4				mV	F
0416	Specific Conductance	11/2/2015	1110				umhos/cm	F
0416	Specific Conductance	2/1/2016	1260			JF	umhos/cm	F
0416	Specific Conductance	5/2/2016	880			F	umhos/cm	F
0416	Specific Conductance	8/1/2016	1410				umhos/cm	F
0416	Sulfate	11/2/2015	122	2.66			mg/L	F
0416	Sulfate	2/1/2016	131	5.32		F	mg/L	F
0416	Sulfate	5/2/2016	80	0.665		F	mg/L	F
0416	Sulfate	8/1/2016	113	6.65			mg/L	F
0416	Temperature	11/2/2015	16.3				C	F
0416	Temperature	2/1/2016	6.3			JF	C	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0416	Temperature	5/2/2016	12.1			F	C	F
0416	Temperature	8/1/2016	22.9				C	F
0416	Tetrachloroethene	11/2/2015	0.16	0.16	U		µg/L	F
0416	Tetrachloroethene	2/1/2016	0.16	0.16	U	F	µg/L	F
0416	Tetrachloroethene	5/2/2016	0.16	0.16	U	F	µg/L	F
0416	Tetrachloroethene	8/1/2016	0.16	0.16	U		µg/L	F
0416	Trichloroethene	11/2/2015	0.16	0.16	U		µg/L	F
0416	Trichloroethene	2/1/2016	0.16	0.16	U	F	µg/L	F
0416	Trichloroethene	5/2/2016	0.16	0.16	U	F	µg/L	F
0416	Trichloroethene	8/1/2016	0.16	0.16	U		µg/L	F
0416	Turbidity	11/2/2015	6.21				NTU	F
0416	Turbidity	2/1/2016	0.48			JF	NTU	F
0416	Turbidity	5/2/2016	8.03			F	NTU	F
0416	Turbidity	8/1/2016	7.7				NTU	F
0416	Vinyl Chloride	11/2/2015	0.16	0.16	U		µg/L	F
0416	Vinyl Chloride	2/1/2016	0.16	0.16	U	F	µg/L	F
0416	Vinyl Chloride	5/2/2016	0.16	0.16	U	F	µg/L	F
0416	Vinyl Chloride	8/1/2016	0.16	0.16	U		µg/L	F
0416	cis-1,2-Dichloroethene	11/2/2015	0.16	0.16	U		µg/L	F
0416	cis-1,2-Dichloroethene	2/1/2016	0.16	0.16	U	F	µg/L	F
0416	cis-1,2-Dichloroethene	5/2/2016	0.16	0.16	U	F	µg/L	F
0416	cis-1,2-Dichloroethene	8/1/2016	0.16	0.16	U		µg/L	F
0416	pH	11/2/2015	7.57				s.u.	F
0416	pH	2/1/2016	7.56			JF	s.u.	F
0416	pH	5/2/2016	7.54			F	s.u.	F
0416	pH	8/1/2016	7.26				s.u.	F
0416	trans-1,2-Dichloroethene	11/2/2015	0.16	0.16	U		µg/L	F
0416	trans-1,2-Dichloroethene	2/1/2016	0.16	0.16	U	F	µg/L	F
0416	trans-1,2-Dichloroethene	5/2/2016	0.16	0.16	U	F	µg/L	F
0416	trans-1,2-Dichloroethene	8/1/2016	0.16	0.16	U		µg/L	F
0417	Ammonia Total as N	11/4/2015	0.17	0.017		U	mg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0417	Ammonia Total as N	2/1/2016	0.044	0.017	J	UF	mg/L	F
0417	Ammonia Total as N	5/3/2016	0.0522	0.017	J	UF	mg/L	F
0417	Ammonia Total as N	8/4/2016	0.017	0.017	U		mg/L	F
0417	Chloride	11/4/2015	208	2.68			mg/L	F
0417	Chloride	2/1/2016	167	2.68		F	mg/L	F
0417	Chloride	5/3/2016	232	3.35		F	mg/L	F
0417	Chloride	8/4/2016	147	3.35			mg/L	F
0417	Dissolved Oxygen	11/4/2015	1.17				mg/L	F
0417	Dissolved Oxygen	2/1/2016	1.01			F	mg/L	F
0417	Dissolved Oxygen	5/3/2016	2.23			F	mg/L	F
0417	Dissolved Oxygen	8/4/2016	1.59				mg/L	F
0417	Ethane	11/4/2015	10	10	U		µg/L	F
0417	Ethane	2/1/2016	500	500	U	F	µg/L	F
0417	Ethane	5/3/2016	500	500	U	F	µg/L	F
0417	Ethane	8/4/2016	10	10	U		µg/L	F
0417	Ethene	11/4/2015	10	10	U		µg/L	F
0417	Ethene	2/1/2016	500	500	U	F	µg/L	F
0417	Ethene	5/3/2016	500	500	U	F	µg/L	F
0417	Ethene	8/4/2016	10	10	U		µg/L	F
0417	Iron	11/4/2015	0.267	0.03			mg/L	F
0417	Iron	2/1/2016	0.202	0.03		F	mg/L	F
0417	Iron	5/3/2016	0.165	0.03		F	mg/L	F
0417	Iron	8/4/2016	0.22	0.03			mg/L	F
0417	Methane	11/4/2015	355	20			µg/L	F
0417	Methane	2/1/2016	3590	500		F	µg/L	F
0417	Methane	5/3/2016	3420	500		F	µg/L	F
0417	Methane	8/4/2016	10	10	U		µg/L	F
0417	Nitrate as Nitrogen	11/4/2015	0.165	0.165	U		mg/L	F
0417	Nitrate as Nitrogen	2/1/2016	0.165	0.165	U	F	mg/L	F
0417	Nitrate as Nitrogen	5/3/2016	0.066	0.066	U	F	mg/L	F
0417	Nitrate as Nitrogen	8/4/2016	0.408	0.165	J		mg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0417	Oxidation Reduction Potential	11/4/2015	-14.1				mV	F
0417	Oxidation Reduction Potential	2/1/2016	-31			F	mV	F
0417	Oxidation Reduction Potential	5/3/2016	-7.8			F	mV	F
0417	Oxidation Reduction Potential	8/4/2016	-11.2				mV	F
0417	Specific Conductance	11/4/2015	1530				umhos/cm	F
0417	Specific Conductance	2/1/2016	1330			F	umhos/cm	F
0417	Specific Conductance	5/3/2016	1570			F	umhos/cm	F
0417	Specific Conductance	8/4/2016	1500				umhos/cm	F
0417	Sulfate	11/4/2015	116	5.32			mg/L	F
0417	Sulfate	2/1/2016	108	1.33		F	mg/L	F
0417	Sulfate	5/3/2016	121	6.65		F	mg/L	F
0417	Sulfate	8/4/2016	133	6.65			mg/L	F
0417	Temperature	11/4/2015	14.8				C	F
0417	Temperature	2/1/2016	13.7			F	C	F
0417	Temperature	5/3/2016	13.1			F	C	F
0417	Temperature	8/4/2016	15.2				C	F
0417	Tetrachloroethene	11/4/2015	1.66	0.16			µg/L	F
0417	Tetrachloroethene	2/1/2016	1.2	0.16		F	µg/L	F
0417	Tetrachloroethene	5/3/2016	1.11	0.16		F	µg/L	F
0417	Tetrachloroethene	8/4/2016	2.5	0.16			µg/L	F
0417	Total Organic Carbon	11/4/2015	1.35	0.33			mg/L	F
0417	Total Organic Carbon	2/1/2016	1.76	0.33		F	mg/L	F
0417	Total Organic Carbon	5/3/2016	1.45	0.33		F	mg/L	F
0417	Total Organic Carbon	8/4/2016	1.24	0.33			mg/L	F
0417	Trichloroethene	11/4/2015	1.95	0.16			µg/L	F
0417	Trichloroethene	2/1/2016	1.89	0.16		F	µg/L	F
0417	Trichloroethene	5/3/2016	1.25	0.16		F	µg/L	F
0417	Trichloroethene	8/4/2016	2.68	0.16			µg/L	F
0417	Turbidity	11/4/2015	0.39				NTU	F
0417	Turbidity	2/1/2016	1.08			F	NTU	F
0417	Turbidity	5/3/2016	9.3			F	NTU	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0417	Turbidity	8/4/2016	5.54				NTU	F
0417	Vinyl Chloride	11/4/2015	0.25	0.16	J		µg/L	F
0417	Vinyl Chloride	2/1/2016	0.87	0.16	J	F	µg/L	F
0417	Vinyl Chloride	5/3/2016	3.55	0.16		F	µg/L	F
0417	Vinyl Chloride	8/4/2016	0.16	0.16	U		µg/L	F
0417	cis-1,2-Dichloroethene	11/4/2015	2.87	0.16			µg/L	F
0417	cis-1,2-Dichloroethene	2/1/2016	1.77	0.16		F	µg/L	F
0417	cis-1,2-Dichloroethene	5/3/2016	4.32	0.16		F	µg/L	F
0417	cis-1,2-Dichloroethene	8/4/2016	2.82	0.16			µg/L	F
0417	pH	11/4/2015	7.02				s.u.	F
0417	pH	2/1/2016	7.09			F	s.u.	F
0417	pH	5/3/2016	7.01			F	s.u.	F
0417	pH	8/4/2016	7.07				s.u.	F
0417	trans-1,2-Dichloroethene	11/4/2015	0.16	0.16	U		µg/L	F
0417	trans-1,2-Dichloroethene	2/1/2016	0.16	0.16	U	F	µg/L	F
0417	trans-1,2-Dichloroethene	5/3/2016	0.16	0.16	U	F	µg/L	F
0417	trans-1,2-Dichloroethene	8/4/2016	0.16	0.16	U		µg/L	F
0418	Ammonia Total as N	11/4/2015	0.0824	0.017	J		mg/L	F
0418	Ammonia Total as N	2/3/2016	0.0747	0.017	J	UF	mg/L	F
0418	Ammonia Total as N	5/3/2016	0.0731	0.017	J	UF	mg/L	F
0418	Ammonia Total as N	8/4/2016	0.0647	0.017	J		mg/L	F
0418	Chloride	11/4/2015	248	3.35			mg/L	F
0418	Chloride	2/3/2016	196	1.68		F	mg/L	F
0418	Chloride	5/3/2016	204	3.35		F	mg/L	F
0418	Chloride	8/4/2016	161	3.35			mg/L	F
0418	Dissolved Oxygen	11/4/2015	1.86				mg/L	F
0418	Dissolved Oxygen	2/3/2016	1.19			F	mg/L	F
0418	Dissolved Oxygen	5/3/2016	0.85			F	mg/L	F
0418	Dissolved Oxygen	8/4/2016	1.26				mg/L	F
0418	Ethane	11/4/2015	10	10	U		µg/L	F
0418	Ethane	2/3/2016	500	500	U	F	µg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0418	Ethane	5/3/2016	500	500	U	F	µg/L	F
0418	Ethane	8/4/2016	10	10	U		µg/L	F
0418	Ethene	11/4/2015	10	10	U		µg/L	F
0418	Ethene	2/3/2016	500	500	U	F	µg/L	F
0418	Ethene	5/3/2016	500	500	U	F	µg/L	F
0418	Ethene	8/4/2016	10	10	U		µg/L	F
0418	Iron	11/4/2015	0.274	0.03			mg/L	F
0418	Iron	2/3/2016	0.144	0.03		F	mg/L	F
0418	Iron	5/3/2016	0.134	0.03		F	mg/L	F
0418	Iron	8/4/2016	0.0678	0.03	B		mg/L	F
0418	Methane	11/4/2015	18700	1000			µg/L	F
0418	Methane	2/3/2016	3300	500		F	µg/L	F
0418	Methane	5/3/2016	4290	500		F	µg/L	F
0418	Methane	8/4/2016	758	50			µg/L	F
0418	Nitrate as Nitrogen	11/4/2015	0.165	0.165	U		mg/L	F
0418	Nitrate as Nitrogen	2/3/2016	0.831	0.165		F	mg/L	F
0418	Nitrate as Nitrogen	5/3/2016	0.066	0.066	U	F	mg/L	F
0418	Nitrate as Nitrogen	8/4/2016	0.165	0.165	U		mg/L	F
0418	Oxidation Reduction Potential	11/4/2015	-34.9				mV	F
0418	Oxidation Reduction Potential	2/3/2016	-14.3			F	mV	F
0418	Oxidation Reduction Potential	5/3/2016	7.3			F	mV	F
0418	Oxidation Reduction Potential	8/4/2016	18.5				mV	F
0418	Specific Conductance	11/4/2015	1470				umhos/cm	F
0418	Specific Conductance	2/3/2016	1520			F	umhos/cm	F
0418	Specific Conductance	5/3/2016	1530			F	umhos/cm	F
0418	Specific Conductance	8/4/2016	1510				umhos/cm	F
0418	Sulfate	11/4/2015	68	0.665			mg/L	F
0418	Sulfate	2/3/2016	103	3.33		F	mg/L	F
0418	Sulfate	5/3/2016	145	6.65		F	mg/L	F
0418	Sulfate	8/4/2016	144	6.65			mg/L	F
0418	Temperature	11/4/2015	14.2				C	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0418	Temperature	2/3/2016	14.1			F	C	F
0418	Temperature	5/3/2016	14.6			F	C	F
0418	Temperature	8/4/2016	23.4				C	F
0418	Tetrachloroethene	11/4/2015	3.17	0.16			µg/L	F
0418	Tetrachloroethene	2/3/2016	2.42	0.16		F	µg/L	F
0418	Tetrachloroethene	5/3/2016	3.13	0.16		F	µg/L	F
0418	Tetrachloroethene	8/4/2016	4.05	0.16			µg/L	F
0418	Total Organic Carbon	11/4/2015	1.72	0.33			mg/L	F
0418	Total Organic Carbon	2/3/2016	1.39	0.33		F	mg/L	F
0418	Total Organic Carbon	5/3/2016	1.58	0.33		F	mg/L	F
0418	Total Organic Carbon	8/4/2016	2.48	0.33			mg/L	F
0418	Trichloroethene	11/4/2015	7.09	0.16			µg/L	F
0418	Trichloroethene	2/3/2016	4.62	0.16		F	µg/L	F
0418	Trichloroethene	5/3/2016	4.74	0.16		F	µg/L	F
0418	Trichloroethene	8/4/2016	5.09	0.16			µg/L	F
0418	Turbidity	11/4/2015	0.91				NTU	F
0418	Turbidity	2/3/2016	2.19			F	NTU	F
0418	Turbidity	5/3/2016	1.28			F	NTU	F
0418	Turbidity	8/4/2016	288				NTU	F
0418	Vinyl Chloride	11/4/2015	1.31	0.16			µg/L	F
0418	Vinyl Chloride	2/3/2016	0.46	0.16	J	F	µg/L	F
0418	Vinyl Chloride	5/3/2016	0.86	0.16	J	F	µg/L	F
0418	Vinyl Chloride	8/4/2016	0.64	0.16	J		µg/L	F
0418	cis-1,2-Dichloroethene	11/4/2015	10.2	0.16			µg/L	F
0418	cis-1,2-Dichloroethene	2/3/2016	3.26	0.16		F	µg/L	F
0418	cis-1,2-Dichloroethene	5/3/2016	5.09	0.16		F	µg/L	F
0418	cis-1,2-Dichloroethene	8/4/2016	3.17	0.16			µg/L	F
0418	pH	11/4/2015	7.06				s.u.	F
0418	pH	2/3/2016	6.8			F	s.u.	F
0418	pH	5/3/2016	7			F	s.u.	F
0418	pH	8/4/2016	6.81				s.u.	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0418	trans-1,2-Dichloroethene	11/4/2015	0.26	0.16	J		µg/L	F
0418	trans-1,2-Dichloroethene	2/3/2016	0.16	0.16	U	F	µg/L	F
0418	trans-1,2-Dichloroethene	5/3/2016	0.17	0.16	J	F	µg/L	F
0418	trans-1,2-Dichloroethene	8/4/2016	0.16	0.16	U		µg/L	F
0419	Ammonia Total as N	11/3/2015	0.317	0.017			mg/L	F
0419	Ammonia Total as N	2/4/2016	0.303	0.017		JF	mg/L	F
0419	Ammonia Total as N	2/4/2016	0.217	0.017		JF	mg/L	D
0419	Ammonia Total as N	5/4/2016	0.277	0.017		F	mg/L	F
0419	Ammonia Total as N	8/3/2016	0.495	0.017			mg/L	F
0419	Chloride	11/3/2015	204	2.68			mg/L	F
0419	Chloride	2/4/2016	163	1.68		F	mg/L	F
0419	Chloride	2/4/2016	164	1.68		F	mg/L	D
0419	Chloride	5/4/2016	158	1.68		F	mg/L	F
0419	Chloride	8/3/2016	165	3.35			mg/L	F
0419	Dissolved Oxygen	11/3/2015	0.4				mg/L	F
0419	Dissolved Oxygen	2/4/2016	1.38			F	mg/L	F
0419	Dissolved Oxygen	5/4/2016	3.54			F	mg/L	F
0419	Dissolved Oxygen	8/3/2016	1.1				mg/L	F
0419	Ethane	11/3/2015	10	10	U		µg/L	F
0419	Ethane	2/4/2016	500	500	U	F	µg/L	F
0419	Ethane	2/4/2016	500	500	U	F	µg/L	D
0419	Ethane	5/4/2016	500	500	U	F	µg/L	F
0419	Ethane	8/3/2016	10	10	U		µg/L	F
0419	Ethene	11/3/2015	10	10	U		µg/L	F
0419	Ethene	2/4/2016	500	500	U	F	µg/L	F
0419	Ethene	2/4/2016	500	500	U	F	µg/L	D
0419	Ethene	5/4/2016	500	500	U	F	µg/L	F
0419	Ethene	8/3/2016	10	10	U		µg/L	F
0419	Iron	11/3/2015	9.54	0.03			mg/L	F
0419	Iron	2/4/2016	6.3	0.03		F	mg/L	F
0419	Iron	2/4/2016	6.24	0.03		F	mg/L	D

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0419	Iron	5/4/2016	4.78	0.03		F	mg/L	F
0419	Iron	8/3/2016	11.3	0.03			mg/L	F
0419	Methane	11/3/2015	4060	200			µg/L	F
0419	Methane	2/4/2016	4690	500		F	µg/L	F
0419	Methane	2/4/2016	4420	500		F	µg/L	D
0419	Methane	5/4/2016	8980	500		F	µg/L	F
0419	Methane	8/3/2016	5100	200			µg/L	F
0419	Nitrate as Nitrogen	11/3/2015	0.165	0.165	U		mg/L	F
0419	Nitrate as Nitrogen	2/4/2016	0.165	0.165	U	F	mg/L	F
0419	Nitrate as Nitrogen	2/4/2016	0.165	0.165	U	F	mg/L	D
0419	Nitrate as Nitrogen	5/4/2016	0.066	0.066	U	F	mg/L	F
0419	Nitrate as Nitrogen	8/3/2016	0.066	0.066	U		mg/L	F
0419	Oxidation Reduction Potential	11/3/2015	-132.7				mV	F
0419	Oxidation Reduction Potential	2/4/2016	-91.3			F	mV	F
0419	Oxidation Reduction Potential	5/4/2016	-52.8			F	mV	F
0419	Oxidation Reduction Potential	8/3/2016	-123.7				mV	F
0419	Specific Conductance	11/3/2015	1620				umhos/cm	F
0419	Specific Conductance	2/4/2016	1490			F	umhos/cm	F
0419	Specific Conductance	5/4/2016	1470			F	umhos/cm	F
0419	Specific Conductance	8/3/2016	1720				umhos/cm	F
0419	Sulfate	11/3/2015	159	5.32			mg/L	F
0419	Sulfate	2/4/2016	175	3.33		F	mg/L	F
0419	Sulfate	2/4/2016	175	3.33		F	mg/L	D
0419	Sulfate	5/4/2016	124	3.33		F	mg/L	F
0419	Sulfate	8/3/2016	279	6.65			mg/L	F
0419	Temperature	11/3/2015	14.5				C	F
0419	Temperature	2/4/2016	13.7			F	C	F
0419	Temperature	5/4/2016	14.6			F	C	F
0419	Temperature	8/3/2016	19.4				C	F
0419	Tetrachloroethene	11/3/2015	0.16	0.16	U		µg/L	F
0419	Tetrachloroethene	2/4/2016	0.16	0.16	U	F	µg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0419	Tetrachloroethene	2/4/2016	0.16	0.16	U	F	µg/L	D
0419	Tetrachloroethene	5/4/2016	0.16	0.16	U	F	µg/L	F
0419	Tetrachloroethene	8/3/2016	0.16	0.16	U		µg/L	F
0419	Total Organic Carbon	11/3/2015	2.41	0.33			mg/L	F
0419	Total Organic Carbon	2/4/2016	2.36	0.33		F	mg/L	F
0419	Total Organic Carbon	2/4/2016	2.86	0.33		F	mg/L	D
0419	Total Organic Carbon	5/4/2016	2.85	0.33		F	mg/L	F
0419	Total Organic Carbon	8/3/2016	3.09	0.33			mg/L	F
0419	Trichloroethene	11/3/2015	0.36	0.16	J		µg/L	F
0419	Trichloroethene	2/4/2016	0.69	0.16	J	F	µg/L	F
0419	Trichloroethene	2/4/2016	0.61	0.16	J	F	µg/L	D
0419	Trichloroethene	5/4/2016	0.7	0.16	J	F	µg/L	F
0419	Trichloroethene	8/3/2016	0.16	0.16	U		µg/L	F
0419	Turbidity	11/3/2015	1.73				NTU	F
0419	Turbidity	2/4/2016	1.37			F	NTU	F
0419	Turbidity	5/4/2016	1.97			F	NTU	F
0419	Turbidity	8/3/2016	1.13				NTU	F
0419	Vinyl Chloride	11/3/2015	1.19	0.16			µg/L	F
0419	Vinyl Chloride	2/4/2016	1.43	0.16		F	µg/L	F
0419	Vinyl Chloride	2/4/2016	1.42	0.16		F	µg/L	D
0419	Vinyl Chloride	5/4/2016	1.91	0.16		F	µg/L	F
0419	Vinyl Chloride	8/3/2016	2.74	0.16			µg/L	F
0419	cis-1,2-Dichloroethene	11/3/2015	16.5	0.16			µg/L	F
0419	cis-1,2-Dichloroethene	2/4/2016	11	0.16		F	µg/L	F
0419	cis-1,2-Dichloroethene	2/4/2016	10.8	0.16		F	µg/L	D
0419	cis-1,2-Dichloroethene	5/4/2016	6.16	0.16		F	µg/L	F
0419	cis-1,2-Dichloroethene	8/3/2016	2.31	0.16			µg/L	F
0419	pH	11/3/2015	7.33				s.u.	F
0419	pH	2/4/2016	7.02			F	s.u.	F
0419	pH	5/4/2016	7.03			F	s.u.	F
0419	pH	8/3/2016	6.94				s.u.	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0419	trans-1,2-Dichloroethene	11/3/2015	0.37	0.16	J		µg/L	F
0419	trans-1,2-Dichloroethene	2/4/2016	0.41	0.16	J	F	µg/L	F
0419	trans-1,2-Dichloroethene	2/4/2016	0.36	0.16	J	F	µg/L	D
0419	trans-1,2-Dichloroethene	5/4/2016	0.52	0.16	J	F	µg/L	F
0419	trans-1,2-Dichloroethene	8/3/2016	0.59	0.16	J		µg/L	F
0422	Chloride	11/5/2015	206	2.68			mg/L	F
0422	Chloride	2/2/2016	224	2.68		F	mg/L	F
0422	Chloride	5/2/2016	230	3.35		F	mg/L	F
0422	Chloride	8/1/2016	167	3.35			mg/L	F
0422	Dissolved Oxygen	11/5/2015	1.04				mg/L	F
0422	Dissolved Oxygen	2/2/2016	1.3			F	mg/L	F
0422	Dissolved Oxygen	5/2/2016	1.62			F	mg/L	F
0422	Dissolved Oxygen	8/1/2016	1.54				mg/L	F
0422	Iron	11/5/2015	0.104	0.03			mg/L	F
0422	Iron	2/2/2016	0.185	0.03		F	mg/L	F
0422	Iron	5/2/2016	0.212	0.03		F	mg/L	F
0422	Iron	8/1/2016	0.191	0.03			mg/L	F
0422	Nitrate as Nitrogen	11/5/2015	0.506	0.165			mg/L	F
0422	Nitrate as Nitrogen	2/2/2016	0.727	0.33	J	F	mg/L	F
0422	Nitrate as Nitrogen	5/2/2016	0.803	0.33	J	F	mg/L	F
0422	Nitrate as Nitrogen	8/1/2016	0.373	0.165	J		mg/L	F
0422	Oxidation Reduction Potential	11/5/2015	36.2				mV	F
0422	Oxidation Reduction Potential	2/2/2016	111.6			F	mV	F
0422	Oxidation Reduction Potential	5/2/2016	103.2			F	mV	F
0422	Oxidation Reduction Potential	8/1/2016	161				mV	F
0422	Specific Conductance	11/5/2015	1590				umhos/cm	F
0422	Specific Conductance	2/2/2016	1630			F	umhos/cm	F
0422	Specific Conductance	5/2/2016	1640			F	umhos/cm	F
0422	Specific Conductance	8/1/2016	1570				umhos/cm	F
0422	Sulfate	11/5/2015	115	5.32			mg/L	F
0422	Sulfate	2/2/2016	111	1.33		F	mg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0422	Sulfate	5/2/2016	123	1.33		F	mg/L	F
0422	Sulfate	8/1/2016	142	6.65			mg/L	F
0422	Temperature	11/5/2015	14.6				C	F
0422	Temperature	2/2/2016	12.5			F	C	F
0422	Temperature	5/2/2016	14.4			F	C	F
0422	Temperature	8/1/2016	19.1				C	F
0422	Tetrachloroethene	11/5/2015	3.35	0.16			µg/L	F
0422	Tetrachloroethene	2/2/2016	2.47	0.16		F	µg/L	F
0422	Tetrachloroethene	5/2/2016	2.17	0.16		F	µg/L	F
0422	Tetrachloroethene	8/1/2016	2.44	0.16			µg/L	F
0422	Trichloroethene	11/5/2015	2.45	0.16			µg/L	F
0422	Trichloroethene	2/2/2016	1.77	0.16		F	µg/L	F
0422	Trichloroethene	5/2/2016	1.48	0.16		F	µg/L	F
0422	Trichloroethene	8/1/2016	1.48	0.16			µg/L	F
0422	Turbidity	11/5/2015	16.6				NTU	F
0422	Turbidity	2/2/2016	21			F	NTU	F
0422	Turbidity	5/2/2016	42			F	NTU	F
0422	Turbidity	8/1/2016	2.16				NTU	F
0422	Vinyl Chloride	11/5/2015	0.16	0.16	U		µg/L	F
0422	Vinyl Chloride	2/2/2016	0.16	0.16	U	F	µg/L	F
0422	Vinyl Chloride	5/2/2016	0.16	0.16	U	F	µg/L	F
0422	Vinyl Chloride	8/1/2016	0.16	0.16	U		µg/L	F
0422	cis-1,2-Dichloroethene	11/5/2015	0.16	0.16	U		µg/L	F
0422	cis-1,2-Dichloroethene	2/2/2016	0.16	0.16	U	F	µg/L	F
0422	cis-1,2-Dichloroethene	5/2/2016	0.16	0.16	U	F	µg/L	F
0422	cis-1,2-Dichloroethene	8/1/2016	0.16	0.16	U		µg/L	F
0422	pH	11/5/2015	7.06				s.u.	F
0422	pH	2/2/2016	6.06			F	s.u.	F
0422	pH	5/2/2016	6.19			F	s.u.	F
0422	pH	8/1/2016	6.79				s.u.	F
0422	trans-1,2-Dichloroethene	11/5/2015	0.16	0.16	U		µg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0422	trans-1,2-Dichloroethene	2/2/2016	0.16	0.16	U	F	µg/L	F
0422	trans-1,2-Dichloroethene	5/2/2016	0.16	0.16	U	F	µg/L	F
0422	trans-1,2-Dichloroethene	8/1/2016	0.16	0.16	U		µg/L	F
0423	Chloride	11/5/2015	190	2.68			mg/L	F
0423	Chloride	2/2/2016	166	2.68		F	mg/L	F
0423	Chloride	5/2/2016	219	3.35		F	mg/L	F
0423	Chloride	8/1/2016	135	1.34			mg/L	F
0423	Dissolved Oxygen	11/5/2015	0.47				mg/L	F
0423	Dissolved Oxygen	2/2/2016	0.77			F	mg/L	F
0423	Dissolved Oxygen	5/2/2016	1.48			F	mg/L	F
0423	Dissolved Oxygen	8/1/2016	2.76				mg/L	F
0423	Iron	11/5/2015	0.03	0.03	U		mg/L	F
0423	Iron	2/2/2016	0.03	0.03	U	F	mg/L	F
0423	Iron	5/2/2016	0.03	0.03	U	F	mg/L	F
0423	Iron	8/1/2016	0.03	0.03	U		mg/L	F
0423	Nitrate as Nitrogen	11/5/2015	0.322	0.165	J		mg/L	F
0423	Nitrate as Nitrogen	2/2/2016	0.479	0.165	J	F	mg/L	F
0423	Nitrate as Nitrogen	5/2/2016	0.358	0.066		F	mg/L	F
0423	Nitrate as Nitrogen	8/1/2016	0.28	0.165	J		mg/L	F
0423	Oxidation Reduction Potential	11/5/2015	118.3				mV	F
0423	Oxidation Reduction Potential	2/2/2016	109.5			F	mV	F
0423	Oxidation Reduction Potential	5/2/2016	64.3			F	mV	F
0423	Oxidation Reduction Potential	8/1/2016	15.1				mV	F
0423	Specific Conductance	11/5/2015	1550				umhos/cm	F
0423	Specific Conductance	2/2/2016	1510			F	umhos/cm	F
0423	Specific Conductance	5/2/2016	1610			F	umhos/cm	F
0423	Specific Conductance	8/1/2016	1500				umhos/cm	F
0423	Sulfate	11/5/2015	115	5.32			mg/L	F
0423	Sulfate	2/2/2016	124	5.32		F	mg/L	F
0423	Sulfate	5/2/2016	121	6.65		F	mg/L	F
0423	Sulfate	8/1/2016	151	2.66			mg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0423	Temperature	11/5/2015	14.7				C	F
0423	Temperature	2/2/2016	12.6			F	C	F
0423	Temperature	5/2/2016	13.5			F	C	F
0423	Temperature	8/1/2016	14.4				C	F
0423	Tetrachloroethene	11/5/2015	2.81	0.16			µg/L	F
0423	Tetrachloroethene	2/2/2016	2.29	0.16		F	µg/L	F
0423	Tetrachloroethene	5/2/2016	2.19	0.16		F	µg/L	F
0423	Tetrachloroethene	8/1/2016	2.56	0.16			µg/L	F
0423	Trichloroethene	11/5/2015	2.46	0.16			µg/L	F
0423	Trichloroethene	2/2/2016	1.62	0.16		F	µg/L	F
0423	Trichloroethene	5/2/2016	1.59	0.16		F	µg/L	F
0423	Trichloroethene	8/1/2016	2.24	0.16			µg/L	F
0423	Turbidity	11/5/2015	15.6				NTU	F
0423	Turbidity	2/2/2016	0.65			F	NTU	F
0423	Turbidity	8/1/2016	1.49				NTU	F
0423	Vinyl Chloride	11/5/2015	0.16	0.16	U		µg/L	F
0423	Vinyl Chloride	2/2/2016	0.16	0.16	U	F	µg/L	F
0423	Vinyl Chloride	5/2/2016	0.16	0.16	U	F	µg/L	F
0423	Vinyl Chloride	8/1/2016	0.16	0.16	U		µg/L	F
0423	cis-1,2-Dichloroethene	11/5/2015	0.62	0.16	J		µg/L	F
0423	cis-1,2-Dichloroethene	2/2/2016	0.4	0.16	J	F	µg/L	F
0423	cis-1,2-Dichloroethene	5/2/2016	0.22	0.16	J	F	µg/L	F
0423	cis-1,2-Dichloroethene	8/1/2016	0.32	0.16	J		µg/L	F
0423	pH	11/5/2015	6.87				s.u.	F
0423	pH	2/2/2016	6.84			F	s.u.	F
0423	pH	5/2/2016	6.92			F	s.u.	F
0423	pH	8/1/2016	6.96				s.u.	F
0423	trans-1,2-Dichloroethene	11/5/2015	0.16	0.16	U		µg/L	F
0423	trans-1,2-Dichloroethene	2/2/2016	0.16	0.16	U	F	µg/L	F
0423	trans-1,2-Dichloroethene	5/2/2016	0.16	0.16	U	F	µg/L	F
0423	trans-1,2-Dichloroethene	8/1/2016	0.16	0.16	U		µg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0424	Chloride	11/2/2015	173	2.68			mg/L	F
0424	Chloride	2/3/2016	154	1.68		F	mg/L	F
0424	Chloride	5/2/2016	175	3.35		F	mg/L	F
0424	Chloride	8/1/2016	86.4	1.34			mg/L	F
0424	Dissolved Oxygen	11/2/2015	0.52				mg/L	F
0424	Dissolved Oxygen	2/3/2016	2.51			F	mg/L	F
0424	Dissolved Oxygen	5/2/2016	1.81			F	mg/L	F
0424	Dissolved Oxygen	8/1/2016	2.37				mg/L	F
0424	Iron	11/2/2015	0.03	0.03	U		mg/L	F
0424	Iron	2/3/2016	0.03	0.03	U	F	mg/L	F
0424	Iron	5/2/2016	0.03	0.03	U	F	mg/L	F
0424	Iron	8/1/2016	0.03	0.03	U		mg/L	F
0424	Nitrate as Nitrogen	11/2/2015	0.407	0.165	J		mg/L	F
0424	Nitrate as Nitrogen	2/3/2016	0.51	0.165		F	mg/L	F
0424	Nitrate as Nitrogen	5/2/2016	0.307	0.066		F	mg/L	F
0424	Nitrate as Nitrogen	8/1/2016	1.26	0.165			mg/L	F
0424	Oxidation Reduction Potential	11/2/2015	162.5				mV	F
0424	Oxidation Reduction Potential	2/3/2016	62.3			F	mV	F
0424	Oxidation Reduction Potential	5/2/2016	72.5			F	mV	F
0424	Oxidation Reduction Potential	8/1/2016	59.8				mV	F
0424	Specific Conductance	11/2/2015	1420				umhos/cm	F
0424	Specific Conductance	2/3/2016	1360			F	umhos/cm	F
0424	Specific Conductance	5/2/2016	1430			F	umhos/cm	F
0424	Specific Conductance	8/1/2016	1330				umhos/cm	F
0424	Sulfate	11/2/2015	109	5.32			mg/L	F
0424	Sulfate	2/3/2016	118	3.33		F	mg/L	F
0424	Sulfate	5/2/2016	115	6.65		F	mg/L	F
0424	Sulfate	8/1/2016	145	2.66			mg/L	F
0424	Temperature	11/2/2015	14.9				C	F
0424	Temperature	2/3/2016	14.5			F	C	F
0424	Temperature	5/2/2016	13.6			F	C	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0424	Temperature	8/1/2016	17.8				C	F
0424	Tetrachloroethene	11/2/2015	0.16	0.16	U		µg/L	F
0424	Tetrachloroethene	2/3/2016	0.16	0.16	U	F	µg/L	F
0424	Tetrachloroethene	5/2/2016	0.17	0.16	J	F	µg/L	F
0424	Tetrachloroethene	8/1/2016	0.57	0.16	J		µg/L	F
0424	Trichloroethene	11/2/2015	0.16	0.16	U		µg/L	F
0424	Trichloroethene	2/3/2016	0.16	0.16	U	F	µg/L	F
0424	Trichloroethene	5/2/2016	0.16	0.16	U	F	µg/L	F
0424	Trichloroethene	8/1/2016	0.45	0.16	J		µg/L	F
0424	Turbidity	11/2/2015	1.28				NTU	F
0424	Turbidity	2/3/2016	0.5			F	NTU	F
0424	Turbidity	5/2/2016	0.92			F	NTU	F
0424	Turbidity	8/1/2016	0.69				NTU	F
0424	Vinyl Chloride	11/2/2015	0.16	0.16	U		µg/L	F
0424	Vinyl Chloride	2/3/2016	0.16	0.16	U	F	µg/L	F
0424	Vinyl Chloride	5/2/2016	0.16	0.16	U	F	µg/L	F
0424	Vinyl Chloride	8/1/2016	0.16	0.16	U		µg/L	F
0424	cis-1,2-Dichloroethene	11/2/2015	0.16	0.16	U		µg/L	F
0424	cis-1,2-Dichloroethene	2/3/2016	0.16	0.16	U	F	µg/L	F
0424	cis-1,2-Dichloroethene	5/2/2016	0.16	0.16	U	F	µg/L	F
0424	cis-1,2-Dichloroethene	8/1/2016	0.16	0.16	U		µg/L	F
0424	pH	11/2/2015	7.23				s.u.	F
0424	pH	2/3/2016	7.33			F	s.u.	F
0424	pH	5/2/2016	7.16			F	s.u.	F
0424	pH	8/1/2016	7.02				s.u.	F
0424	trans-1,2-Dichloroethene	11/2/2015	0.16	0.16	U		µg/L	F
0424	trans-1,2-Dichloroethene	2/3/2016	0.16	0.16	U	F	µg/L	F
0424	trans-1,2-Dichloroethene	5/2/2016	0.16	0.16	U	F	µg/L	F
0424	trans-1,2-Dichloroethene	8/1/2016	0.16	0.16	U		µg/L	F
0425	Chloride	11/5/2015	137	2.68			mg/L	F
0425	Chloride	2/3/2016	101	1.34		F	mg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0425	Chloride	5/3/2016	144	1.34		F	mg/L	F
0425	Chloride	8/2/2016	85.7	0.67			mg/L	F
0425	Dissolved Oxygen	11/5/2015	0.35				mg/L	F
0425	Dissolved Oxygen	2/3/2016	1.06			F	mg/L	F
0425	Dissolved Oxygen	5/3/2016	2.06			F	mg/L	F
0425	Dissolved Oxygen	8/2/2016	2.13				mg/L	F
0425	Iron	11/5/2015	0.03	0.03	U		mg/L	F
0425	Iron	2/3/2016	0.03	0.03	U	F	mg/L	F
0425	Iron	5/3/2016	0.0507	0.03	B	F	mg/L	F
0425	Iron	8/2/2016	0.0548	0.03	B		mg/L	F
0425	Nitrate as Nitrogen	11/5/2015	0.752	0.165			mg/L	F
0425	Nitrate as Nitrogen	2/3/2016	1.06	0.165		F	mg/L	F
0425	Nitrate as Nitrogen	5/3/2016	0.572	0.165		F	mg/L	F
0425	Nitrate as Nitrogen	8/2/2016	1.4	0.165			mg/L	F
0425	Oxidation Reduction Potential	11/5/2015	49.3				mV	F
0425	Oxidation Reduction Potential	2/3/2016	98			F	mV	F
0425	Oxidation Reduction Potential	5/3/2016	120.6			F	mV	F
0425	Oxidation Reduction Potential	8/2/2016	96.5				mV	F
0425	Specific Conductance	11/5/2015	1430				umhos/cm	F
0425	Specific Conductance	2/3/2016	1270			F	umhos/cm	F
0425	Specific Conductance	5/3/2016	1320			F	umhos/cm	F
0425	Specific Conductance	8/2/2016	1310				umhos/cm	F
0425	Sulfate	11/5/2015	124	5.32			mg/L	F
0425	Sulfate	2/3/2016	114	2.66		F	mg/L	F
0425	Sulfate	5/3/2016	116	2.66		F	mg/L	F
0425	Sulfate	8/2/2016	158	1.33			mg/L	F
0425	Temperature	11/5/2015	14.5				C	F
0425	Temperature	2/3/2016	14			F	C	F
0425	Temperature	5/3/2016	12.6			F	C	F
0425	Temperature	8/2/2016	13.7				C	F
0425	Tetrachloroethene	11/5/2015	0.57	0.16	J		µg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0425	Tetrachloroethene	2/3/2016	0.42	0.16	J	F	µg/L	F
0425	Tetrachloroethene	5/3/2016	0.4	0.16	J	F	µg/L	F
0425	Tetrachloroethene	8/2/2016	0.78	0.16	J		µg/L	F
0425	Trichloroethene	11/5/2015	0.51	0.16	J		µg/L	F
0425	Trichloroethene	2/3/2016	0.33	0.16	J	F	µg/L	F
0425	Trichloroethene	5/3/2016	0.3	0.16	J	F	µg/L	F
0425	Trichloroethene	8/2/2016	0.74	0.16	J		µg/L	F
0425	Turbidity	11/5/2015	5.25				NTU	F
0425	Turbidity	2/3/2016	2.37			F	NTU	F
0425	Turbidity	5/3/2016	1.04			F	NTU	F
0425	Turbidity	8/2/2016	1.24				NTU	F
0425	Vinyl Chloride	11/5/2015	0.16	0.16	U		µg/L	F
0425	Vinyl Chloride	2/3/2016	0.16	0.16	U	F	µg/L	F
0425	Vinyl Chloride	5/3/2016	0.16	0.16	U	F	µg/L	F
0425	Vinyl Chloride	8/2/2016	0.16	0.16	U		µg/L	F
0425	cis-1,2-Dichloroethene	11/5/2015	0.36	0.16	J		µg/L	F
0425	cis-1,2-Dichloroethene	2/3/2016	0.16	0.16	U	F	µg/L	F
0425	cis-1,2-Dichloroethene	5/3/2016	0.27	0.16	J	F	µg/L	F
0425	cis-1,2-Dichloroethene	8/2/2016	0.16	0.16	U		µg/L	F
0425	pH	11/5/2015	7.03				s.u.	F
0425	pH	2/3/2016	6.85			F	s.u.	F
0425	pH	5/3/2016	6.88			F	s.u.	F
0425	pH	8/2/2016	6.31				s.u.	F
0425	trans-1,2-Dichloroethene	11/5/2015	0.16	0.16	U		µg/L	F
0425	trans-1,2-Dichloroethene	2/3/2016	0.16	0.16	U	F	µg/L	F
0425	trans-1,2-Dichloroethene	5/3/2016	0.16	0.16	U	F	µg/L	F
0425	trans-1,2-Dichloroethene	8/2/2016	0.16	0.16	U		µg/L	F
0451	Ammonia Total as N	11/3/2015	0.0294	0.017	J		mg/L	F
0451	Ammonia Total as N	2/3/2016	0.16	0.017		F	mg/L	F
0451	Ammonia Total as N	5/5/2016	0.0387	0.017	J	UF	mg/L	F
0451	Ammonia Total as N	8/4/2016	0.0811	0.017	J		mg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0451	Chloride	11/3/2015	237	3.35			mg/L	F
0451	Chloride	2/3/2016	219	2.68		F	mg/L	F
0451	Chloride	5/5/2016	200	3.35		F	mg/L	F
0451	Chloride	8/4/2016	185	3.35			mg/L	F
0451	Dissolved Oxygen	11/3/2015	0.32				mg/L	F
0451	Dissolved Oxygen	2/3/2016	0.65			F	mg/L	F
0451	Dissolved Oxygen	2/8/2016	0.34			F	mg/L	F
0451	Dissolved Oxygen	5/5/2016	3.15			F	mg/L	F
0451	Dissolved Oxygen	8/4/2016	1.44				mg/L	F
0451	Ethane	11/3/2015	10	10	U		µg/L	F
0451	Ethane	2/3/2016	500	500	U	F	µg/L	F
0451	Ethane	5/5/2016	500	500	U	F	µg/L	F
0451	Ethane	8/4/2016	10	10	U		µg/L	F
0451	Ethene	11/3/2015	10	10	U		µg/L	F
0451	Ethene	2/3/2016	500	500	U	F	µg/L	F
0451	Ethene	5/5/2016	500	500	U	F	µg/L	F
0451	Ethene	8/4/2016	10	10	U		µg/L	F
0451	Iron	11/3/2015	0.03	0.03	U		mg/L	F
0451	Iron	2/8/2016	0.03	0.03	U	F	mg/L	F
0451	Iron	5/5/2016	0.03	0.03	U	F	mg/L	F
0451	Iron	8/4/2016	0.03	0.03	U		mg/L	F
0451	Methane	11/3/2015	3160	200			µg/L	F
0451	Methane	2/3/2016	4670	500		F	µg/L	F
0451	Methane	5/5/2016	3220	500		F	µg/L	F
0451	Methane	8/4/2016	4680	200			µg/L	F
0451	Nitrate as Nitrogen	11/3/2015	1.05	0.165			mg/L	F
0451	Nitrate as Nitrogen	2/3/2016	0.296	0.165	J	F	mg/L	F
0451	Nitrate as Nitrogen	5/5/2016	0.264	0.066		F	mg/L	F
0451	Nitrate as Nitrogen	8/4/2016	0.165	0.165	U		mg/L	F
0451	Oxidation Reduction Potential	11/3/2015	58.5				mV	F
0451	Oxidation Reduction Potential	2/3/2016	82.6			F	mV	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0451	Oxidation Reduction Potential	2/8/2016	132.4			F	mV	F
0451	Oxidation Reduction Potential	5/5/2016	66.7			F	mV	F
0451	Oxidation Reduction Potential	8/4/2016	45.5				mV	F
0451	Specific Conductance	11/3/2015	1750				umhos/cm	F
0451	Specific Conductance	2/3/2016	1640			F	umhos/cm	F
0451	Specific Conductance	2/8/2016	1630			F	umhos/cm	F
0451	Specific Conductance	5/5/2016	1590			F	umhos/cm	F
0451	Specific Conductance	8/4/2016	1630				umhos/cm	F
0451	Sulfate	11/3/2015	143	6.65			mg/L	F
0451	Sulfate	2/3/2016	130	5.32		F	mg/L	F
0451	Sulfate	5/5/2016	147	6.65		F	mg/L	F
0451	Sulfate	8/4/2016	136	6.65			mg/L	F
0451	Temperature	11/3/2015	15.6				C	F
0451	Temperature	2/3/2016	14.6			F	C	F
0451	Temperature	2/8/2016	12.9			F	C	F
0451	Temperature	5/5/2016	14.1			F	C	F
0451	Temperature	8/4/2016	26.9				C	F
0451	Tetrachloroethene	11/3/2015	7.52	0.16			µg/L	F
0451	Tetrachloroethene	2/3/2016	7.21	0.16		F	µg/L	F
0451	Tetrachloroethene	5/5/2016	7.39	0.16		F	µg/L	F
0451	Tetrachloroethene	8/4/2016	4.07	0.16			µg/L	F
0451	Total Organic Carbon	11/3/2015	1.54	0.33			mg/L	F
0451	Total Organic Carbon	2/3/2016	1.27	0.33		F	mg/L	F
0451	Total Organic Carbon	5/5/2016	1.46	0.33		F	mg/L	F
0451	Total Organic Carbon	8/4/2016	1.48	0.33			mg/L	F
0451	Trichloroethene	11/3/2015	4.84	0.16			µg/L	F
0451	Trichloroethene	2/3/2016	4.24	0.16		F	µg/L	F
0451	Trichloroethene	5/5/2016	4.35	0.16		F	µg/L	F
0451	Trichloroethene	8/4/2016	4.18	0.16			µg/L	F
0451	Turbidity	11/3/2015	4.09				NTU	F
0451	Turbidity	2/3/2016	0.97			F	NTU	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0451	Turbidity	2/8/2016	1.11			F	NTU	F
0451	Turbidity	5/5/2016	1.71			F	NTU	F
0451	Vinyl Chloride	11/3/2015	0.16	0.16	U		µg/L	F
0451	Vinyl Chloride	2/3/2016	0.16	0.16	U	F	µg/L	F
0451	Vinyl Chloride	5/5/2016	0.16	0.16	U	F	µg/L	F
0451	Vinyl Chloride	8/4/2016	0.16	0.16	U		µg/L	F
0451	cis-1,2-Dichloroethene	11/3/2015	0.48	0.16	J		µg/L	F
0451	cis-1,2-Dichloroethene	2/3/2016	0.54	0.16	J	F	µg/L	F
0451	cis-1,2-Dichloroethene	5/5/2016	1.26	0.16		F	µg/L	F
0451	cis-1,2-Dichloroethene	8/4/2016	2.47	0.16			µg/L	F
0451	pH	11/3/2015	7.12				s.u.	F
0451	pH	2/3/2016	6.97			F	s.u.	F
0451	pH	2/8/2016	6.93			F	s.u.	F
0451	pH	5/5/2016	6.82			F	s.u.	F
0451	pH	8/4/2016	6.78				s.u.	F
0451	trans-1,2-Dichloroethene	11/3/2015	0.16	0.16	U		µg/L	F
0451	trans-1,2-Dichloroethene	2/3/2016	0.16	0.16	U	F	µg/L	F
0451	trans-1,2-Dichloroethene	5/5/2016	0.16	0.16	U	F	µg/L	F
0451	trans-1,2-Dichloroethene	8/4/2016	0.16	0.16	U		µg/L	F
0452	Ammonia Total as N	11/5/2015	0.315	0.017			mg/L	F
0452	Ammonia Total as N	2/3/2016	0.566	0.017		F	mg/L	D
0452	Ammonia Total as N	2/3/2016	0.564	0.017		F	mg/L	F
0452	Ammonia Total as N	5/5/2016	0.553	0.017		F	mg/L	F
0452	Ammonia Total as N	8/2/2016	0.301	0.017			mg/L	F
0452	Chloride	11/5/2015	141	1.34			mg/L	F
0452	Chloride	2/3/2016	112	1.34		F	mg/L	D
0452	Chloride	2/3/2016	112	1.34		F	mg/L	F
0452	Chloride	5/5/2016	105	1.34		F	mg/L	F
0452	Chloride	8/2/2016	138	1.34			mg/L	F
0452	Dissolved Oxygen	11/5/2015	4.74				mg/L	F
0452	Dissolved Oxygen	2/3/2016	4.81			F	mg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0452	Dissolved Oxygen	5/5/2016	0.72			F	mg/L	F
0452	Dissolved Oxygen	8/2/2016	0.66				mg/L	F
0452	Ethane	11/5/2015	10	10	U		µg/L	F
0452	Ethane	2/3/2016	500	500	U	F	µg/L	D
0452	Ethane	2/3/2016	500	500	U	F	µg/L	F
0452	Ethane	5/5/2016	500	500	U	F	µg/L	F
0452	Ethane	8/2/2016	10	10	U		µg/L	F
0452	Ethene	11/5/2015	10	10	U		µg/L	F
0452	Ethene	2/3/2016	500	500	U	F	µg/L	D
0452	Ethene	2/3/2016	500	500	U	F	µg/L	F
0452	Ethene	5/5/2016	500	500	U	F	µg/L	F
0452	Ethene	8/2/2016	10	10	U		µg/L	F
0452	Iron	11/5/2015	2.18	0.03			mg/L	F
0452	Iron	2/3/2016	9.04	0.03		F	mg/L	D
0452	Iron	2/3/2016	9.47	0.03		F	mg/L	F
0452	Iron	5/5/2016	10.1	0.03		F	mg/L	F
0452	Iron	8/2/2016	32.3	0.03			mg/L	F
0452	Methane	11/5/2015	19500	1000			µg/L	F
0452	Methane	2/3/2016	12700	500		F	µg/L	D
0452	Methane	2/3/2016	11900	500		F	µg/L	F
0452	Methane	5/5/2016	11100	500		F	µg/L	F
0452	Methane	8/2/2016	7410	500			µg/L	F
0452	Nitrate as Nitrogen	11/5/2015	0.165	0.165	U		mg/L	F
0452	Nitrate as Nitrogen	2/3/2016	0.132	0.132	U	F	mg/L	D
0452	Nitrate as Nitrogen	2/3/2016	0.165	0.165	U	F	mg/L	F
0452	Nitrate as Nitrogen	5/5/2016	0.066	0.066	U	F	mg/L	F
0452	Nitrate as Nitrogen	8/2/2016	0.066	0.066	U		mg/L	F
0452	Oxidation Reduction Potential	11/5/2015	-188.6				mV	F
0452	Oxidation Reduction Potential	2/3/2016	98.6			F	mV	F
0452	Oxidation Reduction Potential	5/5/2016	-123.4			F	mV	F
0452	Oxidation Reduction Potential	8/2/2016	-112.2				mV	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0452	Specific Conductance	11/5/2015	1370				umhos/cm	F
0452	Specific Conductance	2/3/2016	1320			F	umhos/cm	F
0452	Specific Conductance	5/5/2016	1350			F	umhos/cm	F
0452	Specific Conductance	8/2/2016	1710				umhos/cm	F
0452	Sulfate	11/5/2015	16.8	0.665			mg/L	F
0452	Sulfate	2/3/2016	78.7	0.665		F	mg/L	D
0452	Sulfate	2/3/2016	79.7	0.665		F	mg/L	F
0452	Sulfate	5/5/2016	61.5	2.66		F	mg/L	F
0452	Sulfate	8/2/2016	260	2.66			mg/L	F
0452	Temperature	11/5/2015	15.3				C	F
0452	Temperature	2/3/2016	13.8			F	C	F
0452	Temperature	5/5/2016	13.5			F	C	F
0452	Temperature	8/2/2016	16.8				C	F
0452	Tetrachloroethene	11/5/2015	0.24	0.16	J		µg/L	F
0452	Tetrachloroethene	2/3/2016	0.23	0.16	J	F	µg/L	D
0452	Tetrachloroethene	2/3/2016	0.34	0.16	J	F	µg/L	F
0452	Tetrachloroethene	5/5/2016	0.16	0.16	U	F	µg/L	F
0452	Tetrachloroethene	8/2/2016	0.16	0.16	U		µg/L	F
0452	Total Organic Carbon	11/5/2015	3.6	0.33			mg/L	F
0452	Total Organic Carbon	2/3/2016	4.91	0.33		F	mg/L	D
0452	Total Organic Carbon	2/3/2016	5.07	0.33		F	mg/L	F
0452	Total Organic Carbon	5/5/2016	6.03	0.33		F	mg/L	F
0452	Total Organic Carbon	8/2/2016	2.93	0.33			mg/L	F
0452	Trichloroethene	11/5/2015	0.86	0.16	J		µg/L	F
0452	Trichloroethene	2/3/2016	3.08	0.16		F	µg/L	D
0452	Trichloroethene	2/3/2016	2.89	0.16		F	µg/L	F
0452	Trichloroethene	5/5/2016	0.64	0.16	J	F	µg/L	F
0452	Trichloroethene	8/2/2016	2.53	0.16			µg/L	F
0452	Turbidity	11/5/2015	28				NTU	F
0452	Turbidity	2/3/2016	12.7			F	NTU	F
0452	Turbidity	5/5/2016	15			F	NTU	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
0452	Turbidity	8/2/2016	4.98				NTU	F
0452	Vinyl Chloride	11/5/2015	0.16	0.16	U		µg/L	F
0452	Vinyl Chloride	2/3/2016	0.16	0.16	U	F	µg/L	D
0452	Vinyl Chloride	2/3/2016	0.16	0.16	U	F	µg/L	F
0452	Vinyl Chloride	5/5/2016	0.16	0.16	U	F	µg/L	F
0452	Vinyl Chloride	8/2/2016	0.16	0.16	U		µg/L	F
0452	cis-1,2-Dichloroethene	11/5/2015	9.29	0.16			µg/L	F
0452	cis-1,2-Dichloroethene	2/3/2016	6.6	0.16		F	µg/L	D
0452	cis-1,2-Dichloroethene	2/3/2016	6.09	0.16		F	µg/L	F
0452	cis-1,2-Dichloroethene	5/5/2016	11.6	0.16		F	µg/L	F
0452	cis-1,2-Dichloroethene	8/2/2016	8.61	0.16			µg/L	F
0452	pH	11/5/2015	7.06				s.u.	F
0452	pH	2/3/2016	6.92			F	s.u.	F
0452	pH	5/5/2016	6.95			F	s.u.	F
0452	pH	8/2/2016	6.79				s.u.	F
0452	trans-1,2-Dichloroethene	11/5/2015	0.16	0.16	J		µg/L	F
0452	trans-1,2-Dichloroethene	2/3/2016	0.16	0.16	J	F	µg/L	D
0452	trans-1,2-Dichloroethene	2/3/2016	0.16	0.16	U	F	µg/L	F
0452	trans-1,2-Dichloroethene	5/5/2016	0.38	0.16	J	F	µg/L	F
0452	trans-1,2-Dichloroethene	8/2/2016	0.16	0.16	U		µg/L	F
P015	Ammonia Total as N	11/3/2015	0.0314	0.017	J		mg/L	F
P015	Ammonia Total as N	2/2/2016	0.175	0.017		F	mg/L	F
P015	Ammonia Total as N	5/5/2016	0.117	0.017		F	mg/L	F
P015	Ammonia Total as N	8/3/2016	0.0757	0.017	J		mg/L	F
P015	Chloride	11/3/2015	261	3.35			mg/L	F
P015	Chloride	2/2/2016	179	2.68		F	mg/L	F
P015	Chloride	5/5/2016	171	3.35		F	mg/L	F
P015	Chloride	8/3/2016	200	3.35			mg/L	F
P015	Dissolved Oxygen	11/3/2015	0.55				mg/L	F
P015	Dissolved Oxygen	11/16/2015	0.37				mg/L	F
P015	Dissolved Oxygen	2/2/2016	0.91			F	mg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P015	Dissolved Oxygen	5/5/2016	0.76			F	mg/L	F
P015	Dissolved Oxygen	8/3/2016	0.95				mg/L	F
P015	Ethane	11/3/2015	10	10	U		µg/L	F
P015	Ethane	2/2/2016	500	500	U	F	µg/L	F
P015	Ethane	5/5/2016	500	500	U	F	µg/L	F
P015	Ethane	8/3/2016	10	10	U		µg/L	F
P015	Ethene	11/3/2015	10	10	U		µg/L	F
P015	Ethene	2/2/2016	500	500	U	F	µg/L	F
P015	Ethene	5/5/2016	500	500	U	F	µg/L	F
P015	Ethene	8/3/2016	10	10	U		µg/L	F
P015	Iron	11/3/2015	0.03	0.03	U		mg/L	F
P015	Iron	2/2/2016	2.46	0.03		F	mg/L	F
P015	Iron	5/5/2016	0.828	0.03		F	mg/L	F
P015	Iron	8/3/2016	1.08	0.03			mg/L	F
P015	Methane	11/3/2015	9340	500			µg/L	F
P015	Methane	2/2/2016	4430	500		F	µg/L	F
P015	Methane	5/5/2016	4980	500		F	µg/L	F
P015	Methane	8/3/2016	2990	100			µg/L	F
P015	Nitrate as Nitrogen	11/3/2015	0.165	0.165	U		mg/L	F
P015	Nitrate as Nitrogen	2/2/2016	0.33	0.33	U	F	mg/L	F
P015	Nitrate as Nitrogen	5/5/2016	0.066	0.066	U	F	mg/L	F
P015	Nitrate as Nitrogen	8/3/2016	0.066	0.066	U		mg/L	F
P015	Oxidation Reduction Potential	11/3/2015	112.9				mV	F
P015	Oxidation Reduction Potential	11/16/2015	112.6				mV	F
P015	Oxidation Reduction Potential	2/2/2016	-28.3			F	mV	F
P015	Oxidation Reduction Potential	5/5/2016	20			F	mV	F
P015	Oxidation Reduction Potential	8/3/2016	-56.1				mV	F
P015	Specific Conductance	11/3/2015	1590				umhos/cm	F
P015	Specific Conductance	11/16/2015	1570				umhos/cm	F
P015	Specific Conductance	2/2/2016	1540			F	umhos/cm	F
P015	Specific Conductance	5/5/2016	1530			F	umhos/cm	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P015	Specific Conductance	8/3/2016	1720				umhos/cm	F
P015	Sulfate	11/3/2015	67	0.665			mg/L	F
P015	Sulfate	2/2/2016	143	1.33		F	mg/L	F
P015	Sulfate	5/5/2016	131	6.65		F	mg/L	F
P015	Sulfate	8/3/2016	181	6.65			mg/L	F
P015	Temperature	11/3/2015	15.1				C	F
P015	Temperature	11/16/2015	14.1				C	F
P015	Temperature	2/2/2016	14			F	C	F
P015	Temperature	5/5/2016	13.7			F	C	F
P015	Temperature	8/3/2016	19.5				C	F
P015	Tetrachloroethene	11/3/2015	3.44	0.16			µg/L	F
P015	Tetrachloroethene	2/2/2016	2.42	0.16		F	µg/L	F
P015	Tetrachloroethene	5/5/2016	2.4	0.16		F	µg/L	F
P015	Tetrachloroethene	8/3/2016	0.96	0.16	J		µg/L	F
P015	Total Organic Carbon	11/16/2015	2.03	0.33			mg/L	F
P015	Total Organic Carbon	11/16/2015	2.09	0.33			mg/L	D
P015	Total Organic Carbon	2/2/2016	3.61	0.33		F	mg/L	F
P015	Total Organic Carbon	5/5/2016	2.94	0.33		F	mg/L	F
P015	Total Organic Carbon	8/3/2016	2.33	0.33			mg/L	F
P015	Trichloroethene	11/3/2015	3.03	0.16			µg/L	F
P015	Trichloroethene	2/2/2016	1.38	0.16		F	µg/L	F
P015	Trichloroethene	5/5/2016	2.27	0.16		F	µg/L	F
P015	Trichloroethene	8/3/2016	3.11	0.16			µg/L	F
P015	Turbidity	11/3/2015	3.36				NTU	F
P015	Turbidity	11/16/2015	4.46				NTU	F
P015	Turbidity	2/2/2016	2.36			F	NTU	F
P015	Turbidity	5/5/2016	0.89			F	NTU	F
P015	Turbidity	8/3/2016	1.11				NTU	F
P015	Vinyl Chloride	11/3/2015	0.16	0.16	U		µg/L	F
P015	Vinyl Chloride	2/2/2016	0.16	0.16	U	F	µg/L	F
P015	Vinyl Chloride	5/5/2016	0.16	0.16	U	F	µg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P015	Vinyl Chloride	8/3/2016	0.7	0.16	J		µg/L	F
P015	cis-1,2-Dichloroethene	11/3/2015	7.41	0.16			µg/L	F
P015	cis-1,2-Dichloroethene	2/2/2016	7.48	0.16		F	µg/L	F
P015	cis-1,2-Dichloroethene	5/5/2016	5.63	0.16		F	µg/L	F
P015	cis-1,2-Dichloroethene	8/3/2016	6.13	0.16			µg/L	F
P015	pH	11/3/2015	6.5				s.u.	F
P015	pH	11/16/2015	6.25				s.u.	F
P015	pH	2/2/2016	6.34			F	s.u.	F
P015	pH	5/5/2016	6.2			F	s.u.	F
P015	pH	8/3/2016	6.9				s.u.	F
P015	trans-1,2-Dichloroethene	11/3/2015	0.19	0.16	J		µg/L	F
P015	trans-1,2-Dichloroethene	2/2/2016	0.27	0.16	J	F	µg/L	F
P015	trans-1,2-Dichloroethene	5/5/2016	0.24	0.16	J	F	µg/L	F
P015	trans-1,2-Dichloroethene	8/3/2016	0.32	0.16	J		µg/L	F
P027	Chloride	11/2/2015	173	2.68			mg/L	F
P027	Chloride	2/3/2016	149	1.34		F	mg/L	F
P027	Chloride	5/2/2016	135	1.34		F	mg/L	F
P027	Chloride	8/2/2016	161	3.35			mg/L	F
P027	Chloride	8/2/2016	163	3.35			mg/L	D
P027	Dissolved Oxygen	11/2/2015	1.01				mg/L	F
P027	Dissolved Oxygen	2/3/2016	2.18			F	mg/L	F
P027	Dissolved Oxygen	5/2/2016	2.34			F	mg/L	F
P027	Dissolved Oxygen	6/30/2016	1.08				mg/L	F
P027	Dissolved Oxygen	8/2/2016	2.7				mg/L	F
P027	Dissolved Oxygen	8/29/2016	2.06			F	mg/L	F
P027	Ethane	2/3/2016	10	10	U	F	µg/L	F
P027	Ethane	5/2/2016	500	500	U	F	µg/L	F
P027	Ethane	8/2/2016	100	100	U		µg/L	F
P027	Ethane	8/2/2016	10	10	U		µg/L	D
P027	Ethene	2/3/2016	10	10	U	F	µg/L	F
P027	Ethene	5/2/2016	500	500	U	F	µg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P027	Ethene	8/2/2016	100	100	U		µg/L	F
P027	Ethene	8/2/2016	10	10	U		µg/L	D
P027	Iron	11/2/2015	0.03	0.03	U		mg/L	F
P027	Iron	2/3/2016	0.03	0.03	U	F	mg/L	F
P027	Iron	5/2/2016	0.03	0.03	U	F	mg/L	F
P027	Iron	8/2/2016	0.03	0.03	U		mg/L	F
P027	Iron	8/2/2016	0.0477	0.03	B		mg/L	D
P027	Methane	2/3/2016	337	10		F	µg/L	F
P027	Methane	5/2/2016	500	500	U	F	µg/L	F
P027	Methane	8/2/2016	1160	100			µg/L	F
P027	Methane	8/2/2016	10	10	U		µg/L	D
P027	Nitrate as Nitrogen	11/2/2015	0.915	0.165			mg/L	F
P027	Nitrate as Nitrogen	2/3/2016	1.31	0.165		F	mg/L	F
P027	Nitrate as Nitrogen	5/2/2016	1.58	0.165		F	mg/L	F
P027	Nitrate as Nitrogen	8/2/2016	0.77	0.066			mg/L	F
P027	Nitrate as Nitrogen	8/2/2016	0.737	0.066			mg/L	D
P027	Oxidation Reduction Potential	11/2/2015	154.2				mV	F
P027	Oxidation Reduction Potential	2/3/2016	96.5			F	mV	F
P027	Oxidation Reduction Potential	5/2/2016	103.1			F	mV	F
P027	Oxidation Reduction Potential	6/30/2016	20.4				mV	F
P027	Oxidation Reduction Potential	8/2/2016	18.3				mV	F
P027	Oxidation Reduction Potential	8/29/2016	31.7			F	mV	F
P027	Specific Conductance	11/2/2015	1470				umhos/cm	F
P027	Specific Conductance	2/3/2016	1390			F	umhos/cm	F
P027	Specific Conductance	5/2/2016	1410			F	umhos/cm	F
P027	Specific Conductance	6/30/2016	1490				umhos/cm	F
P027	Specific Conductance	8/2/2016	1460				umhos/cm	F
P027	Specific Conductance	8/29/2016	1450			F	umhos/cm	F
P027	Sulfate	11/2/2015	100	5.32			mg/L	F
P027	Sulfate	2/3/2016	99.4	2.66		F	mg/L	F
P027	Sulfate	5/2/2016	117	2.66		F	mg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P027	Sulfate	8/2/2016	124	6.65			mg/L	F
P027	Sulfate	8/2/2016	126	6.65			mg/L	D
P027	Temperature	11/2/2015	14.7				C	F
P027	Temperature	2/3/2016	14.4			F	C	F
P027	Temperature	5/2/2016	13.5			F	C	F
P027	Temperature	6/30/2016	18.8				C	F
P027	Temperature	8/2/2016	14.5				C	F
P027	Temperature	8/29/2016	14.3			F	C	F
P027	Tetrachloroethene	11/2/2015	0.53	0.16	J		µg/L	F
P027	Tetrachloroethene	2/3/2016	0.41	0.16	J	F	µg/L	F
P027	Tetrachloroethene	5/2/2016	0.51	0.16	J	F	µg/L	F
P027	Tetrachloroethene	6/30/2016	0.57	0.16	J		µg/L	F
P027	Tetrachloroethene	8/2/2016	0.62	0.16	J		µg/L	F
P027	Tetrachloroethene	8/2/2016	0.67	0.16	J		µg/L	D
P027	Tetrachloroethene	8/29/2016	0.65	0.16	J	F	µg/L	F
P027	Trichloroethene	11/2/2015	0.41	0.16	J		µg/L	F
P027	Trichloroethene	2/3/2016	0.24	0.16	J	F	µg/L	F
P027	Trichloroethene	5/2/2016	0.39	0.16	J	F	µg/L	F
P027	Trichloroethene	6/30/2016	2.01	0.16			µg/L	F
P027	Trichloroethene	8/2/2016	1.47	0.16			µg/L	F
P027	Trichloroethene	8/2/2016	1.62	0.16			µg/L	D
P027	Trichloroethene	8/29/2016	1.96	0.16		F	µg/L	F
P027	Turbidity	11/2/2015	1.05				NTU	F
P027	Turbidity	2/3/2016	0.41			F	NTU	F
P027	Turbidity	5/2/2016	1.72			F	NTU	F
P027	Turbidity	6/30/2016	1.66				NTU	F
P027	Turbidity	8/2/2016	0.51				NTU	F
P027	Turbidity	8/29/2016	0.78			F	NTU	F
P027	Vinyl Chloride	11/2/2015	0.19	0.16	J		µg/L	F
P027	Vinyl Chloride	2/3/2016	0.16	0.16	U	F	µg/L	F
P027	Vinyl Chloride	5/2/2016	0.16	0.16	U	F	µg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P027	Vinyl Chloride	6/30/2016	2.11	0.16			µg/L	F
P027	Vinyl Chloride	8/2/2016	0.62	0.16	J		µg/L	F
P027	Vinyl Chloride	8/2/2016	0.68	0.16	J		µg/L	D
P027	Vinyl Chloride	8/29/2016	0.16	0.16	U	F	µg/L	F
P027	cis-1,2-Dichloroethene	11/2/2015	1.37	0.16			µg/L	F
P027	cis-1,2-Dichloroethene	2/3/2016	0.52	0.16	J	F	µg/L	F
P027	cis-1,2-Dichloroethene	5/2/2016	0.58	0.16	J	F	µg/L	F
P027	cis-1,2-Dichloroethene	6/30/2016	3.58	0.16			µg/L	F
P027	cis-1,2-Dichloroethene	8/2/2016	3.69	0.16			µg/L	F
P027	cis-1,2-Dichloroethene	8/2/2016	4.25	0.16			µg/L	D
P027	cis-1,2-Dichloroethene	8/29/2016	3.44	0.16		F	µg/L	F
P027	pH	11/2/2015	7.06				s.u.	F
P027	pH	2/3/2016	7			F	s.u.	F
P027	pH	5/2/2016	6.86			F	s.u.	F
P027	pH	6/30/2016	7.03				s.u.	F
P027	pH	8/2/2016	6.76				s.u.	F
P027	pH	8/29/2016	6.98			F	s.u.	F
P027	trans-1,2-Dichloroethene	11/2/2015	0.16	0.16	U		µg/L	F
P027	trans-1,2-Dichloroethene	2/3/2016	0.16	0.16	U	F	µg/L	F
P027	trans-1,2-Dichloroethene	5/2/2016	0.16	0.16	U	F	µg/L	F
P027	trans-1,2-Dichloroethene	6/30/2016	0.16	0.16	U		µg/L	F
P027	trans-1,2-Dichloroethene	8/2/2016	0.16	0.16	U		µg/L	F
P027	trans-1,2-Dichloroethene	8/2/2016	0.16	0.16	U		µg/L	D
P027	trans-1,2-Dichloroethene	8/29/2016	0.16	0.16	U	F	µg/L	F
P031	Ammonia Total as N	11/2/2015	0.0656	0.017	J		mg/L	F
P031	Ammonia Total as N	2/4/2016	0.107	0.017		F	mg/L	F
P031	Ammonia Total as N	5/4/2016	0.017	0.017	U	F	mg/L	F
P031	Ammonia Total as N	8/2/2016	0.119	0.017			mg/L	F
P031	Chloride	11/2/2015	163	2.68			mg/L	F
P031	Chloride	2/4/2016	131	1.34		F	mg/L	F
P031	Chloride	5/4/2016	94.5	0.67		F	mg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P031	Chloride	8/2/2016	193	3.35			mg/L	F
P031	Dissolved Oxygen	11/2/2015	0.45				mg/L	F
P031	Dissolved Oxygen	2/4/2016	1.31			F	mg/L	F
P031	Dissolved Oxygen	5/4/2016	0.83			F	mg/L	F
P031	Dissolved Oxygen	6/30/2016	1.08				mg/L	F
P031	Dissolved Oxygen	8/2/2016	5.65				mg/L	F
P031	Dissolved Oxygen	8/30/2016	1.22			F	mg/L	F
P031	Ethane	2/4/2016	50	50	U	F	µg/L	F
P031	Ethane	5/4/2016	500	500	U	F	µg/L	F
P031	Ethane	8/2/2016	100	100	U		µg/L	F
P031	Ethene	2/4/2016	50	50	U	F	µg/L	F
P031	Ethene	5/4/2016	500	500	U	F	µg/L	F
P031	Ethene	8/2/2016	100	100	U		µg/L	F
P031	Iron	11/2/2015	0.03	0.03	U		mg/L	F
P031	Iron	2/4/2016	0.03	0.03	U	F	mg/L	F
P031	Iron	5/4/2016	0.03	0.03	U	F	mg/L	F
P031	Iron	8/2/2016	0.03	0.03	U		mg/L	F
P031	Methane	2/4/2016	1240	50		F	µg/L	F
P031	Methane	5/4/2016	13500	500		F	µg/L	F
P031	Methane	8/2/2016	1240	100			µg/L	F
P031	Nitrate as Nitrogen	11/2/2015	0.94	0.165			mg/L	F
P031	Nitrate as Nitrogen	2/4/2016	1.01	0.33		F	mg/L	F
P031	Nitrate as Nitrogen	5/4/2016	2.17	0.33		F	mg/L	F
P031	Nitrate as Nitrogen	8/2/2016	0.235	0.066			mg/L	F
P031	Oxidation Reduction Potential	11/2/2015	148.8				mV	F
P031	Oxidation Reduction Potential	2/4/2016	89.7			F	mV	F
P031	Oxidation Reduction Potential	5/4/2016	101.3			F	mV	F
P031	Oxidation Reduction Potential	6/30/2016	-33.7				mV	F
P031	Oxidation Reduction Potential	8/2/2016	23.1				mV	F
P031	Oxidation Reduction Potential	8/30/2016	44.5			F	mV	F
P031	Specific Conductance	11/2/2015	1470				umhos/cm	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P031	Specific Conductance	2/4/2016	1360			F	umhos/cm	F
P031	Specific Conductance	5/4/2016	1270			F	umhos/cm	F
P031	Specific Conductance	6/30/2016	1480				umhos/cm	F
P031	Specific Conductance	8/2/2016	1520				umhos/cm	F
P031	Specific Conductance	8/30/2016	1480			F	umhos/cm	F
P031	Sulfate	11/2/2015	114	5.32			mg/L	F
P031	Sulfate	2/4/2016	121	1.33		F	mg/L	F
P031	Sulfate	5/4/2016	110	1.33		F	mg/L	F
P031	Sulfate	8/2/2016	137	6.65			mg/L	F
P031	Temperature	11/2/2015	13.8				C	F
P031	Temperature	2/4/2016	13.2			F	C	F
P031	Temperature	5/4/2016	12.9			F	C	F
P031	Temperature	6/30/2016	13.5				C	F
P031	Temperature	8/2/2016	14.1				C	F
P031	Temperature	8/30/2016	14			F	C	F
P031	Tetrachloroethene	11/2/2015	0.9	0.16	J		µg/L	F
P031	Tetrachloroethene	2/4/2016	0.8	0.16	J	F	µg/L	F
P031	Tetrachloroethene	5/4/2016	0.77	0.16	J	F	µg/L	F
P031	Tetrachloroethene	6/30/2016	1.3	0.16			µg/L	F
P031	Tetrachloroethene	6/30/2016	1.24	0.16			µg/L	D
P031	Tetrachloroethene	8/2/2016	1.34	0.16			µg/L	F
P031	Tetrachloroethene	8/30/2016	1.28	0.16		F	µg/L	F
P031	Tetrachloroethene	8/30/2016	1.29	0.16		F	µg/L	D
P031	Total Organic Carbon	11/2/2015	1.47	0.33			mg/L	F
P031	Total Organic Carbon	2/4/2016	1.45	0.33		F	mg/L	F
P031	Total Organic Carbon	5/4/2016	1.5	0.33		F	mg/L	F
P031	Total Organic Carbon	8/2/2016	1.47	0.33			mg/L	F
P031	Trichloroethene	11/2/2015	0.57	0.16	J		µg/L	F
P031	Trichloroethene	2/4/2016	0.36	0.16	J	F	µg/L	F
P031	Trichloroethene	5/4/2016	0.45	0.16	J	F	µg/L	F
P031	Trichloroethene	6/30/2016	1.11	0.16			µg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P031	Trichloroethene	6/30/2016	1.22	0.16			µg/L	D
P031	Trichloroethene	8/2/2016	1.19	0.16			µg/L	F
P031	Trichloroethene	8/30/2016	1.37	0.16		F	µg/L	F
P031	Trichloroethene	8/30/2016	1.39	0.16		F	µg/L	D
P031	Turbidity	11/2/2015	1.55				NTU	F
P031	Turbidity	2/4/2016	0.33			F	NTU	F
P031	Turbidity	5/4/2016	0.71			F	NTU	F
P031	Turbidity	6/30/2016	2.27				NTU	F
P031	Turbidity	8/2/2016	0.56				NTU	F
P031	Turbidity	8/30/2016	0.81			F	NTU	F
P031	Vinyl Chloride	11/2/2015	0.16	0.16	U		µg/L	F
P031	Vinyl Chloride	2/4/2016	0.16	0.16	U	F	µg/L	F
P031	Vinyl Chloride	5/4/2016	0.16	0.16	U	F	µg/L	F
P031	Vinyl Chloride	6/30/2016	0.47	0.16	J		µg/L	F
P031	Vinyl Chloride	6/30/2016	0.48	0.16	J		µg/L	D
P031	Vinyl Chloride	8/2/2016	1.14	0.16			µg/L	F
P031	Vinyl Chloride	8/30/2016	0.46	0.16	J	UF	µg/L	F
P031	Vinyl Chloride	8/30/2016	0.45	0.16	J	UF	µg/L	D
P031	cis-1,2-Dichloroethene	11/2/2015	2.27	0.16			µg/L	F
P031	cis-1,2-Dichloroethene	2/4/2016	1.34	0.16		F	µg/L	F
P031	cis-1,2-Dichloroethene	5/4/2016	2.56	0.16		F	µg/L	F
P031	cis-1,2-Dichloroethene	6/30/2016	4.27	0.16			µg/L	F
P031	cis-1,2-Dichloroethene	6/30/2016	4.35	0.16			µg/L	D
P031	cis-1,2-Dichloroethene	8/2/2016	3.15	0.16			µg/L	F
P031	cis-1,2-Dichloroethene	8/30/2016	3.35	0.16		F	µg/L	F
P031	cis-1,2-Dichloroethene	8/30/2016	3.31	0.16		F	µg/L	D
P031	pH	11/2/2015	7.05				s.u.	F
P031	pH	2/4/2016	6.99			F	s.u.	F
P031	pH	5/4/2016	6.81			F	s.u.	F
P031	pH	6/30/2016	7.35				s.u.	F
P031	pH	8/2/2016	7.08				s.u.	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P031	pH	8/30/2016	7.01			F	s.u.	F
P031	trans-1,2-Dichloroethene	11/2/2015	0.16	0.16	U		µg/L	F
P031	trans-1,2-Dichloroethene	2/4/2016	0.16	0.16	U	F	µg/L	F
P031	trans-1,2-Dichloroethene	5/4/2016	0.16	0.16	U	F	µg/L	F
P031	trans-1,2-Dichloroethene	6/30/2016	0.16	0.16	U		µg/L	F
P031	trans-1,2-Dichloroethene	6/30/2016	0.16	0.16	U		µg/L	D
P031	trans-1,2-Dichloroethene	8/2/2016	0.16	0.16	U		µg/L	F
P031	trans-1,2-Dichloroethene	8/30/2016	0.16	0.16	U	F	µg/L	F
P031	trans-1,2-Dichloroethene	8/30/2016	0.16	0.16	U	F	µg/L	D
P045	Dissolved Oxygen	8/1/2016	0.37				mg/L	F
P045	Dissolved Oxygen	8/30/2016	1.46			F	mg/L	F
P045	Oxidation Reduction Potential	8/1/2016	204.3				mV	F
P045	Oxidation Reduction Potential	8/30/2016	41.3			F	mV	F
P045	Specific Conductance	8/1/2016	1450				umhos/cm	F
P045	Specific Conductance	8/30/2016	1460			F	umhos/cm	F
P045	Temperature	8/1/2016	16.1				C	F
P045	Temperature	8/30/2016	16.5			F	C	F
P045	Tetrachloroethene	8/1/2016	0.16	0.16	U		µg/L	F
P045	Tetrachloroethene	8/30/2016	0.16	0.16	U	F	µg/L	F
P045	Trichloroethene	8/1/2016	0.16	0.16	U		µg/L	F
P045	Trichloroethene	8/30/2016	0.16	0.16	U	F	µg/L	F
P045	Turbidity	8/1/2016	25.1				NTU	F
P045	Turbidity	8/30/2016	19.9			F	NTU	F
P045	Vinyl Chloride	8/1/2016	0.16	0.16	U		µg/L	F
P045	Vinyl Chloride	8/30/2016	0.16	0.16	U	F	µg/L	F
P045	cis-1,2-Dichloroethene	8/1/2016	0.48	0.16	J		µg/L	F
P045	cis-1,2-Dichloroethene	8/30/2016	0.3	0.16	J	F	µg/L	F
P045	pH	8/1/2016	6.95				s.u.	F
P045	pH	8/30/2016	7.17			F	s.u.	F
P045	trans-1,2-Dichloroethene	8/1/2016	0.16	0.16	U		µg/L	F
P045	trans-1,2-Dichloroethene	8/30/2016	0.16	0.16	U	F	µg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P046	Dissolved Oxygen	8/1/2016	0.22				mg/L	F
P046	Dissolved Oxygen	8/30/2016	0.89			F	mg/L	F
P046	Oxidation Reduction Potential	8/1/2016	116.3				mV	F
P046	Oxidation Reduction Potential	8/30/2016	3.2			F	mV	F
P046	Specific Conductance	8/1/2016	1440				umhos/cm	F
P046	Specific Conductance	8/30/2016	1470			F	umhos/cm	F
P046	Temperature	8/1/2016	15.9				C	F
P046	Temperature	8/30/2016	15.6			F	C	F
P046	Tetrachloroethene	8/1/2016	1.55	0.16			µg/L	F
P046	Tetrachloroethene	8/30/2016	1.8	0.16		F	µg/L	F
P046	Trichloroethene	8/1/2016	1.78	0.16			µg/L	F
P046	Trichloroethene	8/30/2016	1.83	0.16		F	µg/L	F
P046	Turbidity	8/1/2016	50				NTU	F
P046	Turbidity	8/30/2016	42.1			F	NTU	F
P046	Vinyl Chloride	8/1/2016	0.16	0.16	U		µg/L	F
P046	Vinyl Chloride	8/30/2016	0.16	0.16	U	F	µg/L	F
P046	cis-1,2-Dichloroethene	8/1/2016	0.16	0.16	U		µg/L	F
P046	cis-1,2-Dichloroethene	8/30/2016	0.16	0.16	U	F	µg/L	F
P046	pH	8/1/2016	6.96				s.u.	F
P046	pH	8/30/2016	7.12			F	s.u.	F
P046	trans-1,2-Dichloroethene	8/1/2016	0.16	0.16	U		µg/L	F
P046	trans-1,2-Dichloroethene	8/30/2016	0.16	0.16	U	F	µg/L	F
P053	Ammonia Total as N	11/3/2015	0.0519	0.017	J		mg/L	F
P053	Ammonia Total as N	2/2/2016	0.0489	0.017	J	UF	mg/L	F
P053	Ammonia Total as N	5/4/2016	0.0775	0.017	J	UF	mg/L	F
P053	Ammonia Total as N	8/3/2016	0.0818	0.017	J		mg/L	F
P053	Chloride	11/3/2015	250	2.68			mg/L	F
P053	Chloride	2/2/2016	244	2.68		F	mg/L	F
P053	Chloride	5/4/2016	185	1.68		F	mg/L	F
P053	Chloride	8/3/2016	246	3.35			mg/L	F
P053	Dissolved Oxygen	11/3/2015	2.33				mg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P053	Dissolved Oxygen	2/2/2016	1.01			F	mg/L	F
P053	Dissolved Oxygen	5/4/2016	2.98			F	mg/L	F
P053	Dissolved Oxygen	8/3/2016	1.92				mg/L	F
P053	Ethane	11/3/2015	10	10	U		µg/L	F
P053	Ethane	2/2/2016	50	50	U	F	µg/L	F
P053	Ethane	5/4/2016	10	10	U	F	µg/L	F
P053	Ethane	8/3/2016	10	10	U		µg/L	F
P053	Ethene	11/3/2015	10	10	U		µg/L	F
P053	Ethene	2/2/2016	50	50	U	F	µg/L	F
P053	Ethene	5/4/2016	10	10	U	F	µg/L	F
P053	Ethene	8/3/2016	10	10	U		µg/L	F
P053	Iron	11/3/2015	0.412	0.03			mg/L	F
P053	Iron	2/2/2016	0.339	0.03		F	mg/L	F
P053	Iron	5/4/2016	0.383	0.03		F	mg/L	F
P053	Iron	8/3/2016	0.814	0.03			mg/L	F
P053	Methane	11/3/2015	475	20			µg/L	F
P053	Methane	2/2/2016	526	50		F	µg/L	F
P053	Methane	5/4/2016	259	10		F	µg/L	F
P053	Methane	8/3/2016	451	20			µg/L	F
P053	Nitrate as Nitrogen	11/3/2015	0.923	0.165			mg/L	F
P053	Nitrate as Nitrogen	2/2/2016	0.671	0.165		F	mg/L	F
P053	Nitrate as Nitrogen	5/4/2016	0.895	0.066		F	mg/L	F
P053	Nitrate as Nitrogen	8/3/2016	0.066	0.066	U		mg/L	F
P053	Oxidation Reduction Potential	11/3/2015	-94.6				mV	F
P053	Oxidation Reduction Potential	2/2/2016	-164.1			F	mV	F
P053	Oxidation Reduction Potential	5/4/2016	-99			F	mV	F
P053	Oxidation Reduction Potential	8/3/2016	-82.9				mV	F
P053	Specific Conductance	11/3/2015	1660				umhos/cm	F
P053	Specific Conductance	2/2/2016	1660			F	umhos/cm	F
P053	Specific Conductance	5/4/2016	1460			F	umhos/cm	F
P053	Specific Conductance	8/3/2016	1750				umhos/cm	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P053	Sulfate	11/3/2015	114	5.32			mg/L	F
P053	Sulfate	2/2/2016	113	5.32		F	mg/L	F
P053	Sulfate	5/4/2016	139	3.33		F	mg/L	F
P053	Sulfate	8/3/2016	129	6.65			mg/L	F
P053	Temperature	11/3/2015	14.7				C	F
P053	Temperature	2/2/2016	13.3			F	C	F
P053	Temperature	5/4/2016	14.1			F	C	F
P053	Temperature	8/3/2016	15.8				C	F
P053	Tetrachloroethene	11/3/2015	5.18	0.16			µg/L	F
P053	Tetrachloroethene	2/2/2016	4.63	0.16		F	µg/L	F
P053	Tetrachloroethene	5/4/2016	4.77	0.16		F	µg/L	F
P053	Tetrachloroethene	8/3/2016	5.9	0.16			µg/L	F
P053	Total Organic Carbon	11/3/2015	2.41	0.33			mg/L	F
P053	Total Organic Carbon	2/2/2016	1.58	0.33		F	mg/L	F
P053	Total Organic Carbon	5/4/2016	1.68	0.33		F	mg/L	F
P053	Total Organic Carbon	8/3/2016	4.87	0.33			mg/L	F
P053	Trichloroethene	11/3/2015	3.55	0.16			µg/L	F
P053	Trichloroethene	2/2/2016	3.04	0.16		F	µg/L	F
P053	Trichloroethene	5/4/2016	2.93	0.16		F	µg/L	F
P053	Trichloroethene	8/3/2016	3.5	0.16			µg/L	F
P053	Turbidity	11/3/2015	3.42				NTU	F
P053	Turbidity	2/2/2016	7.02			F	NTU	F
P053	Turbidity	5/4/2016	2.51			F	NTU	F
P053	Turbidity	8/3/2016	1.27				NTU	F
P053	Vinyl Chloride	11/3/2015	0.16	0.16	U		µg/L	F
P053	Vinyl Chloride	2/2/2016	0.16	0.16	U	F	µg/L	F
P053	Vinyl Chloride	5/4/2016	0.16	0.16	U	F	µg/L	F
P053	Vinyl Chloride	8/3/2016	0.16	0.16	U		µg/L	F
P053	cis-1,2-Dichloroethene	11/3/2015	0.53	0.16	J		µg/L	F
P053	cis-1,2-Dichloroethene	2/2/2016	0.77	0.16	J	F	µg/L	F
P053	cis-1,2-Dichloroethene	5/4/2016	0.7	0.16	J	F	µg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P053	cis-1,2-Dichloroethene	8/3/2016	0.71	0.16	J		µg/L	F
P053	pH	11/3/2015	7.12				s.u.	F
P053	pH	2/2/2016	7.01			F	s.u.	F
P053	pH	5/4/2016	7.02			F	s.u.	F
P053	pH	8/3/2016	7.04				s.u.	F
P053	trans-1,2-Dichloroethene	11/3/2015	0.16	0.16	U		µg/L	F
P053	trans-1,2-Dichloroethene	2/2/2016	0.16	0.16	U	F	µg/L	F
P053	trans-1,2-Dichloroethene	5/4/2016	0.16	0.16	U	F	µg/L	F
P053	trans-1,2-Dichloroethene	8/3/2016	0.16	0.16	U		µg/L	F
P054	Ammonia Total as N	11/3/2015	0.0823	0.017	J		mg/L	F
P054	Ammonia Total as N	2/2/2016	0.0653	0.017	J	F	mg/L	F
P054	Ammonia Total as N	5/4/2016	0.0806	0.017	J	UF	mg/L	F
P054	Ammonia Total as N	8/3/2016	0.125	0.017			mg/L	F
P054	Chloride	11/3/2015	236	3.35			mg/L	F
P054	Chloride	2/2/2016	224	2.68		F	mg/L	F
P054	Chloride	5/4/2016	194	3.35		F	mg/L	F
P054	Chloride	8/3/2016	253	3.35			mg/L	F
P054	Dissolved Oxygen	11/3/2015	0.25				mg/L	F
P054	Dissolved Oxygen	2/2/2016	0.76			F	mg/L	F
P054	Dissolved Oxygen	5/4/2016	0.51			F	mg/L	F
P054	Dissolved Oxygen	8/3/2016	0.88				mg/L	F
P054	Ethane	11/3/2015	10	10	U		µg/L	F
P054	Ethane	2/2/2016	500	500	U	F	µg/L	F
P054	Ethane	5/4/2016	500	500	U	F	µg/L	F
P054	Ethane	8/3/2016	10	10	U		µg/L	F
P054	Ethene	11/3/2015	10	10	U		µg/L	F
P054	Ethene	2/2/2016	500	500	U	F	µg/L	F
P054	Ethene	5/4/2016	500	500	U	F	µg/L	F
P054	Ethene	8/3/2016	10	10	U		µg/L	F
P054	Iron	11/3/2015	2	0.03			mg/L	F
P054	Iron	2/2/2016	2.63	0.03		F	mg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P054	Iron	5/4/2016	3.2	0.03		F	mg/L	F
P054	Iron	8/3/2016	1.27	0.03			mg/L	F
P054	Methane	11/3/2015	5050	200			µg/L	F
P054	Methane	2/2/2016	2220	500		F	µg/L	F
P054	Methane	5/4/2016	3680	500		F	µg/L	F
P054	Methane	8/3/2016	1950	100			µg/L	F
P054	Nitrate as Nitrogen	11/3/2015	0.165	0.165	U		mg/L	F
P054	Nitrate as Nitrogen	2/2/2016	0.165	0.165	U	F	mg/L	F
P054	Nitrate as Nitrogen	5/4/2016	0.066	0.066	U	F	mg/L	F
P054	Nitrate as Nitrogen	8/3/2016	0.066	0.066	U		mg/L	F
P054	Oxidation Reduction Potential	11/3/2015	-146.6				mV	F
P054	Oxidation Reduction Potential	2/2/2016	-138.6			F	mV	F
P054	Oxidation Reduction Potential	5/4/2016	-135.7			F	mV	F
P054	Oxidation Reduction Potential	8/3/2016	-89.7				mV	F
P054	Specific Conductance	11/3/2015	1590				umhos/cm	F
P054	Specific Conductance	2/2/2016	1610			F	umhos/cm	F
P054	Specific Conductance	5/4/2016	1570			F	umhos/cm	F
P054	Specific Conductance	8/3/2016	1700				umhos/cm	F
P054	Sulfate	11/3/2015	65.9	0.665			mg/L	F
P054	Sulfate	2/2/2016	109	5.32		F	mg/L	F
P054	Sulfate	5/4/2016	132	6.65		F	mg/L	F
P054	Sulfate	8/3/2016	133	6.65			mg/L	F
P054	Temperature	11/3/2015	14.8				C	F
P054	Temperature	2/2/2016	13.7			F	C	F
P054	Temperature	5/4/2016	14.1			F	C	F
P054	Temperature	8/3/2016	17.1				C	F
P054	Tetrachloroethene	11/3/2015	1.02	0.16			µg/L	F
P054	Tetrachloroethene	2/2/2016	0.81	0.16	J	F	µg/L	F
P054	Tetrachloroethene	5/4/2016	0.86	0.16	J	F	µg/L	F
P054	Tetrachloroethene	8/3/2016	3.53	0.16			µg/L	F
P054	Total Organic Carbon	11/3/2015	2.46	0.33			mg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P054	Total Organic Carbon	2/2/2016	1.84	0.33		F	mg/L	F
P054	Total Organic Carbon	5/4/2016	1.93	0.33		F	mg/L	F
P054	Total Organic Carbon	8/3/2016	1.45	0.33			mg/L	F
P054	Trichloroethene	11/3/2015	1.23	0.16			µg/L	F
P054	Trichloroethene	2/2/2016	1.2	0.16		F	µg/L	F
P054	Trichloroethene	5/4/2016	1.23	0.16		F	µg/L	F
P054	Trichloroethene	8/3/2016	25.8	0.16			µg/L	F
P054	Turbidity	11/3/2015	1.1				NTU	F
P054	Turbidity	2/2/2016	0.47			F	NTU	F
P054	Turbidity	5/4/2016	1.15			F	NTU	F
P054	Turbidity	8/3/2016	2.04				NTU	F
P054	Vinyl Chloride	11/3/2015	0.16	0.16	U		µg/L	F
P054	Vinyl Chloride	2/2/2016	1.76	0.16		F	µg/L	F
P054	Vinyl Chloride	5/4/2016	2.19	0.16		F	µg/L	F
P054	Vinyl Chloride	8/3/2016	1.71	0.16			µg/L	F
P054	cis-1,2-Dichloroethene	11/3/2015	21.9	0.16			µg/L	F
P054	cis-1,2-Dichloroethene	2/2/2016	16.5	0.16		F	µg/L	F
P054	cis-1,2-Dichloroethene	5/4/2016	10.7	0.16		F	µg/L	F
P054	cis-1,2-Dichloroethene	8/3/2016	10.4	0.16			µg/L	F
P054	pH	11/3/2015	7.16				s.u.	F
P054	pH	2/2/2016	7.09			F	s.u.	F
P054	pH	5/4/2016	7.01			F	s.u.	F
P054	pH	8/3/2016	6.76				s.u.	F
P054	trans-1,2-Dichloroethene	11/3/2015	0.41	0.16	J		µg/L	F
P054	trans-1,2-Dichloroethene	2/2/2016	0.32	0.16	J	F	µg/L	F
P054	trans-1,2-Dichloroethene	5/4/2016	0.21	0.16	J	F	µg/L	F
P054	trans-1,2-Dichloroethene	8/3/2016	0.16	0.16	U		µg/L	F
P056	Ammonia Total as N	11/3/2015	0.14	0.017			mg/L	F
P056	Ammonia Total as N	2/3/2016	0.15	0.017		F	mg/L	F
P056	Ammonia Total as N	5/4/2016	0.0638	0.017	J	UF	mg/L	F
P056	Ammonia Total as N	8/3/2016	0.155	0.017			mg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P056	Chloride	11/3/2015	229	3.35			mg/L	F
P056	Chloride	2/3/2016	223	2.68		F	mg/L	F
P056	Chloride	5/4/2016	185	3.35		F	mg/L	F
P056	Chloride	8/3/2016	291	3.35			mg/L	F
P056	Dissolved Oxygen	11/3/2015	0.44				mg/L	F
P056	Dissolved Oxygen	2/3/2016	0.76			F	mg/L	F
P056	Dissolved Oxygen	5/4/2016	0.6			F	mg/L	F
P056	Dissolved Oxygen	8/3/2016	0.84				mg/L	F
P056	Ethane	11/3/2015	10	10	U		µg/L	F
P056	Ethane	2/3/2016	500	500	U	F	µg/L	F
P056	Ethane	5/4/2016	500	500	U	F	µg/L	F
P056	Ethane	8/3/2016	10	10	U		µg/L	F
P056	Ethene	11/3/2015	10	10	U		µg/L	F
P056	Ethene	2/3/2016	500	500	U	F	µg/L	F
P056	Ethene	5/4/2016	500	500	U	F	µg/L	F
P056	Ethene	8/3/2016	10	10	U		µg/L	F
P056	Iron	11/3/2015	0.588	0.03			mg/L	F
P056	Iron	2/3/2016	1.36	0.03		F	mg/L	F
P056	Iron	5/4/2016	1.37	0.03		F	mg/L	F
P056	Iron	8/3/2016	0.28	0.03			mg/L	F
P056	Methane	11/3/2015	2790	100			µg/L	F
P056	Methane	2/3/2016	3580	500		F	µg/L	F
P056	Methane	5/4/2016	3720	500		F	µg/L	F
P056	Methane	8/3/2016	871	50			µg/L	F
P056	Nitrate as Nitrogen	11/3/2015	0.165	0.165	U		mg/L	F
P056	Nitrate as Nitrogen	2/3/2016	0.132	0.132	U	F	mg/L	F
P056	Nitrate as Nitrogen	5/4/2016	0.066	0.066	U	F	mg/L	F
P056	Nitrate as Nitrogen	8/3/2016	0.49	0.066			mg/L	F
P056	Oxidation Reduction Potential	11/3/2015	-71.9				mV	F
P056	Oxidation Reduction Potential	2/3/2016	-90.4			F	mV	F
P056	Oxidation Reduction Potential	5/4/2016	-44.4			F	mV	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P056	Oxidation Reduction Potential	8/3/2016	-46.9				mV	F
P056	Specific Conductance	11/3/2015	1580				umhos/cm	F
P056	Specific Conductance	2/3/2016	1560			F	umhos/cm	F
P056	Specific Conductance	5/4/2016	1530			F	umhos/cm	F
P056	Specific Conductance	8/3/2016	1650				umhos/cm	F
P056	Sulfate	11/3/2015	91.7	0.665			mg/L	F
P056	Sulfate	2/3/2016	97.7	5.32		F	mg/L	F
P056	Sulfate	5/4/2016	142	6.65		F	mg/L	F
P056	Sulfate	8/3/2016	106	6.65			mg/L	F
P056	Temperature	11/3/2015	14.6				C	F
P056	Temperature	2/3/2016	14.1			F	C	F
P056	Temperature	5/4/2016	13.8			F	C	F
P056	Temperature	8/3/2016	15.4				C	F
P056	Tetrachloroethene	11/3/2015	3	0.16			µg/L	F
P056	Tetrachloroethene	2/3/2016	2.94	0.16		F	µg/L	F
P056	Tetrachloroethene	5/4/2016	2.17	0.16		F	µg/L	F
P056	Tetrachloroethene	8/3/2016	2.1	0.16			µg/L	F
P056	Total Organic Carbon	11/3/2015	1.37	0.33			mg/L	F
P056	Total Organic Carbon	2/3/2016	1.18	0.33		F	mg/L	F
P056	Total Organic Carbon	5/4/2016	1.45	0.33		F	mg/L	F
P056	Total Organic Carbon	8/3/2016	1.38	0.33			mg/L	F
P056	Trichloroethene	11/3/2015	2	0.16			µg/L	F
P056	Trichloroethene	2/3/2016	2.32	0.16		F	µg/L	F
P056	Trichloroethene	5/4/2016	1.36	0.16		F	µg/L	F
P056	Trichloroethene	8/3/2016	1.42	0.16			µg/L	F
P056	Turbidity	11/3/2015	1.25				NTU	F
P056	Turbidity	2/3/2016	0.46			F	NTU	F
P056	Turbidity	5/4/2016	1.31			F	NTU	F
P056	Turbidity	8/3/2016	0.51				NTU	F
P056	Vinyl Chloride	11/3/2015	3.53	0.16			µg/L	F
P056	Vinyl Chloride	2/3/2016	1.67	0.16		F	µg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P056	Vinyl Chloride	5/4/2016	1.95	0.16		F	µg/L	F
P056	Vinyl Chloride	8/3/2016	2.72	0.16			µg/L	F
P056	cis-1,2-Dichloroethene	11/3/2015	7.56	0.16			µg/L	F
P056	cis-1,2-Dichloroethene	2/3/2016	5.51	0.16		F	µg/L	F
P056	cis-1,2-Dichloroethene	5/4/2016	4.91	0.16		F	µg/L	F
P056	cis-1,2-Dichloroethene	8/3/2016	7.66	0.16			µg/L	F
P056	pH	11/3/2015	7.17				s.u.	F
P056	pH	2/3/2016	7.04			F	s.u.	F
P056	pH	5/4/2016	7			F	s.u.	F
P056	pH	8/3/2016	6.93				s.u.	F
P056	trans-1,2-Dichloroethene	11/3/2015	0.3	0.16	J		µg/L	F
P056	trans-1,2-Dichloroethene	2/3/2016	0.23	0.16	J	F	µg/L	F
P056	trans-1,2-Dichloroethene	5/4/2016	0.23	0.16	J	F	µg/L	F
P056	trans-1,2-Dichloroethene	8/3/2016	0.16	0.16	U		µg/L	F
P057	Ammonia Total as N	11/4/2015	0.0822	0.017	J		mg/L	F
P057	Ammonia Total as N	2/3/2016	0.179	0.017		F	mg/L	F
P057	Ammonia Total as N	5/5/2016	0.0872	0.017	J	UF	mg/L	F
P057	Ammonia Total as N	8/2/2016	0.0448	0.017	J		mg/L	F
P057	Chloride	11/4/2015	232	3.35			mg/L	F
P057	Chloride	2/3/2016	204	2.68		F	mg/L	F
P057	Chloride	5/5/2016	187	3.35		F	mg/L	F
P057	Chloride	8/2/2016	202	3.35			mg/L	F
P057	Dissolved Oxygen	11/4/2015	0.57				mg/L	F
P057	Dissolved Oxygen	2/3/2016	0.35			F	mg/L	F
P057	Dissolved Oxygen	5/5/2016	0.81			F	mg/L	F
P057	Dissolved Oxygen	8/2/2016	1.16				mg/L	F
P057	Ethane	11/4/2015	10	10	U		µg/L	F
P057	Ethane	2/3/2016	500	500	U	F	µg/L	F
P057	Ethane	5/5/2016	500	500	U	F	µg/L	F
P057	Ethane	8/2/2016	10	10	U		µg/L	F
P057	Ethene	11/4/2015	10	10	U		µg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P057	Ethene	2/3/2016	500	500	U	F	µg/L	F
P057	Ethene	5/5/2016	500	500	U	F	µg/L	F
P057	Ethene	8/2/2016	10	10	U		µg/L	F
P057	Iron	11/4/2015	0.03	0.03	U		mg/L	F
P057	Iron	2/3/2016	0.03	0.03	U	F	mg/L	F
P057	Iron	5/5/2016	0.03	0.03	U	F	mg/L	F
P057	Iron	8/2/2016	0.03	0.03	U		mg/L	F
P057	Methane	11/4/2015	4770	200			µg/L	F
P057	Methane	2/3/2016	2540	500		F	µg/L	F
P057	Methane	5/5/2016	2590	500		F	µg/L	F
P057	Methane	8/2/2016	295	20			µg/L	F
P057	Nitrate as Nitrogen	11/4/2015	0.296	0.165	J		mg/L	F
P057	Nitrate as Nitrogen	2/3/2016	0.52	0.165		F	mg/L	F
P057	Nitrate as Nitrogen	5/5/2016	0.971	0.066		F	mg/L	F
P057	Nitrate as Nitrogen	8/2/2016	0.246	0.165	J		mg/L	F
P057	Oxidation Reduction Potential	11/4/2015	70.4				mV	F
P057	Oxidation Reduction Potential	2/3/2016	68.8			F	mV	F
P057	Oxidation Reduction Potential	5/5/2016	68			F	mV	F
P057	Oxidation Reduction Potential	8/2/2016	102.6				mV	F
P057	Specific Conductance	11/4/2015	1520				umhos/cm	F
P057	Specific Conductance	2/3/2016	1520			F	umhos/cm	F
P057	Specific Conductance	5/5/2016	1550			F	umhos/cm	F
P057	Specific Conductance	8/2/2016	1570				umhos/cm	F
P057	Sulfate	11/4/2015	98.2	6.65			mg/L	F
P057	Sulfate	2/3/2016	113	5.32		F	mg/L	F
P057	Sulfate	5/5/2016	136	6.65		F	mg/L	F
P057	Sulfate	8/2/2016	133	6.65			mg/L	F
P057	Temperature	11/4/2015	14.2				C	F
P057	Temperature	2/3/2016	14.2			F	C	F
P057	Temperature	5/5/2016	13.9			F	C	F
P057	Temperature	8/2/2016	14.7				C	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P057	Tetrachloroethene	11/4/2015	0.88	0.16	J		µg/L	F
P057	Tetrachloroethene	2/3/2016	0.92	0.16	J	F	µg/L	F
P057	Tetrachloroethene	5/5/2016	1.32	0.16		F	µg/L	F
P057	Tetrachloroethene	8/2/2016	1.25	0.16			µg/L	F
P057	Total Organic Carbon	11/4/2015	1.21	0.33			mg/L	F
P057	Total Organic Carbon	2/3/2016	1.26	0.33		F	mg/L	F
P057	Total Organic Carbon	5/5/2016	1.66	0.33		F	mg/L	F
P057	Total Organic Carbon	8/2/2016	1.32	0.33			mg/L	F
P057	Trichloroethene	11/4/2015	2.12	0.16			µg/L	F
P057	Trichloroethene	2/3/2016	1.86	0.16		F	µg/L	F
P057	Trichloroethene	5/5/2016	2.03	0.16		F	µg/L	F
P057	Trichloroethene	8/2/2016	4.28	0.16			µg/L	F
P057	Turbidity	11/4/2015	0.31				NTU	F
P057	Turbidity	2/3/2016	0.95			F	NTU	F
P057	Turbidity	5/5/2016	4.1			F	NTU	F
P057	Turbidity	8/2/2016	1.77				NTU	F
P057	Vinyl Chloride	11/4/2015	0.76	0.16	J		µg/L	F
P057	Vinyl Chloride	2/3/2016	0.16	0.16	U	F	µg/L	F
P057	Vinyl Chloride	5/5/2016	0.32	0.16	J	F	µg/L	F
P057	Vinyl Chloride	8/2/2016	1.03	0.16			µg/L	F
P057	cis-1,2-Dichloroethene	11/4/2015	4.69	0.16			µg/L	F
P057	cis-1,2-Dichloroethene	2/3/2016	2.92	0.16		F	µg/L	F
P057	cis-1,2-Dichloroethene	5/5/2016	3.11	0.16		F	µg/L	F
P057	cis-1,2-Dichloroethene	8/2/2016	7.37	0.16			µg/L	F
P057	pH	11/4/2015	7.11				s.u.	F
P057	pH	2/3/2016	7.01			F	s.u.	F
P057	pH	5/5/2016	6.89			F	s.u.	F
P057	pH	8/2/2016	6.82				s.u.	F
P057	trans-1,2-Dichloroethene	11/4/2015	0.16	0.16	U		µg/L	F
P057	trans-1,2-Dichloroethene	2/3/2016	0.16	0.16	U	F	µg/L	F
P057	trans-1,2-Dichloroethene	5/5/2016	0.16	0.16	U	F	µg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P057	trans-1,2-Dichloroethene	8/2/2016	0.16	0.16	U		µg/L	F
P058	Ammonia Total as N	11/4/2015	0.132	0.017			mg/L	F
P058	Ammonia Total as N	2/3/2016	0.109	0.017		F	mg/L	F
P058	Ammonia Total as N	5/4/2016	0.0869	0.017	J	UF	mg/L	F
P058	Ammonia Total as N	8/2/2016	0.244	0.017			mg/L	F
P058	Chloride	11/4/2015	236	3.35			mg/L	F
P058	Chloride	2/3/2016	183	1.68		F	mg/L	F
P058	Chloride	5/4/2016	189	1.68		F	mg/L	F
P058	Chloride	8/2/2016	181	3.35			mg/L	F
P058	Dissolved Oxygen	11/4/2015	2.83				mg/L	F
P058	Dissolved Oxygen	2/3/2016	0.84			F	mg/L	F
P058	Dissolved Oxygen	5/4/2016	3.13			F	mg/L	F
P058	Dissolved Oxygen	8/2/2016	0.61				mg/L	F
P058	Ethane	11/4/2015	10	10	U		µg/L	F
P058	Ethane	2/3/2016	500	500	U	F	µg/L	F
P058	Ethane	5/4/2016	500	500	U	F	µg/L	F
P058	Ethane	8/2/2016	10	10	U		µg/L	F
P058	Ethene	11/4/2015	10	10	U		µg/L	F
P058	Ethene	2/3/2016	500	500	U	F	µg/L	F
P058	Ethene	5/4/2016	500	500	U	F	µg/L	F
P058	Ethene	8/2/2016	10	10	U		µg/L	F
P058	Iron	11/4/2015	0.03	0.03	U		mg/L	F
P058	Iron	2/3/2016	0.03	0.03	U	F	mg/L	F
P058	Iron	5/4/2016	0.03	0.03	U	F	mg/L	F
P058	Iron	8/2/2016	0.03	0.03	U		mg/L	F
P058	Methane	11/4/2015	3220	100			µg/L	F
P058	Methane	2/3/2016	5320	500		F	µg/L	F
P058	Methane	5/4/2016	9590	500		F	µg/L	F
P058	Methane	8/2/2016	2010	100			µg/L	F
P058	Nitrate as Nitrogen	11/4/2015	0.355	0.165	J		mg/L	F
P058	Nitrate as Nitrogen	2/3/2016	0.078	0.066	J	F	mg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P058	Nitrate as Nitrogen	5/4/2016	0.066	0.066	U	F	mg/L	F
P058	Nitrate as Nitrogen	8/2/2016	0.066	0.066	U		mg/L	F
P058	Oxidation Reduction Potential	11/4/2015	63.6				mV	F
P058	Oxidation Reduction Potential	2/3/2016	54.3			F	mV	F
P058	Oxidation Reduction Potential	5/4/2016	112.9			F	mV	F
P058	Oxidation Reduction Potential	8/2/2016	60.3				mV	F
P058	Specific Conductance	11/4/2015	1580				umhos/cm	F
P058	Specific Conductance	2/3/2016	1500			F	umhos/cm	F
P058	Specific Conductance	5/4/2016	1500			F	umhos/cm	F
P058	Specific Conductance	8/2/2016	1660				umhos/cm	F
P058	Sulfate	11/4/2015	118	6.65			mg/L	F
P058	Sulfate	2/3/2016	131	3.33		F	mg/L	F
P058	Sulfate	5/4/2016	123	3.33		F	mg/L	F
P058	Sulfate	8/2/2016	165	6.65			mg/L	F
P058	Temperature	11/4/2015	15.6				C	F
P058	Temperature	2/3/2016	14.8			F	C	F
P058	Temperature	5/4/2016	14.1			F	C	F
P058	Temperature	8/2/2016	18				C	F
P058	Tetrachloroethene	11/4/2015	5.11	0.16			µg/L	F
P058	Tetrachloroethene	2/3/2016	4.14	0.16		F	µg/L	F
P058	Tetrachloroethene	5/4/2016	3.72	0.16		F	µg/L	F
P058	Tetrachloroethene	8/2/2016	4.54	0.16			µg/L	F
P058	Total Organic Carbon	11/4/2015	1.84	0.33			mg/L	F
P058	Total Organic Carbon	2/3/2016	1.7	0.33		F	mg/L	F
P058	Total Organic Carbon	5/4/2016	1.97	0.33		F	mg/L	F
P058	Total Organic Carbon	8/2/2016	2	0.33			mg/L	F
P058	Trichloroethene	11/4/2015	4.67	0.16			µg/L	F
P058	Trichloroethene	2/3/2016	2.67	0.16		F	µg/L	F
P058	Trichloroethene	5/4/2016	2.64	0.16		F	µg/L	F
P058	Trichloroethene	8/2/2016	4.53	0.16			µg/L	F
P058	Turbidity	11/4/2015	0.21				NTU	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P058	Turbidity	2/3/2016	0.454			F	NTU	F
P058	Turbidity	5/4/2016	0.62			F	NTU	F
P058	Turbidity	8/2/2016	0.58				NTU	F
P058	Vinyl Chloride	11/4/2015	0.16	0.16	U		µg/L	F
P058	Vinyl Chloride	2/3/2016	0.16	0.16	U	F	µg/L	F
P058	Vinyl Chloride	5/4/2016	1.93	0.16		F	µg/L	F
P058	Vinyl Chloride	8/2/2016	0.44	0.16	J		µg/L	F
P058	cis-1,2-Dichloroethene	11/4/2015	5.94	0.16			µg/L	F
P058	cis-1,2-Dichloroethene	2/3/2016	5.97	0.16		F	µg/L	F
P058	cis-1,2-Dichloroethene	5/4/2016	9.64	0.16		F	µg/L	F
P058	cis-1,2-Dichloroethene	8/2/2016	6.93	0.16			µg/L	F
P058	pH	11/4/2015	7.15				s.u.	F
P058	pH	2/3/2016	7.1			F	s.u.	F
P058	pH	5/4/2016	7.14			F	s.u.	F
P058	pH	8/2/2016	6.76				s.u.	F
P058	trans-1,2-Dichloroethene	11/4/2015	0.16	0.16	U		µg/L	F
P058	trans-1,2-Dichloroethene	2/3/2016	0.21	0.16	J	F	µg/L	F
P058	trans-1,2-Dichloroethene	5/4/2016	0.37	0.16	J	F	µg/L	F
P058	trans-1,2-Dichloroethene	8/2/2016	0.16	0.16	U		µg/L	F
P059	Ammonia Total as N	11/4/2015	0.152	0.017			mg/L	F
P059	Ammonia Total as N	2/1/2016	0.0419	0.017	J	UF	mg/L	F
P059	Ammonia Total as N	5/5/2016	0.122	0.017		F	mg/L	F
P059	Ammonia Total as N	8/2/2016	0.119	0.017			mg/L	F
P059	Chloride	11/4/2015	205	2.68			mg/L	F
P059	Chloride	2/1/2016	203	2.68		F	mg/L	F
P059	Chloride	5/5/2016	199	3.35		F	mg/L	F
P059	Chloride	8/2/2016	172	3.35			mg/L	F
P059	Dissolved Oxygen	11/4/2015	0.35				mg/L	F
P059	Dissolved Oxygen	2/1/2016	0.36			F	mg/L	F
P059	Dissolved Oxygen	5/5/2016	0.85			F	mg/L	F
P059	Dissolved Oxygen	8/2/2016	1.25				mg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P059	Ethane	11/4/2015	10	10	U		µg/L	F
P059	Ethane	2/1/2016	500	500	U	F	µg/L	F
P059	Ethane	5/5/2016	500	500	U	F	µg/L	F
P059	Ethane	8/2/2016	10	10	U		µg/L	F
P059	Ethene	11/4/2015	10	10	U		µg/L	F
P059	Ethene	2/1/2016	500	500	U	F	µg/L	F
P059	Ethene	5/5/2016	500	500	U	F	µg/L	F
P059	Ethene	8/2/2016	10	10	U		µg/L	F
P059	Iron	11/4/2015	2.27	0.03			mg/L	F
P059	Iron	2/1/2016	0.815	0.03		F	mg/L	F
P059	Iron	5/5/2016	1.17	0.03		F	mg/L	F
P059	Iron	8/2/2016	1.11	0.03			mg/L	F
P059	Methane	11/4/2015	6180	200			µg/L	F
P059	Methane	2/1/2016	7020	500		F	µg/L	F
P059	Methane	5/5/2016	20000	500		F	µg/L	F
P059	Methane	8/2/2016	4730	200			µg/L	F
P059	Nitrate as Nitrogen	11/4/2015	0.793	0.165			mg/L	F
P059	Nitrate as Nitrogen	2/1/2016	0.491	0.33	J	F	mg/L	F
P059	Nitrate as Nitrogen	5/5/2016	0.13	0.066	J	F	mg/L	F
P059	Nitrate as Nitrogen	8/2/2016	0.21	0.165	J		mg/L	F
P059	Oxidation Reduction Potential	11/4/2015	-55.1				mV	F
P059	Oxidation Reduction Potential	2/1/2016	-28.5			F	mV	F
P059	Oxidation Reduction Potential	5/5/2016	-33.2			F	mV	F
P059	Oxidation Reduction Potential	8/2/2016	-32.9				mV	F
P059	Specific Conductance	11/4/2015	1520				umhos/cm	F
P059	Specific Conductance	2/1/2016	1570			F	umhos/cm	F
P059	Specific Conductance	5/5/2016	1540			F	umhos/cm	F
P059	Specific Conductance	8/2/2016	1520				umhos/cm	F
P059	Sulfate	11/4/2015	110	5.32			mg/L	F
P059	Sulfate	2/1/2016	97.5	1.33		F	mg/L	F
P059	Sulfate	5/5/2016	102	6.65		F	mg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P059	Sulfate	8/2/2016	126	6.65			mg/L	F
P059	Temperature	11/4/2015	14.3				C	F
P059	Temperature	2/1/2016	13.9			F	C	F
P059	Temperature	5/5/2016	14			F	C	F
P059	Temperature	8/2/2016	14.7				C	F
P059	Tetrachloroethene	11/4/2015	4.86	0.16			µg/L	F
P059	Tetrachloroethene	2/1/2016	5.01	0.16		F	µg/L	F
P059	Tetrachloroethene	5/5/2016	5.84	0.16		F	µg/L	F
P059	Tetrachloroethene	8/2/2016	4.83	0.16			µg/L	F
P059	Total Organic Carbon	11/4/2015	1.33	0.33			mg/L	F
P059	Total Organic Carbon	2/1/2016	1.22	0.33		F	mg/L	F
P059	Total Organic Carbon	5/5/2016	1.66	0.33		F	mg/L	F
P059	Total Organic Carbon	8/2/2016	1.39	0.33			mg/L	F
P059	Trichloroethene	11/4/2015	10.7	0.16			µg/L	F
P059	Trichloroethene	2/1/2016	6.21	0.16		F	µg/L	F
P059	Trichloroethene	5/5/2016	5.32	0.16		F	µg/L	F
P059	Trichloroethene	8/2/2016	10.3	0.16			µg/L	F
P059	Turbidity	11/4/2015	6.7				NTU	F
P059	Turbidity	2/1/2016	8.94			F	NTU	F
P059	Turbidity	5/5/2016	15.3			F	NTU	F
P059	Turbidity	8/2/2016	49.1				NTU	F
P059	Vinyl Chloride	11/4/2015	0.16	0.16	U		µg/L	F
P059	Vinyl Chloride	2/1/2016	0.16	0.16	U	F	µg/L	F
P059	Vinyl Chloride	5/5/2016	0.16	0.16	U	F	µg/L	F
P059	Vinyl Chloride	8/2/2016	0.16	0.16	U		µg/L	F
P059	cis-1,2-Dichloroethene	11/4/2015	2.5	0.16			µg/L	F
P059	cis-1,2-Dichloroethene	2/1/2016	3.12	0.16		F	µg/L	F
P059	cis-1,2-Dichloroethene	5/5/2016	4.24	0.16		F	µg/L	F
P059	cis-1,2-Dichloroethene	8/2/2016	4.86	0.16			µg/L	F
P059	pH	11/4/2015	7.07				s.u.	F
P059	pH	2/1/2016	7.04			F	s.u.	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P059	pH	5/5/2016	6.9			F	s.u.	F
P059	pH	8/2/2016	6.89				s.u.	F
P059	trans-1,2-Dichloroethene	11/4/2015	0.17	0.16	J		µg/L	F
P059	trans-1,2-Dichloroethene	2/1/2016	0.16	0.16	U	F	µg/L	F
P059	trans-1,2-Dichloroethene	5/5/2016	0.16	0.16	U	F	µg/L	F
P059	trans-1,2-Dichloroethene	8/2/2016	0.42	0.16	J		µg/L	F
P060	Ammonia Total as N	11/4/2015	0.133	0.017			mg/L	F
P060	Ammonia Total as N	2/1/2016	0.0771	0.017	J	UF	mg/L	F
P060	Ammonia Total as N	5/4/2016	0.989	0.017		F	mg/L	F
P060	Ammonia Total as N	8/2/2016	0.59	0.017			mg/L	F
P060	Chloride	11/4/2015	146	1.34			mg/L	F
P060	Chloride	2/1/2016	125	1.34		F	mg/L	F
P060	Chloride	5/4/2016	106	1.34		F	mg/L	F
P060	Chloride	8/2/2016	128	1.34			mg/L	F
P060	Dissolved Oxygen	11/4/2015	0.39				mg/L	F
P060	Dissolved Oxygen	2/1/2016	0.38			F	mg/L	F
P060	Dissolved Oxygen	5/4/2016	1.4			F	mg/L	F
P060	Dissolved Oxygen	8/2/2016	2.85				mg/L	F
P060	Ethane	11/4/2015	10	10	U		µg/L	F
P060	Ethane	2/1/2016	500	500	U	F	µg/L	F
P060	Ethane	5/4/2016	1000	1000	U	F	µg/L	F
P060	Ethane	8/2/2016	10	10	U		µg/L	F
P060	Ethene	11/4/2015	10	10	U		µg/L	F
P060	Ethene	2/1/2016	500	500	U	F	µg/L	F
P060	Ethene	5/4/2016	1000	1000	U	F	µg/L	F
P060	Ethene	8/2/2016	10	10	U		µg/L	F
P060	Iron	11/4/2015	29.5	0.03			mg/L	F
P060	Iron	2/1/2016	21	0.03		F	mg/L	F
P060	Iron	5/4/2016	27.1	0.03		F	mg/L	F
P060	Iron	8/2/2016	16.5	0.03			mg/L	F
P060	Methane	11/4/2015	29700	1000			µg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P060	Methane	2/1/2016	24700	500		F	µg/L	F
P060	Methane	5/4/2016	26400	1000		F	µg/L	F
P060	Methane	8/2/2016	17400	1000			µg/L	F
P060	Nitrate as Nitrogen	11/4/2015	0.165	0.165	U		mg/L	F
P060	Nitrate as Nitrogen	2/1/2016	0.165	0.165	U	F	mg/L	F
P060	Nitrate as Nitrogen	5/4/2016	0.066	0.066	U	F	mg/L	F
P060	Nitrate as Nitrogen	8/2/2016	0.165	0.165	U		mg/L	F
P060	Oxidation Reduction Potential	11/4/2015	125.9				mV	F
P060	Oxidation Reduction Potential	2/1/2016	118.6			F	mV	F
P060	Oxidation Reduction Potential	5/4/2016	-64.3			F	mV	F
P060	Oxidation Reduction Potential	8/2/2016	-109.9				mV	F
P060	Specific Conductance	11/4/2015	1390				umhos/cm	F
P060	Specific Conductance	2/1/2016	1320			F	umhos/cm	F
P060	Specific Conductance	5/4/2016	1470			F	umhos/cm	F
P060	Specific Conductance	8/2/2016	1320				umhos/cm	F
P060	Sulfate	11/4/2015	20.8	0.665			mg/L	F
P060	Sulfate	2/1/2016	33.6	0.665		F	mg/L	F
P060	Sulfate	5/4/2016	3.97	0.266		F	mg/L	F
P060	Sulfate	8/2/2016	7.55	0.133			mg/L	F
P060	Temperature	11/4/2015	14.8				C	F
P060	Temperature	2/1/2016	14.1			F	C	F
P060	Temperature	5/4/2016	14			F	C	F
P060	Temperature	8/2/2016	15				C	F
P060	Tetrachloroethene	11/4/2015	0.23	0.16	J		µg/L	F
P060	Tetrachloroethene	2/1/2016	0.38	0.16	J	F	µg/L	F
P060	Tetrachloroethene	5/4/2016	0.16	0.16	U	F	µg/L	F
P060	Tetrachloroethene	8/2/2016	0.16	0.16	U		µg/L	F
P060	Total Organic Carbon	11/4/2015	43.6	1.65			mg/L	F
P060	Total Organic Carbon	2/1/2016	21.7	0.66		F	mg/L	F
P060	Total Organic Carbon	5/4/2016	9.77	1.65		F	mg/L	F
P060	Total Organic Carbon	8/2/2016	8.14	0.33			mg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P060	Trichloroethene	11/4/2015	1.34	0.16			µg/L	F
P060	Trichloroethene	2/1/2016	2.5	0.16		F	µg/L	F
P060	Trichloroethene	5/4/2016	0.23	0.16	J	F	µg/L	F
P060	Trichloroethene	8/2/2016	2.04	0.16			µg/L	F
P060	Turbidity	11/4/2015	15.2				NTU	F
P060	Turbidity	2/1/2016	16.2			F	NTU	F
P060	Turbidity	5/4/2016	59.5			F	NTU	F
P060	Turbidity	8/2/2016	28				NTU	F
P060	Vinyl Chloride	11/4/2015	0.16	0.16	U		µg/L	F
P060	Vinyl Chloride	2/1/2016	0.16	0.16	U	F	µg/L	F
P060	Vinyl Chloride	5/4/2016	0.16	0.16	U	F	µg/L	F
P060	Vinyl Chloride	8/2/2016	0.39	0.16	J		µg/L	F
P060	cis-1,2-Dichloroethene	11/4/2015	28.3	0.16			µg/L	F
P060	cis-1,2-Dichloroethene	2/1/2016	20.6	0.16		F	µg/L	F
P060	cis-1,2-Dichloroethene	5/4/2016	13.7	0.16		F	µg/L	F
P060	cis-1,2-Dichloroethene	8/2/2016	43.4	0.16			µg/L	F
P060	pH	11/4/2015	6.97				s.u.	F
P060	pH	2/1/2016	6.98			F	s.u.	F
P060	pH	5/4/2016	6.81			F	s.u.	F
P060	pH	8/2/2016	6.79				s.u.	F
P060	trans-1,2-Dichloroethene	11/4/2015	0.52	0.16	J		µg/L	F
P060	trans-1,2-Dichloroethene	2/1/2016	0.45	0.16	J	F	µg/L	F
P060	trans-1,2-Dichloroethene	5/4/2016	0.45	0.16	J	F	µg/L	F
P060	trans-1,2-Dichloroethene	8/2/2016	1.4	0.16			µg/L	F
P061	Ammonia Total as N	11/4/2015	0.133	0.017			mg/L	F
P061	Ammonia Total as N	11/4/2015	0.11	0.017			mg/L	D
P061	Ammonia Total as N	2/1/2016	0.102	0.017		F	mg/L	F
P061	Ammonia Total as N	5/4/2016	0.156	0.017		F	mg/L	F
P061	Ammonia Total as N	5/4/2016	0.155	0.017		F	mg/L	D
P061	Ammonia Total as N	8/1/2016	0.171	0.017			mg/L	F
P061	Chloride	11/4/2015	260	3.35			mg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P061	Chloride	11/4/2015	260	3.35			mg/L	D
P061	Chloride	2/1/2016	226	2.68		F	mg/L	F
P061	Chloride	5/4/2016	211	3.35		F	mg/L	F
P061	Chloride	5/4/2016	207	3.35		F	mg/L	D
P061	Chloride	8/1/2016	213	3.35			mg/L	F
P061	Dissolved Oxygen	11/4/2015	1.03				mg/L	F
P061	Dissolved Oxygen	2/1/2016	0.88			F	mg/L	F
P061	Dissolved Oxygen	5/4/2016	0.48			F	mg/L	F
P061	Dissolved Oxygen	8/1/2016	0.35				mg/L	F
P061	Ethane	2/1/2016	500	500	U	F	µg/L	F
P061	Ethane	5/4/2016	500	500	U	F	µg/L	F
P061	Ethane	8/1/2016	10	10	U		µg/L	F
P061	Ethene	2/1/2016	500	500	U	F	µg/L	F
P061	Ethene	5/4/2016	500	500	U	F	µg/L	F
P061	Ethene	8/1/2016	10	10	U		µg/L	F
P061	Iron	11/4/2015	2.44	0.03			mg/L	F
P061	Iron	11/4/2015	2.34	0.03			mg/L	D
P061	Iron	2/1/2016	1.64	0.03		F	mg/L	F
P061	Iron	5/4/2016	1.06	0.03		F	mg/L	F
P061	Iron	5/4/2016	1.02	0.03		F	mg/L	D
P061	Iron	8/1/2016	0.03	0.03	U		mg/L	F
P061	Methane	2/1/2016	4680	500		F	µg/L	F
P061	Methane	5/4/2016	4950	500		F	µg/L	F
P061	Methane	8/1/2016	312	20			µg/L	F
P061	Nitrate as Nitrogen	11/4/2015	0.165	0.165	U		mg/L	F
P061	Nitrate as Nitrogen	11/4/2015	0.165	0.165	U		mg/L	D
P061	Nitrate as Nitrogen	2/1/2016	0.165	0.165	U	F	mg/L	F
P061	Nitrate as Nitrogen	5/4/2016	0.066	0.066	U	F	mg/L	F
P061	Nitrate as Nitrogen	5/4/2016	0.066	0.066	U	F	mg/L	D
P061	Nitrate as Nitrogen	8/1/2016	0.165	0.165	U		mg/L	F
P061	Oxidation Reduction Potential	11/4/2015	-80.5				mV	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P061	Oxidation Reduction Potential	2/1/2016	139.2			F	mV	F
P061	Oxidation Reduction Potential	5/4/2016	20.5			F	mV	F
P061	Oxidation Reduction Potential	8/1/2016	87.8				mV	F
P061	Specific Conductance	11/4/2015	1690				umhos/cm	F
P061	Specific Conductance	2/1/2016	1600			F	umhos/cm	F
P061	Specific Conductance	5/4/2016	1630			F	umhos/cm	F
P061	Specific Conductance	8/1/2016	1720				umhos/cm	F
P061	Sulfate	11/4/2015	129	6.65			mg/L	F
P061	Sulfate	11/4/2015	128	6.65			mg/L	D
P061	Sulfate	2/1/2016	121	5.32		F	mg/L	F
P061	Sulfate	5/4/2016	138	6.65		F	mg/L	F
P061	Sulfate	5/4/2016	134	6.65		F	mg/L	D
P061	Sulfate	8/1/2016	136	6.65			mg/L	F
P061	Temperature	11/4/2015	13.9				C	F
P061	Temperature	2/1/2016	12.9			F	C	F
P061	Temperature	5/4/2016	14.3			F	C	F
P061	Temperature	8/1/2016	18.1				C	F
P061	Tetrachloroethene	11/4/2015	1.86	0.16			µg/L	F
P061	Tetrachloroethene	11/4/2015	2	0.16			µg/L	D
P061	Tetrachloroethene	2/1/2016	0.7	0.16	J	F	µg/L	F
P061	Tetrachloroethene	5/4/2016	0.45	0.16	J	F	µg/L	F
P061	Tetrachloroethene	5/4/2016	0.52	0.16	J	F	µg/L	D
P061	Tetrachloroethene	8/1/2016	0.54	0.16	J		µg/L	F
P061	Total Organic Carbon	11/4/2015	1.79	0.33			mg/L	F
P061	Total Organic Carbon	11/4/2015	1.52	0.33			mg/L	D
P061	Total Organic Carbon	2/1/2016	1.54	0.33		F	mg/L	F
P061	Total Organic Carbon	5/4/2016	2.29	0.33		F	mg/L	F
P061	Total Organic Carbon	5/4/2016	1.6	0.33		F	mg/L	D
P061	Total Organic Carbon	8/1/2016	1.98	0.33			mg/L	F
P061	Trichloroethene	11/4/2015	6.61	0.16			µg/L	F
P061	Trichloroethene	11/4/2015	7.26	0.16			µg/L	D

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P061	Trichloroethene	2/1/2016	5.31	0.16		F	µg/L	F
P061	Trichloroethene	5/4/2016	3.42	0.16		F	µg/L	F
P061	Trichloroethene	5/4/2016	3.66	0.16		F	µg/L	D
P061	Trichloroethene	8/1/2016	1.66	0.16			µg/L	F
P061	Turbidity	11/4/2015	2.59				NTU	F
P061	Turbidity	2/1/2016	0.51			F	NTU	F
P061	Turbidity	5/4/2016	0.87			F	NTU	F
P061	Turbidity	8/1/2016	5.08				NTU	F
P061	Vinyl Chloride	11/4/2015	0.16	0.16	U		µg/L	F
P061	Vinyl Chloride	11/4/2015	0.16	0.16	U		µg/L	D
P061	Vinyl Chloride	2/1/2016	0.16	0.16	U	F	µg/L	F
P061	Vinyl Chloride	5/4/2016	0.16	0.16	U	F	µg/L	F
P061	Vinyl Chloride	5/4/2016	0.16	0.16	U	F	µg/L	D
P061	Vinyl Chloride	8/1/2016	0.16	0.16	U		µg/L	F
P061	cis-1,2-Dichloroethene	11/4/2015	5.12	0.16			µg/L	F
P061	cis-1,2-Dichloroethene	11/4/2015	5.48	0.16			µg/L	D
P061	cis-1,2-Dichloroethene	2/1/2016	9.8	0.16		F	µg/L	F
P061	cis-1,2-Dichloroethene	5/4/2016	5.18	0.16		F	µg/L	F
P061	cis-1,2-Dichloroethene	5/4/2016	5.35	0.16		F	µg/L	D
P061	cis-1,2-Dichloroethene	8/1/2016	7.12	0.16			µg/L	F
P061	pH	11/4/2015	7.09				s.u.	F
P061	pH	2/1/2016	7.1			F	s.u.	F
P061	pH	5/4/2016	6.98			F	s.u.	F
P061	pH	8/1/2016	6.83				s.u.	F
P061	trans-1,2-Dichloroethene	11/4/2015	0.16	0.16	U		µg/L	F
P061	trans-1,2-Dichloroethene	11/4/2015	0.16	0.16	U		µg/L	D
P061	trans-1,2-Dichloroethene	2/1/2016	0.16	0.16	U	F	µg/L	F
P061	trans-1,2-Dichloroethene	5/4/2016	0.16	0.16	U	F	µg/L	F
P061	trans-1,2-Dichloroethene	5/4/2016	0.16	0.16	U	F	µg/L	D
P061	trans-1,2-Dichloroethene	8/1/2016	0.16	0.16	U		µg/L	F
P062	Ammonia Total as N	11/4/2015	0.271	0.017			mg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P062	Ammonia Total as N	2/1/2016	0.1	0.017		F	mg/L	F
P062	Chloride	11/4/2015	226	3.35			mg/L	F
P062	Chloride	2/1/2016	168	1.34		F	mg/L	F
P062	Dissolved Oxygen	11/4/2015	1.44				mg/L	F
P062	Dissolved Oxygen	2/1/2016	1.71			F	mg/L	F
P062	Dissolved Oxygen	8/30/2016	6.54			F	mg/L	F
P062	Iron	11/4/2015	0.03	0.03	U		mg/L	F
P062	Iron	2/1/2016	0.03	0.03	U	F	mg/L	F
P062	Nitrate as Nitrogen	11/4/2015	0.165	0.165	U		mg/L	F
P062	Nitrate as Nitrogen	2/1/2016	1.72	0.33		F	mg/L	F
P062	Oxidation Reduction Potential	11/4/2015	103.5				mV	F
P062	Oxidation Reduction Potential	2/1/2016	163.6			F	mV	F
P062	Oxidation Reduction Potential	8/30/2016	135.1			F	mV	F
P062	Specific Conductance	11/4/2015	1660				umhos/cm	F
P062	Specific Conductance	2/1/2016	470			F	umhos/cm	F
P062	Specific Conductance	8/30/2016	1690			F	umhos/cm	F
P062	Sulfate	11/4/2015	154	6.65			mg/L	F
P062	Sulfate	2/1/2016	277	2.66		F	mg/L	F
P062	Temperature	11/4/2015	13.6				C	F
P062	Temperature	2/1/2016	12.3			F	C	F
P062	Temperature	8/30/2016	18.3			F	C	F
P062	Tetrachloroethene	11/4/2015	1.37	0.16			µg/L	F
P062	Tetrachloroethene	2/1/2016	0.92	0.16	J	F	µg/L	F
P062	Tetrachloroethene	8/30/2016	0.51	0.16	J	F	µg/L	F
P062	Total Organic Carbon	11/4/2015	1.55	0.33			mg/L	F
P062	Total Organic Carbon	2/1/2016	1.77	0.33		F	mg/L	F
P062	Trichloroethene	11/4/2015	1.95	0.16			µg/L	F
P062	Trichloroethene	2/1/2016	1.69	0.16		F	µg/L	F
P062	Trichloroethene	8/30/2016	0.5	0.16	J	F	µg/L	F
P062	Turbidity	11/4/2015	1.88				NTU	F
P062	Turbidity	2/1/2016	3.13			F	NTU	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P062	Turbidity	8/30/2016	43.1			F	NTU	F
P062	Vinyl Chloride	11/4/2015	0.16	0.16	U		µg/L	F
P062	Vinyl Chloride	2/1/2016	0.16	0.16	U	F	µg/L	F
P062	Vinyl Chloride	8/30/2016	0.16	0.16	U	F	µg/L	F
P062	cis-1,2-Dichloroethene	11/4/2015	1.68	0.16			µg/L	F
P062	cis-1,2-Dichloroethene	2/1/2016	2.96	0.16		F	µg/L	F
P062	cis-1,2-Dichloroethene	8/30/2016	0.16	0.16	U	F	µg/L	F
P062	pH	11/4/2015	7.15				s.u.	F
P062	pH	2/1/2016	7.03			F	s.u.	F
P062	pH	8/30/2016	6.84			F	s.u.	F
P062	trans-1,2-Dichloroethene	11/4/2015	0.16	0.16	U		µg/L	F
P062	trans-1,2-Dichloroethene	2/1/2016	0.16	0.16	U	F	µg/L	F
P062	trans-1,2-Dichloroethene	8/30/2016	0.16	0.16	U	F	µg/L	F
P063	Ammonia Total as N	11/4/2015	0.121	0.017			mg/L	F
P063	Ammonia Total as N	2/1/2016	0.0359	0.017	J	UF	mg/L	F
P063	Ammonia Total as N	5/4/2016	0.0749	0.017	J	UF	mg/L	F
P063	Ammonia Total as N	8/1/2016	0.112	0.017			mg/L	F
P063	Chloride	11/4/2015	177	2.68			mg/L	F
P063	Chloride	2/1/2016	42.6	0.335		F	mg/L	F
P063	Chloride	5/4/2016	90.6	1.34		F	mg/L	F
P063	Chloride	8/1/2016	165	3.35			mg/L	F
P063	Dissolved Oxygen	11/4/2015	0.47				mg/L	F
P063	Dissolved Oxygen	2/1/2016	0.87			F	mg/L	F
P063	Dissolved Oxygen	5/4/2016	3.9			F	mg/L	F
P063	Dissolved Oxygen	6/30/2016	1.38				mg/L	F
P063	Dissolved Oxygen	8/1/2016	0.42				mg/L	F
P063	Dissolved Oxygen	8/29/2016	3.79			F	mg/L	F
P063	Iron	11/4/2015	0.03	0.03	U		mg/L	F
P063	Iron	2/1/2016	0.03	0.03	U	F	mg/L	F
P063	Iron	5/4/2016	0.03	0.03	U	F	mg/L	F
P063	Iron	8/1/2016	0.03	0.03	U		mg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P063	Nitrate as Nitrogen	11/4/2015	0.165	0.165	U		mg/L	F
P063	Nitrate as Nitrogen	2/1/2016	0.439	0.33	J	F	mg/L	F
P063	Nitrate as Nitrogen	5/4/2016	0.066	0.066	U	F	mg/L	F
P063	Nitrate as Nitrogen	8/1/2016	0.165	0.165	U		mg/L	F
P063	Oxidation Reduction Potential	11/4/2015	110.1				mV	F
P063	Oxidation Reduction Potential	2/1/2016	149.4			F	mV	F
P063	Oxidation Reduction Potential	5/4/2016	171			F	mV	F
P063	Oxidation Reduction Potential	6/30/2016	24.3				mV	F
P063	Oxidation Reduction Potential	8/1/2016	110.7				mV	F
P063	Oxidation Reduction Potential	8/29/2016	56			F	mV	F
P063	Specific Conductance	11/4/2015	1410				umhos/cm	F
P063	Specific Conductance	2/1/2016	990			F	umhos/cm	F
P063	Specific Conductance	5/4/2016	1130			F	umhos/cm	F
P063	Specific Conductance	6/30/2016	1520				umhos/cm	F
P063	Specific Conductance	8/1/2016	1410				umhos/cm	F
P063	Specific Conductance	8/29/2016	1200			F	umhos/cm	F
P063	Sulfate	11/4/2015	93.4	0.665			mg/L	F
P063	Sulfate	2/1/2016	119	1.33		F	mg/L	F
P063	Sulfate	5/4/2016	100	2.66		F	mg/L	F
P063	Sulfate	8/1/2016	86.1	0.665			mg/L	F
P063	Temperature	11/4/2015	14.2				C	F
P063	Temperature	2/1/2016	12.8			F	C	F
P063	Temperature	5/4/2016	11			F	C	F
P063	Temperature	6/30/2016	14.3				C	F
P063	Temperature	8/1/2016	15.2				C	F
P063	Temperature	8/29/2016	15.5			F	C	F
P063	Tetrachloroethene	11/4/2015	2.17	0.16			µg/L	F
P063	Tetrachloroethene	2/1/2016	1.97	0.16		F	µg/L	F
P063	Tetrachloroethene	5/4/2016	1	0.16		F	µg/L	F
P063	Tetrachloroethene	6/30/2016	1.23	0.16			µg/L	F
P063	Tetrachloroethene	8/1/2016	1.33	0.16			µg/L	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P063	Tetrachloroethene	8/29/2016	1.38	0.16		F	µg/L	F
P063	Total Organic Carbon	11/4/2015	1.75	0.33			mg/L	F
P063	Total Organic Carbon	2/1/2016	1.99	0.33		F	mg/L	F
P063	Total Organic Carbon	5/4/2016	2.38	0.33		F	mg/L	F
P063	Total Organic Carbon	8/1/2016	2.31	0.33			mg/L	F
P063	Trichloroethene	11/4/2015	1.68	0.16			µg/L	F
P063	Trichloroethene	2/1/2016	1.26	0.16		F	µg/L	F
P063	Trichloroethene	5/4/2016	0.33	0.16	J	F	µg/L	F
P063	Trichloroethene	6/30/2016	0.97	0.16	J		µg/L	F
P063	Trichloroethene	8/1/2016	1.24	0.16			µg/L	F
P063	Trichloroethene	8/29/2016	1.11	0.16		F	µg/L	F
P063	Turbidity	11/4/2015	1.64				NTU	F
P063	Turbidity	2/1/2016	0.71			F	NTU	F
P063	Turbidity	5/4/2016	1.9			F	NTU	F
P063	Turbidity	6/30/2016	9.83				NTU	F
P063	Turbidity	8/1/2016	1.91				NTU	F
P063	Turbidity	8/29/2016	1.17			F	NTU	F
P063	Vinyl Chloride	11/4/2015	0.16	0.16	U		µg/L	F
P063	Vinyl Chloride	2/1/2016	0.16	0.16	U	F	µg/L	F
P063	Vinyl Chloride	5/4/2016	0.16	0.16	U	F	µg/L	F
P063	Vinyl Chloride	6/30/2016	0.16	0.16	U		µg/L	F
P063	Vinyl Chloride	8/1/2016	0.56	0.16	J		µg/L	F
P063	Vinyl Chloride	8/29/2016	0.16	0.16	U	F	µg/L	F
P063	cis-1,2-Dichloroethene	11/4/2015	7.39	0.16			µg/L	F
P063	cis-1,2-Dichloroethene	2/1/2016	1.72	0.16		F	µg/L	F
P063	cis-1,2-Dichloroethene	5/4/2016	2.69	0.16		F	µg/L	F
P063	cis-1,2-Dichloroethene	6/30/2016	7.9	0.16			µg/L	F
P063	cis-1,2-Dichloroethene	8/1/2016	10.3	0.16			µg/L	F
P063	cis-1,2-Dichloroethene	8/29/2016	4.71	0.16		F	µg/L	F
P063	pH	11/4/2015	7.11				s.u.	F
P063	pH	2/1/2016	6.97			F	s.u.	F

Location	Analyte	Sample Date	Value	Detection Limit	Lab Qualifiers	Validation Qualifiers	Units	Sample Type
P063	pH	5/4/2016	7.11			F	s.u.	F
P063	pH	6/30/2016	7.06				s.u.	F
P063	pH	8/1/2016	6.7				s.u.	F
P063	pH	8/29/2016	6.55			F	s.u.	F
P063	trans-1,2-Dichloroethene	11/4/2015	0.24	0.16	J		µg/L	F
P063	trans-1,2-Dichloroethene	2/1/2016	0.16	0.16	U	F	µg/L	F
P063	trans-1,2-Dichloroethene	5/4/2016	0.16	0.16	U	F	µg/L	F
P063	trans-1,2-Dichloroethene	6/30/2016	0.16	0.16	U		µg/L	F
P063	trans-1,2-Dichloroethene	8/1/2016	0.36	0.16	J		µg/L	F
P063	trans-1,2-Dichloroethene	8/29/2016	0.16	0.16	U	F	µg/L	F

LAB QUALIFIERS:
- B Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.
- J Estimated
- U Analytical result below detection limit.

DATA QUALIFIERS:
- D Field duplicate
- F Low flow sampling method used.
- U Parameter analyzed for but was not detected.

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Appendix B

Groundwater Elevation Data

Year 2

Location	Date	TOC Elevation	Depth from TOC	Groundwater Elevation
0305	9/9/2015	709.77	29.98	679.79
0305	10/12/2015	709.77	30.94	678.83
0305	11/5/2015	709.77	30.49	679.28
0305	11/16/2015	709.77	30.22	679.55
0305	12/8/2015	709.77	29.83	679.94
0305	1/14/2016	709.77	26.78	682.99
0305	2/3/2016	709.77	28.25	681.52
0305	2/8/2016	709.77	27.78	681.99
0305	3/16/2016	709.77	26.64	683.13
0305	4/14/2016	709.77	28.60	681.17
0305	5/3/2016	709.77	31.61	678.16
0305	5/19/2016	709.77	33.45	676.32
0305	6/13/2016	709.77	35.57	674.20
0305	6/27/2016	709.77	34.57	675.20
0305	7/5/2016	709.77	34.16	675.61
0305	7/11/2016	709.77	34.02	675.75
0305	7/18/2016	709.77	34.00	675.77
0305	7/25/2016	709.77	33.67	676.10
0305	8/1/2016	709.77	33.88	675.89
0305	8/2/2016	709.77	33.88	675.89
0305	8/8/2016	709.77	34.13	675.64
0305	8/15/2016	709.77	34.08	675.69
0305	8/22/2016	709.77	33.71	676.06
0305	8/29/2016	709.77	33.03	676.74
0317	6/27/2016	703.54	28.48	675.06
0317	7/5/2016	703.54	28.12	675.42
0317	7/11/2016	703.54	27.99	675.55
0317	7/18/2016	703.54	27.95	675.59
0317	7/25/2016	703.54	27.60	675.94
0317	8/1/2016	703.54	27.87	675.67
0317	8/8/2016	703.54	28.12	675.42
0317	8/15/2016	703.54	28.05	675.49
0317	8/22/2016	703.54	27.68	675.86
0317	8/29/2016	703.54	27.03	676.51
0319	6/27/2016	701.42	26.86	674.56
0319	7/5/2016	701.42	26.53	674.89
0319	7/11/2016	701.42	26.43	674.99
0319	7/18/2016	701.42	26.40	675.02
0319	7/25/2016	701.42	25.88	675.54
0319	8/1/2016	701.42	26.36	675.06
0319	8/8/2016	701.42	26.60	674.82
0319	8/15/2016	701.42	26.50	674.92
0319	8/22/2016	701.42	26.10	675.32
0319	8/29/2016	701.42	25.45	675.97
0378	9/9/2015	699.81	19.99	679.82

Location	Date	TOC Elevation	Depth from TOC	Groundwater Elevation
0378	10/12/2015	699.81	20.95	678.86
0378	11/16/2015	699.81	20.26	679.55
0378	12/8/2015	699.81	19.86	679.95
0378	1/14/2016	699.81	16.82	682.99
0378	2/8/2016	699.81	17.79	682.02
0378	3/16/2016	699.81	16.63	683.18
0378	4/14/2016	699.81	18.63	681.18
0378	5/19/2016	699.81	23.47	676.34
0378	6/27/2016	699.81	24.54	675.27
0378	7/5/2016	699.81	24.16	675.65
0378	7/11/2016	699.81	24.03	675.78
0378	7/18/2016	699.81	23.97	675.84
0378	7/25/2016	699.81	23.65	676.16
0378	8/1/2016	699.81	23.93	675.88
0378	8/8/2016	699.81	24.16	675.65
0378	8/15/2016	699.81	24.06	675.75
0378	8/22/2016	699.81	23.70	676.11
0378	8/29/2016	699.81	23.03	676.78
0379	9/9/2015	716.11	36.17	679.94
0379	10/12/2015	716.11	37.12	678.99
0379	10/26/2015	716.11	37.28	678.83
0379	11/2/2015	716.11	36.38	679.73
0379	11/16/2015	716.11	36.39	679.72
0379	12/8/2015	716.11	36.00	680.11
0379	1/14/2016	716.11	33.02	683.09
0379	1/25/2016	716.11	34.04	682.07
0379	2/1/2016	716.11	34.66	681.45
0379	2/8/2016	716.11	33.97	682.14
0379	3/16/2016	716.11	32.99	683.12
0379	4/14/2016	716.11	34.94	681.17
0379	4/26/2016	716.11	36.40	679.71
0379	5/2/2016	716.11	37.30	678.81
0379	5/19/2016	716.11	39.37	676.74
0379	6/13/2016	716.11	41.62	674.49
0379	6/27/2016	716.11	40.33	675.78
0379	7/5/2016	716.11	39.94	676.17
0379	7/11/2016	716.11	39.74	676.37
0379	7/18/2016	716.11	39.74	676.37
0379	7/25/2016	716.11	39.59	676.52
0379	7/26/2016	716.11	39.51	676.60
0379	8/1/2016	716.11	39.62	676.49
0379	8/1/2016	716.11	39.62	676.49
0379	8/8/2016	716.11	39.85	676.26
0379	8/15/2016	716.11	39.85	676.26
0379	8/22/2016	716.11	39.47	676.64

Location	Date	TOC Elevation	Depth from TOC	Groundwater Elevation
0379	8/29/2016	716.11	38.77	677.34
0379	8/29/2016	716.11	38.77	677.34
0394	9/9/2015	703.26	23.47	679.79
0394	10/12/2015	703.26	24.43	678.83
0394	11/16/2015	703.26	23.71	679.55
0394	12/8/2015	703.26	23.32	679.94
0394	1/14/2016	703.26	20.26	683.00
0394	2/8/2016	703.26	21.27	681.99
0394	3/16/2016	703.26	20.13	683.13
0394	4/14/2016	703.26	22.09	681.17
0394	5/19/2016	703.26	26.97	676.29
0394	6/13/2016	703.26	29.08	674.18
0394	6/27/2016	703.26	28.03	675.23
0394	7/5/2016	703.26	27.68	675.58
0394	7/11/2016	703.26	27.51	675.75
0394	7/18/2016	703.26	27.50	675.76
0394	7/25/2016	703.26	27.15	676.11
0394	8/1/2016	703.26	27.39	675.87
0394	8/8/2016	703.26	27.63	675.63
0394	8/15/2016	703.26	27.59	675.67
0394	8/22/2016	703.26	27.21	676.05
0394	8/29/2016	703.26	26.53	676.73
0400	6/13/2016	705.11	30.92	674.19
0400	6/27/2016	705.11	30.50	674.61
0400	7/5/2016	705.11	30.13	674.98
0400	7/11/2016	705.11	30.00	675.11
0400	7/18/2016	705.11	29.96	675.15
0400	7/25/2016	705.11	29.58	675.53
0400	8/1/2016	705.11	29.84	675.27
0400	8/8/2016	705.11	30.05	675.06
0400	8/15/2016	705.11	30.12	674.99
0400	8/22/2016	705.11	29.74	675.37
0400	8/29/2016	705.11	29.05	676.06
0402	9/9/2015	704.02	24.31	679.71
0402	10/12/2015	704.02	25.30	678.72
0402	11/2/2015	704.02	24.88	679.14
0402	11/16/2015	704.02	24.59	679.43
0402	12/8/2015	704.02	24.20	679.82
0402	1/14/2016	704.02	21.01	683.01
0402	1/25/2016	704.02	22.08	681.94
0402	2/1/2016	704.02	22.74	681.28
0402	2/8/2016	704.02	22.09	681.93
0402	3/16/2016	704.02	20.85	683.17
0402	4/14/2016	704.02	22.79	681.23
0402	5/3/2016	704.02	26.12	677.90

Location	Date	TOC Elevation	Depth from TOC	Groundwater Elevation
0402	5/19/2016	704.02	27.91	676.11
0402	6/13/2016	704.02	29.86	674.16
0402	6/27/2016	704.02	29.12	674.90
0402	6/30/2016	704.02	29.12	674.90
0402	7/5/2016	704.02	28.78	675.24
0402	7/11/2016	704.02	28.65	675.37
0402	7/18/2016	704.02	28.60	675.42
0402	7/20/2016	704.02	28.60	675.42
0402	7/25/2016	704.02	28.20	675.82
0402	7/25/2016	704.02	28.20	675.82
0402	8/1/2016	704.02	28.48	675.54
0402	8/2/2016	704.02	28.48	675.54
0402	8/8/2016	704.02	28.73	675.29
0402	8/15/2016	704.02	28.73	675.29
0402	8/22/2016	704.02	28.34	675.68
0402	8/29/2016	704.02	27.68	676.34
0402	8/29/2016	704.02	27.70	676.32
0410	9/9/2015	713.83	34.02	679.81
0410	10/12/2015	713.83	35.00	678.83
0410	11/3/2015	713.83	34.28	679.55
0410	11/16/2015	713.83	34.29	679.54
0410	12/8/2015	713.83	33.89	679.94
0410	1/14/2016	713.83	30.79	683.04
0410	2/1/2016	713.83	32.47	681.36
0410	2/8/2016	713.83	31.84	681.99
0410	3/16/2016	713.83	30.73	683.10
0410	4/14/2016	713.83	32.64	681.19
0410	5/19/2016	713.83	37.51	676.32
0410	6/13/2016	713.83	39.51	674.32
0410	6/27/2016	713.83	38.71	675.12
0410	7/5/2016	713.83	38.31	675.52
0410	7/11/2016	713.83	38.15	675.68
0410	7/18/2016	713.83	38.13	675.70
0410	7/25/2016	713.83	37.85	675.98
0410	8/1/2016	713.83	37.99	675.84
0410	8/4/2016	713.83	38.07	675.76
0410	8/8/2016	713.83	38.20	675.63
0410	8/15/2016	713.83	38.22	675.61
0410	8/22/2016	713.83	37.84	675.99
0410	8/29/2016	713.83	37.23	676.60
0416	9/9/2015	704.28	24.46	679.82
0416	10/12/2015	704.28	25.43	678.85
0416	11/2/2015	704.28	25.02	679.26
0416	11/16/2015	704.28	24.70	679.58
0416	12/8/2015	704.28	24.31	679.97

Location	Date	TOC Elevation	Depth from TOC	Groundwater Elevation
0416	1/14/2016	704.28	21.28	683.00
0416	2/1/2016	704.28	22.95	681.33
0416	2/8/2016	704.28	22.26	682.02
0416	3/16/2016	704.28	21.15	683.13
0416	4/14/2016	704.28	23.11	681.17
0416	5/2/2016	704.28	25.95	678.33
0416	5/19/2016	704.28	27.94	676.34
0416	6/13/2016	704.28	30.07	674.21
0416	6/27/2016	704.28	29.02	675.26
0416	7/5/2016	704.28	28.64	675.64
0416	7/11/2016	704.28	28.48	675.80
0416	7/18/2016	704.28	28.46	675.82
0416	7/25/2016	704.28	28.14	676.14
0416	8/1/2016	704.28	28.35	675.93
0416	8/1/2016	704.28	28.35	675.93
0416	8/8/2016	704.28	28.60	675.68
0416	8/15/2016	704.28	28.56	675.72
0416	8/22/2016	704.28	28.17	676.11
0416	8/29/2016	704.28	27.49	676.79
0417	9/9/2015	705.06	25.24	679.82
0417	10/12/2015	705.06	26.21	678.85
0417	11/4/2015	705.06	25.77	679.29
0417	11/16/2015	705.06	25.48	679.58
0417	12/8/2015	705.06	25.09	679.97
0417	1/14/2016	705.06	22.03	683.03
0417	2/1/2016	705.06	23.77	681.29
0417	2/8/2016	705.06	23.03	682.03
0417	3/16/2016	705.06	21.91	683.15
0417	4/14/2016	705.06	23.88	681.18
0417	5/3/2016	705.06	26.90	678.16
0417	5/19/2016	705.06	28.71	676.35
0417	6/13/2016	705.06	30.85	674.21
0417	6/27/2016	705.06	29.79	675.27
0417	7/5/2016	705.06	29.41	675.65
0417	7/11/2016	705.06	29.27	675.79
0417	7/18/2016	705.06	29.24	675.82
0417	7/25/2016	705.06	28.94	676.12
0417	8/1/2016	705.06	29.13	675.93
0417	8/4/2016	705.06	29.13	675.93
0417	8/8/2016	705.06	29.37	675.69
0417	8/15/2016	705.06	39.24	665.82
0417	8/22/2016	705.06	28.95	676.11
0417	8/29/2016	705.06	28.27	676.79
0418	9/9/2015	709.65	29.88	679.77
0418	10/12/2015	709.65	30.85	678.80

Location	Date	TOC Elevation	Depth from TOC	Groundwater Elevation
0418	11/4/2015	709.65	30.40	679.25
0418	11/16/2015	709.65	30.12	679.53
0418	12/8/2015	709.65	29.73	679.92
0418	1/14/2016	709.65	26.66	682.99
0418	2/3/2016	709.65	28.16	681.49
0418	2/8/2016	709.65	27.66	681.99
0418	3/16/2016	709.65	26.53	683.12
0418	4/14/2016	709.65	28.50	681.15
0418	5/3/2016	709.65	31.55	678.10
0418	5/19/2016	709.65	33.38	676.27
0418	6/13/2016	709.65	35.46	674.19
0418	6/27/2016	709.65	34.47	675.18
0418	7/5/2016	709.65	34.10	675.55
0418	7/11/2016	709.65	33.93	675.72
0418	7/18/2016	709.65	33.93	675.72
0418	7/25/2016	709.65	33.60	676.05
0418	8/1/2016	709.65	33.80	675.85
0418	8/4/2016	709.65	33.80	675.85
0418	8/8/2016	709.65	34.05	675.60
0418	8/15/2016	709.65	34.03	675.62
0418	8/22/2016	709.65	33.63	676.02
0418	8/29/2016	709.65	32.96	676.69
0419	9/9/2015	716.40	36.61	679.79
0419	10/12/2015	716.40	37.59	678.81
0419	11/3/2015	716.40	37.15	679.25
0419	11/16/2015	716.40	36.88	679.52
0419	12/8/2015	716.40	36.48	679.92
0419	1/14/2016	716.40	33.37	683.03
0419	2/4/2016	716.40	34.72	681.68
0419	2/8/2016	716.40	34.42	681.98
0419	3/16/2016	716.40	33.30	683.10
0419	4/14/2016	716.40	35.21	681.19
0419	5/4/2016	716.40	38.37	678.03
0419	5/19/2016	716.40	40.10	676.30
0419	6/13/2016	716.40	42.10	674.30
0419	6/27/2016	716.40	41.31	675.09
0419	7/5/2016	716.40	40.92	675.48
0419	7/11/2016	716.40	40.75	675.65
0419	7/18/2016	716.40	40.72	675.68
0419	7/25/2016	716.40	40.46	675.94
0419	8/1/2016	716.40	40.58	675.82
0419	8/3/2016	716.40	40.70	675.70
0419	8/8/2016	716.40	40.81	675.59
0419	8/15/2016	716.40	40.82	675.58
0419	8/22/2016	716.40	40.44	675.96

Location	Date	TOC Elevation	Depth from TOC	Groundwater Elevation
0419	8/29/2016	716.40	39.84	676.56
0422	9/9/2015	714.75	34.92	679.83
0422	10/12/2015	714.75	35.88	678.87
0422	11/5/2015	714.75	35.37	679.38
0422	11/16/2015	714.75	35.15	679.60
0422	12/8/2015	714.75	34.77	679.98
0422	1/14/2016	714.75	31.75	683.00
0422	2/2/2016	714.75	33.48	681.27
0422	2/8/2016	714.75	32.72	682.03
0422	3/16/2016	714.75	31.66	683.09
0422	4/14/2016	714.75	33.61	681.14
0422	5/2/2016	714.75	36.31	678.44
0422	5/19/2016	714.75	38.33	676.42
0422	6/13/2016	714.75	40.53	674.22
0422	6/27/2016	714.75	39.39	675.36
0422	7/5/2016	714.75	38.99	675.76
0422	7/11/2016	714.75	38.82	675.93
0422	7/18/2016	714.75	38.81	675.94
0422	7/25/2016	714.75	38.52	676.23
0422	8/1/2016	714.75	38.70	676.05
0422	8/1/2016	714.75	38.70	676.05
0422	8/8/2016	714.75	38.94	675.81
0422	8/15/2016	714.75	38.93	675.82
0422	8/22/2016	714.75	38.53	676.22
0422	8/29/2016	714.75	37.83	676.92
0423	9/9/2015	708.98	29.18	679.80
0423	10/12/2015	708.98	30.15	678.83
0423	11/5/2015	708.98	29.65	679.33
0423	11/16/2015	708.98	29.42	679.56
0423	12/8/2015	708.98	29.02	679.96
0423	1/14/2016	708.98	26.01	682.97
0423	2/2/2016	708.98	27.74	681.24
0423	2/8/2016	708.98	26.99	681.99
0423	3/16/2016	708.98	25.90	683.08
0423	4/14/2016	708.98	27.87	681.11
0423	5/2/2016	708.98	30.63	678.35
0423	5/19/2016	708.98	32.62	676.36
0423	6/13/2016	708.98	34.80	674.18
0423	6/27/2016	708.98	33.67	675.31
0423	7/5/2016	708.98	33.29	675.69
0423	7/11/2016	708.98	33.13	675.85
0423	7/18/2016	708.98	33.11	675.87
0423	7/25/2016	708.98	32.81	676.17
0423	8/1/2016	708.98	33.02	675.96
0423	8/1/2016	708.98	33.02	675.96

Location	Date	TOC Elevation	Depth from TOC	Groundwater Elevation
0423	8/8/2016	708.98	33.24	675.74
0423	8/15/2016	708.98	33.23	675.75
0423	8/22/2016	708.98	32.83	676.15
0423	8/29/2016	708.98	32.13	676.85
0424	11/2/2015	704.43	25.17	679.26
0424	1/14/2016	704.43	21.45	682.98
0424	2/3/2016	704.43	22.85	681.58
0424	2/8/2016	704.43	22.44	681.99
0424	3/16/2016	704.43	21.29	683.14
0424	4/14/2016	704.43	23.27	681.16
0424	5/2/2016	704.43	26.16	678.27
0424	5/19/2016	704.43	28.14	676.29
0424	6/13/2016	704.43	30.24	674.19
0424	6/27/2016	704.43	29.21	675.22
0424	7/5/2016	704.43	28.83	675.60
0424	7/11/2016	704.43	28.69	675.74
0424	7/18/2016	704.43	28.65	675.78
0424	7/25/2016	704.43	28.32	676.11
0424	8/1/2016	704.43	28.55	675.88
0424	8/1/2016	704.43	28.55	675.88
0424	8/8/2016	704.43	28.80	675.63
0424	8/15/2016	704.43	28.78	675.65
0424	8/22/2016	704.43	28.36	676.07
0424	8/29/2016	704.43	27.70	676.73
0425	11/5/2015	704.50	25.17	679.33
0425	1/14/2016	704.50	21.52	682.98
0425	2/3/2016	704.50	22.95	681.55
0425	2/8/2016	704.50	22.52	681.98
0425	3/16/2016	704.50	21.38	683.12
0425	4/14/2016	704.50	23.35	681.15
0425	5/3/2016	704.50	26.40	678.10
0425	5/19/2016	704.50	28.21	676.29
0425	6/13/2016	704.50	30.33	674.17
0425	6/27/2016	704.50	29.30	675.20
0425	7/5/2016	704.50	28.91	675.59
0425	7/11/2016	704.50	28.77	675.73
0425	7/18/2016	704.50	28.75	675.75
0425	7/25/2016	704.50	28.39	676.11
0425	8/1/2016	704.50	28.64	675.86
0425	8/2/2016	704.50	28.64	675.86
0425	8/8/2016	704.50	28.89	675.61
0425	8/15/2016	704.50	28.86	675.64
0425	8/22/2016	704.50	28.46	676.04
0425	8/29/2016	704.50	27.79	676.71
0449	9/9/2015	707.06	27.25	679.81

Location	Date	TOC Elevation	Depth from TOC	Groundwater Elevation
0449	10/12/2015	707.06	28.22	678.84
0449	11/16/2015	707.06	27.50	679.56
0449	12/8/2015	707.06	27.10	679.96
0449	1/14/2016	707.06	24.05	683.01
0449	2/8/2016	707.06	25.05	682.01
0449	3/16/2016	707.06	23.91	683.15
0449	4/14/2016	707.06	25.90	681.16
0449	5/19/2016	707.06	30.73	676.33
0449	6/13/2016	707.06	32.86	674.20
0449	6/27/2016	707.06	31.81	675.25
0449	7/5/2016	707.06	31.43	675.63
0449	7/11/2016	707.06	31.29	675.77
0449	7/18/2016	707.06	31.25	675.81
0449	7/25/2016	707.06	30.93	676.13
0449	8/1/2016	707.06	31.15	675.91
0449	8/8/2016	707.06	31.39	675.67
0449	8/15/2016	707.06	31.35	675.71
0449	8/22/2016	707.06	30.97	676.09
0449	8/29/2016	707.06	30.29	676.77
0450	9/9/2015	711.15	31.26	679.89
0450	10/12/2015	711.15	32.33	678.82
0450	11/16/2015	711.15	31.60	679.55
0450	12/8/2015	711.15	31.23	679.92
0450	1/14/2016	711.15	28.14	683.01
0450	2/8/2016	711.15	29.17	681.98
0450	3/16/2016	711.15	28.02	683.13
0450	4/14/2016	711.15	29.99	681.16
0450	5/19/2016	711.15	34.85	676.30
0450	6/13/2016	711.15	36.97	674.18
0450	6/27/2016	711.15	35.91	675.24
0450	7/5/2016	711.15	35.54	675.61
0450	7/11/2016	711.15	35.41	675.74
0450	7/18/2016	711.15	35.37	675.78
0450	7/25/2016	711.15	35.05	676.10
0450	8/1/2016	711.15	35.26	675.89
0450	8/8/2016	711.15	35.51	675.64
0450	8/15/2016	711.15	35.47	675.68
0450	8/22/2016	711.15	35.09	676.06
0450	8/29/2016	711.15	34.42	676.73
0451	9/9/2015	714.67	34.94	679.73
0451	10/12/2015	714.67	35.91	678.76
0451	11/3/2015	714.67	35.50	679.17
0451	11/16/2015	714.67	35.21	679.46
0451	12/8/2015	714.67	34.82	679.85
0451	1/14/2016	714.67	31.66	683.01

Location	Date	TOC Elevation	Depth from TOC	Groundwater Elevation
0451	2/3/2016	714.67	33.23	681.44
0451	2/8/2016	714.67	32.74	681.93
0451	2/8/2016	714.67	32.74	681.93
0451	3/16/2016	714.67	31.59	683.08
0451	4/14/2016	714.67	33.50	681.17
0451	5/5/2016	714.67	36.90	677.77
0451	5/19/2016	714.67	38.45	676.22
0451	6/13/2016	714.67	dry	
0451	6/27/2016	714.67	dry	
0451	7/5/2016	714.67	39.34	675.33
0451	7/11/2016	714.67	39.18	675.49
0451	7/18/2016	714.67	39.12	675.55
0451	7/25/2016	714.67	38.86	675.81
0451	8/1/2016	714.67	39.00	675.67
0451	8/4/2016	714.67	39.00	675.67
0451	8/8/2016	714.67	39.22	675.45
0451	8/15/2016	714.67	39.31	675.36
0451	8/22/2016	714.67	38.91	675.76
0451	8/29/2016	714.67	38.31	676.36
0452	9/9/2015	711.05	31.35	679.70
0452	10/12/2015	711.05	32.31	678.74
0452	11/5/2015	711.05	31.86	679.19
0452	11/16/2015	711.05	31.61	679.44
0452	12/8/2015	711.05	31.22	679.83
0452	1/14/2016	711.05	28.09	682.96
0452	2/3/2016	711.05	29.67	681.38
0452	2/8/2016	711.05	29.13	681.92
0452	3/16/2016	711.05	28.00	683.05
0452	4/14/2016	711.05	29.91	681.14
0452	5/5/2016	711.05	33.30	677.75
0452	5/19/2016	711.05	34.84	676.21
0452	6/13/2016	711.05	36.95	674.10
0452	6/27/2016	711.05	36.67	674.38
0452	7/5/2016	711.05	35.70	675.35
0452	7/11/2016	711.05	35.55	675.50
0452	7/18/2016	711.05	35.50	675.55
0452	7/25/2016	711.05	35.20	675.85
0452	8/1/2016	711.05	35.38	675.67
0452	8/2/2016	711.05	36.00	675.05
0452	8/8/2016	711.05	35.61	675.44
0452	8/15/2016	711.05	35.65	675.40
0452	8/22/2016	711.05	35.26	675.79
0452	8/29/2016	711.05	34.67	676.38
P015	9/9/2015	716.23	36.52	679.71
P015	10/12/2015	716.23	below pump	

Location	Date	TOC Elevation	Depth from TOC	Groundwater Elevation
P015	11/3/2015	716.23	37.08	679.15
P015	11/16/2015	716.23	36.83	679.40
P015	11/16/2015	716.23	36.82	679.41
P015	12/8/2015	716.23	36.40	679.83
P015	1/14/2016	716.23	33.26	682.97
P015	2/2/2016	716.23	35.05	681.18
P015	2/8/2016	716.23	34.33	681.90
P015	3/16/2016	716.23	33.20	683.03
P015	4/14/2016	716.23	35.10	681.13
P015	5/5/2016	716.23	38.58	677.65
P015	5/19/2016	716.23	40.04	676.19
P015	6/13/2016	716.23	41.99	674.24
P015	6/27/2016	716.23	41.30	674.93
P015	7/5/2016	716.23	40.91	675.32
P015	7/11/2016	716.23	40.75	675.48
P015	7/18/2016	716.23	40.71	675.52
P015	7/25/2016	716.23	40.42	675.81
P015	8/1/2016	716.23	40.56	675.67
P015	8/8/2016	716.23	40.79	675.44
P015	8/15/2016	716.23	40.86	675.37
P015	8/22/2016	716.23	40.46	675.77
P015	8/29/2016	716.23	39.86	676.37
P027	9/9/2015	703.91	24.15	679.76
P027	10/12/2015	703.91	25.12	678.79
P027	11/2/2015	703.91	24.70	679.21
P027	11/16/2015	703.91	24.40	679.51
P027	12/8/2015	703.91	24.02	679.89
P027	1/14/2016	703.91	20.92	682.99
P027	2/3/2016	703.91	22.38	681.53
P027	2/8/2016	703.91	21.95	681.96
P027	3/16/2016	703.91	20.75	683.16
P027	4/14/2016	703.91	22.72	681.19
P027	5/2/2016	703.91	25.75	678.16
P027	5/19/2016	703.91	27.70	676.21
P027	6/13/2016	703.91	29.74	674.17
P027	6/27/2016	703.91	28.83	675.08
P027	6/30/2016	703.91	28.83	675.08
P027	7/5/2016	703.91	28.46	675.45
P027	7/11/2016	703.91	28.32	675.59
P027	7/18/2016	703.91	28.29	675.62
P027	7/20/2016	703.91	28.29	675.62
P027	7/25/2016	703.91	27.93	675.98
P027	8/1/2016	703.91	28.22	675.69
P027	8/2/2016	703.91	28.22	675.69
P027	8/8/2016	703.91	28.43	675.48

Location	Date	TOC Elevation	Depth from TOC	Groundwater Elevation
P027	8/15/2016	703.91	28.40	675.51
P027	8/22/2016	703.91	28.01	675.90
P027	8/29/2016	703.91	27.37	676.54
P027	8/29/2016	703.91	27.37	676.54
P031	9/9/2015	701.54	21.81	679.73
P031	10/12/2015	701.54	22.79	678.75
P031	11/2/2015	701.54	22.35	679.19
P031	11/16/2015	701.54	22.07	679.47
P031	12/8/2015	701.54	21.68	679.86
P031	1/14/2016	701.54	18.57	682.97
P031	2/4/2016	701.54	19.85	681.69
P031	2/8/2016	701.54	19.61	681.93
P031	3/16/2016	701.54	18.38	683.16
P031	4/14/2016	701.54	20.35	681.19
P031	5/4/2016	701.54	23.80	677.74
P031	5/19/2016	701.54	25.42	676.12
P031	6/13/2016	701.54	27.40	674.14
P031	6/27/2016	701.54	26.55	674.99
P031	6/30/2016	701.54	26.55	674.99
P031	7/5/2016	701.54	26.20	675.34
P031	7/11/2016	701.54	26.08	675.46
P031	7/18/2016	701.54	26.03	675.51
P031	7/20/2016	701.54	26.03	675.51
P031	7/25/2016	701.54	25.66	675.88
P031	8/1/2016	701.54	25.97	675.57
P031	8/2/2016	701.54	25.97	675.57
P031	8/8/2016	701.54	26.20	675.34
P031	8/15/2016	701.54	26.13	675.41
P031	8/22/2016	701.54	25.76	675.78
P031	8/29/2016	701.54	25.11	676.43
P031	8/30/2016	701.54	25.11	676.43
P033	1/25/2016	705.83	23.97	681.86
P033	6/13/2016	705.83	30.99	674.84
P033	6/27/2016	705.83	30.99	674.84
P033	7/5/2016	705.83	30.83	675.00
P033	7/11/2016	705.83	30.70	675.13
P033	7/18/2016	705.83	30.66	675.17
P033	7/25/2016	705.83	30.38	675.45
P033	8/1/2016	705.83	30.58	675.25
P033	8/8/2016	705.83	30.74	675.09
P033	8/15/2016	705.83	30.79	675.04
P033	8/22/2016	705.83	30.51	675.32
P033	8/29/2016	705.83	29.81	676.02
P043	9/9/2015	704.71	24.94	679.77
P043	10/12/2015	704.71	25.90	678.81

Location	Date	TOC Elevation	Depth from TOC	Groundwater Elevation
P043	11/16/2015	704.71	25.18	679.53
P043	12/8/2015	704.71	24.78	679.93
P043	1/14/2016	704.71	21.73	682.98
P043	2/8/2016	704.71	22.73	681.98
P043	3/16/2016	704.71	21.60	683.11
P043	4/14/2016	704.71	23.56	681.15
P043	5/19/2016	704.71	28.44	676.27
P043	6/13/2016	704.71	30.56	674.15
P043	6/27/2016	704.71	29.52	675.19
P043	7/5/2016	704.71	29.15	675.56
P043	7/11/2016	704.71	29.00	675.71
P043	7/18/2016	704.71	28.99	675.72
P043	7/25/2016	704.71	28.62	676.09
P043	8/1/2016	704.71	28.86	675.85
P043	8/8/2016	704.71	29.10	675.61
P043	8/15/2016	704.71	29.09	675.62
P043	8/22/2016	704.71	28.68	676.03
P043	8/29/2016	704.71	28.01	676.70
P045	6/27/2016	704.14	29.14	675.00
P045	7/5/2016	704.14	28.81	675.33
P045	7/11/2016	704.14	28.67	675.47
P045	7/18/2016	704.14	28.62	675.52
P045	7/25/2016	704.14	28.23	675.91
P045	8/1/2016	704.14	28.55	675.59
P045	8/1/2016	704.14	28.55	675.59
P045	8/8/2016	704.14	28.78	675.36
P045	8/15/2016	704.14	28.73	675.41
P045	8/22/2016	704.14	28.35	675.79
P045	8/29/2016	704.14	27.69	676.45
P045	8/30/2016	704.14	27.69	676.45
P046	6/27/2016	702.97	28.05	674.92
P046	7/5/2016	702.97	27.70	675.27
P046	7/11/2016	702.97	27.56	675.41
P046	7/18/2016	702.97	27.53	675.44
P046	7/25/2016	702.97	27.10	675.87
P046	8/1/2016	702.97	27.43	675.54
P046	8/1/2016	702.97	27.43	675.54
P046	8/8/2016	702.97	27.69	675.28
P046	8/15/2016	702.97	27.64	675.33
P046	8/22/2016	702.97	27.27	675.70
P046	8/29/2016	702.97	26.62	676.35
P046	8/30/2016	702.97	26.62	676.35
P052	9/9/2015	711.71	31.93	679.78
P052	10/12/2015	711.71	32.89	678.82
P052	11/16/2015	711.71	32.19	679.52

Location	Date	TOC Elevation	Depth from TOC	Groundwater Elevation
P052	12/8/2015	711.71	31.80	679.91
P052	1/14/2016	711.71	28.70	683.01
P052	2/8/2016	711.71	29.73	681.98
P052	3/16/2016	711.71	28.63	683.08
P052	4/14/2016	711.71	30.50	681.21
P052	5/19/2016	711.71	35.41	676.30
P052	6/13/2016	711.71	37.52	674.19
P052	6/27/2016	711.71	36.51	675.20
P052	7/5/2016	711.71	36.12	675.59
P052	7/11/2016	711.71	35.96	675.75
P052	7/18/2016	711.71	35.92	675.79
P052	7/25/2016	711.71	35.61	676.10
P052	8/1/2016	711.71	35.84	675.87
P052	8/8/2016	711.71	36.01	675.70
P052	8/15/2016	711.71	36.06	675.65
P052	8/22/2016	711.71	35.66	676.05
P052	8/29/2016	711.71	34.99	676.72
P053	11/3/2015	713.16	oil	
P053	11/16/2015	713.16	oil	
P053	1/14/2016	713.16	oil	
P053	2/2/2016	713.16	oil	
P053	2/8/2016	713.16	oil	
P053	3/16/2016	713.16	oil	
P053	4/14/2016	713.16	oil	
P053	5/4/2016	713.16	oil	
P053	5/19/2016	713.16	oil	
P053	6/13/2016	713.16	oil	
P053	6/27/2016	713.16	oil	
P053	8/3/2016	713.16	oil	
P054	11/3/2015	709.89	oil	
P054	11/16/2015	709.89	oil	
P054	1/14/2016	709.89	oil	
P054	2/2/2016	709.89	oil	
P054	2/8/2016	709.89	oil	
P054	3/16/2016	709.89	oil	
P054	4/14/2016	709.89	oil	
P054	5/4/2016	709.89	oil	
P054	5/19/2016	709.89	oil	
P054	6/13/2016	709.89	oil	
P054	6/27/2016	709.89	oil	
P054	8/3/2016	709.89	oil	
P056	9/9/2015	706.51	26.72	679.79
P056	10/12/2015	706.51	27.69	678.82
P056	11/3/2015	706.51	27.35	679.16
P056	11/16/2015	706.51	26.97	679.54

Location	Date	TOC Elevation	Depth from TOC	Groundwater Elevation
P056	12/8/2015	706.51	26.58	679.93
P056	1/14/2016	706.51	23.53	682.98
P056	2/3/2016	706.51	25.02	681.49
P056	2/8/2016	706.51	24.55	681.96
P056	3/16/2016	706.51	23.41	683.10
P056	4/14/2016	706.51	25.37	681.14
P056	5/4/2016	706.51	28.50	678.01
P056	5/19/2016	706.51	30.21	676.30
P056	6/13/2016	706.51	32.33	674.18
P056	6/27/2016	706.51	31.28	675.23
P056	7/5/2016	706.51	30.89	675.62
P056	7/11/2016	706.51	30.75	675.76
P056	7/18/2016	706.51	30.73	675.78
P056	7/25/2016	706.51	30.38	676.13
P056	8/1/2016	706.51	30.61	675.90
P056	8/3/2016	706.51	30.61	675.90
P056	8/8/2016	706.51	30.84	675.67
P056	8/15/2016	706.51	30.80	675.71
P056	8/22/2016	706.51	30.44	676.07
P056	8/29/2016	706.51	29.76	676.75
P057	9/9/2015	711.63	31.95	679.68
P057	10/12/2015	711.63	32.91	678.72
P057	11/4/2015	711.63	32.47	679.16
P057	11/16/2015	711.63	32.20	679.43
P057	12/8/2015	711.63	31.81	679.82
P057	1/14/2016	711.63	28.74	682.89
P057	2/3/2016	711.63	30.20	681.43
P057	2/8/2016	711.63	29.74	681.89
P057	3/16/2016	711.63	28.59	683.04
P057	4/14/2016	711.63	30.55	681.08
P057	5/5/2016	711.63	33.95	677.68
P057	5/19/2016	711.63	35.46	676.17
P057	6/13/2016	711.63	37.57	674.06
P057	6/27/2016	711.63	36.60	675.03
P057	7/5/2016	711.63	36.22	675.41
P057	7/11/2016	711.63	36.19	675.44
P057	7/18/2016	711.63	36.05	675.58
P057	7/25/2016	711.63	35.71	675.92
P057	8/1/2016	711.63	35.96	675.67
P057	8/2/2016	711.63	36.24	675.39
P057	8/8/2016	711.63	36.20	675.43
P057	8/15/2016	711.63	36.15	675.48
P057	8/22/2016	711.63	35.76	675.87
P057	8/29/2016	711.63	35.12	676.51
P058	9/9/2015	716.15	36.37	679.78

Location	Date	TOC Elevation	Depth from TOC	Groundwater Elevation
P058	10/12/2015	716.15	37.34	678.81
P058	11/4/2015	716.15	36.92	679.23
P058	11/16/2015	716.15	36.63	679.52
P058	12/8/2015	716.15	36.24	679.91
P058	1/14/2016	716.15	33.11	683.04
P058	2/3/2016	716.15	34.66	681.49
P058	2/8/2016	716.15	34.17	681.98
P058	3/16/2016	716.15	33.03	683.12
P058	4/14/2016	716.15	34.95	681.20
P058	5/4/2016	716.15	38.42	677.73
P058	5/19/2016	716.15	39.88	676.27
P058	6/13/2016	716.15	41.71	674.44
P058	6/27/2016	716.15	41.72	674.43
P058	7/5/2016	716.15	40.73	675.42
P058	7/11/2016	716.15	40.57	675.58
P058	7/18/2016	716.15	40.53	675.62
P058	7/25/2016	716.15	40.25	675.90
P058	8/1/2016	716.15	40.40	675.75
P058	8/2/2016	716.15	40.64	675.51
P058	8/8/2016	716.15	40.61	675.54
P058	8/15/2016	716.15	40.68	675.47
P058	8/22/2016	716.15	40.28	675.87
P058	8/29/2016	716.15	39.68	676.47
P059	9/9/2015	712.06	32.33	679.73
P059	10/12/2015	712.06	33.29	678.77
P059	11/4/2015	712.06	32.81	679.25
P059	11/16/2015	712.06	32.58	679.48
P059	12/8/2015	712.06	32.19	679.87
P059	1/14/2016	712.06	29.11	682.95
P059	2/1/2016	712.06	30.78	681.28
P059	2/8/2016	712.06	30.11	681.95
P059	3/16/2016	712.06	28.95	683.11
P059	4/14/2016	712.06	30.92	681.14
P059	5/5/2016	712.06	34.35	677.71
P059	5/19/2016	712.06	35.86	676.20
P059	6/13/2016	712.06	37.90	674.16
P059	6/27/2016	712.06	37.00	675.06
P059	7/5/2016	712.06	36.63	675.43
P059	7/11/2016	712.06	36.49	675.57
P059	7/18/2016	712.06	36.45	675.61
P059	7/25/2016	712.06	36.10	675.96
P059	8/1/2016	712.06	36.34	675.72
P059	8/2/2016	712.06	36.78	675.28
P059	8/8/2016	712.06	36.59	675.47
P059	8/15/2016	712.06	36.57	675.49

Location	Date	TOC Elevation	Depth from TOC	Groundwater Elevation
P059	8/22/2016	712.06	36.18	675.88
P059	8/29/2016	712.06	35.54	676.52
P060	9/9/2015	715.52	35.77	679.75
P060	10/12/2015	715.52	36.72	678.80
P060	11/4/2015	715.52	36.27	679.25
P060	11/16/2015	715.52	36.03	679.49
P060	12/8/2015	715.52	35.63	679.89
P060	1/14/2016	715.52	32.52	683.00
P060	2/1/2016	715.52	34.21	681.31
P060	2/8/2016	715.52	33.55	681.97
P060	3/16/2016	715.52	32.40	683.12
P060	4/14/2016	715.52	34.31	681.21
P060	5/4/2016	715.52	37.84	677.68
P060	5/19/2016	715.52	39.29	676.23
P060	6/13/2016	715.52	41.24	674.28
P060	6/27/2016	715.52	40.53	674.99
P060	7/5/2016	715.52	40.14	675.38
P060	7/11/2016	715.52	39.98	675.54
P060	7/18/2016	715.52	39.96	675.56
P060	7/25/2016	715.52	39.61	675.91
P060	8/1/2016	715.52	39.81	675.71
P060	8/2/2016	715.52	40.09	675.43
P060	8/8/2016	715.52	40.04	675.48
P060	8/15/2016	715.52	40.07	675.45
P060	8/22/2016	715.52	39.69	675.83
P060	8/29/2016	715.52	39.09	676.43
P061	9/9/2015	715.98	36.44	679.54
P061	10/12/2015	715.98	37.43	678.55
P061	11/4/2015	715.98	37.00	678.98
P061	11/16/2015	715.98	36.72	679.26
P061	12/8/2015	715.98	36.33	679.65
P061	1/14/2016	715.98	33.12	682.86
P061	2/1/2016	715.98	34.87	681.11
P061	2/8/2016	715.98	34.22	681.76
P061	3/16/2016	715.98	32.98	683.00
P061	4/14/2016	715.98	34.90	681.08
P061	5/4/2016	715.98	38.75	677.23
P061	5/19/2016	715.98	40.01	675.97
P061	6/13/2016	715.98	41.94	674.04
P061	6/27/2016	715.98	41.29	674.69
P061	7/5/2016	715.98	40.93	675.05
P061	7/11/2016	715.98	40.75	675.23
P061	7/18/2016	715.98	40.74	675.24
P061	7/20/2016	715.98	40.74	675.24
P061	7/25/2016	715.98	40.41	675.57

Location	Date	TOC Elevation	Depth from TOC	Groundwater Elevation
P061	8/1/2016	715.98	40.61	675.37
P061	8/1/2016	715.98	40.61	675.37
P061	8/8/2016	715.98	40.84	675.14
P061	8/15/2016	715.98	40.90	675.08
P061	8/22/2016	715.98	40.50	675.48
P061	8/29/2016	715.98	39.87	676.11
P062	9/9/2015	717.89	38.33	679.56
P062	10/12/2015	717.89	39.30	678.59
P062	11/4/2015	717.89	38.87	679.02
P062	11/16/2015	717.89	38.61	679.28
P062	12/8/2015	717.89	38.22	679.67
P062	1/14/2016	717.89	35.00	682.89
P062	2/1/2016	717.89	36.75	681.14
P062	2/8/2016	717.89	36.10	681.79
P062	3/16/2016	717.89	34.85	683.04
P062	4/14/2016	717.89	36.77	681.12
P062	5/19/2016	717.89	41.90	675.99
P062	6/13/2016	717.89	dry	
P062	6/27/2016	717.89	dry	
P062	7/5/2016	717.89	dry	
P062	7/11/2016	717.89	dry	
P062	7/18/2016	717.89	42.61	675.28
P062	7/25/2016	717.89	42.31	675.58
P062	8/1/2016	717.89	42.50	675.39
P062	8/8/2016	717.89	42.69	675.20
P062	8/15/2016	717.89	42.69	675.20
P062	8/22/2016	717.89	42.40	675.49
P062	8/29/2016	717.89	41.76	676.13
P062	8/30/2016	717.89	41.76	676.13
P063	9/9/2015	713.75	34.25	679.50
P063	10/12/2015	713.75	35.23	678.52
P063	11/4/2015	713.75	34.81	678.94
P063	11/16/2015	713.75	34.53	679.22
P063	12/8/2015	713.75	34.16	679.59
P063	1/14/2016	713.75	30.91	682.84
P063	2/1/2016	713.75	32.67	681.08
P063	2/8/2016	713.75	32.02	681.73
P063	3/16/2016	713.75	30.77	682.98
P063	4/14/2016	713.75	32.70	681.05
P063	5/4/2016	713.75	36.75	677.00
P063	5/19/2016	713.75	37.84	675.91
P063	6/13/2016	713.75	39.78	673.97
P063	6/27/2016	713.75	39.11	674.64
P063	6/30/2016	713.75	38.93	674.82
P063	7/5/2016	713.75	38.75	675.00

Location	Date	TOC Elevation	Depth from TOC	Groundwater Elevation
P063	7/11/2016	713.75	38.60	675.15
P063	7/18/2016	713.75	38.57	675.18
P063	7/20/2016	713.75	38.57	675.18
P063	7/25/2016	713.75	38.22	675.53
P063	8/1/2016	713.75	38.45	675.30
P063	8/1/2016	713.75	38.45	675.30
P063	8/8/2016	713.75	38.69	675.06
P063	8/15/2016	713.75	38.70	675.05
P063	8/22/2016	713.75	38.32	675.43
P063	8/29/2016	713.75	37.65	676.10
P063	8/29/2016	713.75	37.68	676.07

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