Colbert Landfill Remediation Project Annual Report 2024

Progress Report for

April 2023 through June 2024

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***Historical monitoring well analytical results and remedial progress reports can be found on the Spokane County Solid Waste Department website at:**

https://www.spokanecounty.org/4726/Colbert-Landfill

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List of Acronyms

AC	Action Criteria: Action Level Criteria is equal to 65% of the Evaluation Criteria for each COC, and will be used for purposes of the shutdown test.
COC	Constintuent(s) of Concern - the COCs for the Colbert Landfill site include TCA, DCA, PCE, TCE, and MC
CD	Consent Decree: Project Consent Decree between EPA, Ecology, Spokane County, and Key Tronic Corp.
DCA	1,1-Dichloroethane
DCE	1,1-Dichloroethylene
EC	Evaluation Criteria: alternative standards developed due to the inability of analytical methods to accurately quantify PCE and MC to the Performance Standards at the time the consent decree was written, but are otherwise the same as the Performance Standards.
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
MC	Methylene chloride
MSL	Mean Sea Level
P&T	Pump-and-treat system
PC	Performance Criteria: Health-based Remedial Action criteria for Constituents of Concern specified in the Record of Decision.
PCE	Tetrachloroethylene
ppb	Parts per billion
ppm	Parts per million

QA/QC	Quality Assurance/Quality Control
RD/RA	Remedial Design/Remedial Action
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision (EPA)
SD	Shutdown Test
TCA	1,1,1-Trichloroethane
TCE	Trichloroethylene
TDS	Total dissolved solids
TOC	Total Organic Carbons
VOC	Volatile Organic Compound

1.0 Colbert Landfill Remediation Project Summary

The Colbert Landfill Superfund site is a closed, 40-acre, municipal solid waste landfill located approximately 15 miles north of Spokane, Washington, and about 2.5 miles north of Colbert, Washington. The landfill received waste from 1968 to 1986 when it became filled to capacity. Groundwater in the vicinity of the landfill was found to be contaminated with volatile organic compounds and in 1983, and the landfill was placed on the National Priorities List (NPL) by EPA. In 1989, a consent decree (CD) was executed to implement a site remedy. The site remedy includes:

- An available alternate water supply for residential wells impacted by groundwater contamination originating from the landfill.
- Institutional Controls
- Construction and operation of a pump and treat system to capture and prevent further spread of groundwater contaminants.
- Landfill closure according to the State of Washington regulations Minimal Functional Standards (WAC 173-304).
- Monitoring of contaminants to protect human health and the environment at the site.

Construction of a pump and treat (P&T) system was completed in 1994. The P&T system operated successfully for 20 years. In 2014, an EPA-recommended shut-down test was initiated to determine if the facility was continuing to add any significant benefit to the clean-up. The programs currently in place include a Shut-down Test (lower aquifer) for the pump and treat system; upper aquifer compliance groundwater monitoring (includes 1,4-dioxane monitoring and Minimal Functional Standards (MFS) monitoring of the upper aquifer); residential well monitoring (includes both upper and lower aquifers); supplemental sampling (includes both upper and lower aquifers); and landfill cover maintenance and monitoring. The groundwater monitoring programs and criteria are summarized below.

Current Monitoring Programs

Program	Aquifer	Parameters	Schedule
Shut-down Test	Lower	VOC's	Annual (Extraction wells Quarterly)
Upper Aquifer Compliance	Upper	VOC's	Annual (Extraction wells Quarterly)
1,4-Dioxane Sampling	Lower/ Upper	1,4-Dioxane	Annual/Monthly
MFS Monitoring	Upper	Cl/NH3/NO2/NH3/ SO4/Fe/Mn/Zn/TOC/COD	Annual
Residential Monitoring	Lower/ Upper	VOC's	Monthly/Quarterly/SemiAnnual/ Annual/BiAnnual
Supplemental Sampling	Lower/ Upper	VOC's	Every five years

Program Criteria

PROGRAM	CRITERIA	TCA	DCE	DCA	TCE	PCE	MC	1,4-Dioxane		Units
CONSENT DECREE	Performance	200	7	4050	5	0.7	2.5			ug/L
	Evaluation	200	7	4050	5	0.7	2.5	7		
SHUT-DOWN TEST	Action Level	130	4.55	2632	3.25	0.5	1.63			
	Evaluation	200	7	4050	5	0.7	2.5			
RESIDENTIAL										ug/L
Monthly sampling initiated, evaluated in 12 months	Action Level	130	4.55	2632	3.25	0.5	1.63			
Exceedance requires alternative drinking water source to be supplied	MCL	200	7	4050	5	0.7	2.5			
		Cl	**Fe**	**Mn**	**Zn**	**TOC**	**COD**	**SO4**	**NO3**	
MFS	(mg/L)	250	0.3	0.05	5	NA	NA	250	10	mg/L

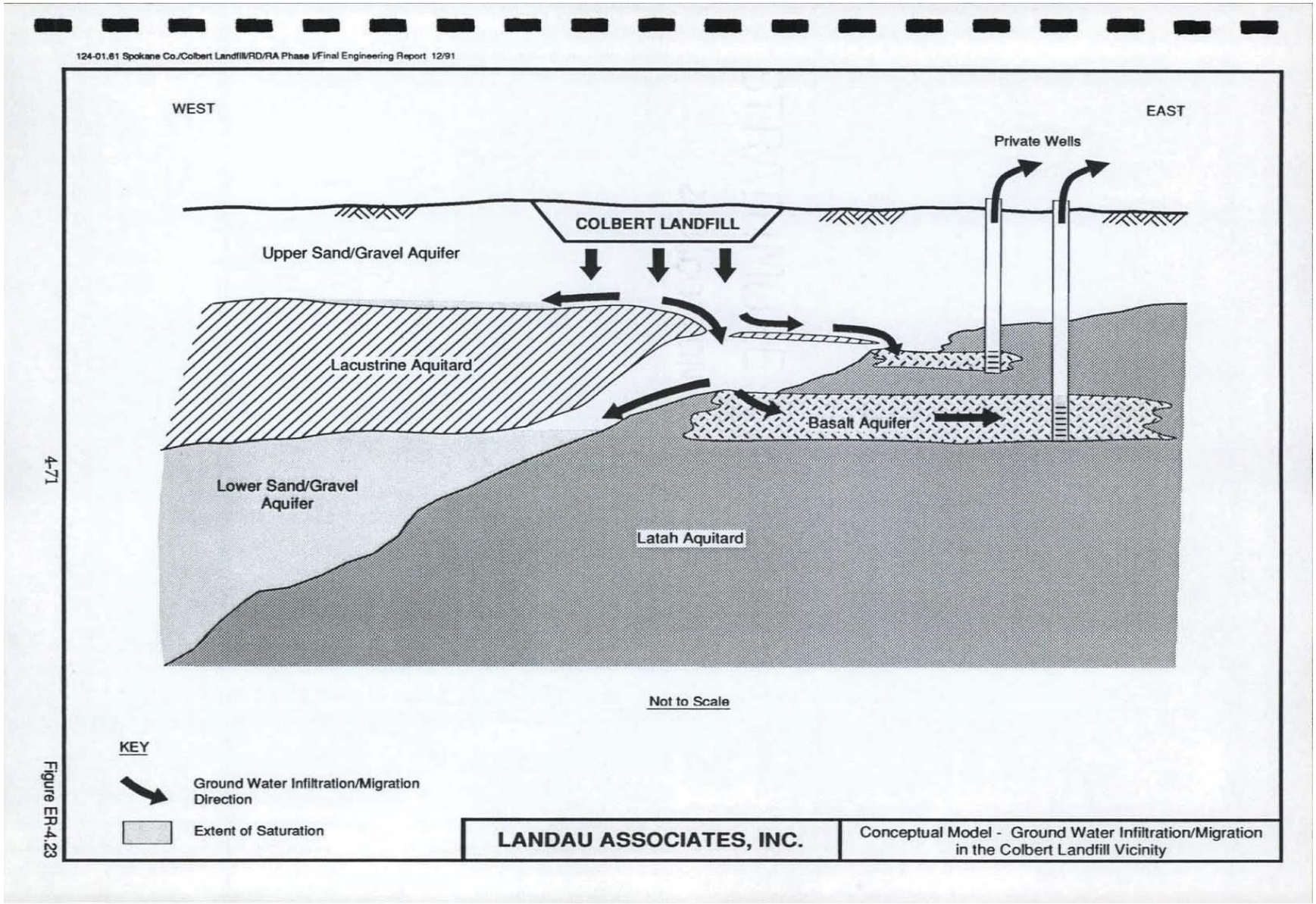
1.1 Geology/Hydrogeology

Hydrogeologic cross-sections for the Colbert Landfill are presented in Appendix D. The geology beneath the Site consists of six vertically stratified and laterally discontinuous geologic units derived from glacial and fluvial material, modified by erosional (and possibly landslide) processes, overlaid on granitic bedrock. There are two primary aquifers that include the saturated portion of the Upper Sand and Gravel Unit and the saturated portion of the Lower Sand and Gravel Unit, which are separated by a Lacustrine Unit that serves as an aquitard. The Latah Formation serves as an aquitard that underlies the Lower Sand and Gravel Aquifer at most locations. A basalt unit forms a secondary aquifer interbedded in the Latah Aquitard and is referred to as the Basalt Aquifer. The Granite Unit is an aquitard that underlies the Latah Formation and serves as the lower boundary to the regional flow system. For more information, please refer to the Phase I Engineering Report (Landau Associates 1991).

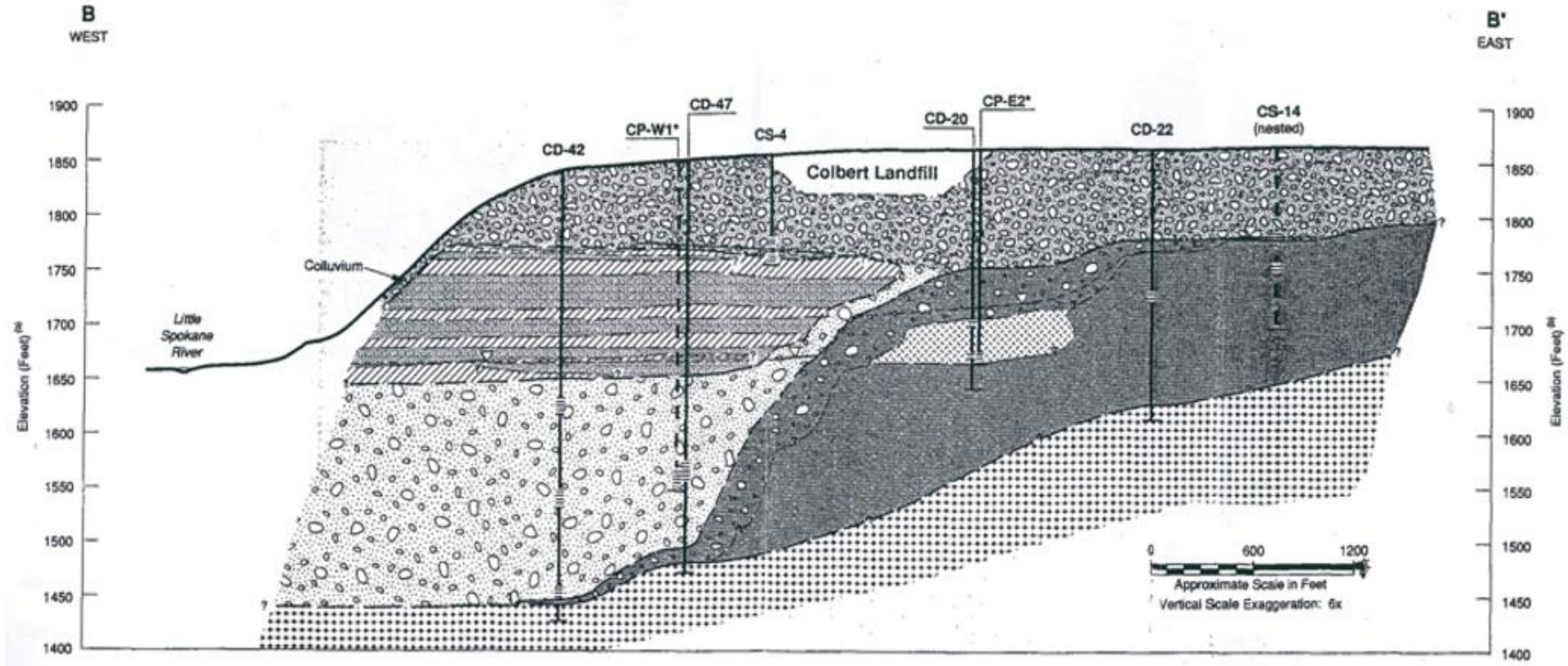
The Upper Sand and Gravel Unit aquifer (Upper Aquifer) is unconfined with a water table that lies approximately 90 ft below the ground surface. Groundwater flow in this aquifer is generally north to south, changing to the southeast approximately 1 mile south of the Site. The direction of flow appears to be influenced by the topography of the upper surface of the Lacustrine Aquitard (Landau Associates 1991).

The Lower Sand and Gravel Unit aquifer (Lower Aquifer) is confined to the west of the landfill and unconfined to the east of the landfill. To the west of the landfill, the Upper and Lower aquifers are separated by the Lacustrine unit, which causes the confined conditions in that area. Groundwater flow in the Lower Aquifer is predominantly toward the west with discharge to the Little Spokane River.

Colbert Landfill Hydrogeology/Groundwater Migration



Colbert Landfill Hydrogeology Overview



1.2 Colbert Landfill Monitoring – Overview of Results/Discussion

Shut-down Test - Lower Aquifer

The highest constituent of concern (COC) concentrations in the vicinity of the Colbert Landfill are found in the lower aquifer. After the shutdown of the Colbert Landfill extraction system, overall COC concentrations exhibited an initial increase followed by a decrease/plateau starting in 2017 and ending in 2021/2022. COC concentrations in the lower aquifer began a secondary increase that started approximately late 2021, and continued to increase through late 2023. It appears, however, that the data from the most recent groundwater sampling events indicate that COC concentrations have potentially started to stabilize, or even begin to decrease. Overall COC constituent concentrations found in the lower aquifer extraction wells exhibited a "peak" in concentrations during late 2022, and then decreased in concentrations to the present, with the exception of DCA for CP-W3/CP-E2 and TCE for CP-E2. Starting in late 2021, TCA and DCE concentrations in CD-49 exhibited increases in COC concentrations until early 2024, where DCE concentrations peaked just below the DCE Action Level of 4.55 ppb, but TCA and DCE concentrations are currently decreasing. The current stabilizing/decreasing COC concentrations in the lower aquifer appears to coincide with increases in groundwater elevations for their respective monitoring/extraction wells.

In May 2022, during the Supplemental Sampling event, Spokane County collected groundwater samples from CD-21C3 to determine COC concentrations in the vicinity of this monitoring well. The results indicated that the highest concentrations of TCA and DCE in the lower aquifer were found at CD-21C3. County personnel installed a dedicated pump in CD-21C3 in October 2023 to monitor these "source area" concentrations on a quarterly basis to assess COC changes and trends. Monitoring Well CD-21C3 COC concentrations vs. time are presented in Figure 2-20. Despite the recent increasing trend(s), there have been no COC criteria exceedances in any of the Shutdown compliance monitoring wells. Individual COC concentration increases/decreases for all shutdown compliance and extraction wells between April 2023 and April 2024 are presented in Table 2-8. For more information regarding the shutdown program, see Section 1.3.

Upper Aquifer Compliance Monitoring

COC concentrations in the upper aquifer compliance wells have continued to exhibit stable/decreasing trends following the shutdown of the extraction wells. Almost all detectable COC concentrations in the upper aquifer monitoring wells exhibited decreases during this reporting period, with the exception of DCA for CD-36A1, and DCA/TCE for CP-S6. These COC concentration decreases appear to coincide with groundwater elevation increases or stabilization. Similar to several monitoring wells found in the lower aquifer, COC concentrations exhibited an initial increase after the shutdown of the extraction system, followed by a decrease/plateau starting in 2016/2017 that has continued to the present. Individual COC concentration increases/decreases for all upper aquifer compliance/extraction wells between April 2022 and April 2023 are presented in Table 3-8. For more information regarding the Upper Aquifer Compliance Monitoring program, see Section 1.4.

Residential Well Monitoring

There are currently 29 residential wells that Spokane County monitors through the Residential Well Monitoring program (excluding the residential wells currently in the Supplemental Sampling program). COC concentrations for residential wells in both the lower and upper aquifers have exhibited decreases prior to the shutdown of the extraction system. After the shutdown of the extraction system, COC concentrations have remained non-detection or at very low concentrations for all of the residential wells sampled through the Residential Monitoring Program. The only COC concentrations above the detection limit during this reporting period were low concentrations (0.95 ug/L) of DCA found in residential well 1073L-1. For more information regarding the Residential Well Monitoring program, see Section 1.5.

1,4-Dioxane Monitoring

From 2005 to 2008, Spokane County conducted an evaluation for 1,4-Dioxane prevalence and distribution in both the upper and lower aquifers. After the conclusion of the evaluation, only 5 wells in the upper aquifer were added to the Spokane County 1,4-Dioxane monitoring program for annual sampling. In 2021, Spokane County received grant funding to conduct another evaluation for the prevalence/distribution of 1,4-Dioxane in post-shutdown conditions. The evaluation concluded in 2023, and County personnel added 2 lower aquifer wells to the 1,4-Dioxane monitoring program – extraction wells CP-E2 and CP-W3. While 1,4-Dioxane concentrations for CP-E2 remained low (1.18 ppb), 1,4-Dioxane concentrations for CP-W3 have significantly increased from 2.54 ppb in April 2023 to 44.4 ppb in April 2024, and even to 65.9 ppb in May 2024 after a confirmation sample was collected.

Most detections found in the upper aquifer were low concentrations of 1,4-Dioxane, with the exception of CD-36A1 (8.66 ppb). CD-36A1 has consistently exhibited the highest concentrations of 1,4-Dioxane at the Colbert Landfill since the most recent 1,4-Dioxane evaluation, and concentrations are currently above the Washington State Model Toxics Control Act (MTCA) criterion of 7 µg/L (1,4-Dioxane has not been designated a COC through administrative action). 1,4-Dioxane concentrations ranged from 0.5 ug/l (1473M-1, non-detection) to 8.66 ug/l (CD-36A1). While the distribution of 1,4-Dioxane appears to be greater since the 2005 evaluation due to a higher number of detections, this is most likely the result of a much lower detection limit used in the laboratory analyses during this evaluation (0.01 ug/L) compared to the 2005 evaluation (up to 5 ug/L). For more information regarding the current 1,4-Dioxane monitoring, see Section 1.6.

Colbert Landfill Upper/Lower Aquifer Data Evaluation

As discussed in the Shut-down Test (lower aquifer) and the Upper Aquifer Compliance Monitoring sections, monitoring wells in both the upper and lower aquifers continued to exhibit increasing trends in COC concentrations following a decrease/stabilization of COC concentrations starting in 2016/2017, but concentrations now appear to be stabilizing and/or decreasing. Exceptions to this include TCE/DCE/MC concentrations for CP-E2, and DCA/DCE/MC concentrations for CP-W3. The stabilizing/decreasing trends shown in the extraction and compliance monitoring wells appear to coincide with COC concentration decreases found in source-area well CD-21C3. COC Concentrations in the lower aquifer compliance wells exhibited decreases for TCA in CD-43C1, CD-44C1, and CD-

45C1. COC Concentrations found in the lower aquifer compliance wells exhibited increases for TCA and DCE in CD-49. Despite the previous increasing concentration trend(s), there have been no COC criteria exceedances in any of the Shutdown compliance monitoring wells. COC concentrations in the upper aquifer compliance wells have continued to exhibit stable/decreasing trends following the shutdown of the extraction wells. Almost all detectable COC concentrations in all upper aquifer monitoring wells showed decreases during this reporting period, with the exception of DCA for CD-36A1, and DCA/TCE for CP-S6.

Groundwater velocities in the Lower Aquifer under non-pumping conditions were reported to be on the order of 100 to 200 ft/yr in the 1991 Final Phase I Engineering Report (Landau Associates 1991), and the existing downgradient compliance monitoring wells are about 900 ft west of the western extraction wells. Therefore, it was anticipated that monitoring for the shutdown test would need to continue for up to 9 years to determine the impact (if any) the system shutdown has on groundwater quality downgradient from the West System extraction wells. Since the shutdown test officially began on April 1, 2014, a 9-year shutdown test would end on April 1, 2023. Spokane County, the EPA, and Ecology met to discuss the data and results of the shutdown test, and the consensus is that the current hydrogeologic system has not equilibrated fully since the shutdown of the pump and treat system. The end point of the shutdown test will be determined by Ecology and EPA, in concert with Spokane County, once either the rebound of downgradient concentrations of any COC has triggered action levels for four consecutive quarters, or the remedy has been deemed successful at achieving long-term protectiveness.

1.3 Shut-down Test - Lower Aquifer

A pump and treat system was successfully operated from 1994 through March 31, 2014, to prevent further spread of groundwater contamination emanating from the landfill. A shut-down test for the lower aquifer pump and treat system was deemed appropriate for the site after a Remedial System Evaluation (RSE) was performed as recommended in the 2009 Five Year Review (EPA). The RSE recommendation stated that with the extensive groundwater monitoring programs in place and with concentrations having decreased substantially after 20 years of operation, the current pump and treat system may not be adding significant benefit to the overall protectiveness of the remedy and that a shut-down test would help determine its efficacy. The shut-down test procedures are outlined in the Final Work Plan, Groundwater Pump and Treat System Shut-down Test, Colbert Landfill CERCLA Site, Spokane County Utilities/ Landau Assoc. 2013. See Section 2 of this report for more details. The upper aquifer monitoring wells are governed by the Consent Decree (CD) compliance, Post Closure (Minimal Functional Standards), and 1,4-dioxane sampling programs and are not included in the Shut-down test work plan. Shut-down testing results and information are presented in Section 2.0.

1.4 Upper Aquifer Monitoring

1.4.1 Compliance Monitoring (VOC's)

The compliance monitoring sampling program is outlined in the Consent Decree and performed according to the Colbert Landfill Operations and Maintenance manual *(Colbert Landfill Operations and Maintenance Manual, 1998*.). During the implementation of the lower aquifer system Shut-down Test, the compliance monitoring will only apply to the upper aquifer. Per conditions outlined in the consent decree (Appendix B, page V-7), the south system extraction wells are not required to be in operation and have been on stand-by status since 2004, and therefore are included in the compliance monitoring program. Compliance monitoring results and information are presented in Section 3.2.

1.4.2 1,4-Dioxane Sampling

In previous years, the 1,4-Dioxane monitoring program only applied to select wells in the upper aquifer. The selected upper aquifer well locations were sampled for 1,4-dioxane according to the *1,4-Dioxane Work Plan for the Colbert Landfill (December 2007)*. Spokane County conducted a 1,4-Dioxane evaluation in the upper and lower aquifers that began in 2021 and ended in 2023. See section 1.6 for additional 1,4-Dioxane monitoring requirements/information.

1.4.3 Minimal Functional Standards (MFS) Post Closure

The landfill was closed pursuant to requirements of the Minimal Functional Standards for Solid Waste Handling (MFS, WAC173-304). Lower aquifer locations, as outlined in the MFS Groundwater Monitoring Plan (Landau Assoc., 1996), require no additional monitoring after the 2 year monitoring period, which ended in January 1999. Monitoring for the upper aquifer will continue according to the *Colbert Landfill Operations and Maintenance Manual, 1998*., and the *MFS Groundwater Monitoring Plan, 1996*. MFS analytical results and information are presented in Section 3.4.

1.5 Residential Well Monitoring

The Consent Decree specified that domestic wells within the vicinity of the landfill be monitored to protect human health. Domestic well locations and schedules for this program were selected by proximity to landfill contamination and are evaluated on a regular basis to accommodate any changes in groundwater contamination. This program includes well locations in both the upper and lower aquifers. Sampling for this program is done in accordance with the Quality Assurance and *Field Sampling Plan-Colbert Residential Well Sampling, 1991*, and is governed by the Consent Decree. Residential program analytical results and information are presented in Section 4.0.

1.6 1,4-Dioxane Sampling

In 2005, the EPA specified an additional constituent, 1,4-Dioxane, for evaluation at the Colbert Landfill site. After extensive monitoring in both the upper and lower aquifers, it was determined that an ongoing monitoring program would apply to selected wells in the upper aquifer only. During the 2019 EPA Five-Year Site Review, the EPA recommended that, "*Sampling for 1,4-Dioxane should be performed across a broader network of monitoring wells, including residential wells for at least two sampling events*" to evaluate the presence and extent of 1,4-Dioxane in post-shutdown conditions. The monitoring wells that are sampled annually for 1,4-Dioxane were selected prior to the P&T system shutdown based on sampling events conducted from 2005 - 2008, and groundwater flow conditions/contaminant transport may have changed. Spokane County conducted a 1,4-Dioxane evaluation in the upper and lower aquifers that began in 2021 and ended in 2023. 1,4-Dioxane analytical results for the lower aquifer are presented in Table 2-9, and the 1,4-Dioxane analytical results for the upper aquifer are presented in Table 3-7.

1.7 Supplemental Sampling

Supplemental sampling occurs every five years and is intended to collect additional data from monitoring and residential wells not regularly sampled. Although there are no criteria for monitoring or reporting associated with supplemental sampling, data collected helps provide a more accurate representation of groundwater flow and contamination throughout the area. The next Supplemental sampling will occur in April and May 2027.

1.8 Landfill Operations and Maintenance

In 1997, the landfill closure construction (cover system and components) was completed as part of the MFS requirements. The landfill gas collection and treatment system are monitored and maintained on a regular basis as outlined in the *Operations and Maintenance Manual for Colbert Landfill Closure, CH2MHill, May 1997*. Landfill operations and maintenance information is presented in Section 6.0.

2.0 Shut-down Test

A shut-down test of the Colbert Landfill Groundwater Pump and Treat facility was initiated on April 1, 2014, when all lower aquifer extraction wells were turned off and placed in standby mode. The shut-down test was deemed appropriate for the site after a Remedial System Evaluation (RSE) was performed as recommended in the 2009 Five-Year Review (EPA). The shut-down test is performed according to the *Final Work Plan, Groundwater Pump and Treat System Shut-down Test, Colbert Landfill CERCLA Site, Spokane County Utilities/ Landau Assoc. 2013*.

2.1 Shut-down Testing Locations and Schedule

The lower aquifer wells selected as monitoring locations for the Colbert Landfill pump and treat system shut-down test include: the compliance monitoring well clusters (CD-41, CD-42, CD-43, CD-44, CD-45, and CD-48), monitoring well CD-49, and the lower aquifer extraction wells (CP-E1, CP-E2, CP-E3, CP-W1, CP-W2, and CP-W3). Locations are presented in Figure 2-1. Collection of groundwater samples (contaminant sampling) from the shut-down locations, along with the collection of water level measurements, was performed as outlined in Table 2-1.

2.2 Shut-down Test Monitoring

The lower aquifer extraction wells, the compliance monitoring well clusters (CD-41, CD-42, CD-43, CD-44, CD-45, and CD-48), and monitoring well CD-49 were sampled according to the *Colbert Landfill Operations and Maintenance Manual, 1998.* Field parameters were taken, and VOC samples were collected.

2.2.1 Groundwater Elevations

Groundwater elevations for the reporting period are shown in Table 2 2 and Figure 2 2. Estimated groundwater contours and flow are shown in Figure 2 4 and Figure 2-5. Measurements were consistent and followed typical seasonal variation with levels slightly higher in the spring and slightly lower during the fall. Extraction well hydrographs show the increase in groundwater levels in the immediate vicinity of those wells in April 2014 when the system was shut down. Groundwater elevations in the lower aquifer appear to be on a current increasing trend since early 2022, which followed a decreasing trend after the observed increase after the extraction wells were shut down.

2.2.2 Field Parameters

Field parameters taken at the shut-down test locations are shown in Table 2-2. The highest conductivities were mostly seen in the east system extraction wells. Conductivity values in monitoring wells ranged from 292 to 1095 umhos/cm. Measurements of pH ranged from 6.9 to 8.08. The highest conductivity/lowest pH values are generally found in the east system extraction wells.

2.2.3 Constituents of Concern (COC's)

Constituent of concern concentrations for Shut-down Test locations are presented in Table 2-4 and Table 2-5. COC Concentrations versus time graphs for Shut-down locations are presented in Figure 2-6 through Figure 2-16. Estimated COC plume boundaries and COC detections in the lower aquifer are presented in Figure 2-21 through Figure 2-31. All detected concentrations found in the shut-

down test compliance wells remained below any applicable criteria. Colbert Landfill COC Criteria are shown in Table 2-3.

Constituent of concern concentrations for Shut-down Test locations are presented in Table 2-4 and Table 2-5. COC Concentrations versus time graphs for Shut-down locations are presented in Figure 2-6 through Figure 2-20. Estimated COC plume boundaries and COC detections in the lower aquifer are presented in Figure 2-21 through Figure 2-31. All detected concentrations found in the shutdown test compliance wells remained below any applicable criteria. Colbert Landfill COC Criteria are shown in Table 2-3. The COCs found in the shut-down program criteria-dependent (SD compliance) wells were low concentrations of TCA and DCE. No concentrations of DCA, PCE, TCE, or MC were detected in the criteria-dependent wells during this reporting period.

Analytical results from the shut-down program criteria-dependent wells are shown in Table 2-4. Time versus concentration plots are presented in Figure 2-6 through Figure 2-12. Although concentrations for TCA and DCE began to decrease/plateau after increases post-shutdown, concentrations for these constituents exhibited increasing trends for wells CD-49 (TCA and DCE) and CD-45C1 (TCA) until early 2024, where concentrations now appear to be stabilizing. TCA concentrations for CD-43C1 are continuing to decrease after initial increases following the shutdown of the extraction wells. DCE concentrations for CD-49 increased from 3.99 ppb in April 2023 to 4.45 in January 2024, and then 4.03 ppb in April 2024. TCA and DCE concentrations in CD-49 appear to be stabilizing, and this appears to coincide with TCA/DCE concentrations stabilization/decreases found in the lower extraction wells and source-area well CD-21C3. Monitoring wells CD-49 and CD-43C1 were kept on a quarterly sampling schedule to better evaluate the previous increasing trends in TCA/DCE concentrations. None of the SD compliance wells exceeded any criteria during this reporting period.

Lower aquifer extraction wells are not criteria-dependent locations, and therefore actions during the shut-down test are not governed by COC concentrations in these wells. Analytical results from the extraction wells are shown in Table 2-5. Time versus concentration plots are found in Figure 2-13 through Figure 2-19. Similar to the SD compliance wells, concentrations for most of the COCs exhibited increasing trends after a decrease/stabilization of concentrations that followed the initial increases (rebound/back-diffusion) post-shutdown, but most COC concentrations appear to be currently stabilizing/decreasing. All COC constituent concentrations found in the lower aquifer extraction wells exhibited decreases in concentrations between April 2023 and April 2024, with the exception of DCA, DCE, and MC found in CP-W3. Lower aquifer extraction well criteria exceedances are summarized below (consent decree criteria only):

- CP-E1 exceeded the criteria for DCE, PCE, and TCE.
- CP-E2 exceeded the criteria for DCE, PCE, and TCE.
- CP-E3 exceeded the criteria for DCE.
- CP-W2 exceeded the criteria for DCE.
- CP-W3 exceeded the criteria for DCE, TCE, and 1,4-Dioxane.

A comparison summarizing the differences in COC concentrations observed in the Shutdown/Extraction wells between 2019, 2023, and 2024 is presented in Table 3-8.

2.3 Data Evaluation

Conclusions from the Colbert Landfill Phase I Engineering Report found that the wells screened within the basalt aquifer (CP-E2 and CD-04E1) are directly (although incompletely) hydrologically connected to the lower sand/gravel aquifer, along with the monitoring and residential wells screened within it. This hydraulic connection potentially provides a hydrogeologic pathway connecting some of the wells with the highest COC concentrations (CD-21C3, CP-E2, and CD-04E1) to the downgradient wells screened in the lower aquifer (CP-W3 and CD-49).

Data indicate that, although there were increasing trends of COC concentrations following the decrease of concentrations (after the rebound/back diffusion "peak") post-shutdown, most COC concentrations are currently exhibiting stabilizing/decreasing trends that began in early 2024 (with some exceptions, see section 2.2.3 above). The stabilization in COC concentrations found in CD-49, along with stabilizing/decreasing COC concentrations in upgradient well CP-W3 and source-area well CD-21C3, indicate that the western migration/plume connectivity of the Colbert Landfill contaminants of concern could potentially be equilibrating. There are, however, several COC concentrations that continue to increase, such as TCE/DCE/MC concentrations for CP-E2, and DCA/DCE/MC concentrations for CP-W3.

2.4 Program Changes or Modifications

Criteria Exceedances in the lower aquifer are presented in Table 2-6 (Consent Decree criteria) and Table 2-7 (updated criteria values from the Colbert Landfill 6th Five-year Review, which includes an increase for Trichloroethene [PCE] from the performance standard in the ROD [0.7 µg/L] to the current MCL [5µg/L], and a decrease for 1,1-Dichloroethane [1,1-DCA] to the regional screening level [RSL] of 2.6 µg/L). The only criteria exceedances that occurred within this reporting period were found in the extraction wells, and those wells are not criteria-dependent.

Sampling at the lower aquifer compliance monitoring wells will continue on an annual basis until a different sampling interval/remedial program is implemented. The exceptions to this are monitoring wells CD-49, CD-43C1, and CD-21C3. Quarterly sampling will continue at these wells to monitor the COC concentration trends for TCA and DCE. Quarterly sampling will continue at the extraction wells, as running the wells periodically will assist with preventive maintenance and provide indicators for any possible changes in COC concentrations near the landfill boundaries.

2.5 Cost Savings

Typical electrical costs associated with operating the pump-and-treat system for the lower aquifer continually for one year were approximately $59,000. From May 2023 through April 2024, the cost of electricity at the facility during the ninth year of the shut-down test was $18,209. Costs incurred during this reporting period continued to remain higher than typical annual sampling years due to the increased number of wells sampled, additional groundwater samples analyzed at the laboratories, increased labor costs associated with additional sampling/sampling events, and price increases at both laboratories. Despite the increased costs incurred during this reporting period, Spokane County saved an estimated $11,370.

Typical Annual Electrical Costs		**$60,000**
Electrical Costs for the Shut-down Test		($18,209)
Additional Lab Cost Associated with Shut-down Test		($28,884)
Estimated labor costs for additional sample rounds		($1,537)
Estimated Total Cost Savings		$11,370

Figure 2-1 Shut-down Test Locations

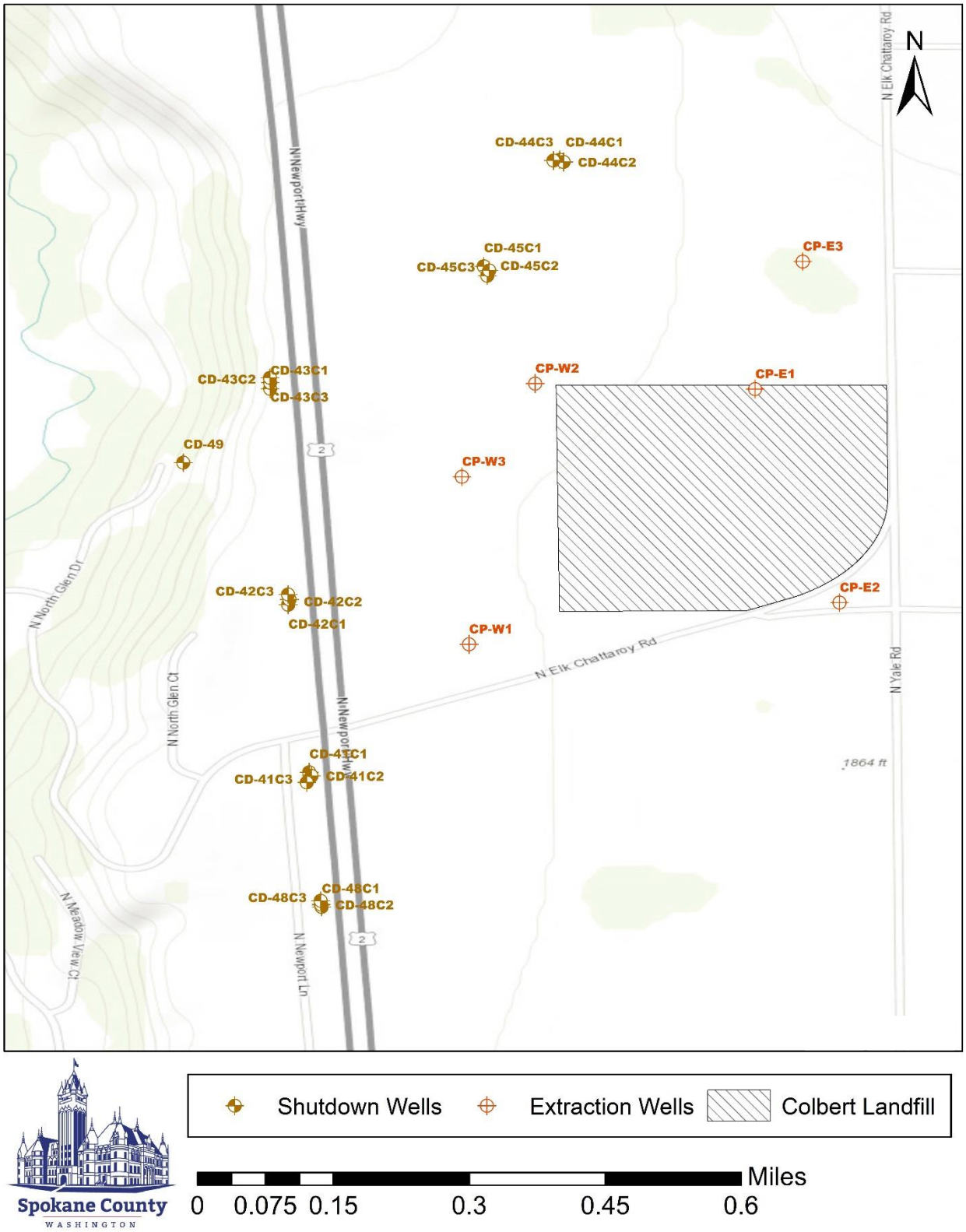
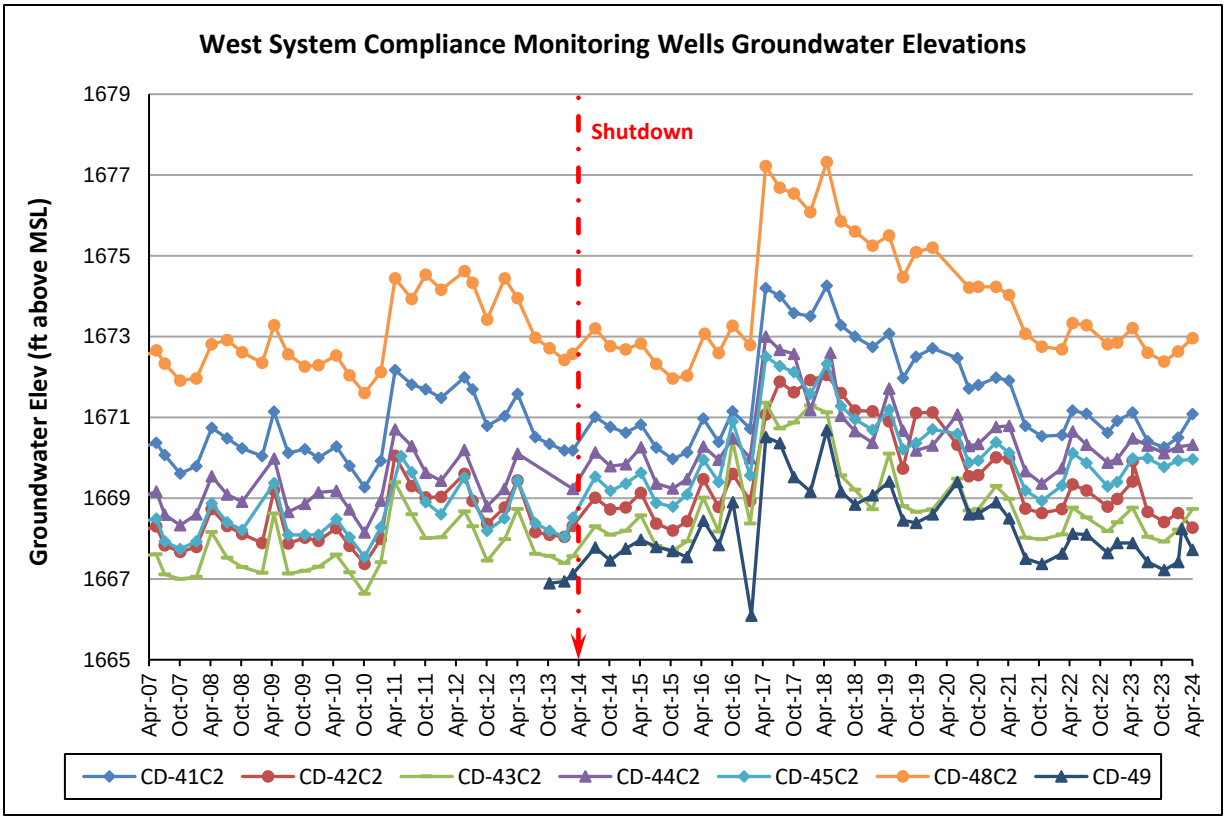


Table 2-1 Colbert Landfill Shut-down Test Sampling Schedule (May 2023 - June 2024)

System	Well ID	Monitoring Frequency		Shut-down Criteria Applies?
		Water Levels	Sampling	
West	CD-41C1	Quarterly	Annual	Yes
	CD-41C2	Quarterly	Annual	
	CD-41C3	Quarterly	Annual	
	CD-42C1	Quarterly	Annual	Yes
	CD-42C2	Quarterly	Annual	
	CD-42C3	Quarterly	Annual	
	CD-43C1	Quarterly	Quarterly	Yes
	CD-43C2	Quarterly	Annual	
	CD-43C3	Quarterly	Annual	
	CD-44C1	Quarterly	Annual	Yes
	CD-44C2	Quarterly	Annual	
	CD-44C3	Quarterly	Annual	
	CD-45C1	Quarterly	Annual	Yes
	CD-45C2	Quarterly	Annual	
	CD-45C3	Quarterly	Annual	
	CD-48C1	Quarterly	Annual	Yes
	CD-48C2	Quarterly	Annual	
	CD-48C3	Quarterly	Annual	
	CD-49	Quarterly	Quarterly	Yes
	CP-W1	Quarterly	Quarterly	No
	CP-W2	Quarterly	Quarterly	
	CP-W3	Quarterly	Quarterly	
East	CP-E1	Quarterly	Quarterly	No
	CP-E2	Quarterly	Quarterly	
	CP-E3	Quarterly	Quarterly	

Changes to the program are highlighted in **RED**

Figure 2-2 Lower Aquifer Groundwater Elevations



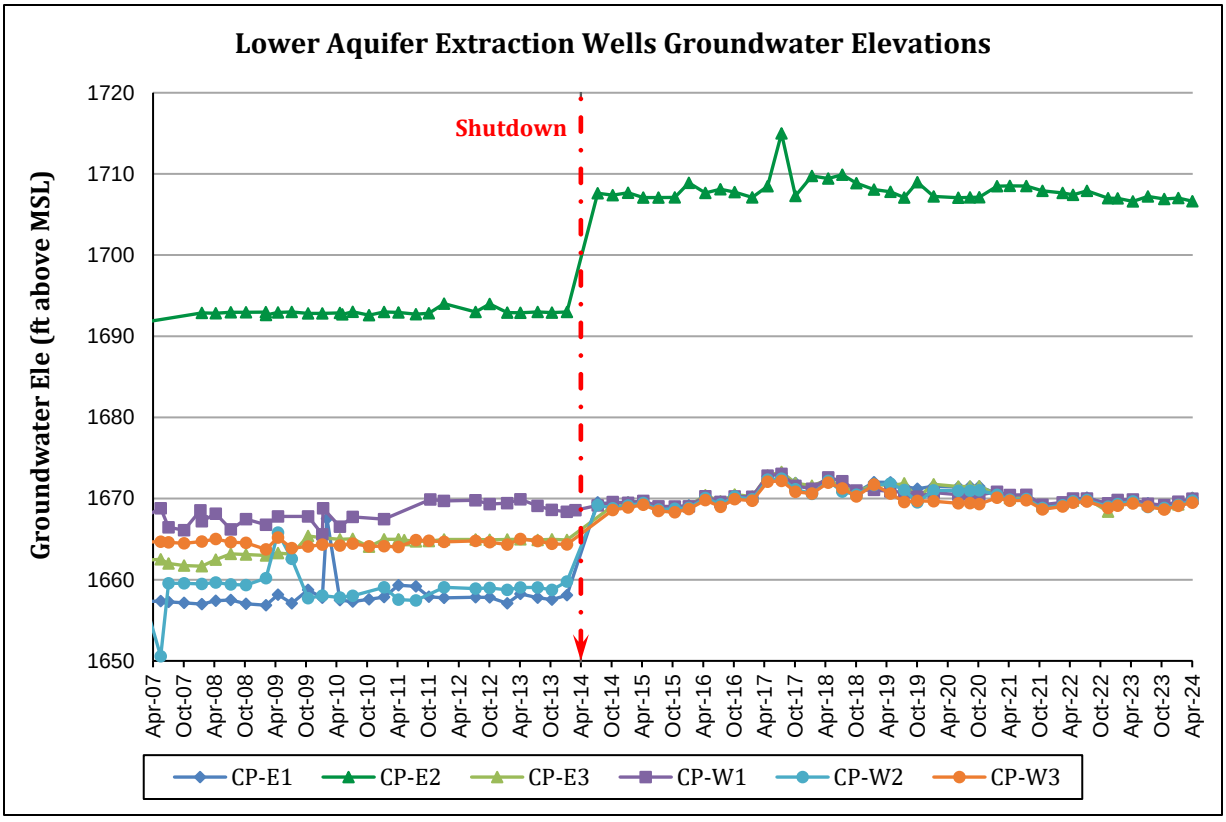
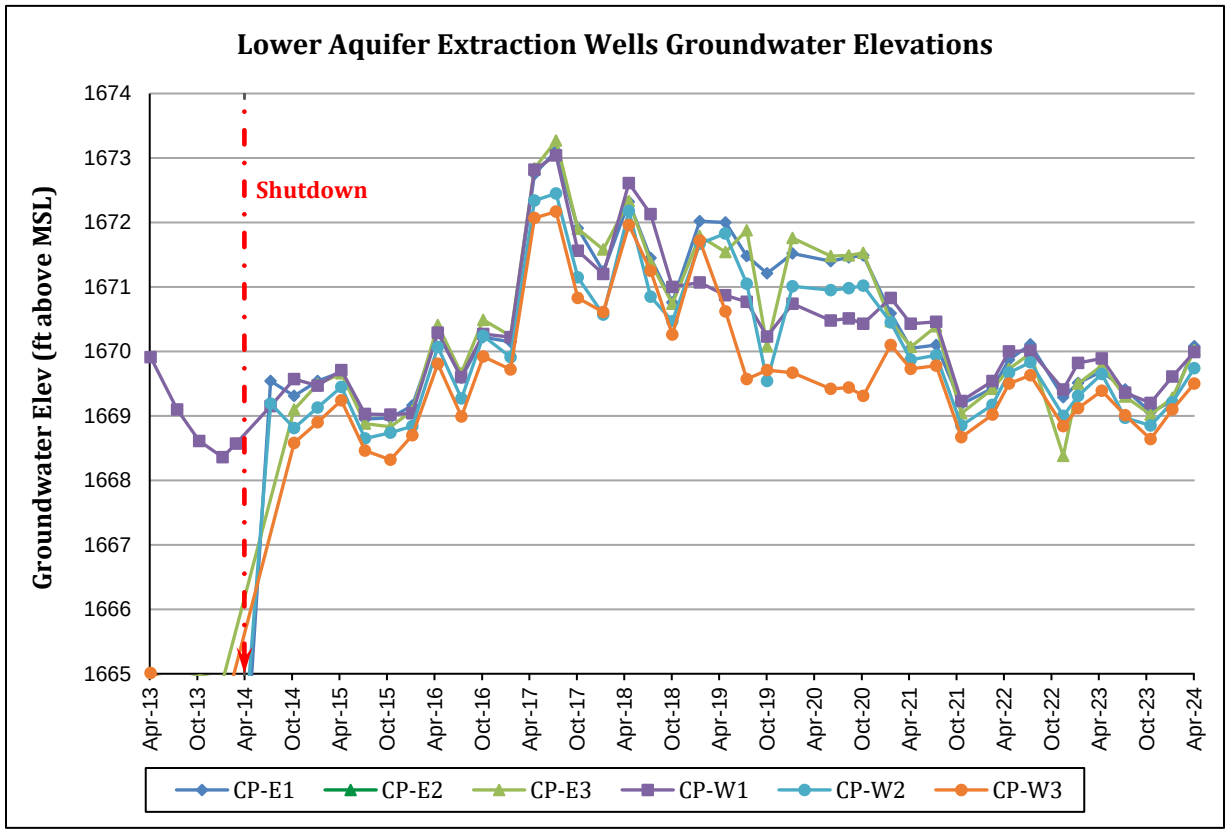


Figure 2-3 Lower Aquifer Groundwater Elevations (cont.)



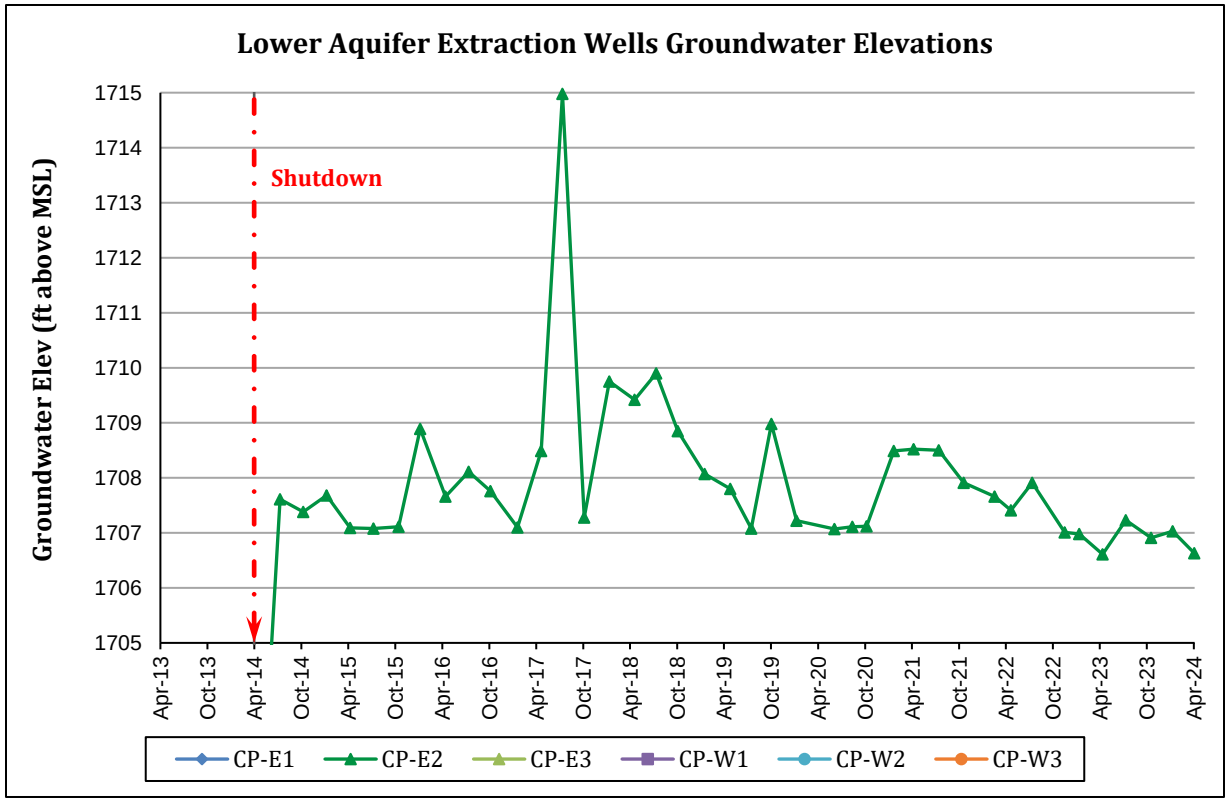


Figure 2-4 Lower Aquifer Groundwater Contours

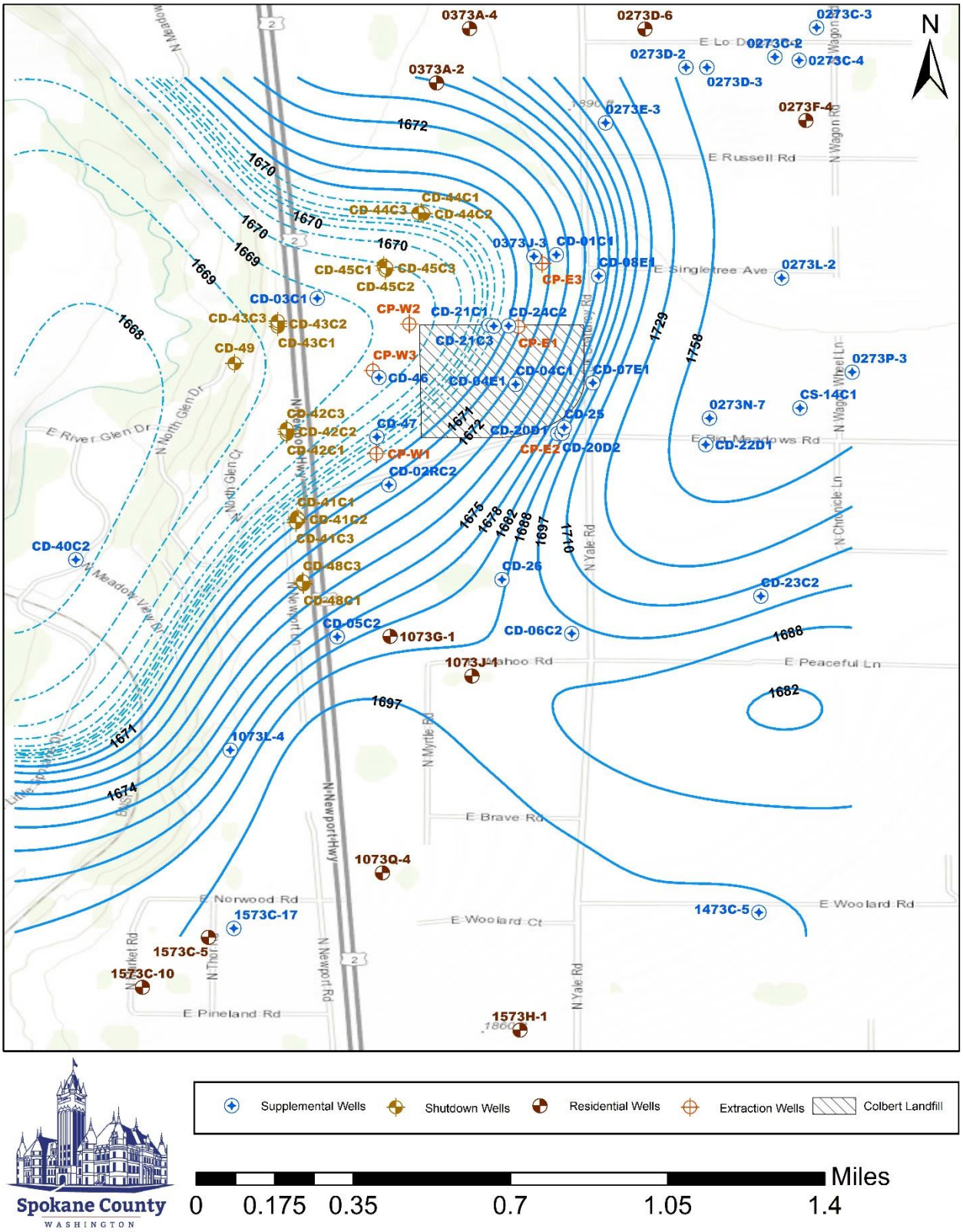


Figure 2-5 Lower Aquifer Groundwater Elevation Map

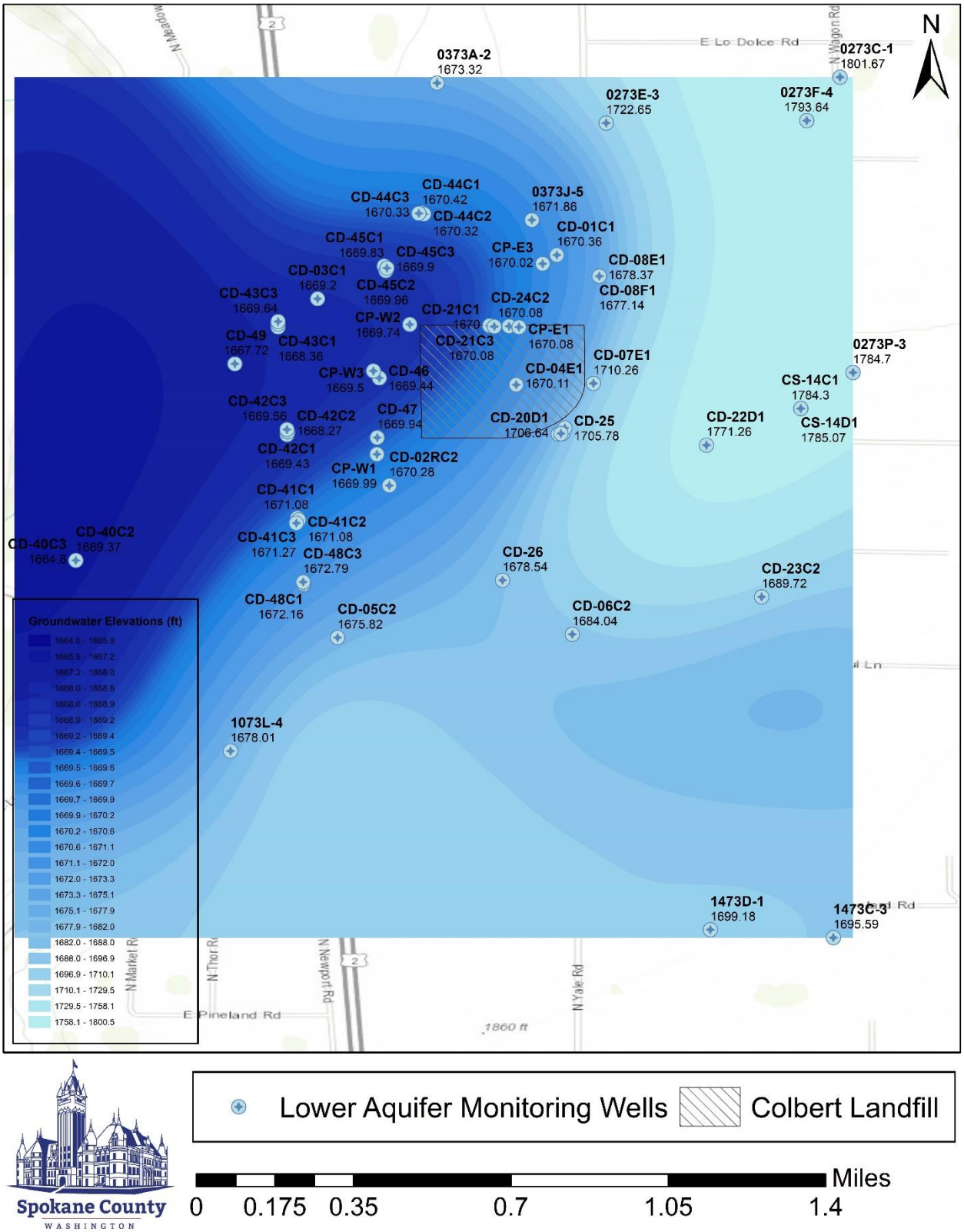


Table 2-2 Shut-down Test Location Field Parameters

StationID	SampleDate	WtrElev	Temp	PH	Conductivity	Turbidity	Aquifer	Program
CD-41C1	4/2/2024	1671.08	11.9	7.95	426	0.09	lower	SD
CD-41C2	4/2/2024	1671.08	11.4	8.05	436	0.05	lower	SD
CD-41C3	4/2/2024	1671.27	11.7	7.88	489	0.08	lower	SD
CD-42C1	4/2/2024	1669.43	12.5	7.86	494	0.04	lower	SD
CD-42C2	4/2/2024	1668.27	12.3	7.91	498	0.02	lower	SD
CD-42C3	4/2/2024	1669.56	12.6	7.98	428	0.06	lower	SD
CD-43C1	7/11/2023	1782.29	10.9	8.08	480	0.12	lower	SD
CD-43C1	10/17/2023	1667.61	11.1	7.95	445	0.02	lower	SD
CD-43C1	1/9/2024	1667.89	10.6	7.98	498	0.08	lower	SD
CD-43C1	4/2/2024	1668.36	11.3	7.98	475	0.09	lower	SD
CD-43C2	4/2/2024	1668.73	11	8.03	292	0.08	lower	SD
CD-43C3	4/2/2024	1669.64	12.3	7.94	320	0.04	lower	SD
CD-44C1	4/3/2024	1670.42	14.6	7.67	449	0.19	lower	SD
CD-44C2	4/3/2024	1670.32	11.8	7.56	442	0.08	lower	SD
CD-44C3	4/3/2024	1670.33	12.6	7.58	430	0.27	lower	SD
CD-45C1	4/3/2024	1669.83	10.8	7.64	491	0.08	lower	SD
CD-45C2	4/3/2024	1669.96	11.3	7.53	447	0.07	lower	SD
CD-45C3	4/3/2024	1669.9	10.9	7.92	363	0.09	lower	SD
CD-48C2	4/2/2024	1672.96	11.2	7.79	479	0.18	lower	SD
CD-48C3	4/2/2024	1672.79	11.3	7.74	491	0.02	lower	SD
CD-49	7/11/2023	1667.42	13.2	7.9	500	0.21	lower	SD
CD-49	10/17/2023	1667.22	12.5	7.84	472	0.3	lower	SD
CD-49	1/9/2024	1667.42	12.5	7.78	519	0.05	lower	SD
CD-49	1/30/2024	1668.24	12.1	7.78	417	0.25	lower	SD
CD-49	4/2/2024	1667.72	12.7	7.85	502	0.09	lower	SD
CP-E1	7/11/2023	1669.41	11.1	7.41	1083	0.31	lower	SD
CP-E1	10/17/2023	1669.06	10.8	7.47	1095	0.29	lower	SD
CP-E1	1/9/2024	1669.23	10.6	7.51	1078	0.21	lower	SD
CP-E1	4/2/2024	1670.08	12.9	6.9	1038	0.39	lower	SD
CP-E2	7/11/2023	1707.23	12.5	6.97	857	0.31	lower	SD
CP-E2	10/17/2023	1706.91	12.6	6.96	874	0.61	lower	SD
CP-E2	1/9/2024	1707.03	12.6	6.94	882	0.42	lower	SD
CP-E2	4/2/2024	1706.63	13.6	7.11	990	0.44	lower	SD
CP-E3	7/11/2023	1669.3	11.7	6.99	707	0.89	lower	SD
CP-E3	10/17/2023	1669.02	11.2	7.01	717	0.71	lower	SD
CP-E3	1/9/2024	1669.28	10.9	7.1	726	0.41	lower	SD
CP-E3	4/2/2024	1670.02	12.7	7.06	840	0.53	lower	SD
CP-W1	7/11/2023	1669.36	11.2	7.92	460	0.21	lower	SD
CP-W1	10/17/2023	1669.2	10.6	7.76	472	0.29	lower	SD
CP-W1	1/9/2024	1669.61	10.6	7.8	457	0.25	lower	SD
CP-W1	4/2/2024	1669.99	11.7	7.8	465	0.35	lower	SD
CP-W2	7/11/2023	1668.97	11	7.76	514	0.12	lower	SD
CP-W2	10/17/2023	1668.85	10.8	7.79	525	0.17	lower	SD
CP-W2	1/9/2024	1669.21	10.6	7.71	533	0.15	lower	SD
CP-W2	4/2/2024	1669.74	11.4	7.66	518	0.53	lower	SD
CP-W3	7/11/2023	1669.01	11.7	7.3	621	0.29	lower	SD
CP-W3	10/17/2023	1668.64	10.9	7.44	630	0.36	lower	SD
CP-W3	1/9/2024	1669.1	10.6	7.45	651	0.29	lower	SD
CP-W3	4/2/2024	1669.5	11.7	7.29	796	0.41	lower	SD

Temp=degrees C; Conductivity=umhos/cm; Turbidity= NTU

Table 2-3 Colbert Landfill Shut-down Test Criteria

Groundwater monitoring associated with the P&T system currently includes water level measurements and groundwater quality monitoring at extraction and compliance monitoring wells in accordance with the Quality Assurance Project Plan (QAPP; Landau Associates 1992b) to meet the criteria established in the Consent Decree. The purpose of this monitoring is to evaluate the performance of the P&T system in preventing the spread of contaminated groundwater downgradient from the capture zone for the West System. Compliance monitoring wells are currently sampled on an annual basis and the extraction wells are sampled on a quarterly basis. The consent decree evaluation criteria and action-level criteria for the shut-down test are presented below:

SHUT-DOWN TEST CRITERIA		
COC	**ACTION LEVEL CRITERIA (ug/L)**	**CONSENT DECREE EVALUATION CRITERIA (ug/L)**
TCA	**130**	**200**
DCA	**2632**	**4050**
DCE	**4.55**	**7**
MC	**1.6**	**2.5**
PCE	**0.5**	**0.7**
TCE	**3.25**	**5**

Table 2-4 Shut-down Test Compliance Well Analytical Results (reported in ug/L)

StationID	SampleDate	DCA	DCE	MC	PCE	TCA	TCE
CD-41C1	4/2/2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-41C2	4/2/2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-41C3	4/2/2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-42C1	4/2/2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-42C2	4/2/2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-42C3	4/2/2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-43C1	7/11/2023	<0.5	<0.5	<0.5	<0.5	**2.93**	<0.5
CD-43C1	10/17/2023	<0.5	<0.5	<0.5	<0.5	**2.47**	<0.5
CD-43C1	1/9/2024	<0.5	<0.5	<0.5	<0.5	**2.15**	<0.5
CD-43C1	4/2/2024	<0.5	<0.5	<0.5	<0.5	**1.3**	<0.5
CD-43C2	4/2/2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-43C3	4/2/2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-44C1	4/3/2024	<0.5	<0.5	<0.5	<0.5	**0.87**	<0.5
CD-44C2	4/3/2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-44C3	4/3/2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-45C1	4/3/2024	<0.5	<0.5	<0.5	<0.5	**1.52**	<0.5
CD-45C2	4/3/2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-45C3	4/3/2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-48C2	4/2/2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-48C3	4/2/2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-49	7/11/2023	<0.5	**3.92**	<0.5	<0.5	**5.23**	<0.5
CD-49	10/17/2023	<0.5	**3.87**	<0.5	<0.5	**4.65**	<0.5
CD-49	1/9/2024	<0.5	**4.45**	<0.5	<0.5	**5.84**	<0.5
CD-49	1/30/2024	<0.5	**4.33**	<0.5	<0.5	**6.15**	<0.5
CD-49	4/2/2024	<0.5	**4.03**	<0.5	<0.5	**5.34**	<0.5

***Bold** indicates a value greater than non-detection.

Table 2-5 Lower Aquifer Extraction Well Analytical Results (reported in ug/L)

StationID	SampleDate	DCA	DCE	MC	PCE	TCA	TCE
CP-E1	7/11/2023	**10**	**20.2**	<0.5	**3.03**	**5.67**	**10.3**
CP-E1	10/17/2023	**9.92**	**19.4**	<0.5	**3.25**	**4.95**	**10.3**
CP-E1	1/9/2024	**9.65**	**19.5**	<0.5	**3.06**	**4.94**	**10.2**
CP-E1	4/2/2024	**7.7**	**16.2**	<0.5	**2.65**	**3.78**	**8.71**
CP-E2	7/11/2023	**38.9**	**172**	<0.5	**0.93**	**37.3**	**185**
CP-E2	10/17/2023	**38.4**	**172**	<0.5	<0.5	**29.1**	**194**
CP-E2	1/9/2024	**37.2**	**149**	<0.5	**0.8**	**35.2**	**146**
CP-E2	4/2/2024	**40.1**	**157**	<0.5	**0.9**	**25.3**	**200**
CP-E3	7/11/2023	**2.3**	**14.1**	<0.5	<0.5	**7.24**	**1.88**
CP-E3	10/17/2023	**2.38**	**15.9**	<0.5	<0.5	**7.63**	**1.97**
CP-E3	1/9/2024	**2.37**	**15.8**	<0.5	<0.5	**7.48**	**2.03**
CP-E3	4/2/2024	**1.92**	**12.9**	<0.5	<0.5	**5.99**	**1.82**
CP-S1	7/11/2023	**1.45**	**0.6**	<0.5	<0.5	**0.71**	**1.17**
CP-S1	10/17/2023	**1.45**	**0.6**	<0.5	<0.5	**0.65**	**1.13**
CP-S1	1/9/2024	**1.37**	<0.5	<0.5	<0.5	**0.61**	**1.04**
CP-S1	4/2/2024	**0.95**	<0.5	<0.5	<0.5	<0.5	**0.82**
CP-S4	7/11/2023	**1.11**	<0.5	<0.5	**0.57**	<0.5	**2.04**
CP-S4	10/17/2023	**1.22**	**0.61**	<0.5	**0.55**	**0.52**	**2.08**
CP-S4	1/9/2024	**0.68**	<0.5	<0.5	<0.5	<0.5	**1.8**
CP-S4	4/2/2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CP-S5	7/11/2023	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CP-S5	10/17/2023	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CP-S5	1/9/2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CP-S5	4/2/2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CP-S6	7/11/2023	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CP-S6	10/17/2023	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CP-S6	1/9/2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CP-S6	4/2/2024	**0.68**	<0.5	<0.5	<0.5	<0.5	**1.64**
CP-W1	7/11/2023	<0.5	**3.82**	<0.5	<0.5	**2.69**	<0.5
CP-W1	10/17/2023	<0.5	**3.79**	<0.5	<0.5	**2.24**	<0.5
CP-W1	1/9/2024	<0.5	**3.89**	<0.5	<0.5	**2.27**	<0.5
CP-W1	4/2/2024	<0.5	**2.8**	<0.5	<0.5	**1.56**	<0.5
CP-W2	7/11/2023	**1.75**	**9.68**	<0.5	<0.5	**21.7**	<0.5
CP-W2	10/17/2023	**1.42**	**8.8**	<0.5	<0.5	**16**	<0.5
CP-W2	1/9/2024	**1.2**	**9.38**	<0.5	<0.5	**15.7**	<0.5
CP-W2	4/2/2024	**0.86**	**7**	<0.5	<0.5	**10.6**	<0.5
CP-W3	7/11/2023	**36.5**	**58**	<0.5	<0.5	**52.3**	**61.5**
CP-W3	10/17/2023	**37.5**	**56.2**	<0.5	<0.5	**41.5**	**56.5**
CP-W3	1/9/2024	**46.7**	**61.3**	**0.54**	<0.5	**39.8**	**56**
CP-W3	4/2/2024	**47.8**	**57.5**	**0.59**	<0.5	**32**	**51.7**

***Bold** indicates a value greater than non-detection.

Table 2-6 Shutdown Program Criteria Exceedances (Consent Decree criteria)

StationID	SampleDate	Aquifer	Program	Analyte	Result	Units	Flag
CP-E1	7/11/2023	lower	SD	1,1-Dichloroethene	20.2	ug/L	Exceedance
CP-E1	10/17/2023	lower	SD	1,1-Dichloroethene	19.4	ug/L	Exceedance
CP-E1	10/17/2023	lower	SD	1,1-Dichloroethene	19.3	ug/L	Exceedance
CP-E1	1/9/2024	lower	SD	1,1-Dichloroethene	19.5	ug/L	Exceedance
CP-E1	4/2/2024	lower	SD	1,1-Dichloroethene	16.2	ug/L	Exceedance
CP-E1	7/11/2023	lower	SD	Tetrachloroethene	3.03	ug/L	Exceedance
CP-E1	10/17/2023	lower	SD	Tetrachloroethene	3.23	ug/L	Exceedance
CP-E1	10/17/2023	lower	SD	Tetrachloroethene	3.25	ug/L	Exceedance
CP-E1	1/9/2024	lower	SD	Tetrachloroethene	3.06	ug/L	Exceedance
CP-E1	4/2/2024	lower	SD	Tetrachloroethene	2.65	ug/L	Exceedance
CP-E1	7/11/2023	lower	SD	Trichloroethene	10.3	ug/L	Exceedance
CP-E1	10/17/2023	lower	SD	Trichloroethene	10.1	ug/L	Exceedance
CP-E1	10/17/2023	lower	SD	Trichloroethene	10.3	ug/L	Exceedance
CP-E1	1/9/2024	lower	SD	Trichloroethene	10.2	ug/L	Exceedance
CP-E1	4/2/2024	lower	SD	Trichloroethene	8.71	ug/L	Exceedance
CP-E2	7/11/2023	lower	SD	1,1-Dichloroethene	172	ug/L	Exceedance
CP-E2	10/17/2023	lower	SD	1,1-Dichloroethene	172	ug/L	Exceedance
CP-E2	1/9/2024	lower	SD	1,1-Dichloroethene	149	ug/L	Exceedance
CP-E2	4/2/2024	lower	SD	1,1-Dichloroethene	157	ug/L	Exceedance
CP-E2	7/11/2023	lower	SD	Tetrachloroethene	0.93	ug/L	Exceedance
CP-E2	1/9/2024	lower	SD	Tetrachloroethene	0.8	ug/L	Exceedance
CP-E2	4/2/2024	lower	SD	Tetrachloroethene	0.9	ug/L	Exceedance
CP-E2	7/11/2023	lower	SD	Trichloroethene	185	ug/L	Exceedance
CP-E2	10/17/2023	lower	SD	Trichloroethene	194	ug/L	Exceedance
CP-E2	1/9/2024	lower	SD	Trichloroethene	146	ug/L	Exceedance
CP-E2	4/2/2024	lower	SD	Trichloroethene	200	ug/L	Exceedance
CP-E3	7/11/2023	lower	SD	1,1-Dichloroethene	14.1	ug/L	Exceedance
CP-E3	10/17/2023	lower	SD	1,1-Dichloroethene	15.9	ug/L	Exceedance
CP-E3	1/9/2024	lower	SD	1,1-Dichloroethene	15.8	ug/L	Exceedance
CP-E3	4/2/2024	lower	SD	1,1-Dichloroethene	12.9	ug/L	Exceedance
CP-W2	7/11/2023	lower	SD	1,1-Dichloroethene	9.68	ug/L	Exceedance
CP-W2	10/17/2023	lower	SD	1,1-Dichloroethene	8.8	ug/L	Exceedance
CP-W2	1/9/2024	lower	SD	1,1-Dichloroethene	9.38	ug/L	Exceedance
CP-W2	1/9/2024	lower	SD	1,1-Dichloroethene	9	ug/L	Exceedance
CP-W3	7/11/2023	lower	SD	1,1-Dichloroethene	58	ug/L	Exceedance
CP-W3	10/17/2023	lower	SD	1,1-Dichloroethene	56.2	ug/L	Exceedance
CP-W3	1/9/2024	lower	SD	1,1-Dichloroethene	61.3	ug/L	Exceedance
CP-W3	4/2/2024	lower	SD	1,1-Dichloroethene	57.5	ug/L	Exceedance
CP-W3	4/2/2024	lower	SD	1,4-Dioxane	44.4	ug/L	Exceedance
CP-W3	7/11/2023	lower	SD	Trichloroethene	61.5	ug/L	Exceedance
CP-W3	10/17/2023	lower	SD	Trichloroethene	56.5	ug/L	Exceedance
CP-W3	1/9/2024	lower	SD	Trichloroethene	56	ug/L	Exceedance
CP-W3	4/2/2024	lower	SD	Trichloroethene	51.7	ug/L	Exceedance

Table 2-7 Shutdown Program Criteria Exceedances (*Updated criteria values)

*Increase for Trichloroethene (PCE) from the performance standard in the ROD (0.7 µg/L) to the current MCL (5 µg/L), and a decrease for 1,1-Dichloroethane (1,1-DCA) to the regional screening level (RSL) of 2.8 µg/L.

StationID	SampleDate	Aquifer	Program	Analyte	Result	Units	Flag
CP-E1	7/11/2023	lower	SD	1,1-Dichloroethane	10	ug/L	Exceedance
CP-E1	10/17/2023	lower	SD	1,1-Dichloroethane	9.92	ug/L	Exceedance
CP-E1	10/17/2023	lower	SD	1,1-Dichloroethane	9.82	ug/L	Exceedance
CP-E1	1/9/2024	lower	SD	1,1-Dichloroethane	9.65	ug/L	Exceedance
CP-E1	4/2/2024	lower	SD	1,1-Dichloroethane	7.7	ug/L	Exceedance
CP-E1	7/11/2023	lower	SD	1,1-Dichloroethene	20.2	ug/L	Exceedance
CP-E1	10/17/2023	lower	SD	1,1-Dichloroethene	19.3	ug/L	Exceedance
CP-E1	10/17/2023	lower	SD	1,1-Dichloroethene	19.4	ug/L	Exceedance
CP-E1	1/9/2024	lower	SD	1,1-Dichloroethene	19.5	ug/L	Exceedance
CP-E1	4/2/2024	lower	SD	1,1-Dichloroethene	16.2	ug/L	Exceedance
CP-E1	7/11/2023	lower	SD	Trichloroethene	10.3	ug/L	Exceedance
CP-E1	10/17/2023	lower	SD	Trichloroethene	10.3	ug/L	Exceedance
CP-E1	10/17/2023	lower	SD	Trichloroethene	10.1	ug/L	Exceedance
CP-E1	1/9/2024	lower	SD	Trichloroethene	10.2	ug/L	Exceedance
CP-E1	4/2/2024	lower	SD	Trichloroethene	8.71	ug/L	Exceedance
CP-E2	7/11/2023	lower	SD	1,1-Dichloroethane	38.9	ug/L	Exceedance
CP-E2	10/17/2023	lower	SD	1,1-Dichloroethane	38.4	ug/L	Exceedance
CP-E2	1/9/2024	lower	SD	1,1-Dichloroethane	37.2	ug/L	Exceedance
CP-E2	4/2/2024	lower	SD	1,1-Dichloroethane	40.1	ug/L	Exceedance
CP-E2	7/11/2023	lower	SD	1,1-Dichloroethene	172	ug/L	Exceedance
CP-E2	10/17/2023	lower	SD	1,1-Dichloroethene	172	ug/L	Exceedance
CP-E2	1/9/2024	lower	SD	1,1-Dichloroethene	149	ug/L	Exceedance
CP-E2	4/2/2024	lower	SD	1,1-Dichloroethene	157	ug/L	Exceedance
CP-E2	7/11/2023	lower	SD	Trichloroethene	185	ug/L	Exceedance
CP-E2	10/17/2023	lower	SD	Trichloroethene	194	ug/L	Exceedance
CP-E2	1/9/2024	lower	SD	Trichloroethene	146	ug/L	Exceedance
CP-E2	4/2/2024	lower	SD	Trichloroethene	200	ug/L	Exceedance
CP-E3	7/11/2023	lower	SD	1,1-Dichloroethene	14.1	ug/L	Exceedance
CP-E3	10/17/2023	lower	SD	1,1-Dichloroethene	15.9	ug/L	Exceedance
CP-E3	1/9/2024	lower	SD	1,1-Dichloroethene	15.8	ug/L	Exceedance
CP-E3	4/2/2024	lower	SD	1,1-Dichloroethene	12.9	ug/L	Exceedance
CP-W2	7/11/2023	lower	SD	1,1-Dichloroethene	9.68	ug/L	Exceedance
CP-W2	10/17/2023	lower	SD	1,1-Dichloroethene	8.8	ug/L	Exceedance
CP-W2	1/9/2024	lower	SD	1,1-Dichloroethene	9	ug/L	Exceedance
CP-W2	1/9/2024	lower	SD	1,1-Dichloroethene	9.38	ug/L	Exceedance
CP-W3	7/11/2023	lower	SD	1,1-Dichloroethane	36.5	ug/L	Exceedance
CP-W3	10/17/2023	lower	SD	1,1-Dichloroethane	37.5	ug/L	Exceedance
CP-W3	1/9/2024	lower	SD	1,1-Dichloroethane	46.7	ug/L	Exceedance
CP-W3	4/2/2024	lower	SD	1,1-Dichloroethane	47.8	ug/L	Exceedance
CP-W3	7/11/2023	lower	SD	1,1-Dichloroethene	58	ug/L	Exceedance
CP-W3	10/17/2023	lower	SD	1,1-Dichloroethene	56.2	ug/L	Exceedance
CP-W3	1/9/2024	lower	SD	1,1-Dichloroethene	61.3	ug/L	Exceedance
CP-W3	4/2/2024	lower	SD	1,1-Dichloroethene	57.5	ug/L	Exceedance
CP-W3	4/2/2024	lower	SD	1,4-Dioxane	44.4	ug/L	Exceedance
CP-W3	7/11/2023	lower	SD	Trichloroethene	61.5	ug/L	Exceedance
CP-W3	10/17/2023	lower	SD	Trichloroethene	56.5	ug/L	Exceedance
CP-W3	1/9/2024	lower	SD	Trichloroethene	56	ug/L	Exceedance
CP-W3	4/2/2024	lower	SD	Trichloroethene	51.7	ug/L	Exceedance

Table 2-8 Shutdown Program Concentrations: Summary of 5-year/1-year Differences

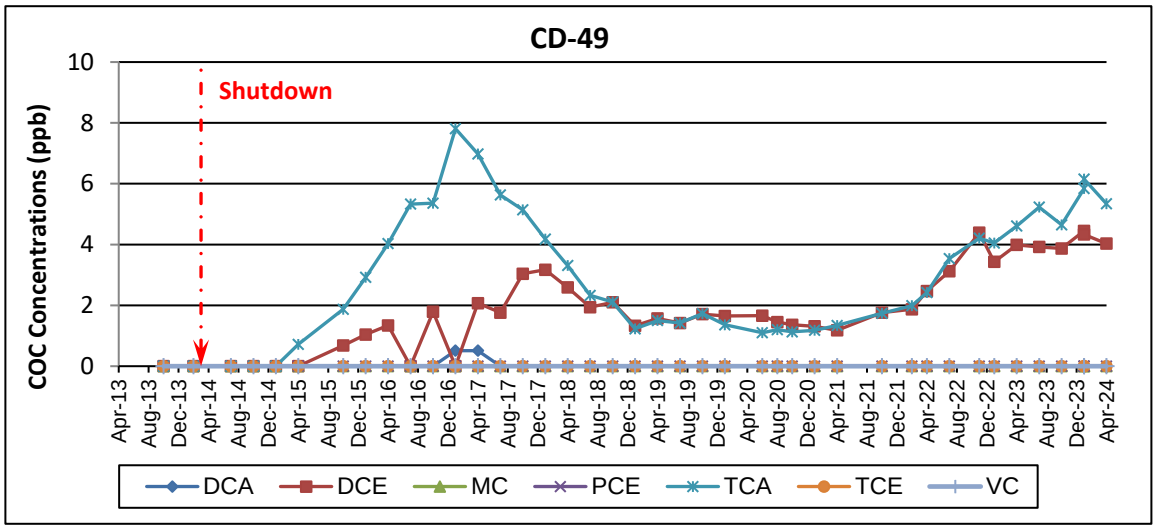
StationID	Aquifer	Program	Analyte	2019 Results	2023 Results	Current Year Results	5-Year Difference	1-Year Difference	Units
CD-41C1	lower	SD	TCA	0	0	0	0	0	ug/L
CD-41C1	lower	SD	DCA	0	0	0	0	0	ug/L
CD-41C1	lower	SD	DCE	0	0	0	0	0	ug/L
CD-41C1	lower	SD	MC	0	0	0	0	0	ug/L
CD-41C1	lower	SD	PCE	0	0	0	0	0	ug/L
CD-41C1	lower	SD	TCE	0	0	0	0	0	ug/L
CD-41C1	lower	SD	VC	0	0	0	0	0	ug/L
CD-41C2	lower	SD	TCA	0	0	0	0	0	ug/L
CD-41C2	lower	SD	DCA	0	0	0	0	0	ug/L
CD-41C2	lower	SD	DCE	0	0	0	0	0	ug/L
CD-41C2	lower	SD	MC	0	0	0	0	0	ug/L
CD-41C2	lower	SD	PCE	0	0	0	0	0	ug/L
CD-41C2	lower	SD	TCE	0	0	0	0	0	ug/L
CD-41C2	lower	SD	VC	0	0	0	0	0	ug/L
CD-41C3	lower	SD	TCA	0	0	0	0	0	ug/L
CD-41C3	lower	SD	DCA	0	0	0	0	0	ug/L
CD-41C3	lower	SD	DCE	0	0	0	0	0	ug/L
CD-41C3	lower	SD	MC	0	0	0	0	0	ug/L
CD-41C3	lower	SD	PCE	0	0	0	0	0	ug/L
CD-41C3	lower	SD	TCE	0	0	0	0	0	ug/L
CD-41C3	lower	SD	VC	0	0	0	0	0	ug/L
CD-42C1	lower	SD	TCA	0	0	0	0	0	ug/L
CD-42C1	lower	SD	DCA	0	0	0	0	0	ug/L
CD-42C1	lower	SD	DCE	0	0	0	0	0	ug/L
CD-42C1	lower	SD	MC	0	0	0	0	0	ug/L
CD-42C1	lower	SD	PCE	0	0	0	0	0	ug/L
CD-42C1	lower	SD	TCE	0	0	0	0	0	ug/L
CD-42C1	lower	SD	VC	0	0	0	0	0	ug/L
CD-42C2	lower	SD	TCA	0	0	0	0	0	ug/L
CD-42C2	lower	SD	DCA	0	0	0	0	0	ug/L
CD-42C2	lower	SD	DCE	0	0	0	0	0	ug/L
CD-42C2	lower	SD	MC	0	0	0	0	0	ug/L
CD-42C2	lower	SD	PCE	0	0	0	0	0	ug/L
CD-42C2	lower	SD	TCE	0	0	0	0	0	ug/L
CD-42C2	lower	SD	VC	0	0	0	0	0	ug/L
CD-42C3	lower	SD	TCA	0	0	0	0	0	ug/L
CD-42C3	lower	SD	DCA	0	0	0	0	0	ug/L
CD-42C3	lower	SD	DCE	0	0	0	0	0	ug/L
CD-42C3	lower	SD	MC	0	0	0	0	0	ug/L
CD-42C3	lower	SD	PCE	0	0	0	0	0	ug/L
CD-42C3	lower	SD	TCE	0	0	0	0	0	ug/L
CD-42C3	lower	SD	VC	0	0	0	0	0	ug/L
CD-43C1	lower	SD	TCA	4.19	3.29	1.3	**-2.89**	**-1.99**	ug/L
CD-43C1	lower	SD	DCA	0	0	0	0	0	ug/L
CD-43C1	lower	SD	DCE	0	0	0	0	0	ug/L
CD-43C1	lower	SD	MC	0	0	0	0	0	ug/L
CD-43C1	lower	SD	PCE	0	0	0	0	0	ug/L
CD-43C1	lower	SD	TCE	0	0	0	0	0	ug/L
CD-43C1	lower	SD	VC	0	0	0	0	0	ug/L
CD-43C2	lower	SD	TCA	0	0	0	0	0	ug/L
CD-43C2	lower	SD	DCA	0	0	0	0	0	ug/L
CD-43C2	lower	SD	DCE	0	0	0	0	0	ug/L
CD-43C2	lower	SD	MC	0	0	0	0	0	ug/L
CD-43C2	lower	SD	PCE	0	0	0	0	0	ug/L
CD-43C2	lower	SD	TCE	0	0	0	0	0	ug/L
CD-43C2	lower	SD	VC	0	0	0	0	0	ug/L
CD-43C3	lower	SD	TCA	0	0	0	0	0	ug/L
CD-43C3	lower	SD	DCA	0	0	0	0	0	ug/L

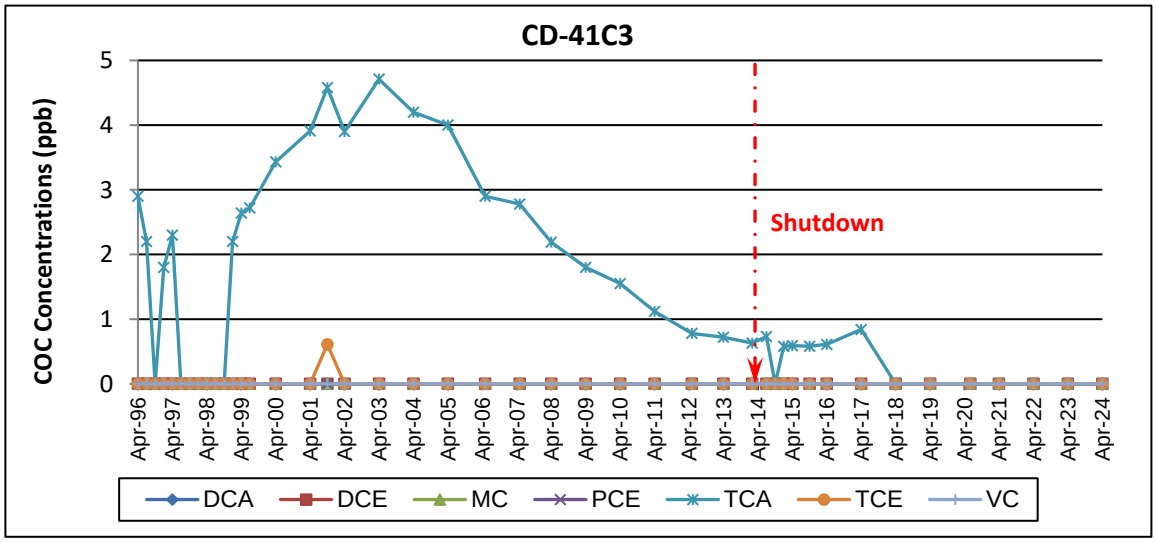
StationID	Aquifer	Program	Analyte	2019 Results	2023 Results	Current Year Results	5-Year Difference	1-Year Difference	Units
CD-43C3	lower	SD	DCE	0	0	0	0	0	ug/L
CD-43C3	lower	SD	MC	0	0	0	0	0	ug/L
CD-43C3	lower	SD	PCE	0	0	0	0	0	ug/L
CD-43C3	lower	SD	TCE	0	0	0	0	0	ug/L
CD-43C3	lower	SD	VC	0	0	0	0	0	ug/L
CD-44C1	lower	SD	TCA	2.65	1.28	0.87	-1.78	-0.41	ug/L
CD-44C1	lower	SD	DCA	0	0	0	0	0	ug/L
CD-44C1	lower	SD	DCE	0	0	0	0	0	ug/L
CD-44C1	lower	SD	MC	0	0	0	0	0	ug/L
CD-44C1	lower	SD	PCE	0	0	0	0	0	ug/L
CD-44C1	lower	SD	TCE	0	0	0	0	0	ug/L
CD-44C1	lower	SD	VC	0	0	0	0	0	ug/L
CD-44C2	lower	SD	TCA	0	0	0	0	0	ug/L
CD-44C2	lower	SD	DCA	0	0	0	0	0	ug/L
CD-44C2	lower	SD	DCE	0	0	0	0	0	ug/L
CD-44C2	lower	SD	MC	0	0	0	0	0	ug/L
CD-44C2	lower	SD	PCE	0	0	0	0	0	ug/L
CD-44C2	lower	SD	TCE	0	0	0	0	0	ug/L
CD-44C2	lower	SD	VC	0	0	0	0	0	ug/L
CD-44C3	lower	SD	TCA	0.9	0	0	-0.9	0	ug/L
CD-44C3	lower	SD	DCA	0	0	0	0	0	ug/L
CD-44C3	lower	SD	DCE	0	0	0	0	0	ug/L
CD-44C3	lower	SD	MC	0	0	0	0	0	ug/L
CD-44C3	lower	SD	PCE	0	0	0	0	0	ug/L
CD-44C3	lower	SD	TCE	0	0	0	0	0	ug/L
CD-44C3	lower	SD	VC	0	0	0	0	0	ug/L
CD-45C1	lower	SD	TCA	1.46	1.77	1.52	0.06	-0.25	ug/L
CD-45C1	lower	SD	DCA	0	0	0	0	0	ug/L
CD-45C1	lower	SD	DCE	0	0	0	0	0	ug/L
CD-45C1	lower	SD	MC	0	0	0	0	0	ug/L
CD-45C1	lower	SD	PCE	0	0	0	0	0	ug/L
CD-45C1	lower	SD	TCE	0	0	0	0	0	ug/L
CD-45C1	lower	SD	VC	0	0	0	0	0	ug/L
CD-45C2	lower	SD	TCA	0.76	0	0	-0.76	0	ug/L
CD-45C2	lower	SD	DCA	0	0	0	0	0	ug/L
CD-45C2	lower	SD	DCE	0	0	0	0	0	ug/L
CD-45C2	lower	SD	MC	0	0	0	0	0	ug/L
CD-45C2	lower	SD	PCE	0	0	0	0	0	ug/L
CD-45C2	lower	SD	TCE	0	0	0	0	0	ug/L
CD-45C2	lower	SD	VC	0	0	0	0	0	ug/L
CD-45C3	lower	SD	TCA	0	0	0	0	0	ug/L
CD-45C3	lower	SD	DCA	0	0	0	0	0	ug/L
CD-45C3	lower	SD	DCE	0	0	0	0	0	ug/L
CD-45C3	lower	SD	MC	0	0	0	0	0	ug/L
CD-45C3	lower	SD	PCE	0	0	0	0	0	ug/L
CD-45C3	lower	SD	TCE	0	0	0	0	0	ug/L
CD-45C3	lower	SD	VC	0	0	0	0	0	ug/L
CD-48C1	lower	SD	TCA	0	0	0	0	0	ug/L
CD-48C1	lower	SD	DCA	0	0	0	0	0	ug/L
CD-48C1	lower	SD	DCE	0	0	0	0	0	ug/L
CD-48C1	lower	SD	MC	0	0	0	0	0	ug/L
CD-48C1	lower	SD	PCE	0	0	0	0	0	ug/L
CD-48C1	lower	SD	TCE	0	0	0	0	0	ug/L
CD-48C1	lower	SD	VC	0	0	0	0	0	ug/L
CD-48C2	lower	SD	TCA	0	0	0	0	0	ug/L
CD-48C2	lower	SD	DCA	0	0	0	0	0	ug/L
CD-48C2	lower	SD	DCE	0	0	0	0	0	ug/L
CD-48C2	lower	SD	MC	0	0	0	0	0	ug/L
CD-48C2	lower	SD	PCE	0	0	0	0	0	ug/L
CD-48C2	lower	SD	TCE	0	0	0	0	0	ug/L

StationID	Aquifer	Program	Analyte	2019 Results	2023 Results	Current Year Results	5-Year Difference	1-Year Difference	Units
CD-48C2	lower	SD	VC	0	0	0	0	0	ug/L
CD-48C3	lower	SD	TCA	0	0	0	0	0	ug/L
CD-48C3	lower	SD	DCA	0	0	0	0	0	ug/L
CD-48C3	lower	SD	DCE	0	0	0	0	0	ug/L
CD-48C3	lower	SD	MC	0	0	0	0	0	ug/L
CD-48C3	lower	SD	PCE	0	0	0	0	0	ug/L
CD-48C3	lower	SD	TCE	0	0	0	0	0	ug/L
CD-48C3	lower	SD	VC	0	0	0	0	0	ug/L
CD-49	lower	SD	TCA	1.5	4.61	5.34	3.84	0.73	ug/L
CD-49	lower	SD	DCA	0	0	0	0	0	ug/L
CD-49	lower	SD	DCE	1.57	3.99	4.03	2.46	0.04	ug/L
CD-49	lower	SD	MC	0	0	0	0	0	ug/L
CD-49	lower	SD	PCE	0	0	0	0	0	ug/L
CD-49	lower	SD	TCE	0	0	0	0	0	ug/L
CD-49	lower	SD	VC	0	0	0	0	0	ug/L
CP-E1	lower	SD	TCA	9.4	5.59	3.78	-5.62	-1.81	ug/L
CP-E1	lower	SD	DCA	8.9	9.47	7.7	-1.2	-1.77	ug/L
CP-E1	lower	SD	DCE	16.6	19.3	16.2	-0.4	-3.1	ug/L
CP-E1	lower	SD	MC	0	0	0	0	0	ug/L
CP-E1	lower	SD	PCE	2.28	2.94	2.65	0.37	-0.29	ug/L
CP-E1	lower	SD	TCE	8.97	9.58	8.71	-0.26	-0.87	ug/L
CP-E1	lower	SD	VC	0	0	0	0	0	ug/L
CP-E2	lower	SD	TCA	54	37	25.3	-28.7	-11.7	ug/L
CP-E2	lower	SD	DCA	42.5	42	40.1	-2.4	-1.9	ug/L
CP-E2	lower	SD	DCE	143	186	157	14	-29	ug/L
CP-E2	lower	SD	MC	0	0	0	0	0	ug/L
CP-E2	lower	SD	PCE	0.83	1.1	0.9	0.07	-0.2	ug/L
CP-E2	lower	SD	TCE	133	196	200	67	4	ug/L
CP-E2	lower	SD	VC	0	0	0	0	0	ug/L
CP-E3	lower	SD	TCA	6.23	7.73	5.99	-0.24	-1.74	ug/L
CP-E3	lower	SD	DCA	2.12	2.27	1.92	-0.2	-0.35	ug/L
CP-E3	lower	SD	DCE	8.1	15.3	12.9	4.8	-2.4	ug/L
CP-E3	lower	SD	MC	0	0	0	0	0	ug/L
CP-E3	lower	SD	PCE	0	0	0	0	0	ug/L
CP-E3	lower	SD	TCE	2.39	1.85	1.82	-0.57	-0.03	ug/L
CP-E3	lower	SD	VC	0	0	0	0	0	ug/L
CP-W1	lower	SD	TCA	4.19	2.73	1.56	-2.63	-1.17	ug/L
CP-W1	lower	SD	DCA	0	0	0	0	0	ug/L
CP-W1	lower	SD	DCE	2.63	4.32	2.8	0.17	-1.52	ug/L
CP-W1	lower	SD	MC	0	0	0	0	0	ug/L
CP-W1	lower	SD	PCE	0	0	0	0	0	ug/L
CP-W1	lower	SD	TCE	0	0	0	0	0	ug/L
CP-W1	lower	SD	VC	0	0	0	0	0	ug/L
CP-W2	lower	SD	TCA	15.3	21.4	10.5	-4.8	-10.9	ug/L
CP-W2	lower	SD	DCA	1.36	2.31	0.86	-0.5	-1.45	ug/L
CP-W2	lower	SD	DCE	1.31	11	6.84	5.53	-4.16	ug/L
CP-W2	lower	SD	MC	0	0	0	0	0	ug/L
CP-W2	lower	SD	PCE	0	0	0	0	0	ug/L
CP-W2	lower	SD	TCE	0	0	0	0	0	ug/L
CP-W2	lower	SD	VC	0	0	0	0	0	ug/L
CP-W3	lower	SD	TCA	36.2	55.1	32	-4.2	-23.1	ug/L
CP-W3	lower	SD	DCA	5.58	34.1	53.6	48.02	19.5	ug/L
CP-W3	lower	SD	DCE	17.7	57.5	62.1	44.4	4.6	ug/L
CP-W3	lower	SD	MC	0	0	0.88	0.88	0.88	ug/L
CP-W3	lower	SD	PCE	0	0	0	0	0	ug/L
CP-W3	lower	SD	TCE	25.4	60.5	51.7	26.3	-8.8	ug/L
CP-W3	lower	SD	VC	0	0	0	0	0	ug/L

Analytes that exceeded clean-up criteria this reporting period are displayed in **ORANGE**.
Increases in analyte concentrations are highlighted in **RED**.
Decreases in analyte concentrations are highlighted in **BLUE**.

Figure 2-6 Lower Aquifer Individual Monitoring Well COC Concentrations





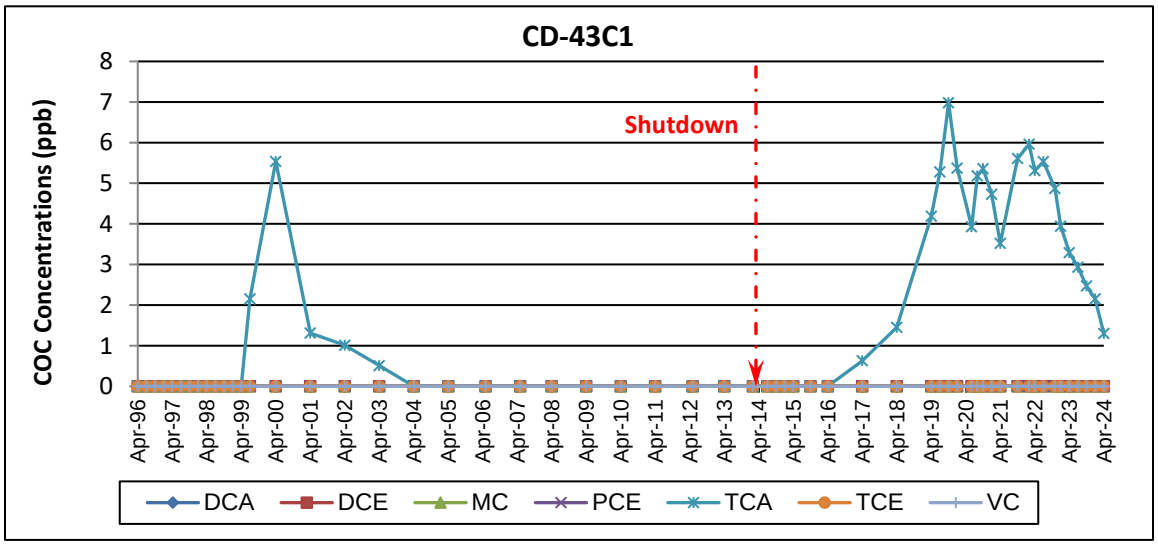
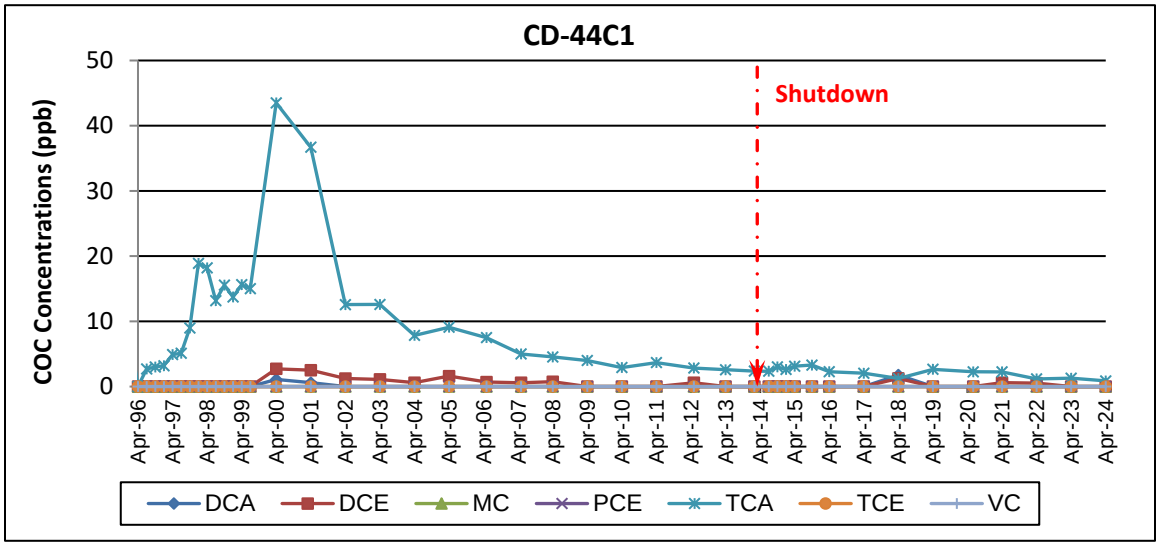
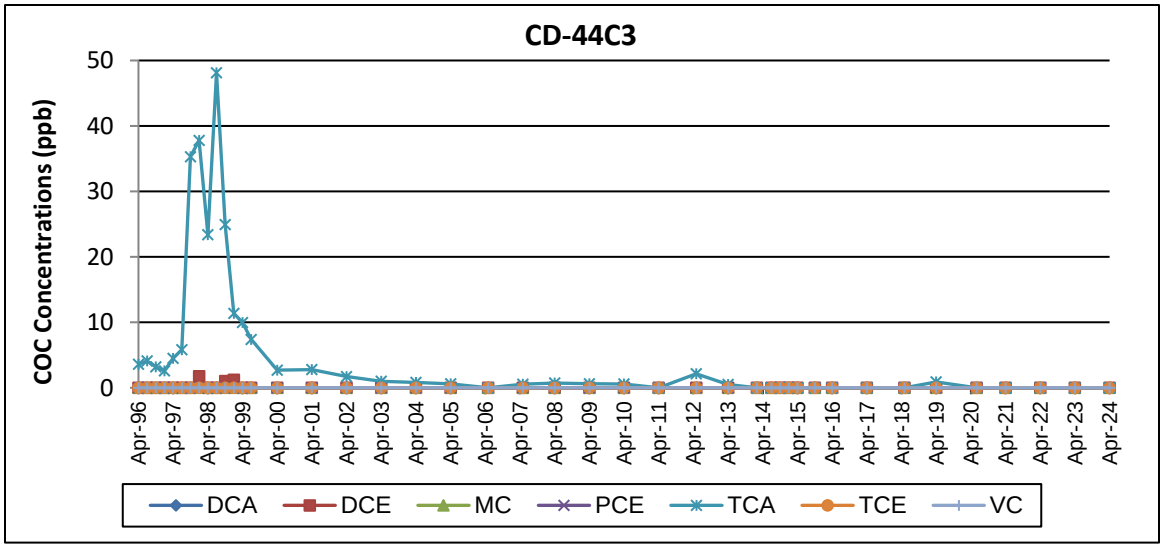


Figure 2-7 Lower Aquifer Individual Monitoring Well COC Concentrations





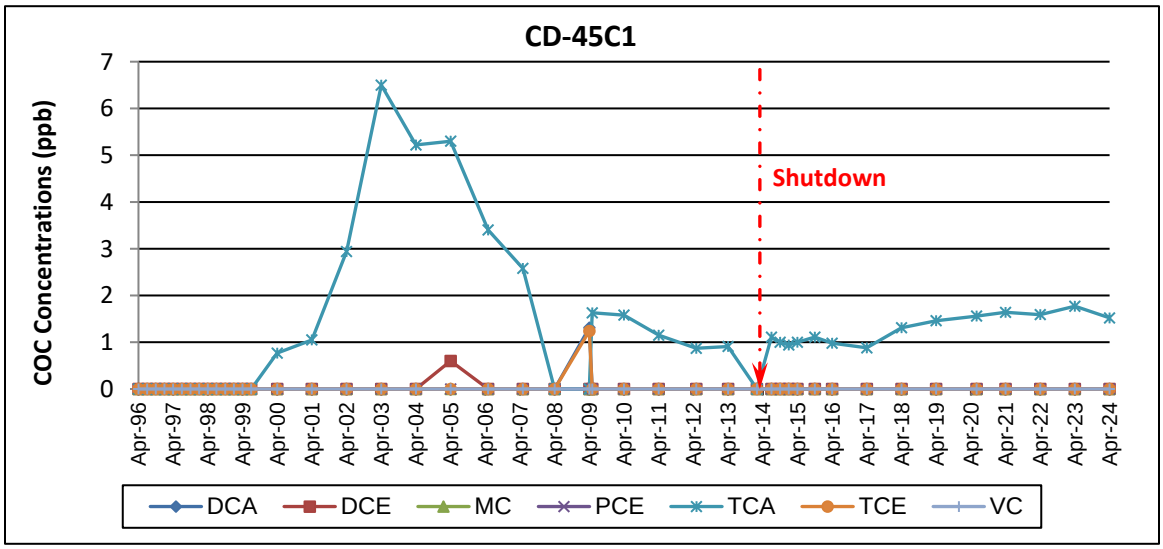
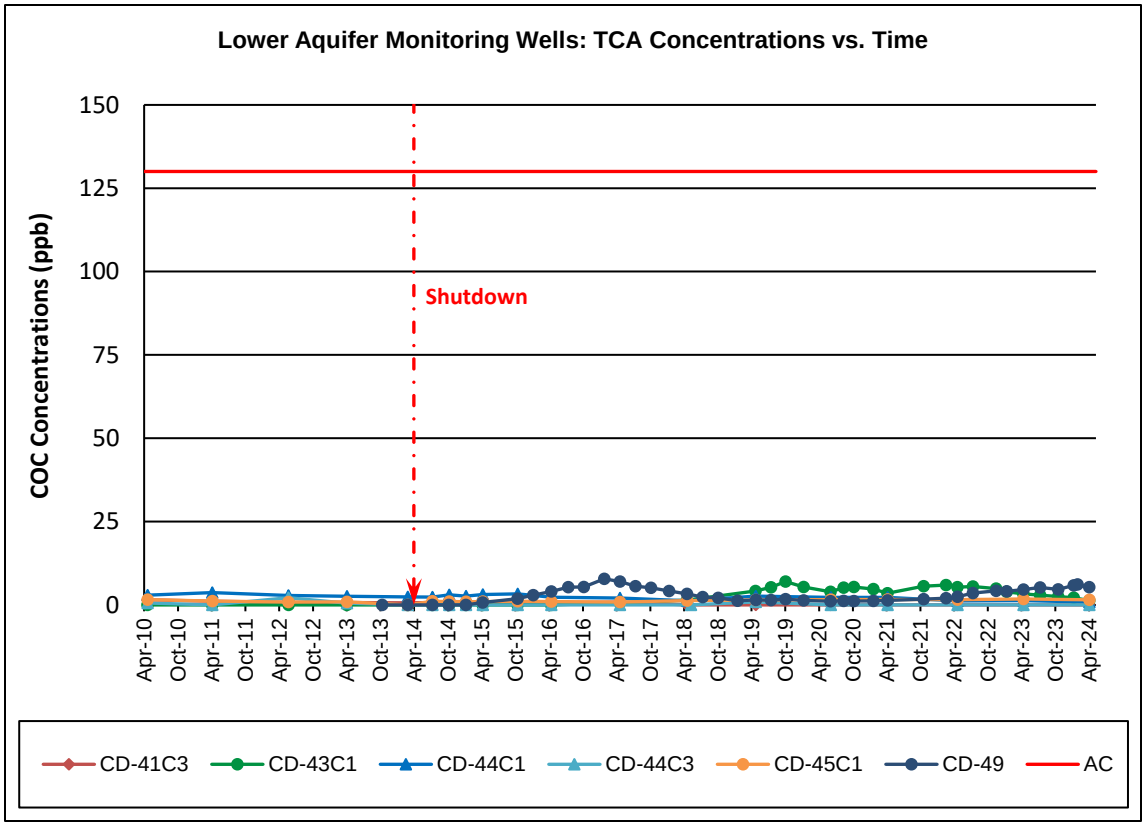


Figure 2-8 Lower Aquifer Compliance Wells TCA Concentrations



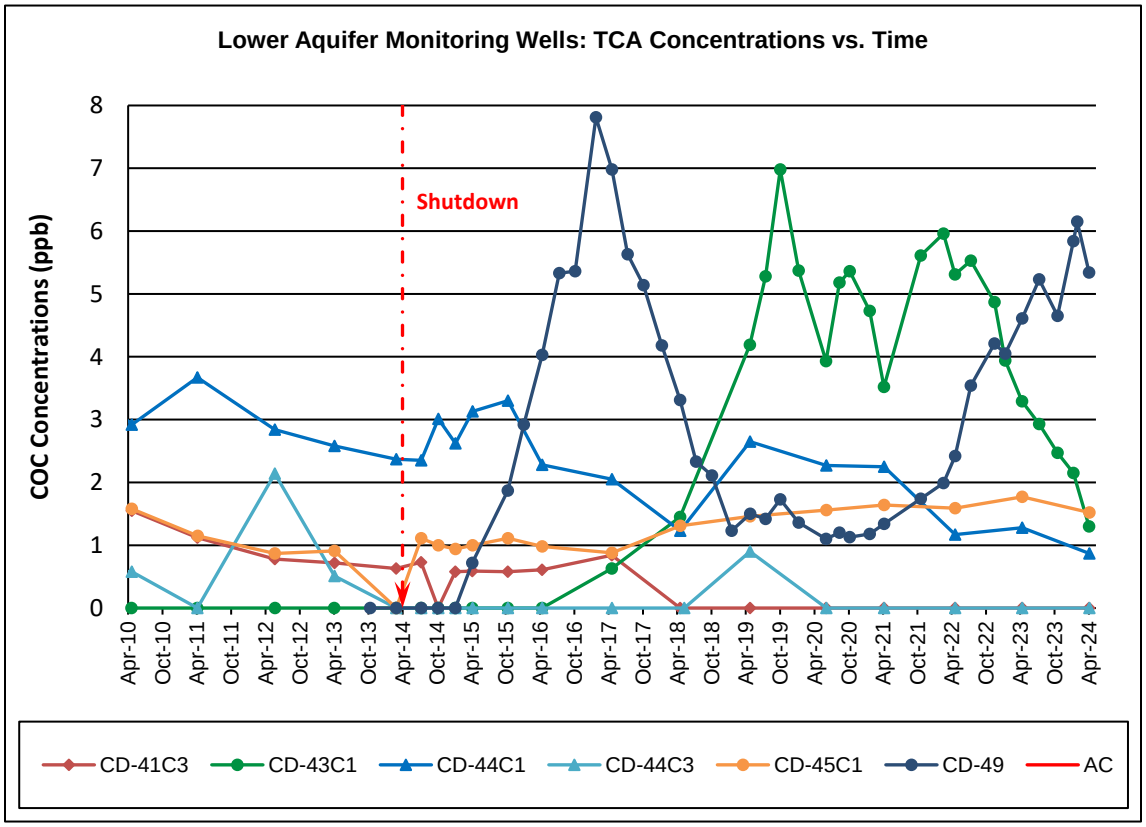
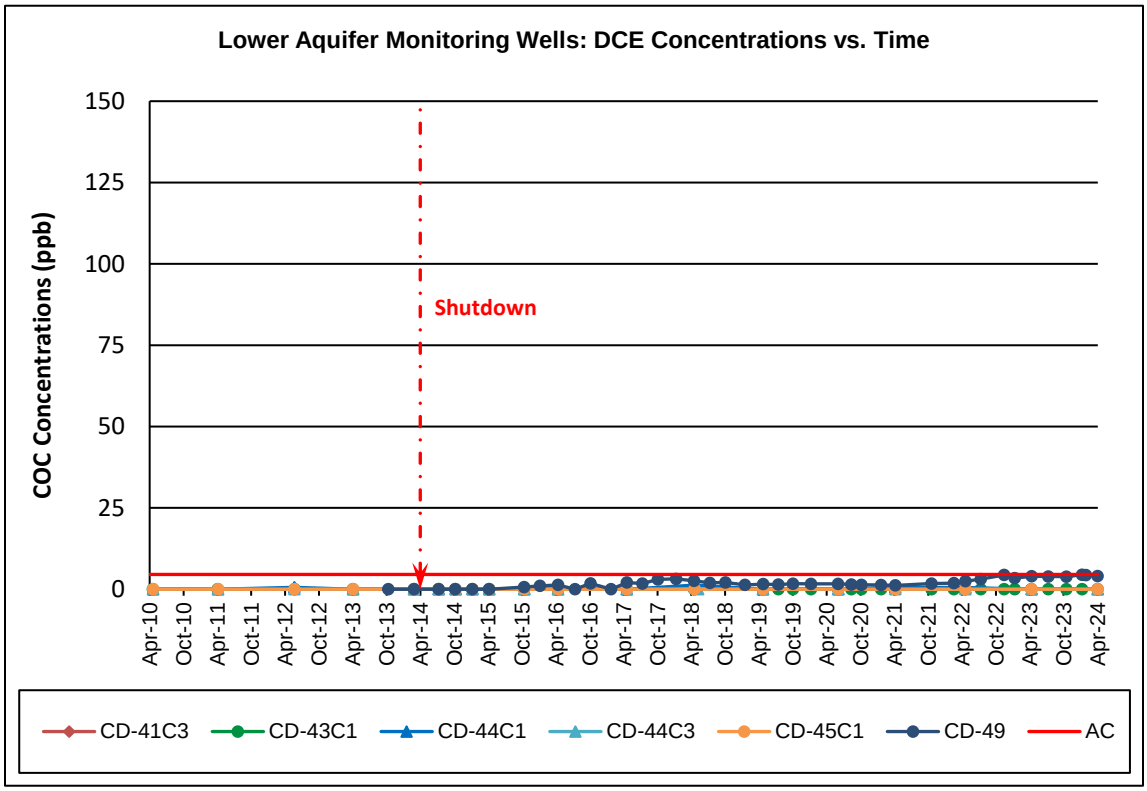


Figure 2-9 Lower Aquifer Compliance Wells DCE Concentrations



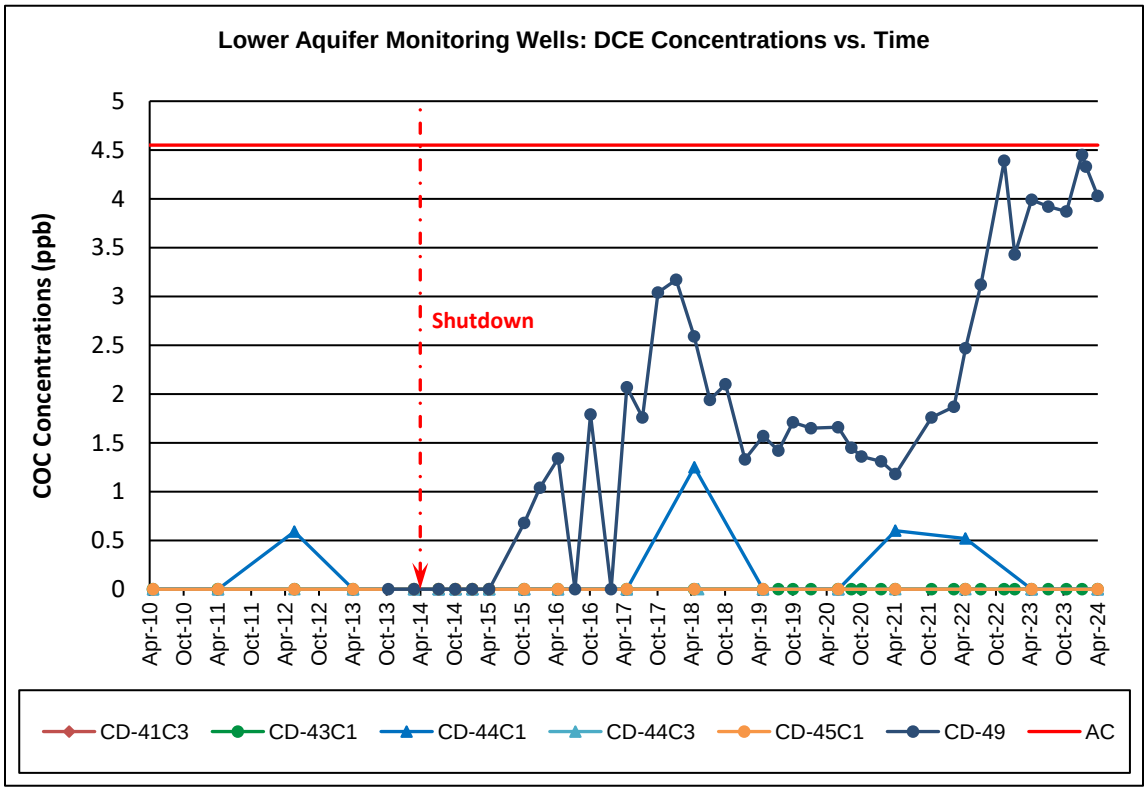
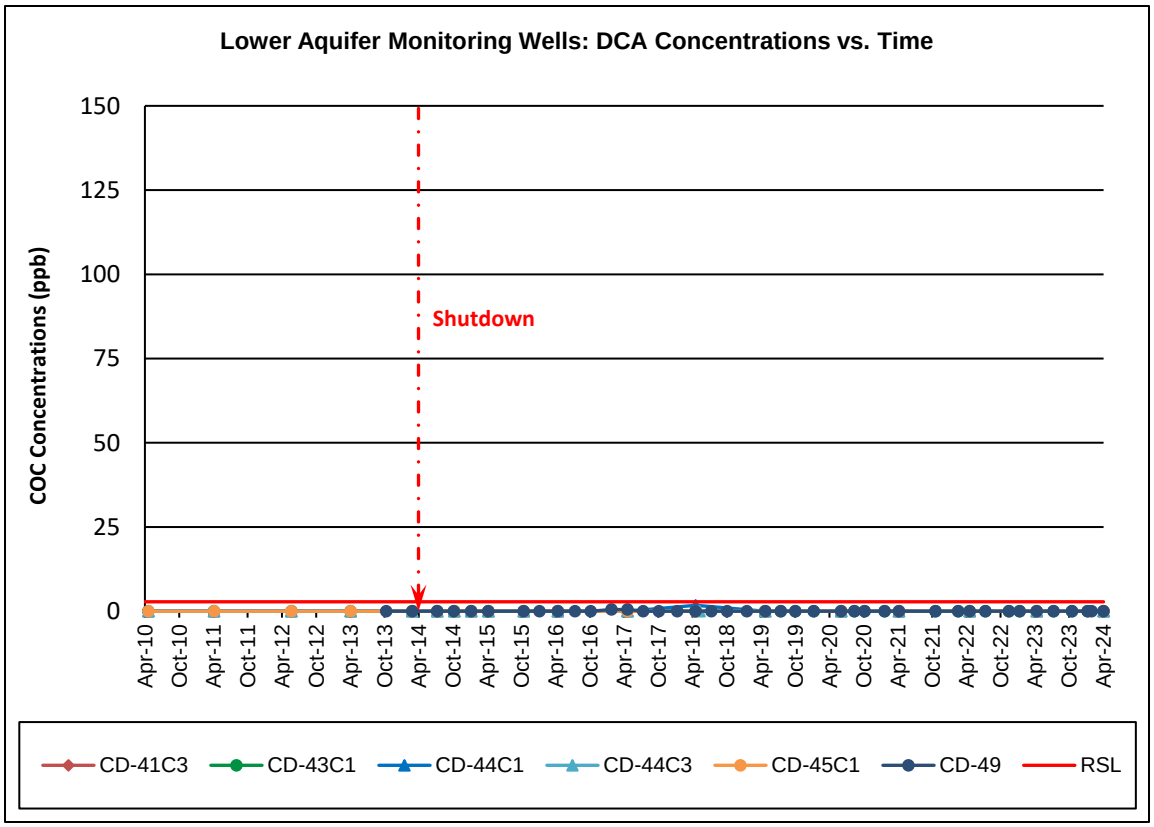


Figure 2-10 Lower Aquifer Compliance Wells DCA Concentrations



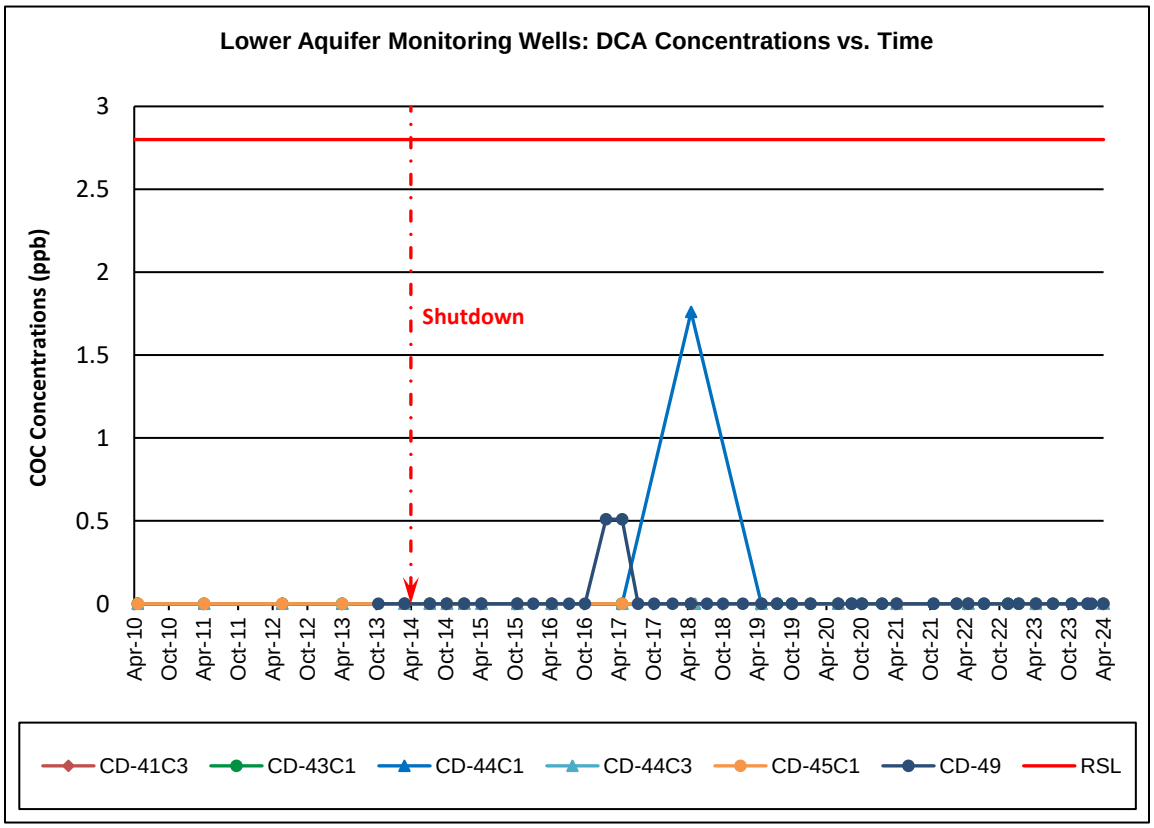
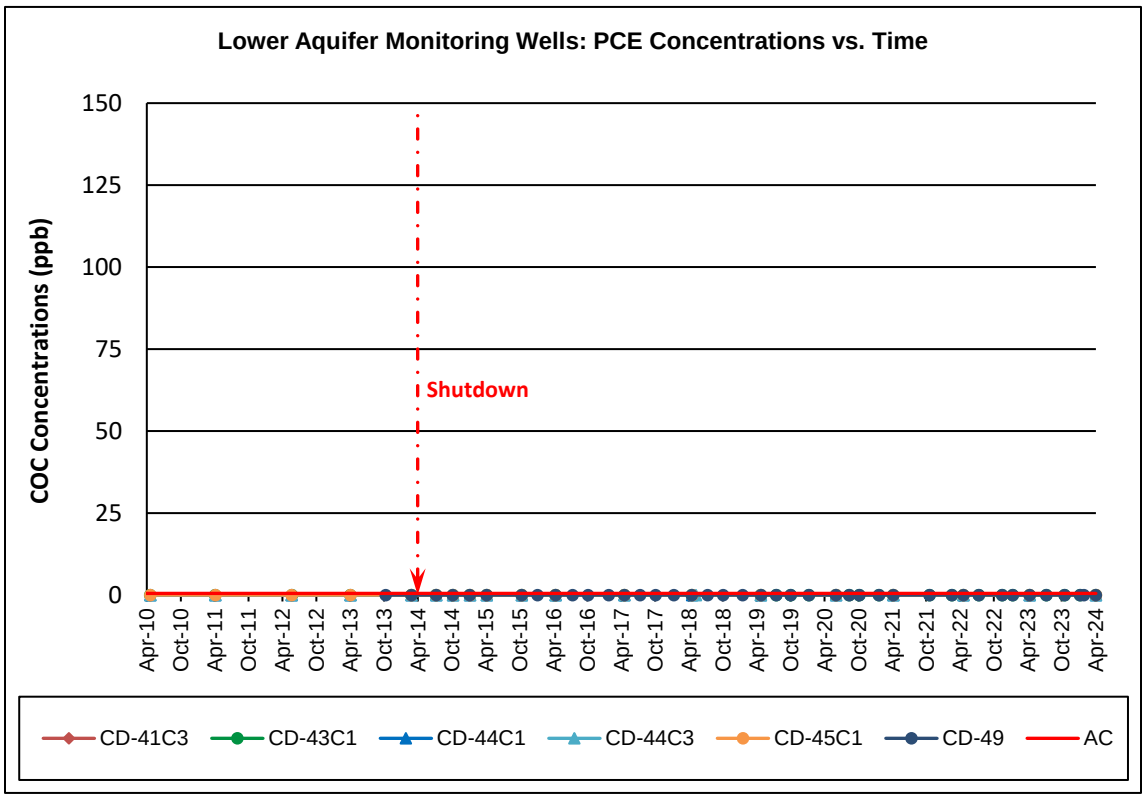


Figure 2-11 Lower Aquifer Compliance Wells PCE Concentrations



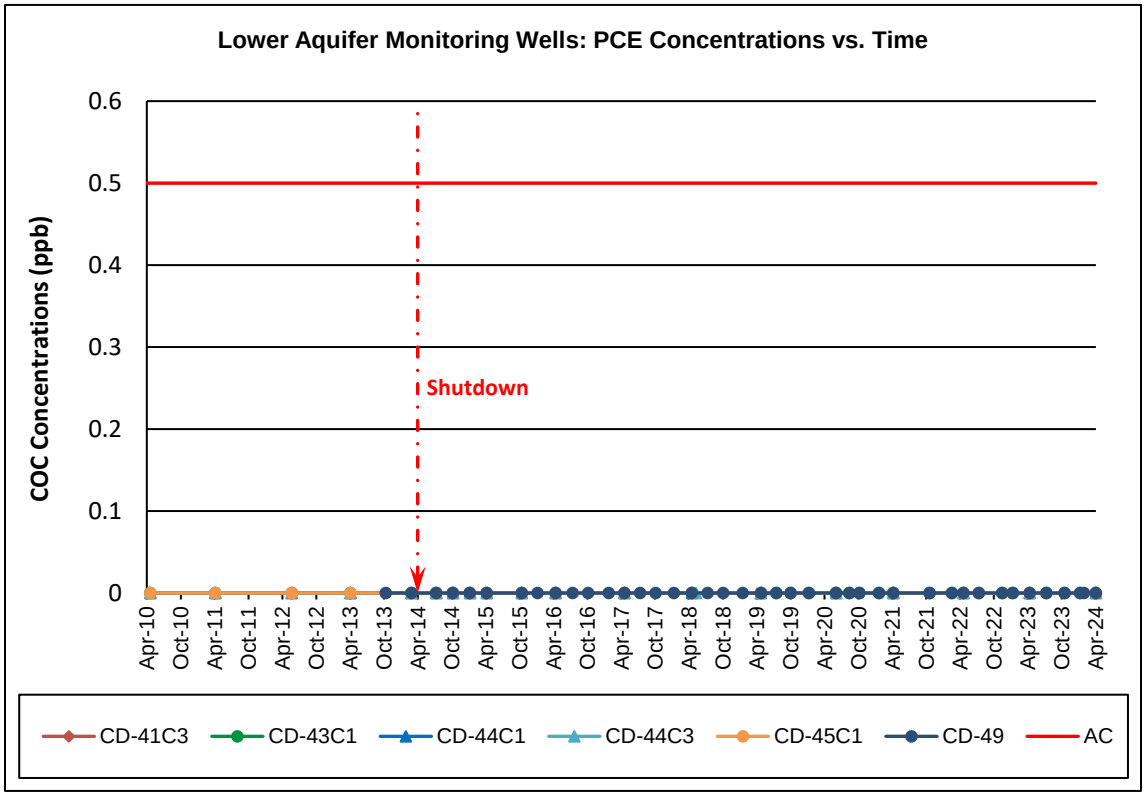
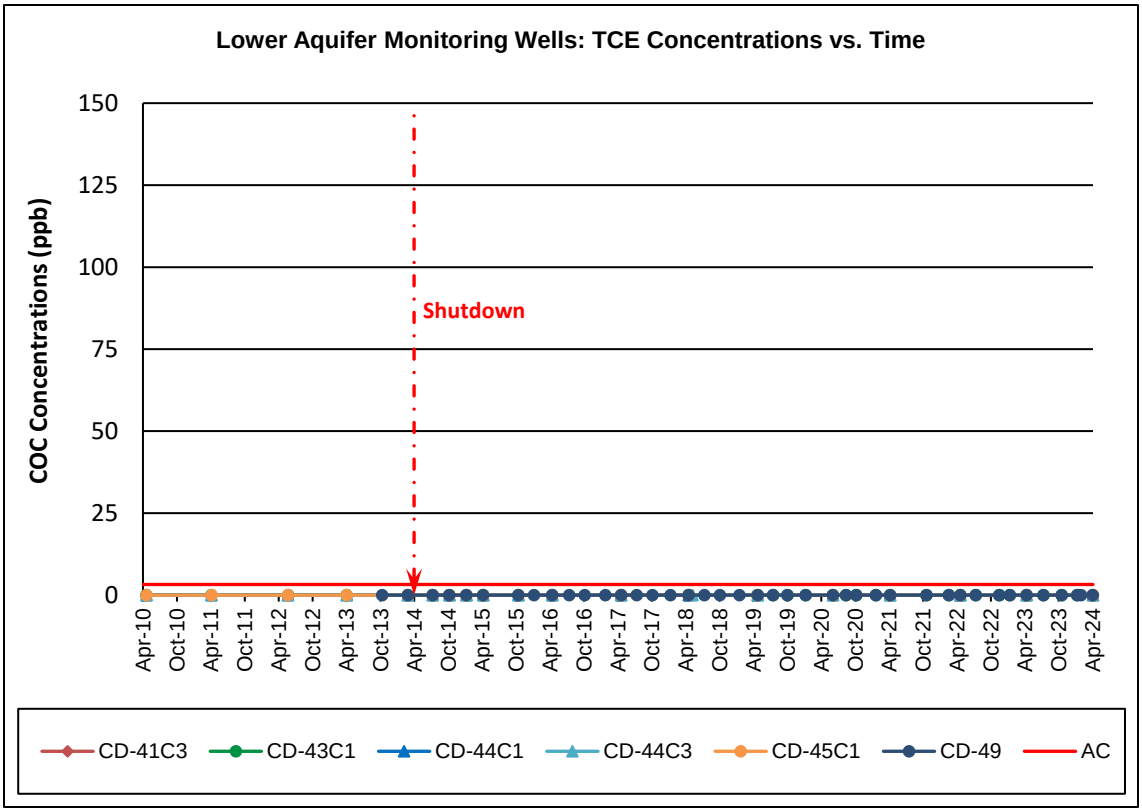


Figure 2-12 Lower Aquifer Compliance Wells TCE Concentrations



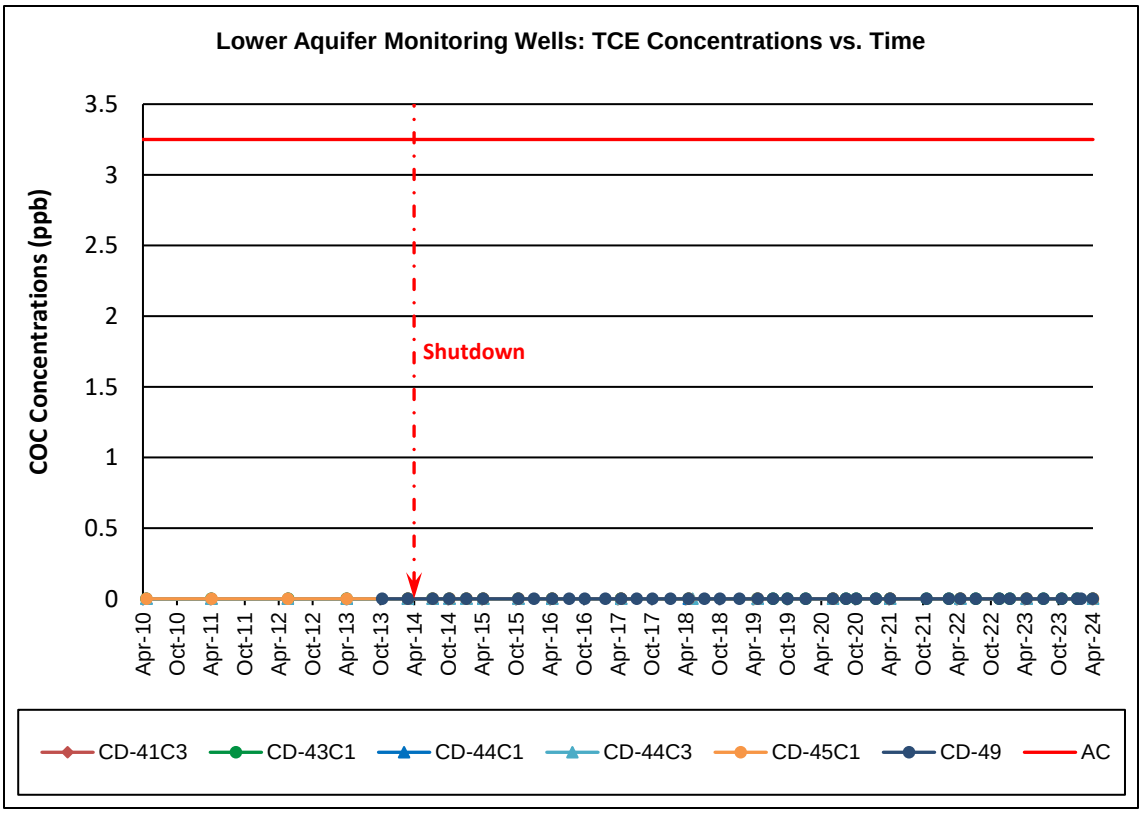
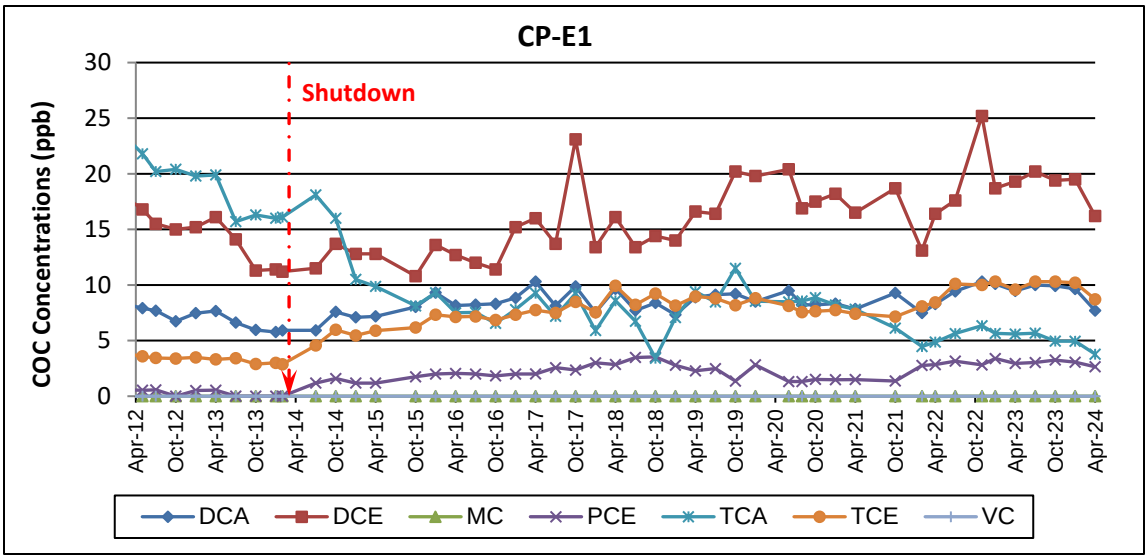
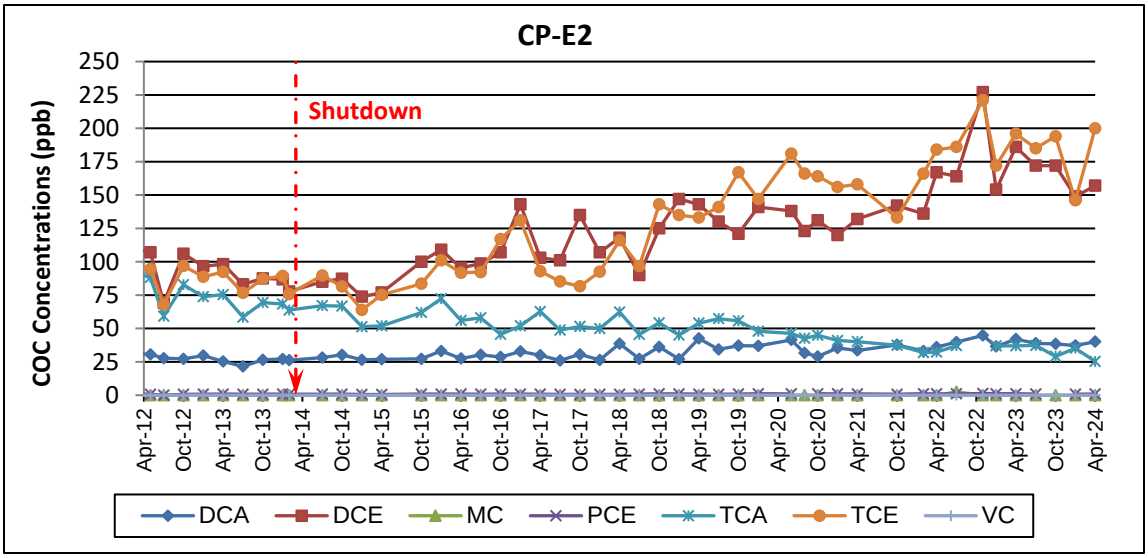


Figure 2-13 Lower Aquifer Individual Extraction Well COC Concentrations





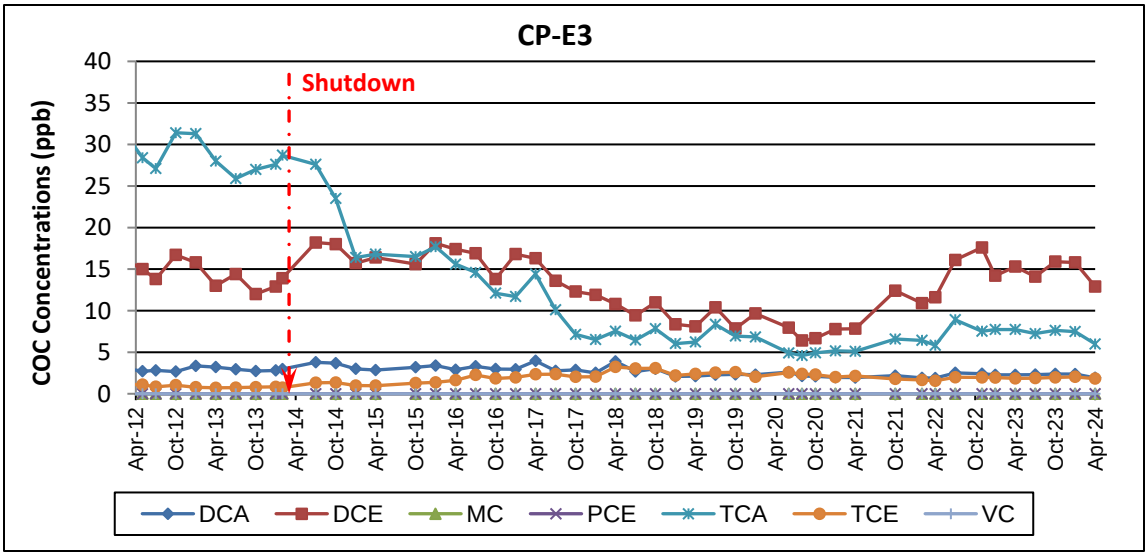


Figure 2-14 Lower Aquifer Individual Extraction Well COC Concentrations

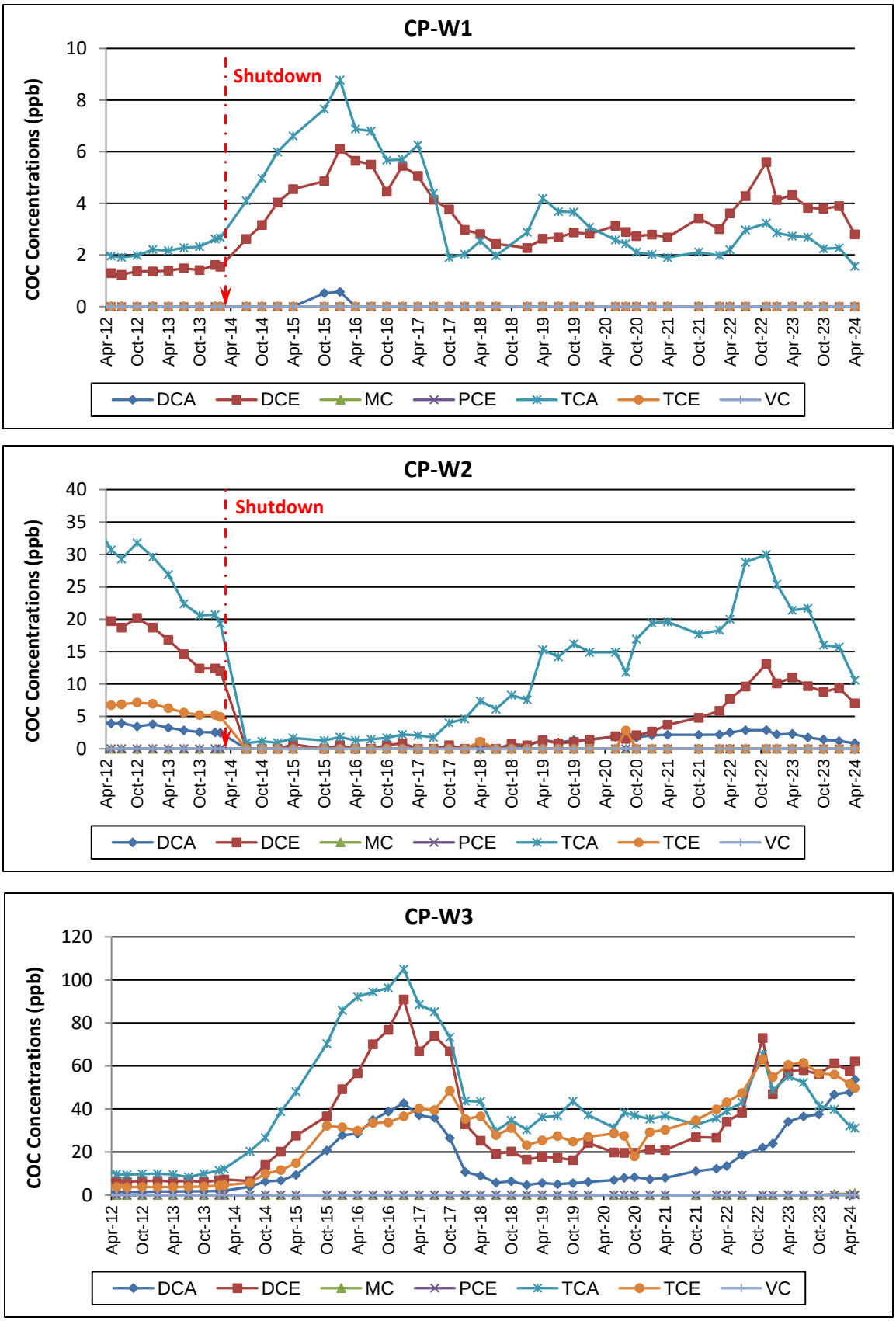
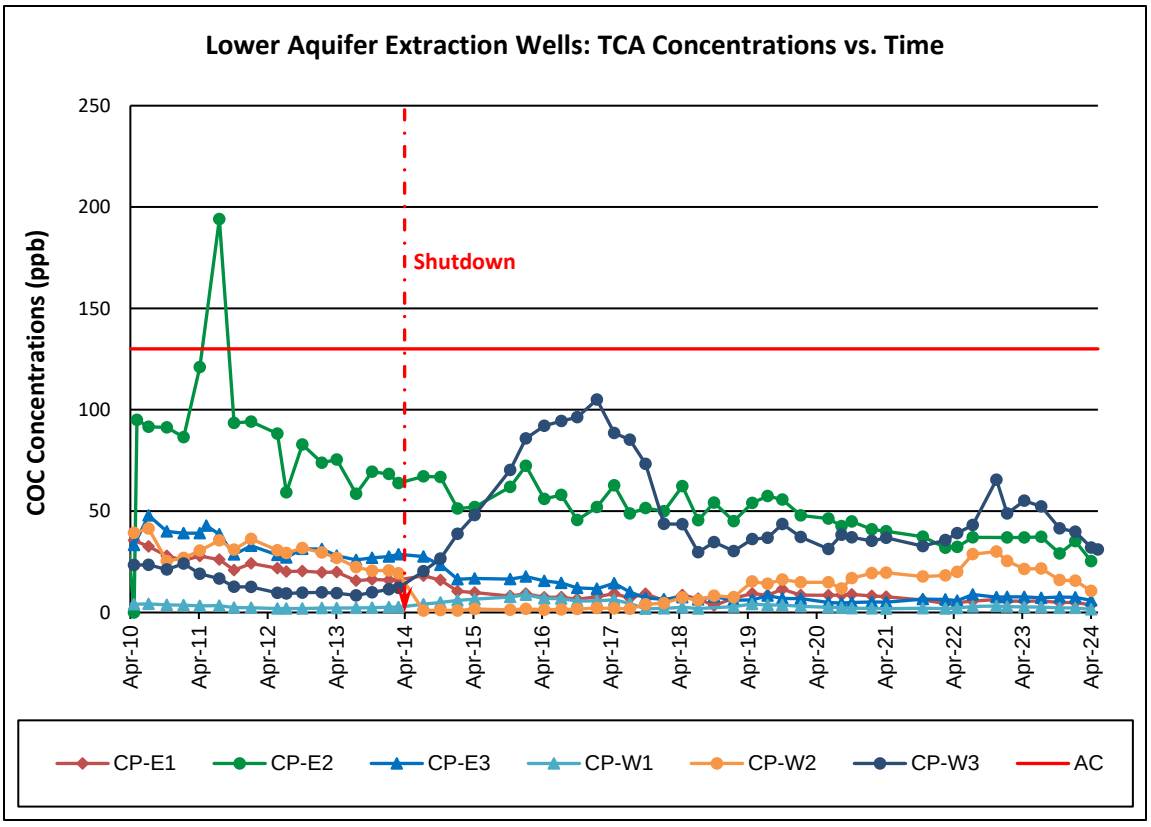


Figure 2-15 Lower Aquifer Extraction Wells TCA Concentrations vs. Time



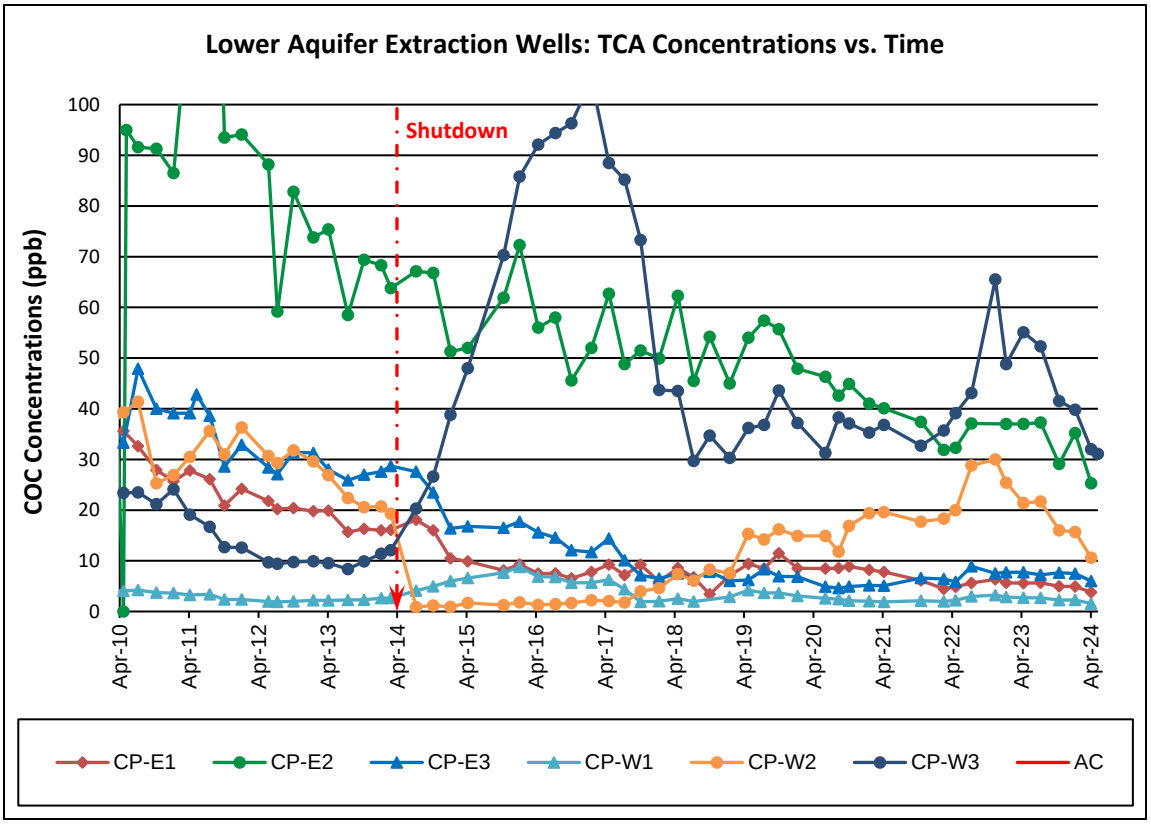
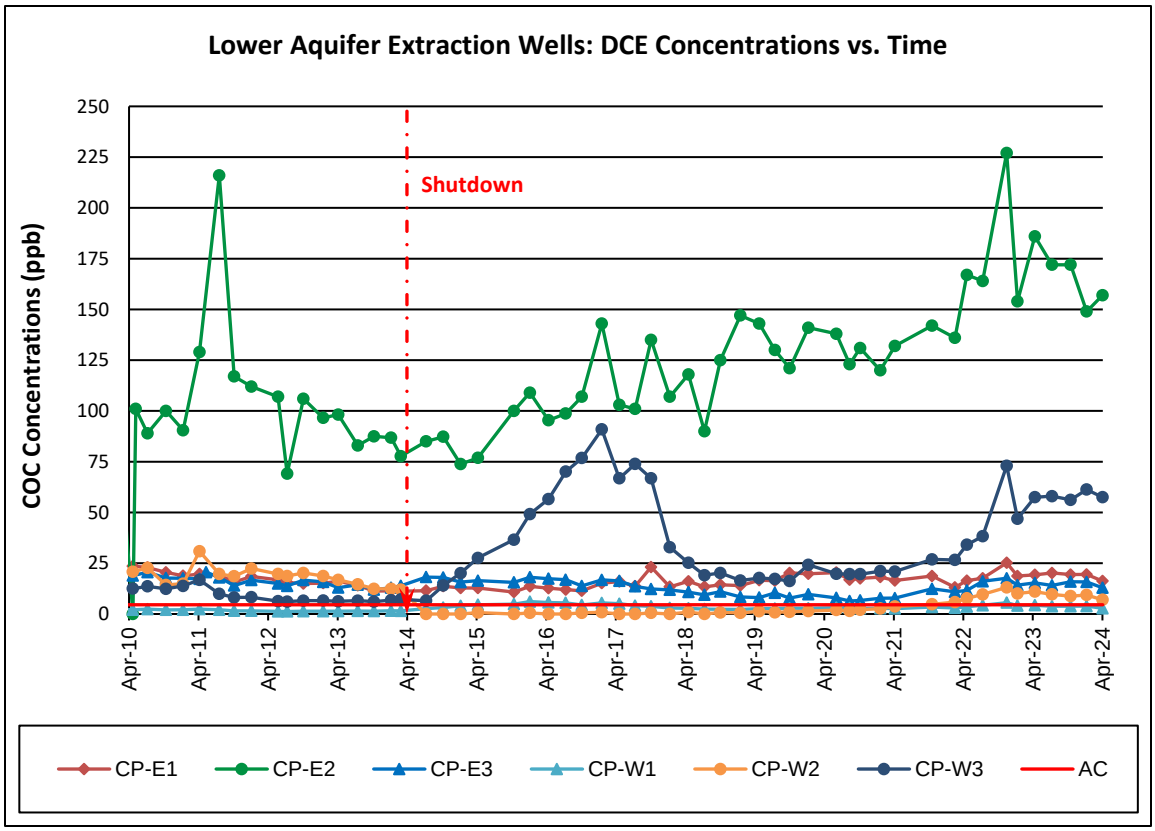


Figure 2-16 Lower Aquifer Extraction Wells DCE Concentrations vs. Time



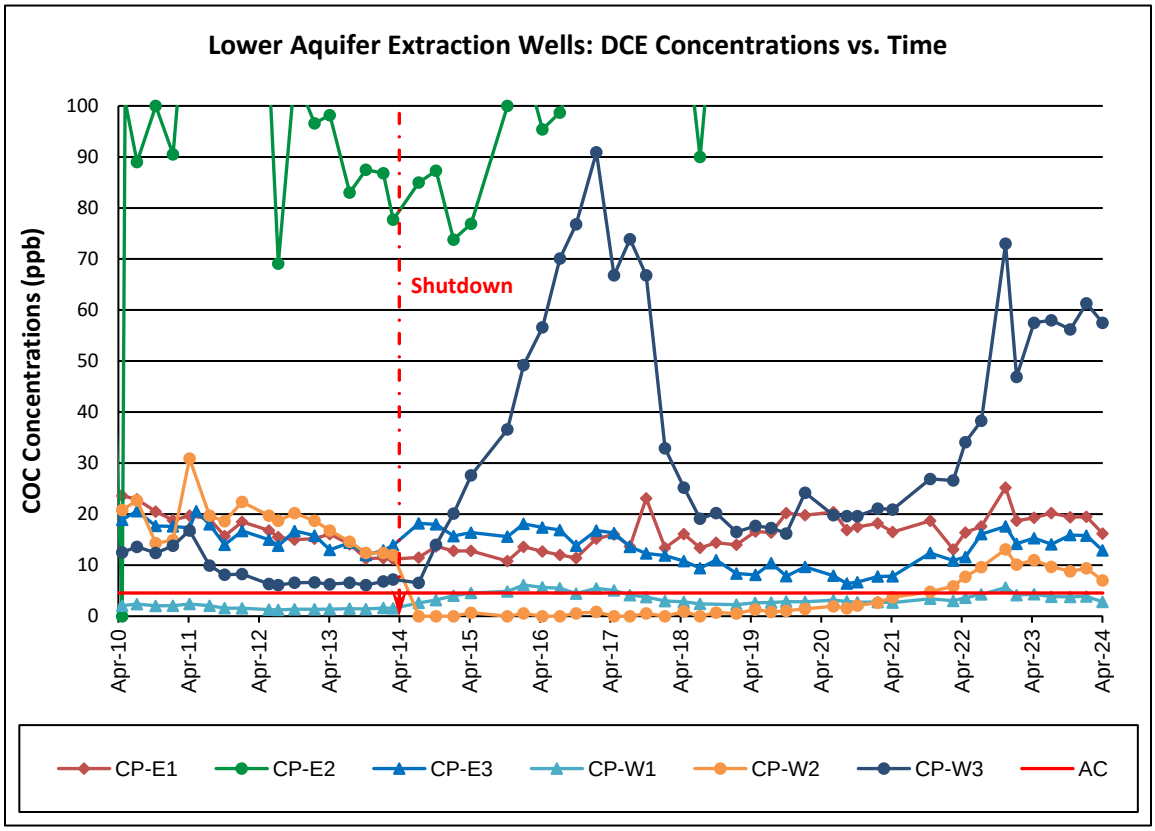
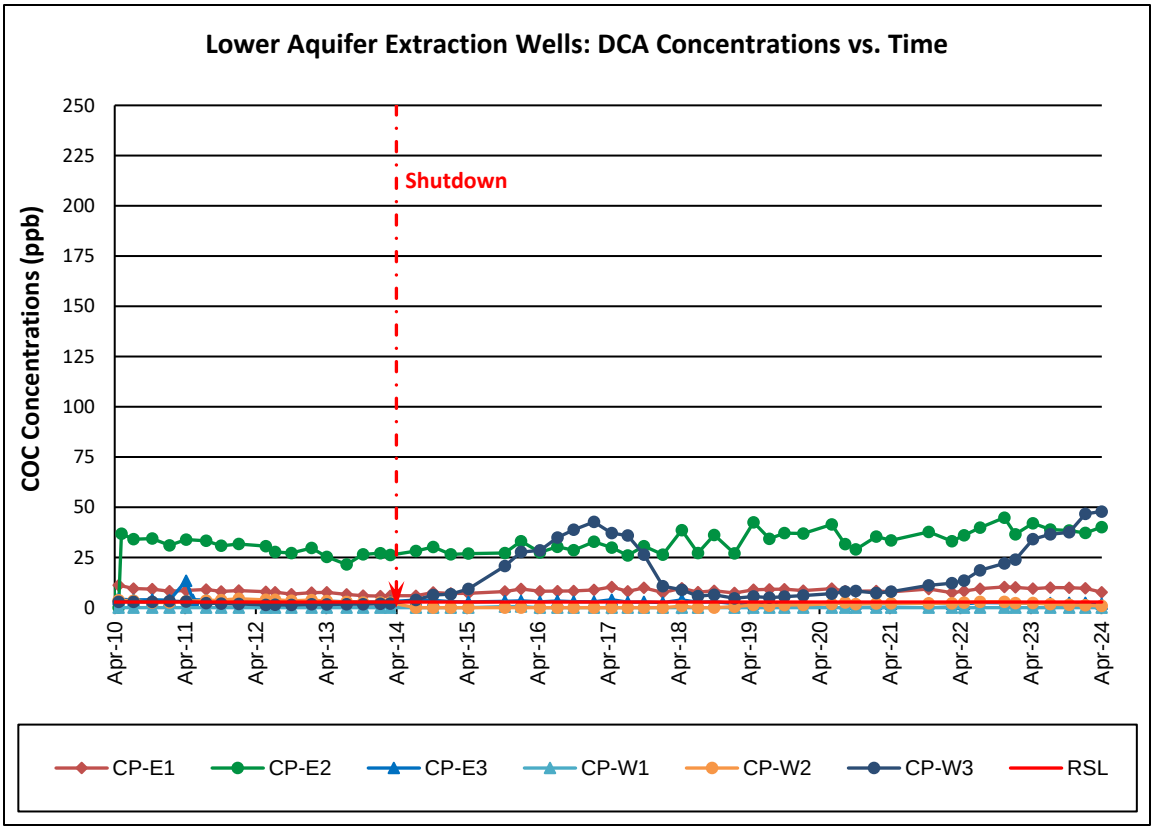


Figure 2-17 Lower Aquifer Extraction Wells DCA Concentrations vs. Time



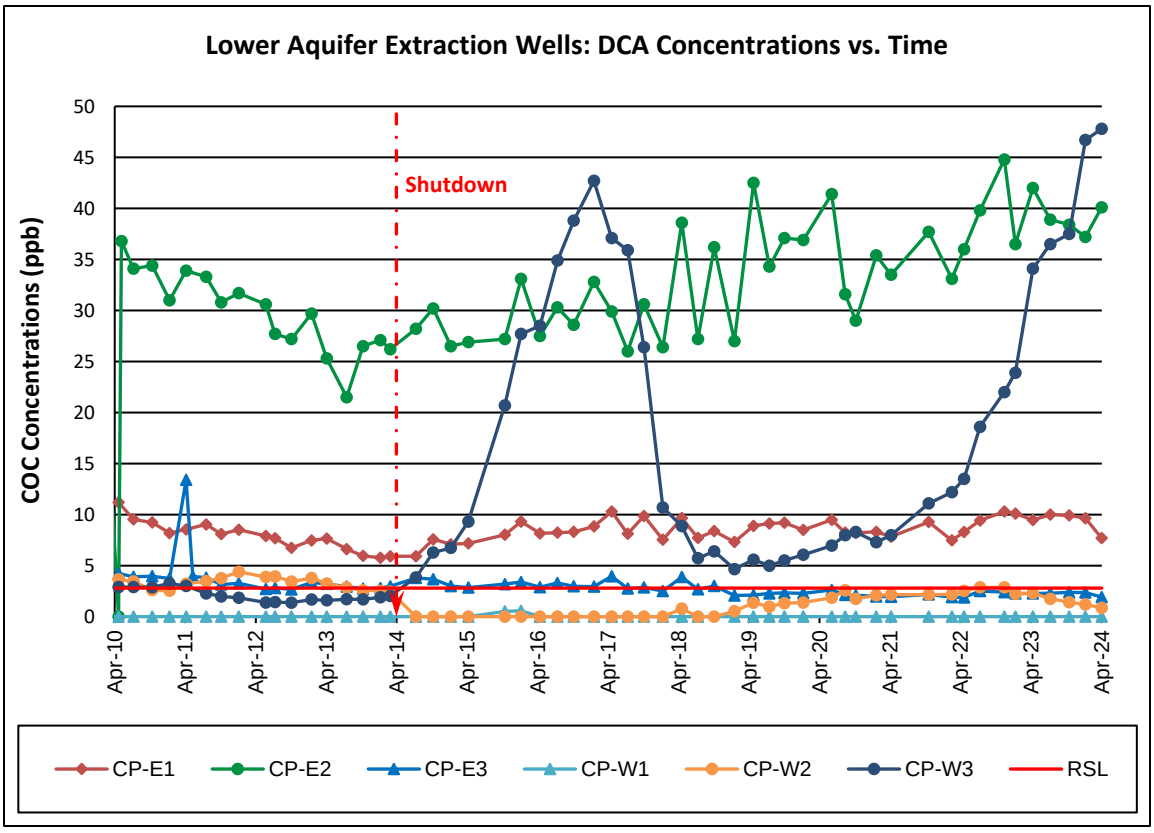
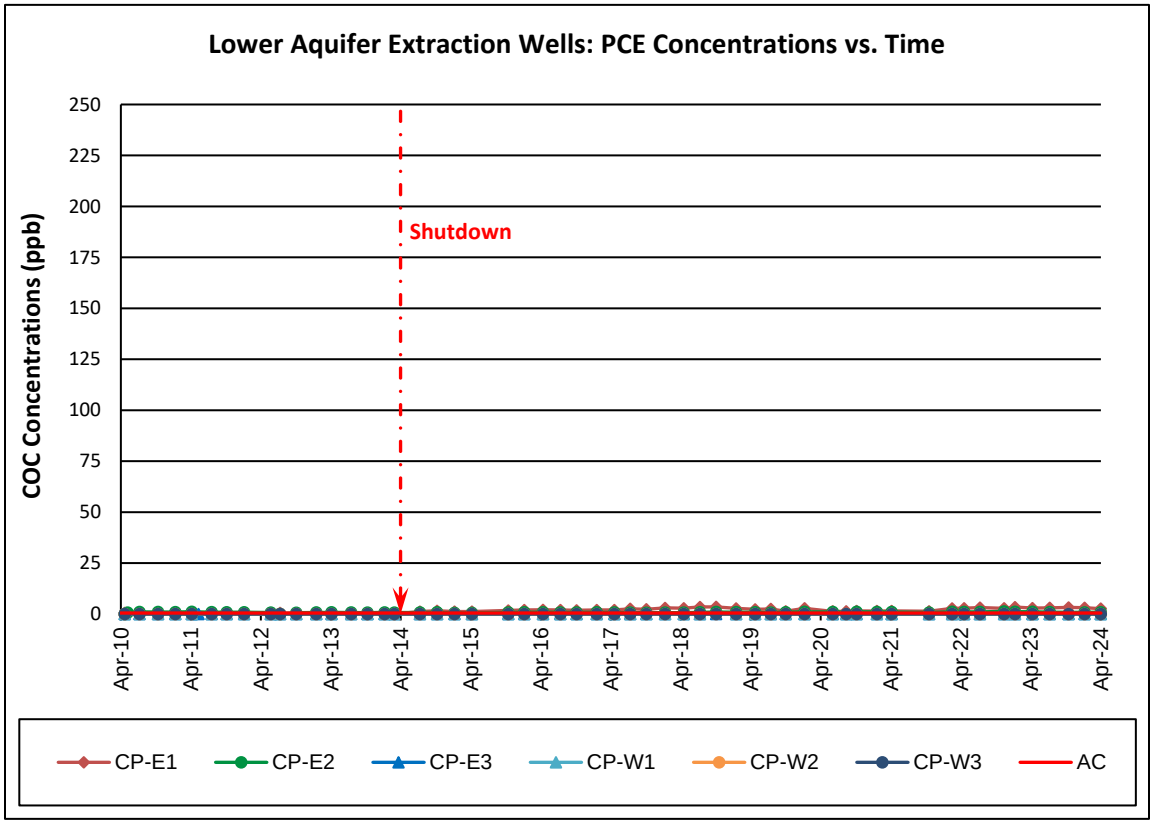


Figure 2-18 Lower Aquifer Extraction Wells PCE Concentrations vs. Time



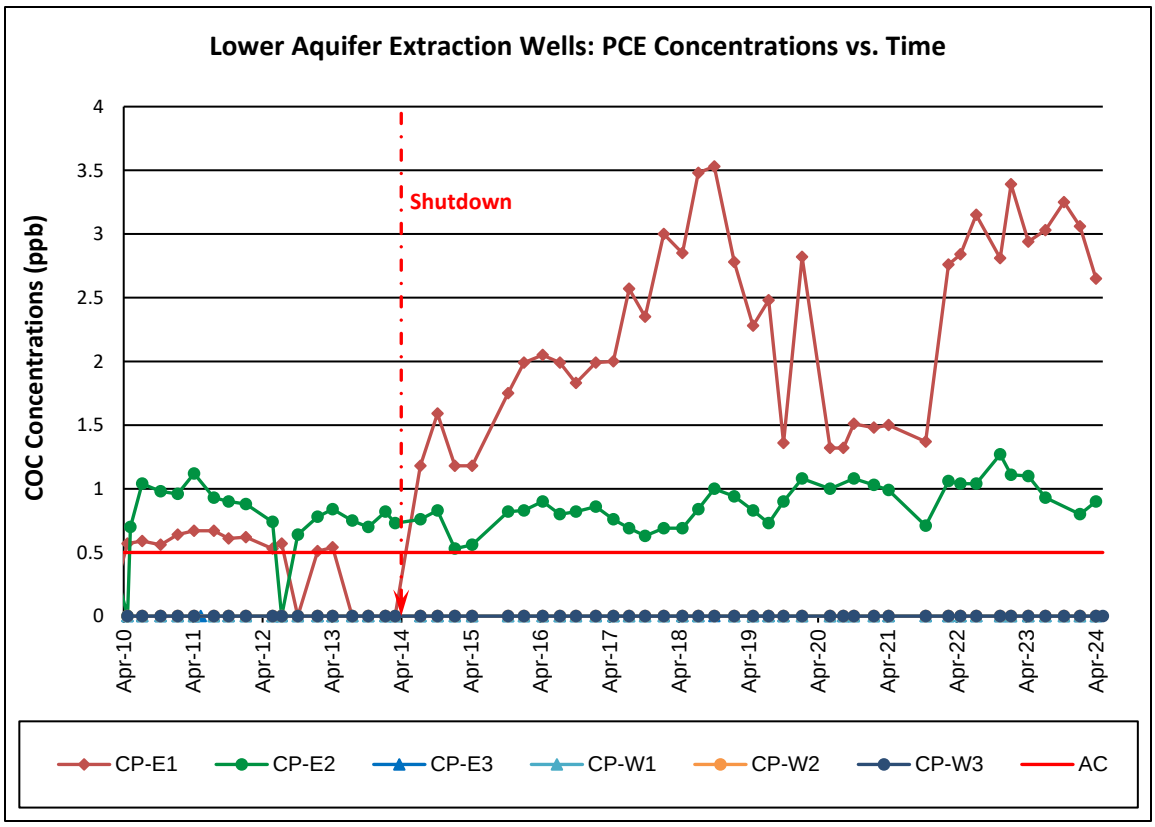
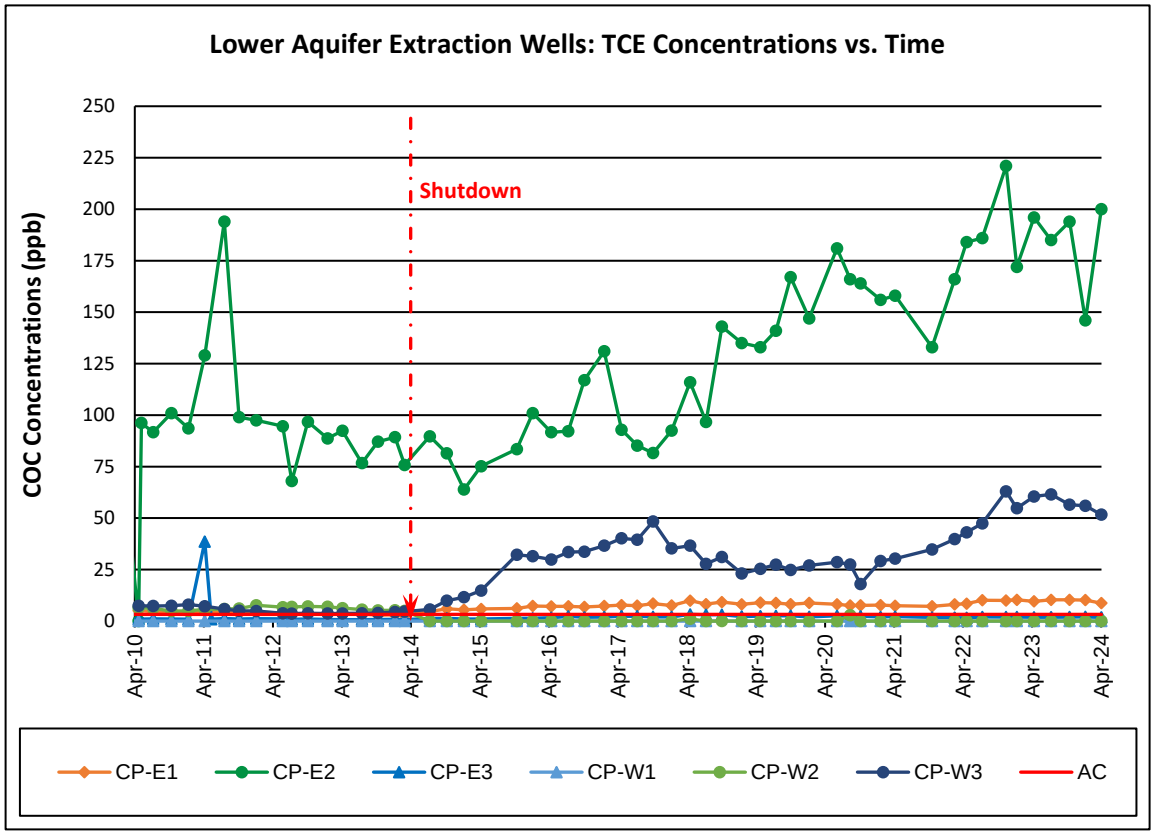


Figure 2-19 Lower Aquifer Extraction Wells TCE Concentrations vs. Time



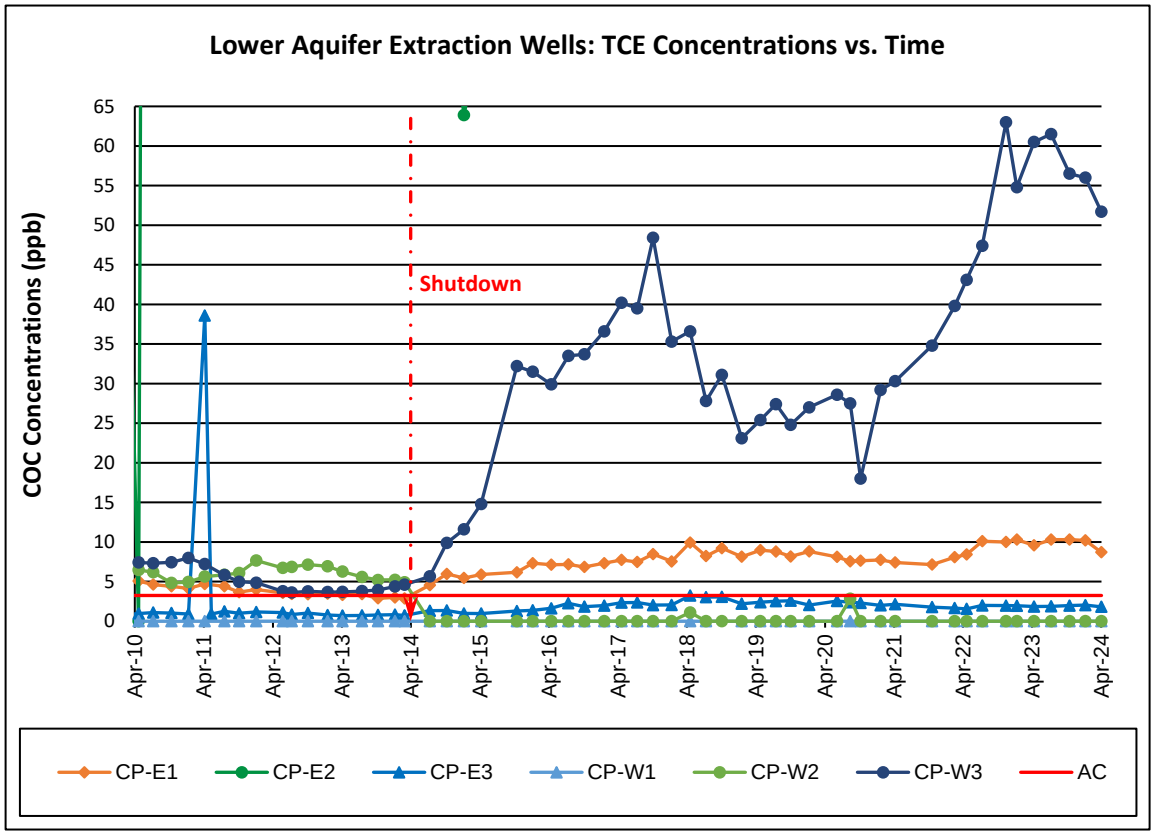
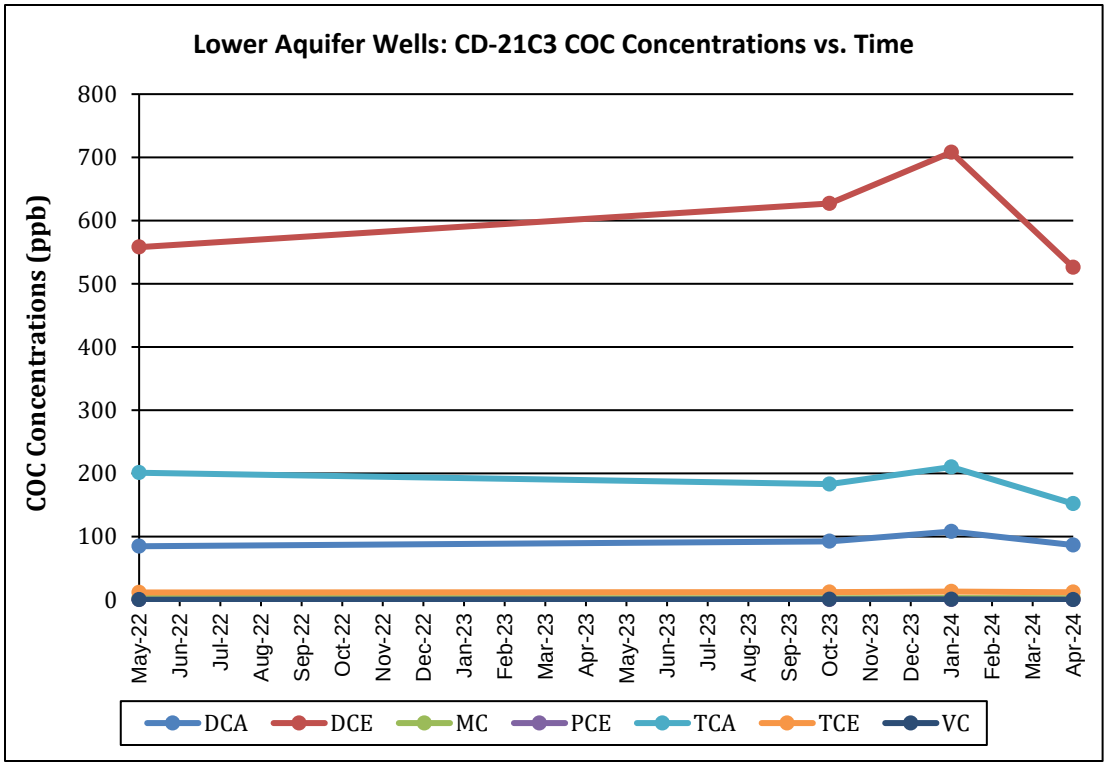


Figure 2-20 CD-21C3 COC Concentrations vs. Time



In May 2022, during the Supplemental Sampling event, Spokane County collected groundwater samples from CD-21C3 to determine COC concentrations in the vicinity of this well. The results indicated that the highest concentrations of TCA and DCE in the vicinity of the Colbert Landfill were found at CD-21C3. County personnel installed a dedicated pump in CD-21C3 in October 2023 to monitor these "source area" concentrations on a quarterly basis to assess COC changes and trends.

For all of the COC concentrations vs. time graphs above, non-detection values from the laboratory are displayed as 0 ppb.

Figure 2-21 Lower Aquifer Estimated TCA Plume

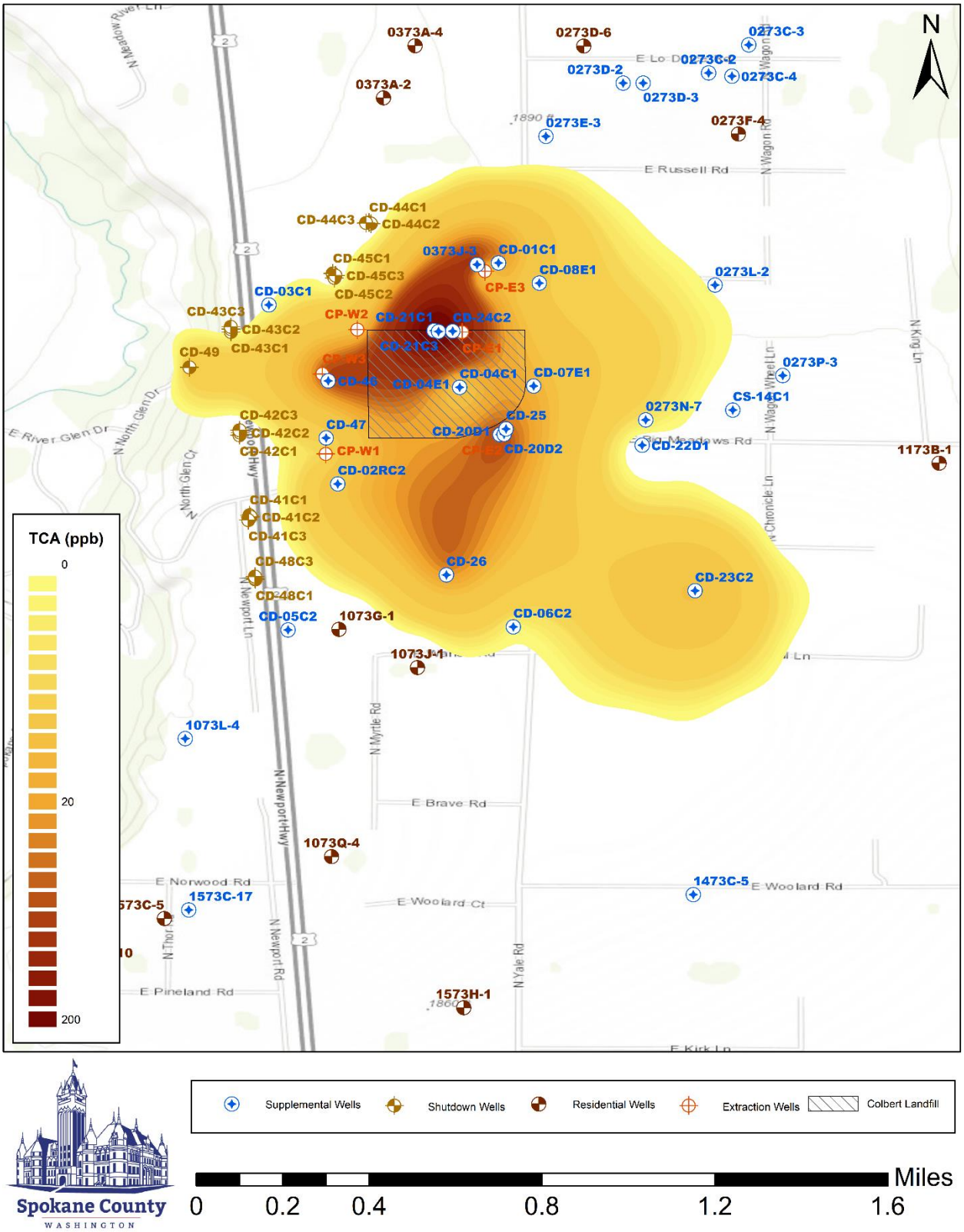


Figure 2-22 Lower Aquifer TCA Detections Map

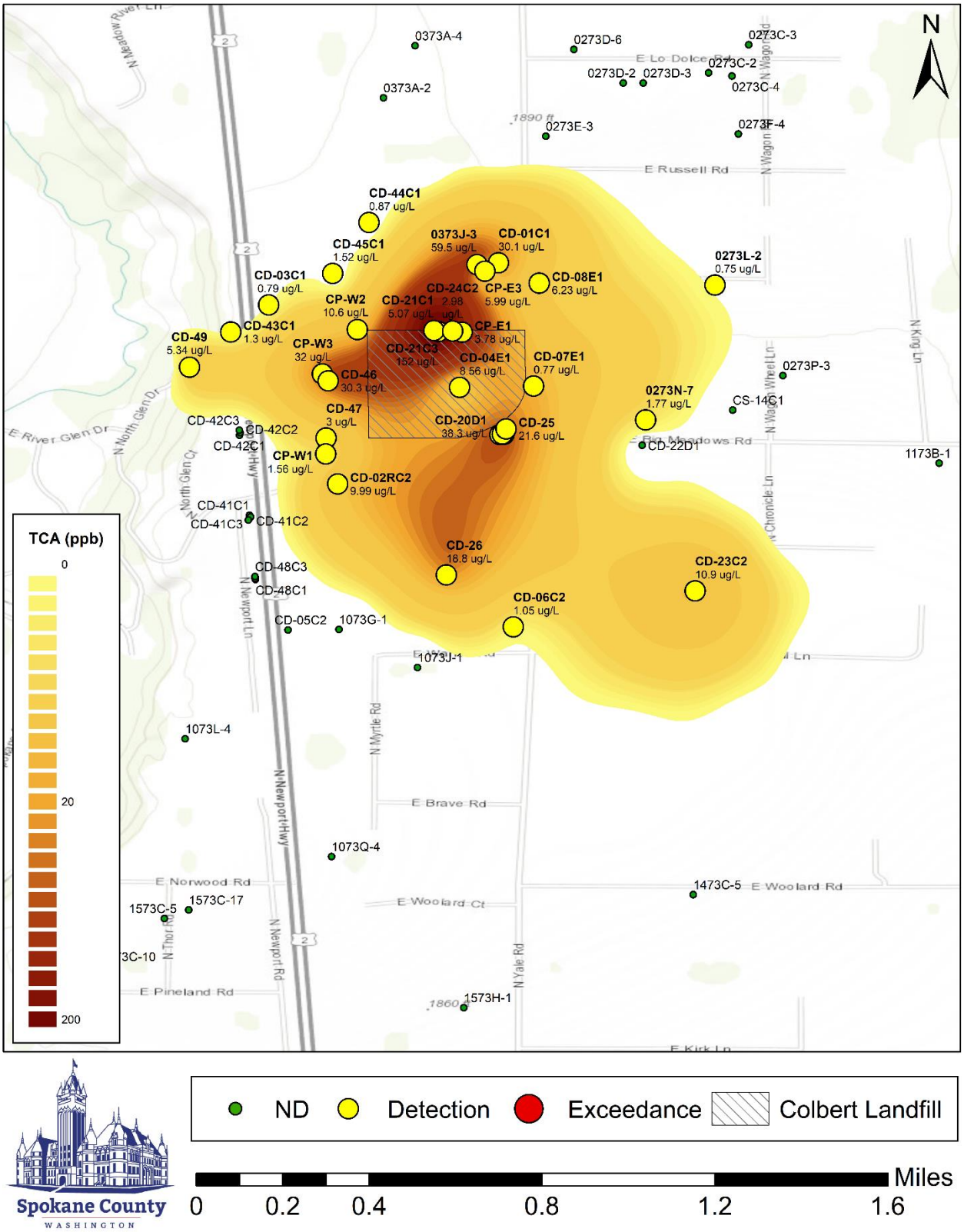


Figure 2-23 Lower Aquifer Estimated DCA Plume

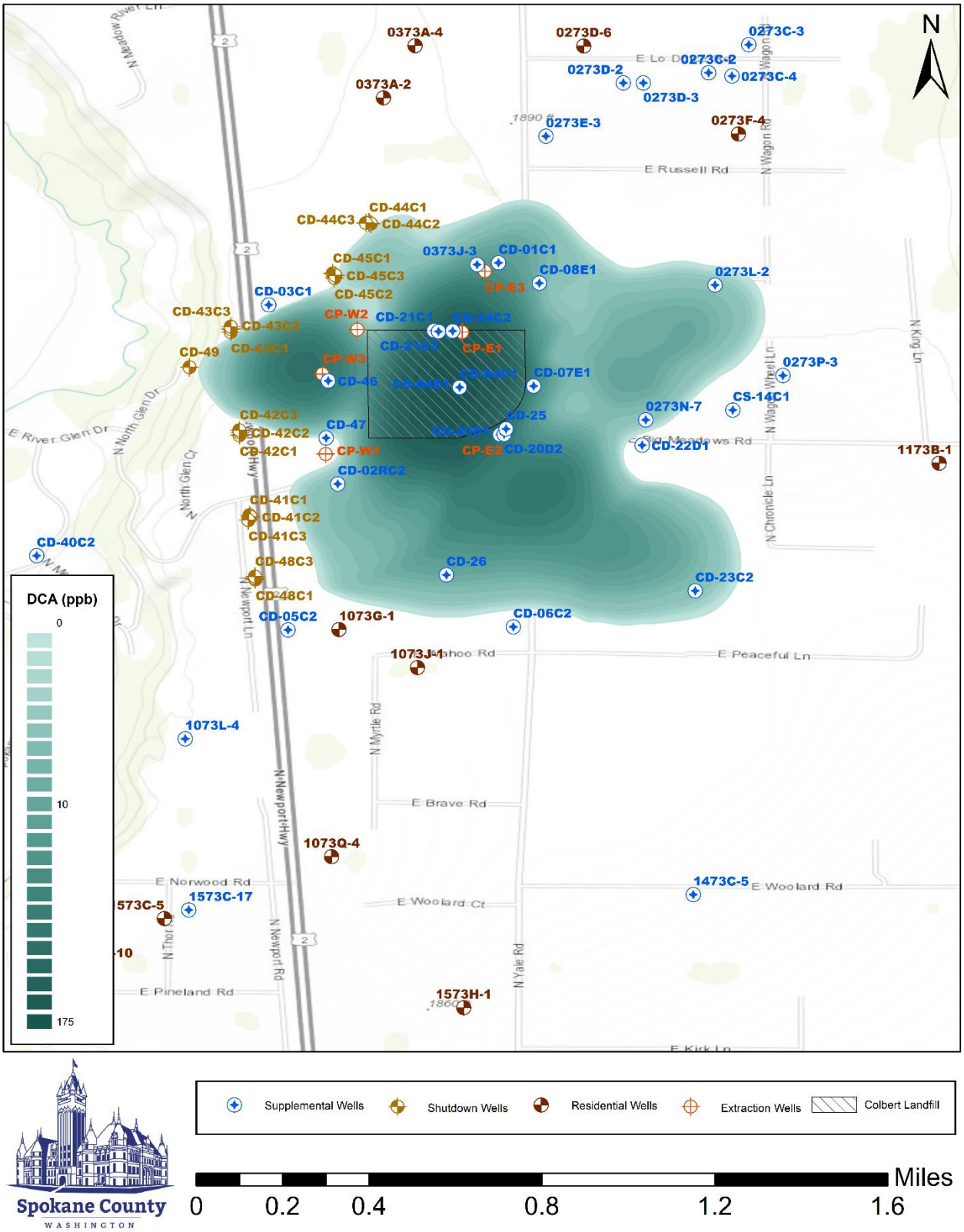


Figure 2-24 Lower Aquifer DCA Detections Map

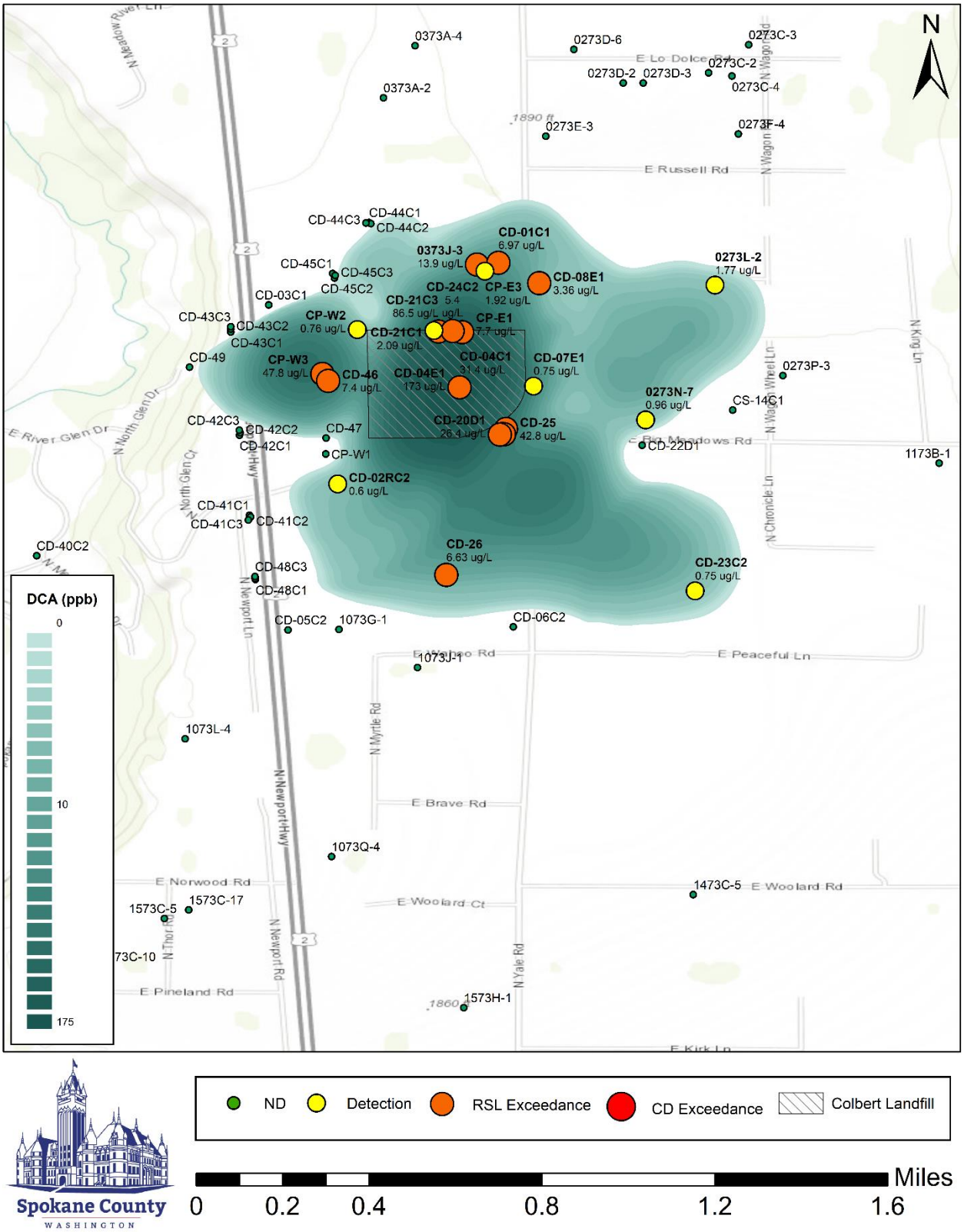


Figure 2-25 Lower Aquifer Estimated DCE Plume

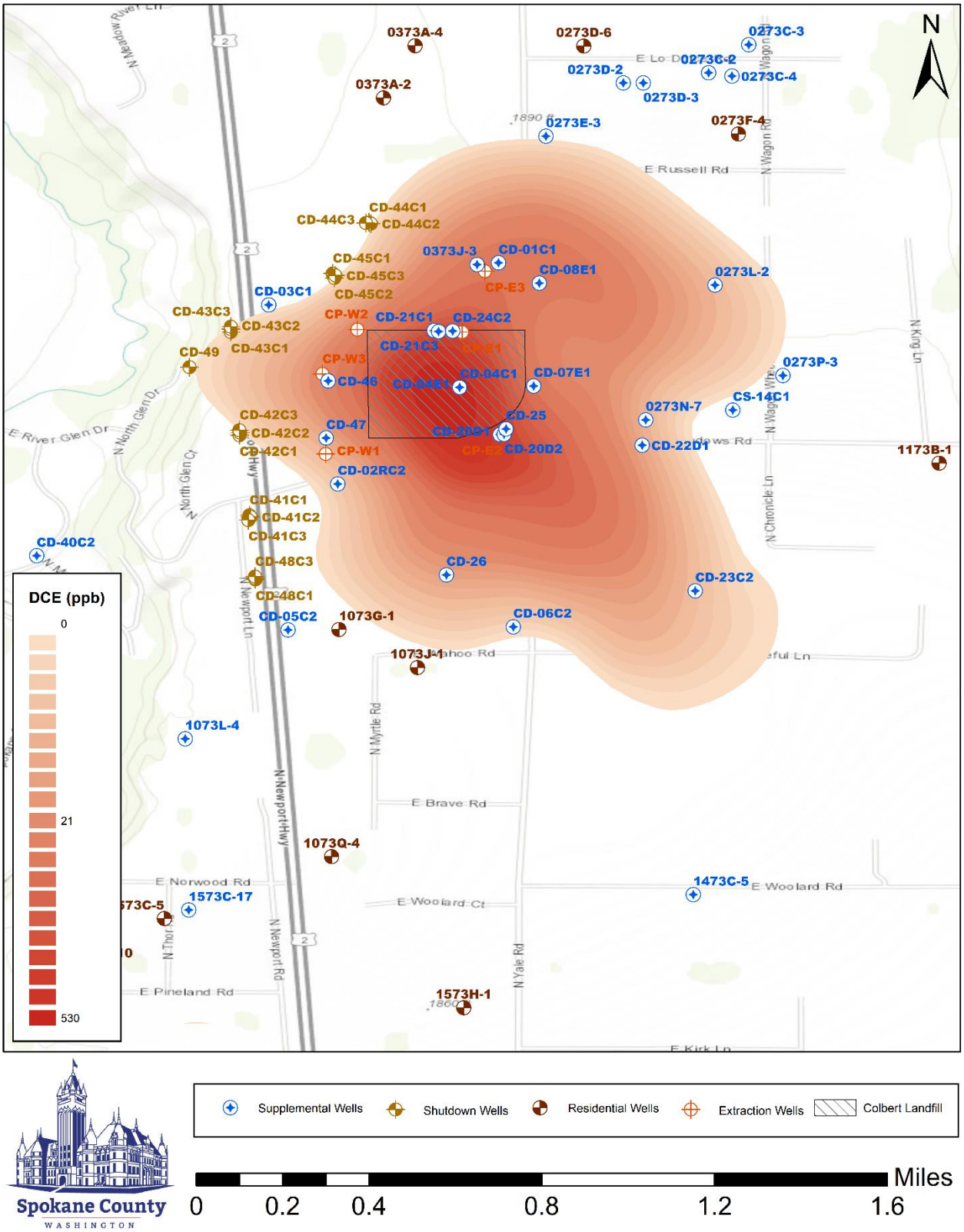


Figure 2-26 Lower Aquifer DCE Detections Map

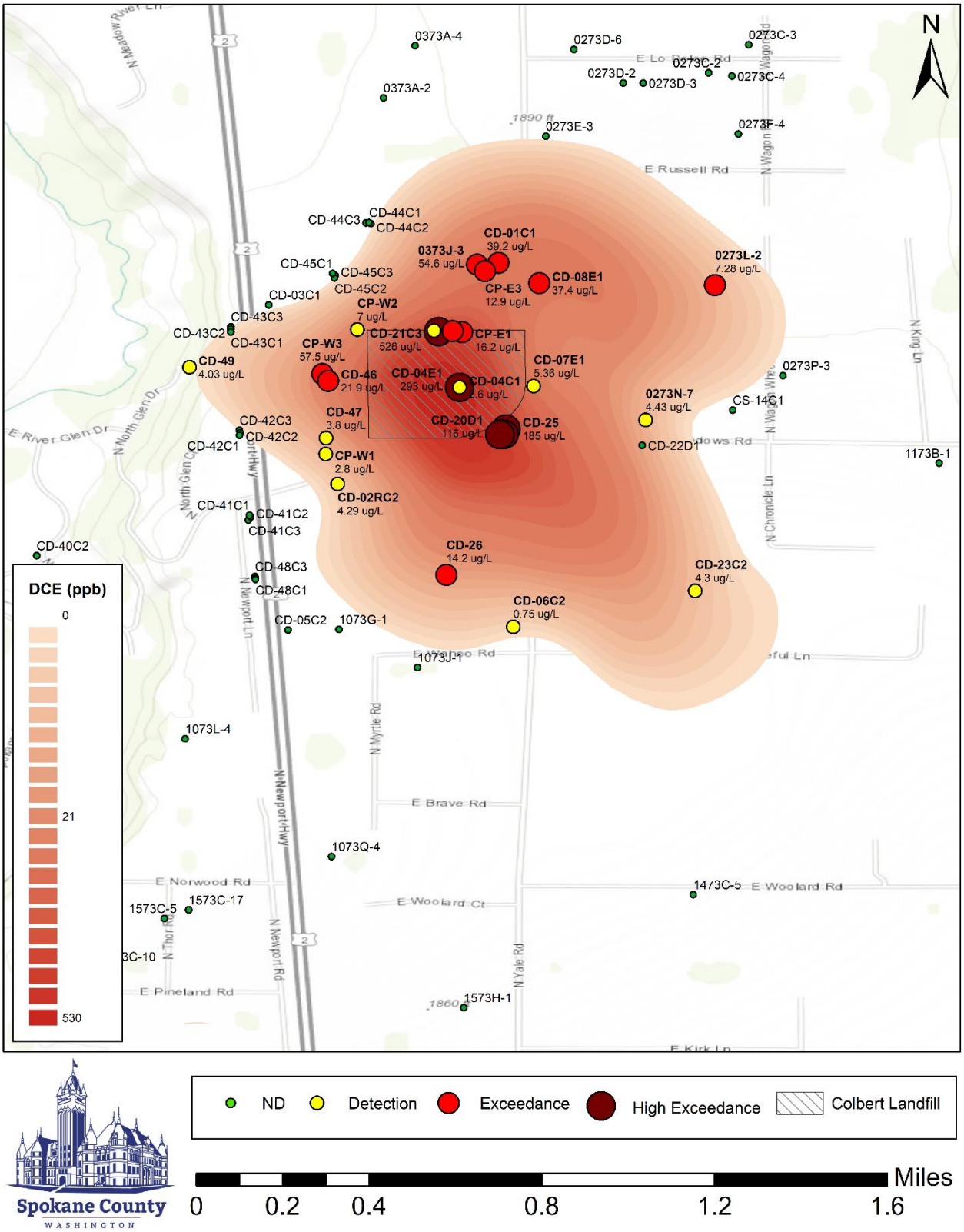


Figure 2-27 Lower Aquifer Estimated PCE Plume

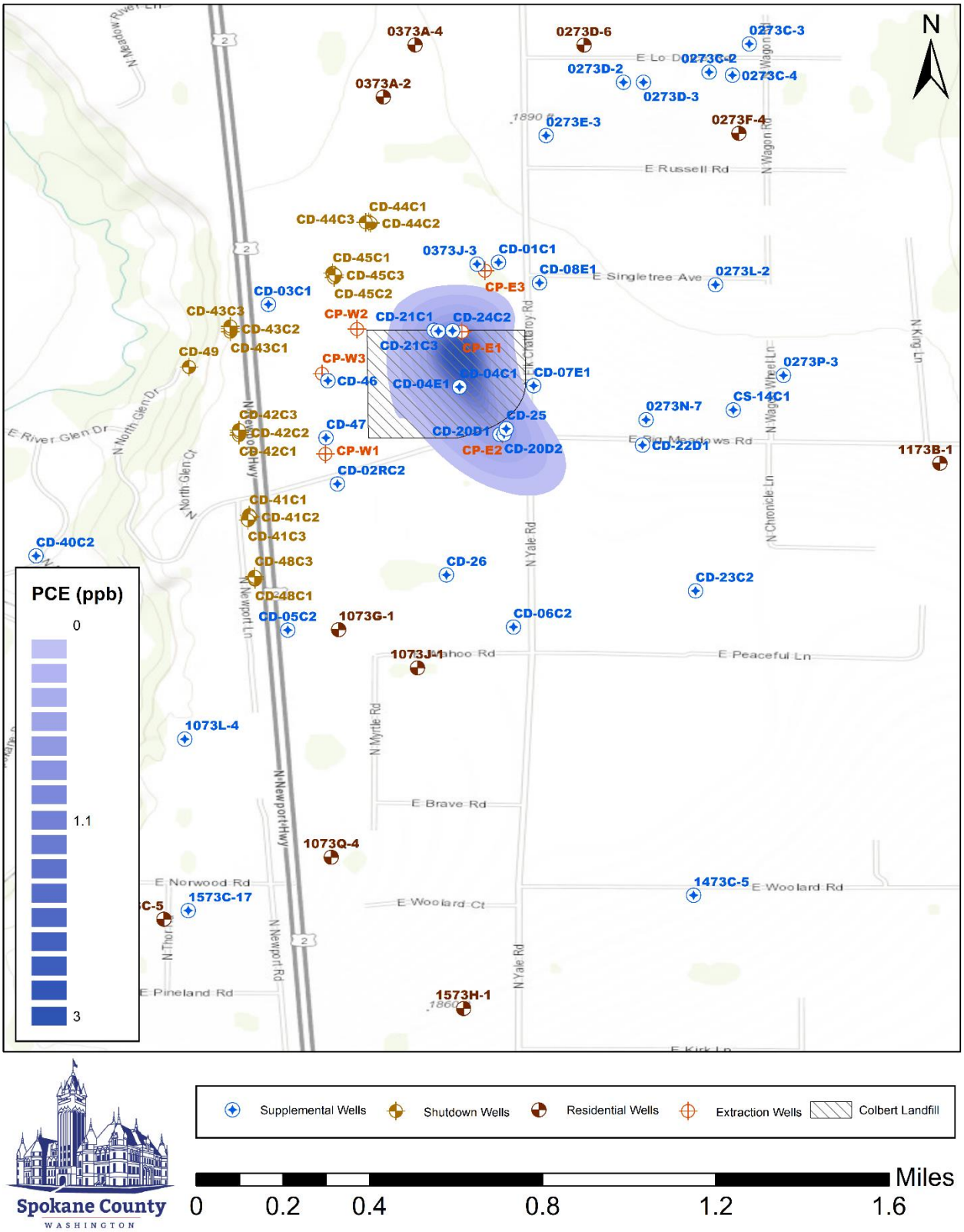


Figure 2-28 Lower Aquifer PCE Detections Map

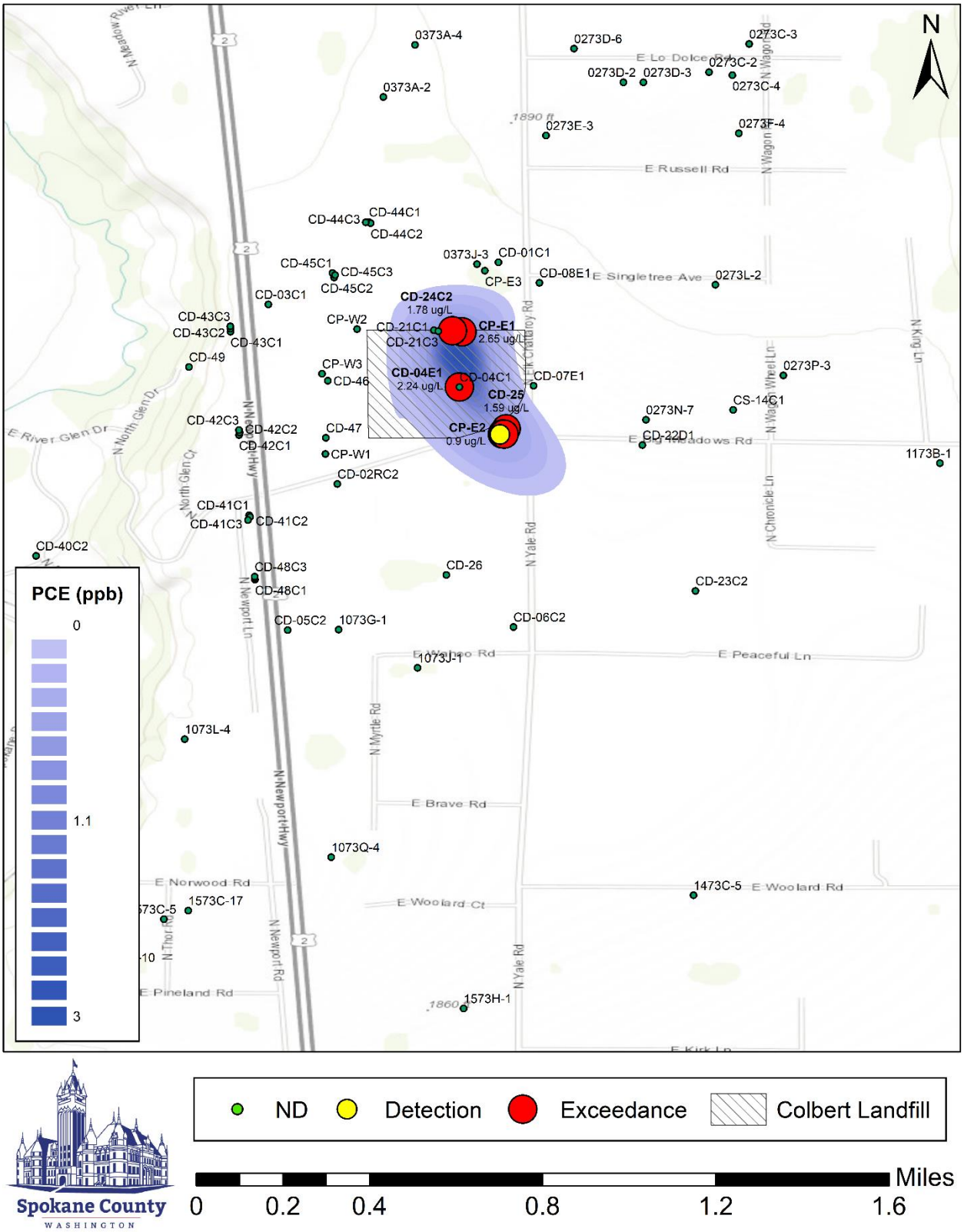


Figure 2-29 Lower Aquifer Estimated TCE Plume

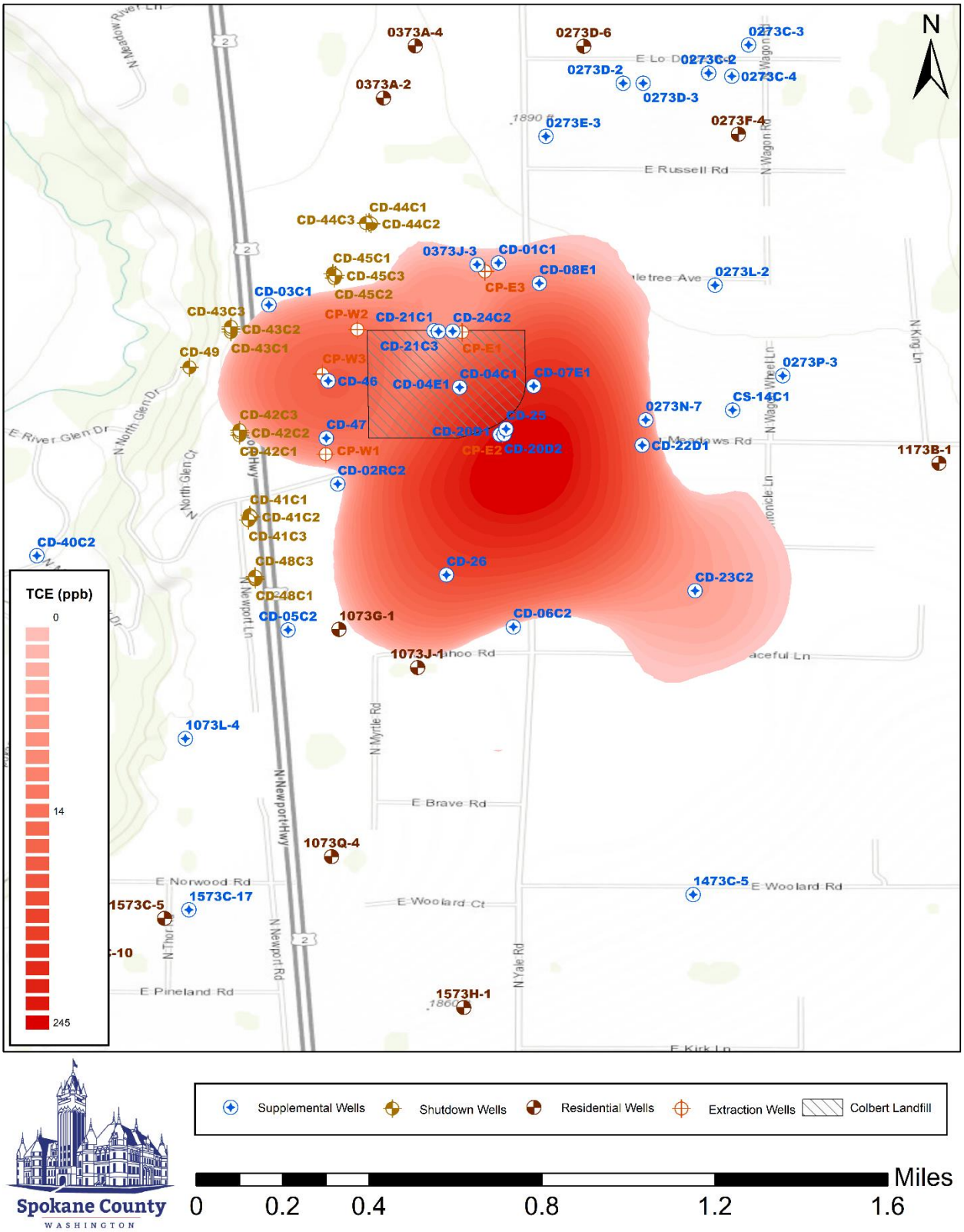


Figure 2-30 Lower Aquifer TCE Detections Map

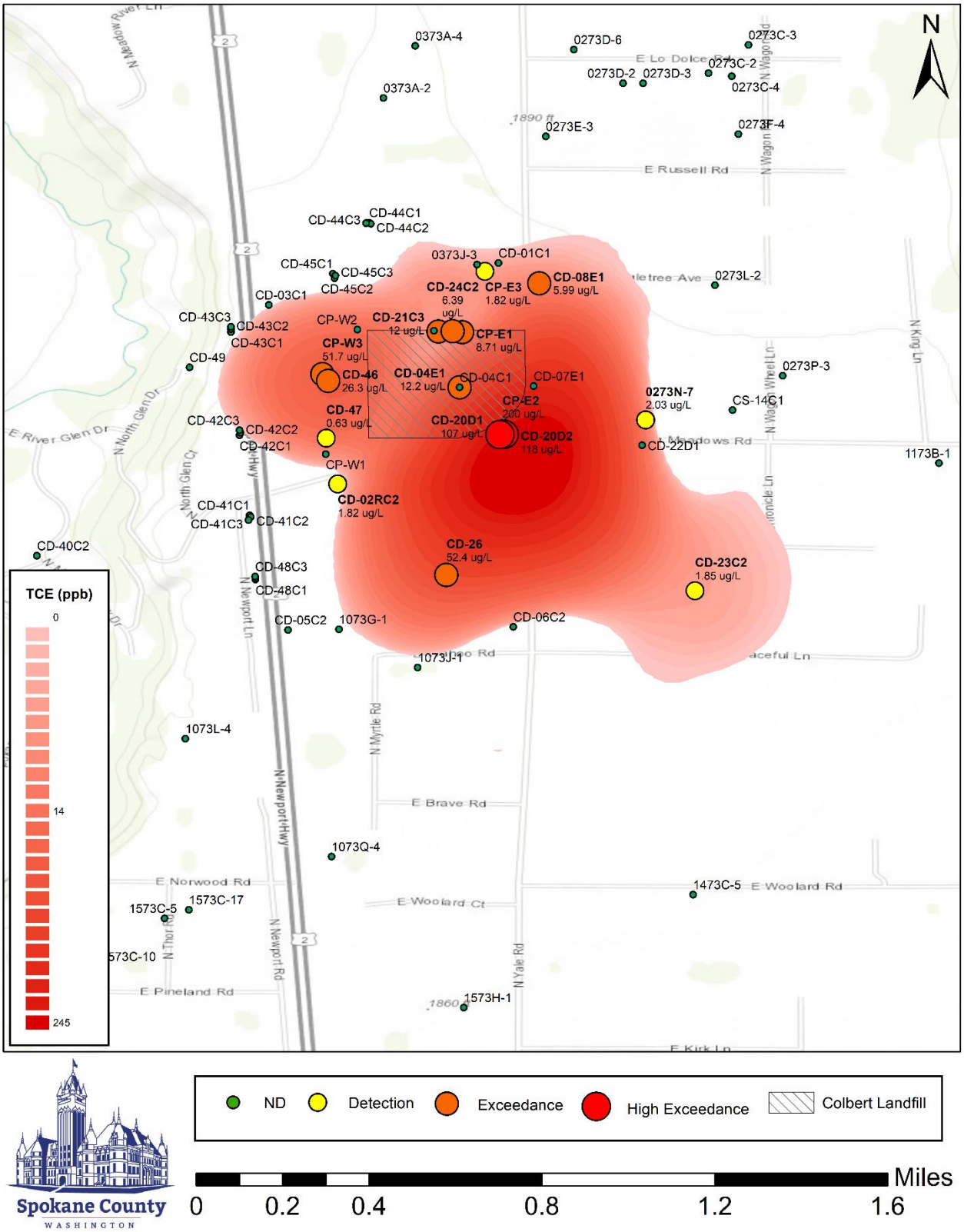


Figure 2-31 Lower Aquifer All Analytes Estimated Plume Map

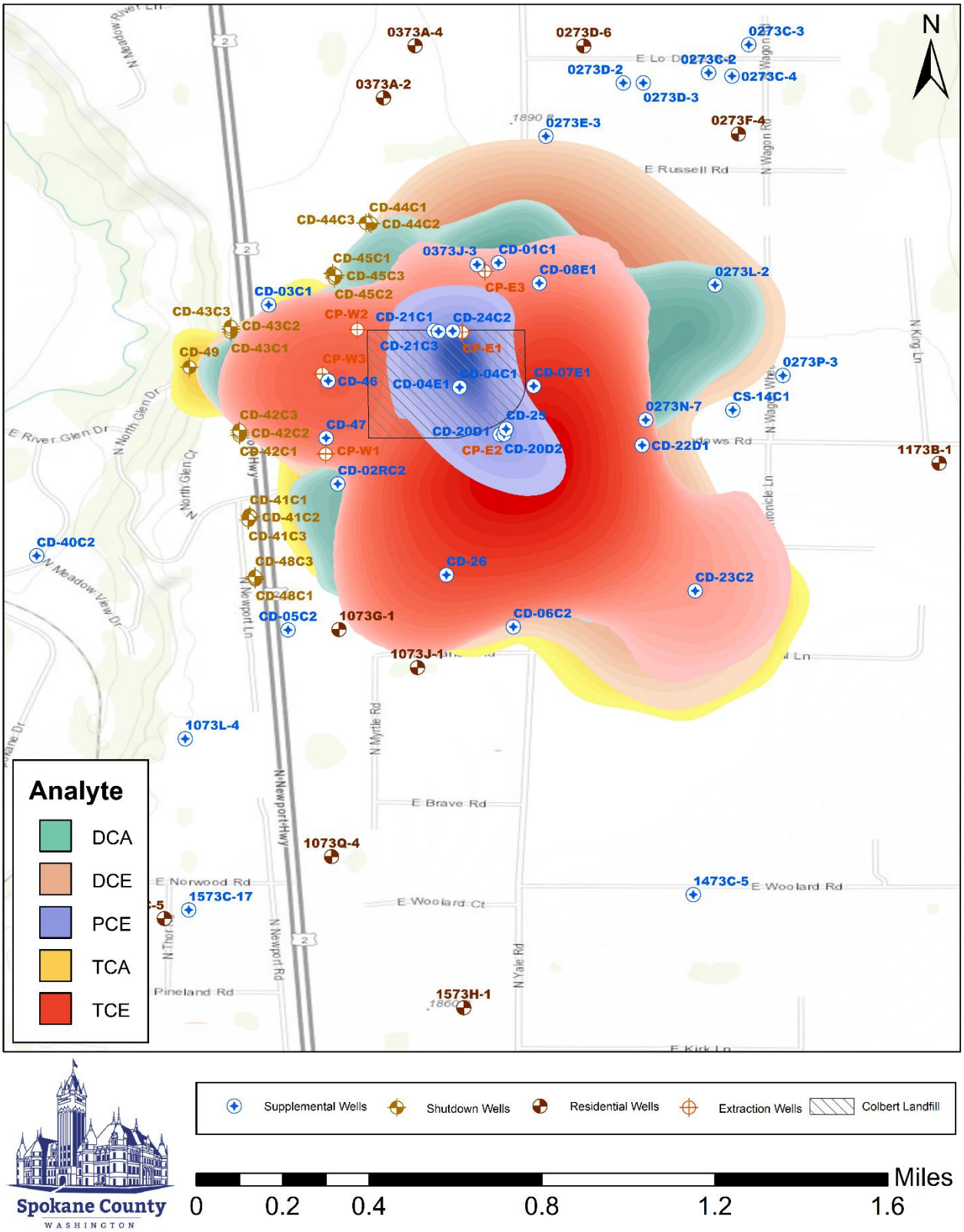
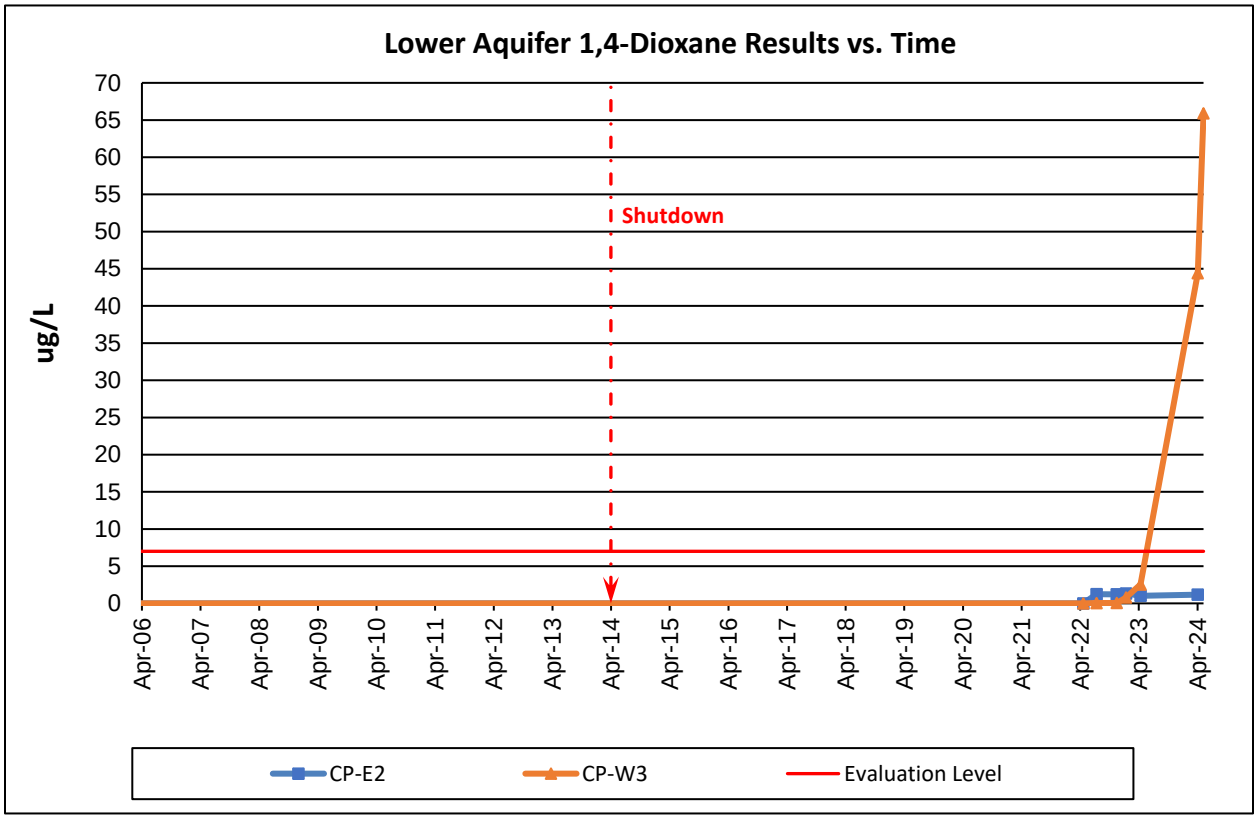


Table 2-9 Lower Aquifer 1,4-Dioxane Monitoring Results

StationID	Aquifer	Analyte	SampleDate	Result	Units	Reporting Limit	Qualifier
CP-E2	lower	1,4-Dioxane	4/2/2024	1.18	ug/L	0.1	D
CP-W3	lower	1,4-Dioxane	4/2/2024	**44.4**	ug/L	0.1	D
CP-W3	lower	1,4-Dioxane	5/8/2024	**65.9**	ug/L	0.1	

Figure 2-32 Lower Aquifer Dioxane Results vs. Time



3.0 Upper Aquifer Monitoring

The upper aquifer monitoring program includes the sampling of compliance indicator COCs (VOCs), 1,4-dioxane sample collection, and MFS sampling from selected monitoring wells. Table 3-1 presents all wells located in the upper aquifer monitoring program and the sample analyses assigned to each well. Upper aquifer monitoring locations are presented in Figure 3-1. All upper aquifer monitoring occurs on an annual basis with the exception of the extraction wells and CD-36A1, which are operated and sampled quarterly.

3.1 Field Data and Groundwater Elevations

All upper aquifer compliance monitoring field parameters and groundwater elevations for this reporting period are shown in Table 3-3. Conductivity values ranged from 351 to 790 umhos/cm. Field pH values ranged from 6.73 to 8.02. The highest Conductivity values and some of the lowest pH values seem to be located in the southern extraction wells. Upper aquifer groundwater elevation contours/flow paths and elevation maps are presented in Figure 3-4 and Figure 3-5.

3.2 Compliance Monitoring (VOC's)

All wells in the upper aquifer have VOC samples collected from them and analyzed, even though the VOC analysis is not required in the MFS or 1,4-Dioxane work plan specifications.

3.2.1 Chemical Data

Constituents of Concern concentrations at the south system extraction wells are presented in Table 3-4. Select upper aquifer wells' COC concentrations vs. time are presented in Figure 3-7 through Figure 3-11. Upper aquifer COC estimated plume boundaries and COC detection maps are shown in Figure 3-12 through Figure 3-22. DCE concentrations for CD-36A1 increased from 1.85 ppb in April 2023 to 2.5 ppb in January 2024, and then decreased to 1.76 in April 2024. DCA concentrations for CD-36A1 increased from 10.9 ppb in April 2023 to 12 ppb in January 2024, and then decreased to 11 in April 2024. COC concentrations in CP-S1 exhibited decreases for TCA, DCA, and TCE. COC concentrations in CP-S4 exhibited decreases for TCA, DCA, PCE, and TCE. The decreases in COC concentrations coincided with groundwater elevation increases for the MFS and upper aquifer compliance wells. A comparison summarizing the differences in COC concentrations observed in the upper aquifer monitoring wells between 2019, 2023, and 2024 is presented in Table 3-8.

3.2.2 Criteria

Criteria for the upper aquifer programs are presented in Table 3-2. All criteria exceedances in the upper aquifer programs are presented in Table 3-5 (Consent Decree criteria) and Table 3-6 (updated criteria values from the Colbert Landfill 6th Five-year Review, which includes an increase for Trichloroethene [PCE] from the performance standard in the ROD [0.7 µg/L] to the current MCL [5µg/L], and a decrease for 1,1-Dichloroethane [1,1-DCA] to the regional screening level [RSL] of 2.6 µg/L). 1,4-Dioxane concentrations for CD-36A1 continued to exceed the Washington State Model Toxics Control Act (MTCA) criterion of 7 µg/L (1,4-Dioxane has not been designated a COC through administrative action), and DCA concentrations for CD-36A1 exceeded the EPA regional screening level (RSL) criteria during this reporting period. Monitoring well CD-36A1 has been

added to the quarterly sampling schedule to better evaluate and confirm the COC concentrations found in this well/vicinity (CP-S1 and CP-S4 are currently on the quarterly sampling schedule).

3.3 1,4-Dioxane Sampling

As outlined in the *1,4-Dioxane Workplan for the Colbert Landfill (December 2007)*, five locations were selected for annual 1,4-dioxane sampling to further evaluate the extent of 1,4-Dioxane as well as protect residential wells at the Colbert Landfill site (see Table 3-1). Given potential changes in 1,4-Dioxane extent/prevalence, along with a potential change in groundwater flow conditions/ contaminant transport in post-P&T system shutdown conditions, Spokane County conducted another evaluation for 1,4-Dioxane at the Colbert Landfill that began in 2021 and ended in 2023. CD-36A1 was added to the annual 1,4-Dioxane sampling schedule for the upper aquifer due to high 1,4-Dioxane concentrations found at this well. See Table 3-7 for more information.

3.3.1 Chemical Data

The results for the 1,4-dioxane sampling during this reporting period are shown in Table 3-7. Concentrations versus time graphs are presented in Figure 3-6. 1,4-Dioxane concentrations for CD-36A1 continued to exceed the Washington State Model Toxics Control Act (MTCA) criterion of 7 µg/L (1,4-Dioxane has not been designated a COC through administrative action) during this reporting period.

3.4 Upper Aquifer Minimal Functional Standards (MFS) Monitoring

Upper aquifer locations designated in the MFS groundwater monitoring program were sampled in April 2024.

3.4.1 Chemical Data

Concentrations of analytes tested for under MFS monitoring were consistent with previous results (see Figure 3-23 and Figure 3-24). MFS well CS-04A1 exhibited detectable concentrations of Manganese (0.0308 ppm) during this reporting period. CD-61A1 and CS-04A1 exhibited increases in TCA and DA, respectively, and CD-60A1 exhibited a decrease in TCA.

3.4.2 Criteria

None of the MFS sampling locations exceeded any of the applicable criteria during this reporting period.

3.4.3 Statistical Analysis

The MFS Groundwater Monitoring Plan (Landau Assoc., 1996) requires three statistical methods to be used when evaluating groundwater Quality in accordance with MFS requirements. Time series plots were performed and discussed previously. Box plots were required after one year of data was collected. Box plots are presented in Figure 3-27. The third statistical method required is the Mann-Whitney nonparametric significance test. The summary results for this test are presented in Table 3-9. Although lower aquifer locations are no longer scheduled for sampling, previous results are shown here as well. A statistically significant change (less than 0.05 level of significance) from this test indicates that a difference may exist between background and downgradient wells but does not differentiate between sets. While it is true that a difference in nitrate and chloride concentrations

may exist between background and downgradient wells, when taking time series plots and box plots into consideration, it is not likely these differences were due to influence by the landfill.

Table 3-1 Upper Aquifer Monitoring Programs and Locations

Program	Schedule	Parameters	Wells
Compliance Monitoring	Annual (Quarterly at extraction wells)	VOC's	CD-31A1, CD-34A1, CD-36A1, CD-37A1, CD-38A1, CD-40C1**, CP-S1, CP-S3, CP-S4, CP-S5, CP-S6
1,4-Dioxane Sampling	Annual	1,4-Dioxane	CP-S1, 1073D-1*, 1473M-1*, 1573A-1*, CD-40C1**, CD-36A1
MFS Monitoring	Annual	Cl/NH3/NO2/NH3/SO4/ Fe/Mn/Zn/TOC/COD	CD-03A1, CD-60A1, CD-61A1, CS-04A1

* Residential use wells

**Well considered to be screened in the fluvial aquifer and COC source is from the upper aquifer west of Hwy 2 (see *Phase 1 Engineering Report. Landau Assoc, 1991*.)

Table 3-2 Upper Aquifer Criteria

PROGRAM	CRITERIA	TCA	DCE	DCA	TCE	PCE	MC	1,4-Dioxane		Units
CONSENT DECREE	Performance	200	7	4050	5	0.7	2.5			ug/L
(Compliance)	Evaluation	200	7	4050	5	0.7	2.5	7		
		Cl	**Fe**	**Mn**	**Zn**	**TOC**	**COD**	**SO4**	**NO3**	
MFS	(mg/L)	250	0.3	0.05	5	NA	NA	250	10	mg/L

Figure 3-1 Upper Aquifer Compliance Monitoring Locations

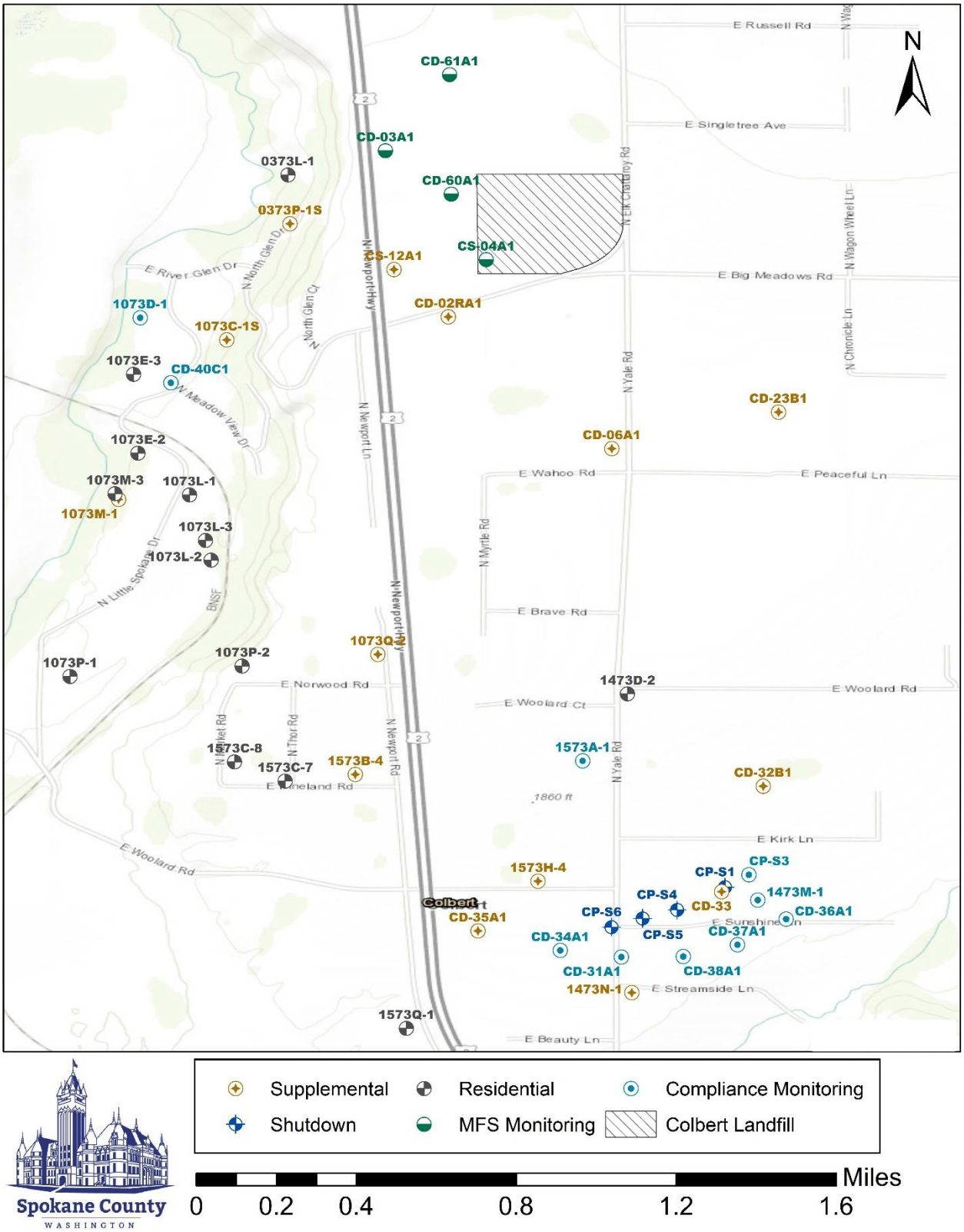
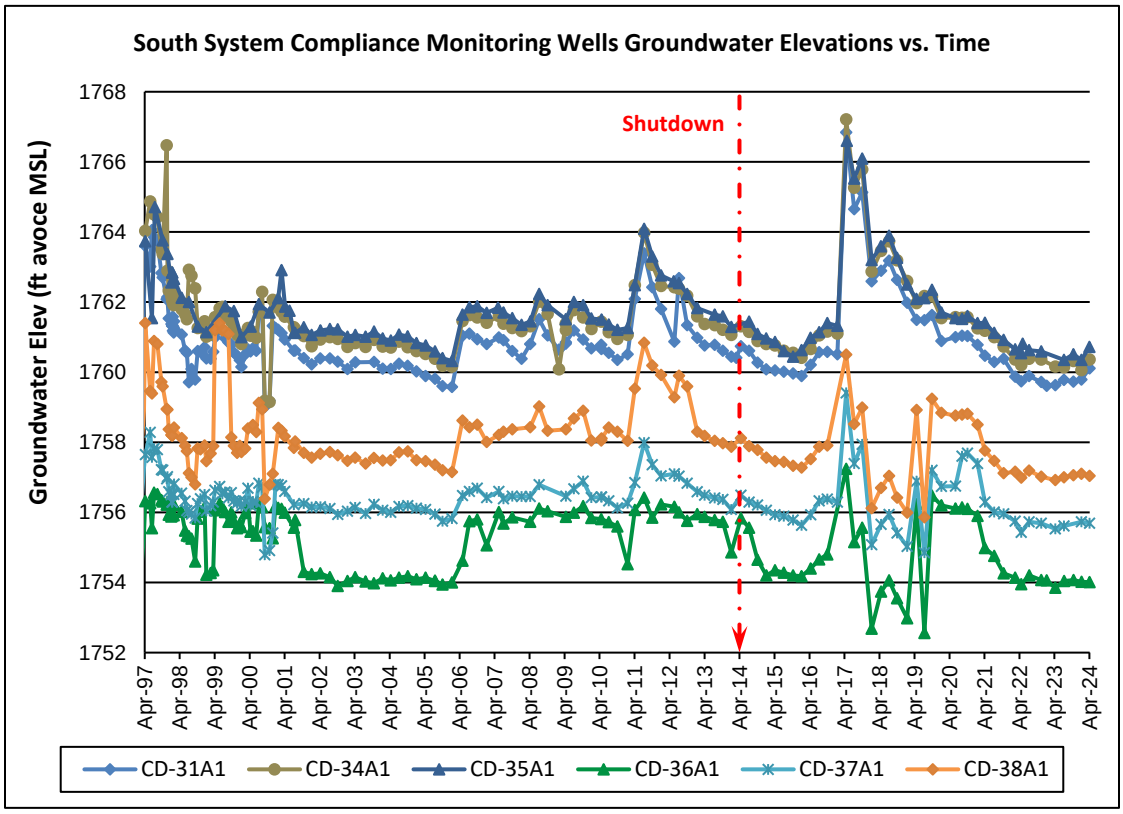


Table 3-3 Upper Aquifer Field Parameters

SampleDate	StationID	WtrElev	Temp	PH	Conductivity	Turbidity	Aquifer	Program
4/3/2024	1573A-1	1760.38	11.7	7.51	495	0.19	upper	CCM
4/2/2024	CD-31A1	1760.11	10.8	7.65	647	0.23	upper	CCM
4/2/2024	CD-34A1	1760.36	10.9	7.47	578	0.32	upper	CCM
7/11/2023	CD-36A1	1754.04	11.2	7.61	613	0.51	upper	CCM
10/18/2023	CD-36A1	1754.07	10	7.51	611	0.07	upper	CCM
1/9/2024	CD-36A1	1754.02	9.6	7.64	641	0.22	upper	CCM
4/2/2024	CD-36A1	1754.01	11.7	7.55	584	0.59	upper	CCM
4/2/2024	CD-37A1	1755.69	10.9	7.37	665	0.21	upper	CCM
4/2/2024	CD-38A1	1757.04	10.6	7.62	570	0.22	upper	CCM
4/2/2024	CD-40C1	1662.88	10.7	8.02	553	0.17	upper	CCM
4/2/2024	CP-S3	1759.08	11.6	7.43	644	0.81	upper	CCM
4/3/2024	1073D-1		10.3	8	362		upper	CCM/res
4/3/2024	1473M-1		10.9	7.65	563		upper	CCM/res
4/3/2024	CD-03A1	1773.22	10	7.7	351	0.29	upper	MFS
4/3/2024	CD-60A1	1772.82	10.4	7.07	533	0.13	upper	MFS
4/3/2024	CD-61A1	1773.75	10.8	7.56	418	0.18	upper	MFS
4/3/2024	CS-04A1		10.9	6.73	697	0.47	upper	MFS
7/11/2023	CP-S1	1758.8	11.6	7.47	480	0.71	upper	SD
10/17/2023	CP-S1	1758.8	11.2	7.51	486	0.65	upper	SD
1/9/2024	CP-S1	1758.6	10	7.5	563	0.52	upper	SD
4/2/2024	CP-S1	1758.84	10.4	7.46	583	0.38	upper	SD
7/11/2023	CP-S4	1759.7	11.6	7.25	576	0.29	upper	SD
10/17/2023	CP-S4	1759.5	11.1	7.34	579	0.39	upper	SD
1/9/2024	CP-S4	1759.31	10	7.31	649	0.45	upper	SD
4/2/2024	CP-S4		10.5	7.31	690	0.48	upper	SD
7/11/2023	CP-S5	1765.48	11.5	7.32	587	0.71	upper	SD
10/17/2023	CP-S5		11	7.36	588	0.66	upper	SD
1/9/2024	CP-S5		10.8	7.34	700	0.56	upper	SD
4/2/2024	CP-S5		11.7	7.34	717	0.34	upper	SD
7/11/2023	CP-S6	1760.43	11.7	7.36	650	0.41	upper	SD
10/17/2023	CP-S6	1760.19	11.2	7.4	655	0.29	upper	SD
1/9/2024	CP-S6	1760.17	10.2	7.31	754	1.34	upper	SD
4/2/2024	CP-S6	1760.42	10.6	7.34	790	0.7	upper	SD

Temp=degrees C; Conductivity=umhos/cm; Turbidity= NTU

Figure 3-2 Upper Aquifer Groundwater Elevations vs. Time



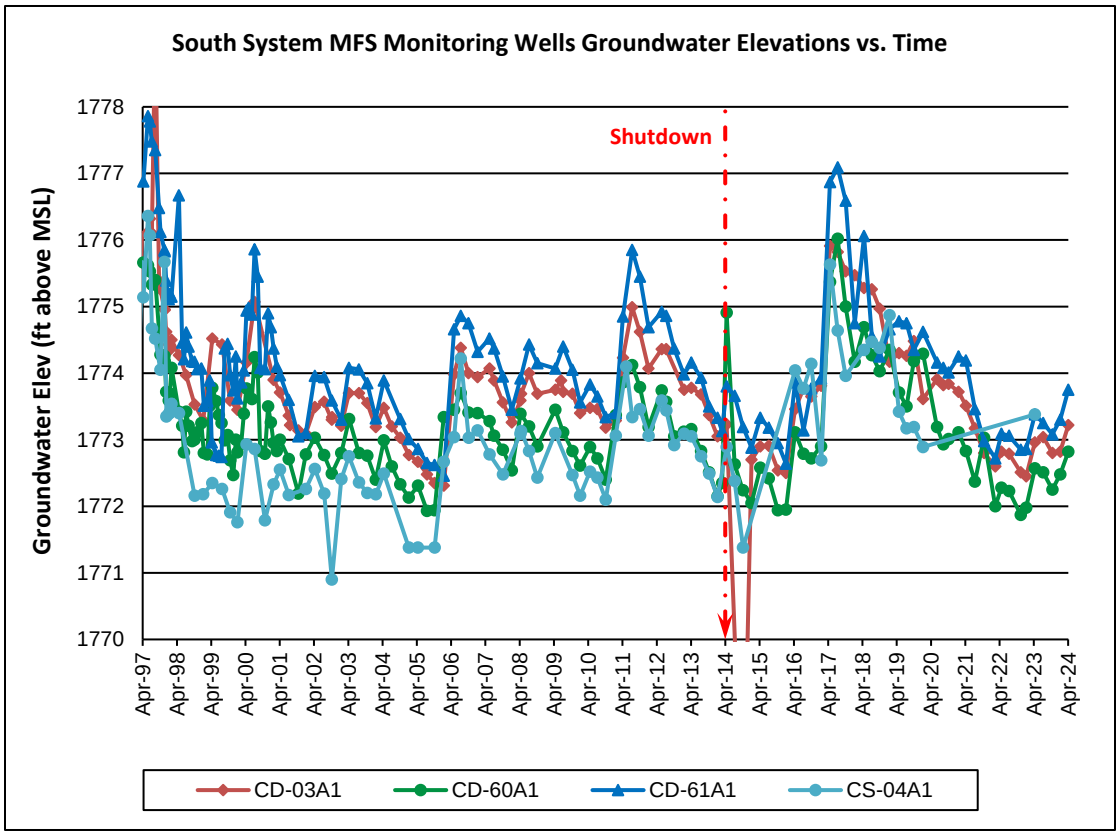
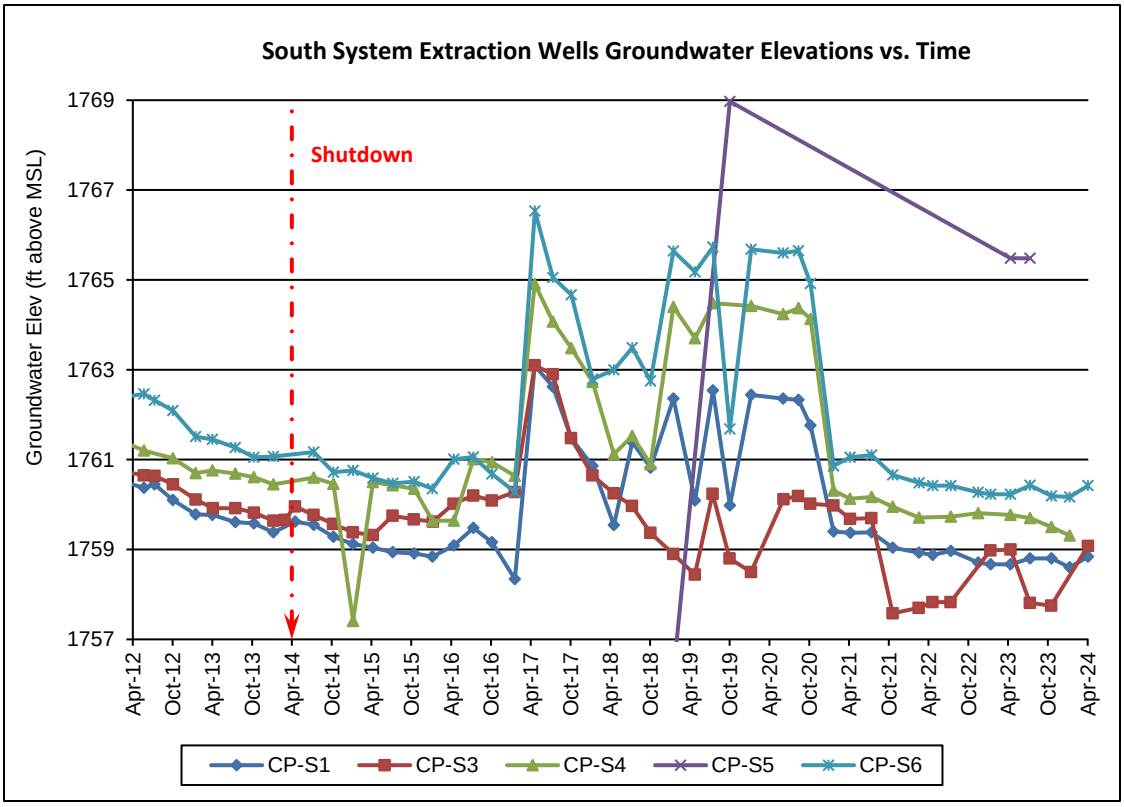


Figure 3-3 Upper Aquifer Groundwater Elevations vs. Time (cont.)



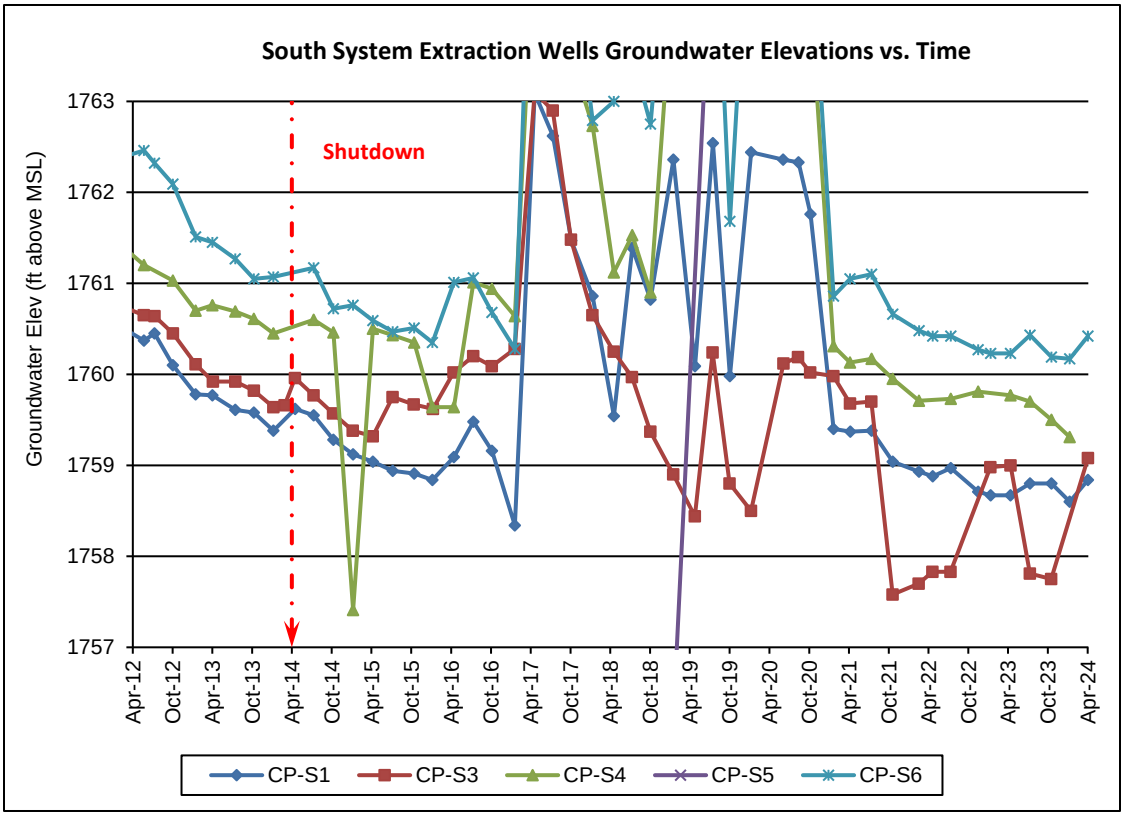


Figure 3-4 Upper Aquifer Estimated Groundwater Elevation Contours

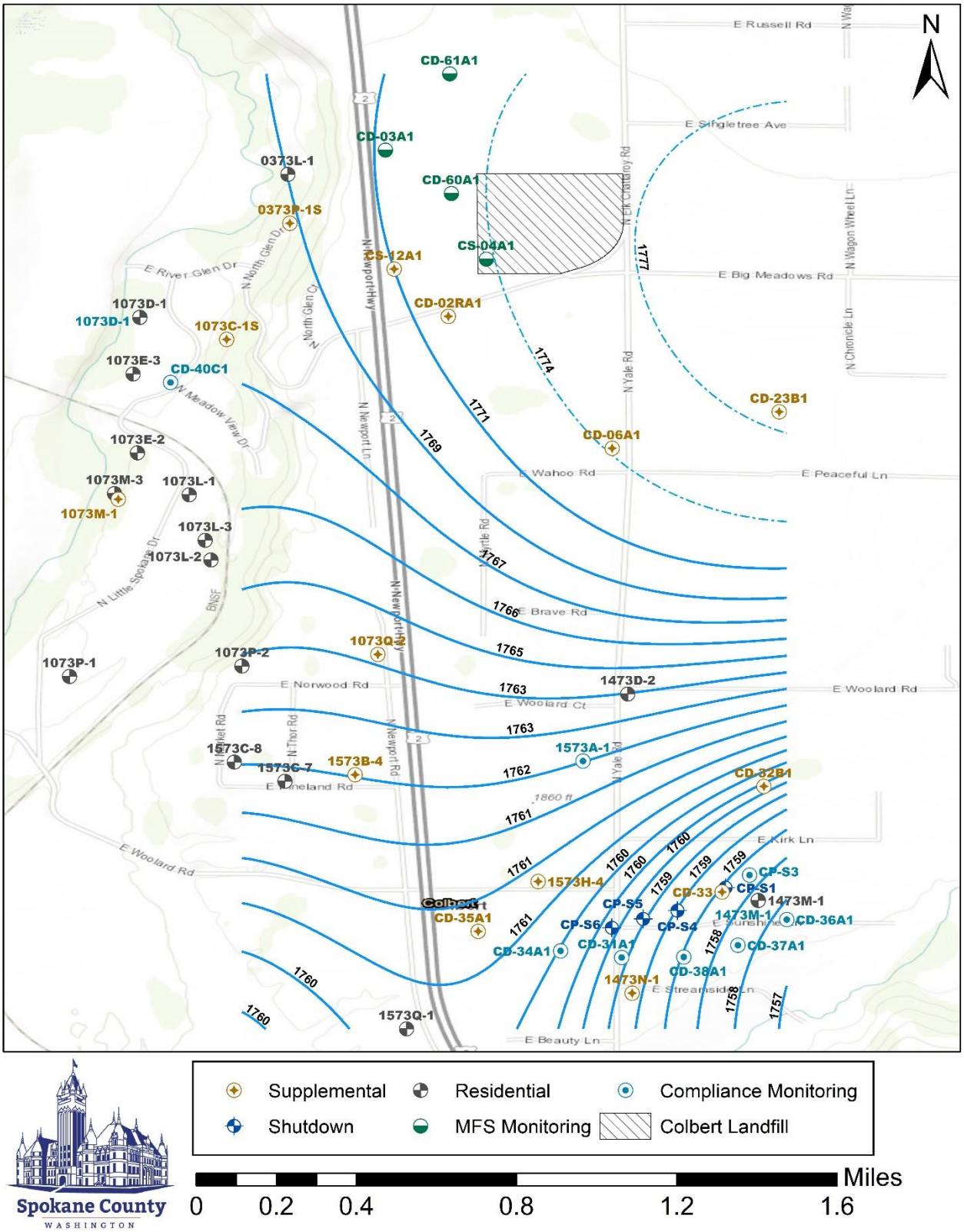


Figure 3-5 Upper Aquifer Groundwater Elevation Map

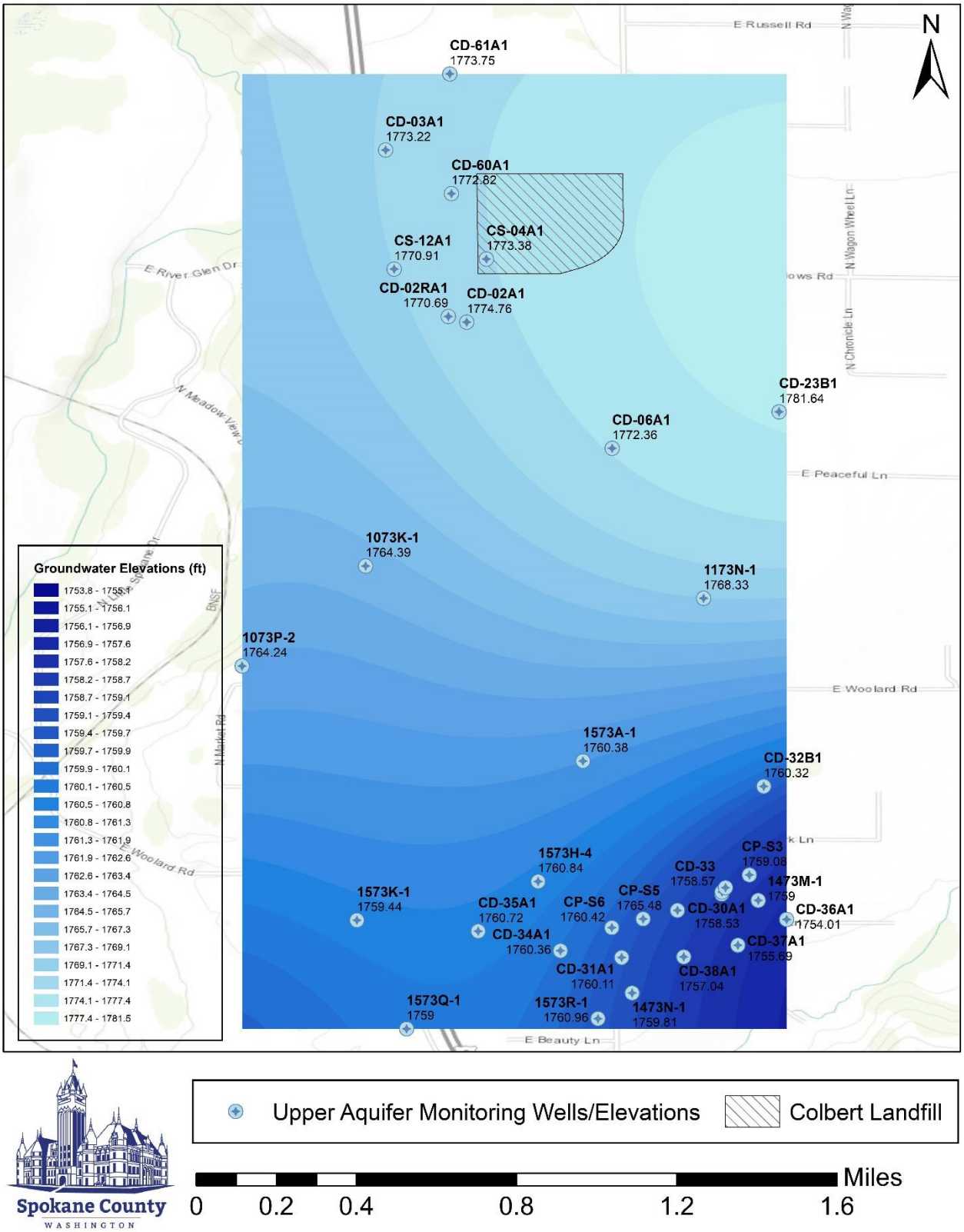


Table 3-4 Upper Aquifer Groundwater Monitoring Results

				ug/L						mg/L								
StationID	Aquifer	Program	SampleDate	DCA	DCE	MC	PCE	TCA	TCE	Cl	COD	Fe	Mn	N-NH3	N-NO3	SO4	TOC	Zn
1573A-1	upper	CCM	4/3/2024	<0.50	<0.50	<0.50	<0.50	0.6	<0.50									
CD-31A1	upper	CCM	4/2/2024	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50									
CD-34A1	upper	CCM	4/2/2024	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50									
CD-36A1	upper	CCM	7/11/2023	11.7	1.82	<0.50	<0.50	<0.50	<0.50									
CD-36A1	upper	CCM	10/18/2023	10.5	1.73	<0.50	<0.50	<0.50	<0.50									
CD-36A1	upper	CCM	1/9/2024	12	2.5	<0.50	<0.50	<0.50	<0.50									
CD-36A1	upper	CCM	4/2/2024	11	1.76	<0.50	<0.50	<0.50	<0.50									
CD-37A1	upper	CCM	4/2/2024	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50									
CD-38A1	upper	CCM	4/2/2024	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50									
CD-40C1	upper	CCM	4/2/2024	0.62	0.67	<0.50	<0.50	<0.50	<0.50									
CP-S3	upper	CCM	4/2/2024	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50									
CD-03A1	upper	MFS	4/3/2024	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.71	<0.50	<0.50	<0.50	<0.50	0.255	6.42	<0.50	<0.50
CD-60A1	upper	MFS	4/3/2024	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.11	<0.50	<0.50	<0.50	<0.50	2.21	9.14	<0.50	<0.50
CD-61A1	upper	MFS	4/3/2024	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.21	<0.50	<0.50	<0.50	<0.50	0.218	9.81	<0.50	<0.50
CS-04A1	upper	MFS	4/3/2024	1.2	<0.50	<0.50	<0.50	<0.50	0.62	2.76	<0.50	<0.50	0.0308	<0.50	2.35	6.57	1.38	<0.50
CP-S1	upper	SD	7/11/2023	1.45	0.6	<0.50	<0.50	0.71	1.17									
CP-S1	upper	SD	10/17/2023	1.45	0.6	<0.50	<0.50	0.65	1.13									
CP-S1	upper	SD	1/9/2024	1.37	<0.50	<0.50	<0.50	0.61	1.04									
CP-S1	upper	SD	4/2/2024	0.95	<0.50	<0.50	<0.50	<0.50	0.82									
CP-S4	upper	SD	7/11/2023	1.11	<0.50	<0.50	0.57	<0.50	2.04									
CP-S4	upper	SD	10/17/2023	1.22	0.61	<0.50	0.55	0.52	2.08									
CP-S4	upper	SD	1/9/2024	0.68	<0.50	<0.50	<0.50	<0.50	1.8									
CP-S4	upper	SD	4/2/2024	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50									
CP-S5	upper	SD	7/11/2023	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50									
CP-S5	upper	SD	10/17/2023	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50									
CP-S5	upper	SD	1/9/2024	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50									
CP-S5	upper	SD	4/2/2024	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50									
CP-S6	upper	SD	7/11/2023	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50									
CP-S6	upper	SD	10/17/2023	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50									
CP-S6	upper	SD	1/9/2024	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50									
CP-S6	upper	SD	4/2/2024	0.68	<0.50	<0.50	<0.50	<0.50	1.64									

Table 3-5 Upper Aquifer Criteria Exceedances (Consent Decree criteria)

StationID	SampleDate	Aquifer	Program	Analyte	Result	Units	Flag
CD-36A1	4/2/2024	upper	CCM	1,4-Dioxane	8.66	ug/L	Exceedance

Table 3-6 Shutdown Program Criteria Exceedances (*updated criteria values)

*Increase for Trichloroethene (PCE) from the performance standard in the ROD (0.7 µg/L) to the current MCL (5µg/L), and a decrease for 1,1-Dichloroethane (1,1-DCA) to the regional screening level (RSL) of 2.8 µg/L.

StationID	SampleDate	Aquifer	Program	Analyte	Result	Units	Flag
CD-36A1	7/11/2023	upper	CCM	1,1-Dichloroethane	11.7	ug/L	Exceedance
CD-36A1	10/18/2023	upper	CCM	1,1-Dichloroethane	10.5	ug/L	Exceedance
CD-36A1	1/9/2024	upper	CCM	1,1-Dichloroethane	12	ug/L	Exceedance
CD-36A1	4/2/2024	upper	CCM	1,1-Dichloroethane	11	ug/L	Exceedance
CD-36A1	4/2/2024	upper	CCM	1,4-Dioxane	8.66	ug/L	Exceedance

Table 3-7 1,4-Dioxane Monitoring Results

StationID	Aquifer	Analyte	SampleDate	Result	Units	Reporting Limit	Qualifier
1073D-1	upper	1,4-Dioxane	4/3/2024	0.288	ug/L	0.1	
1473M-1	upper	1,4-Dioxane	4/3/2024	0.05	ug/L	0.1	U
1573A-1	upper	1,4-Dioxane	4/3/2024	0.102	ug/L	0.1	
CD-36A1	upper	1,4-Dioxane	4/2/2024	**8.66**	ug/L	0.1	
CD-40C1	upper	1,4-Dioxane	4/2/2024	1.21	ug/L	0.1	
CP-S1	upper	1,4-Dioxane	4/2/2024	2.71	ug/L	0.1	

Figure 3-6 1,4-Dioxane Concentrations vs. Time

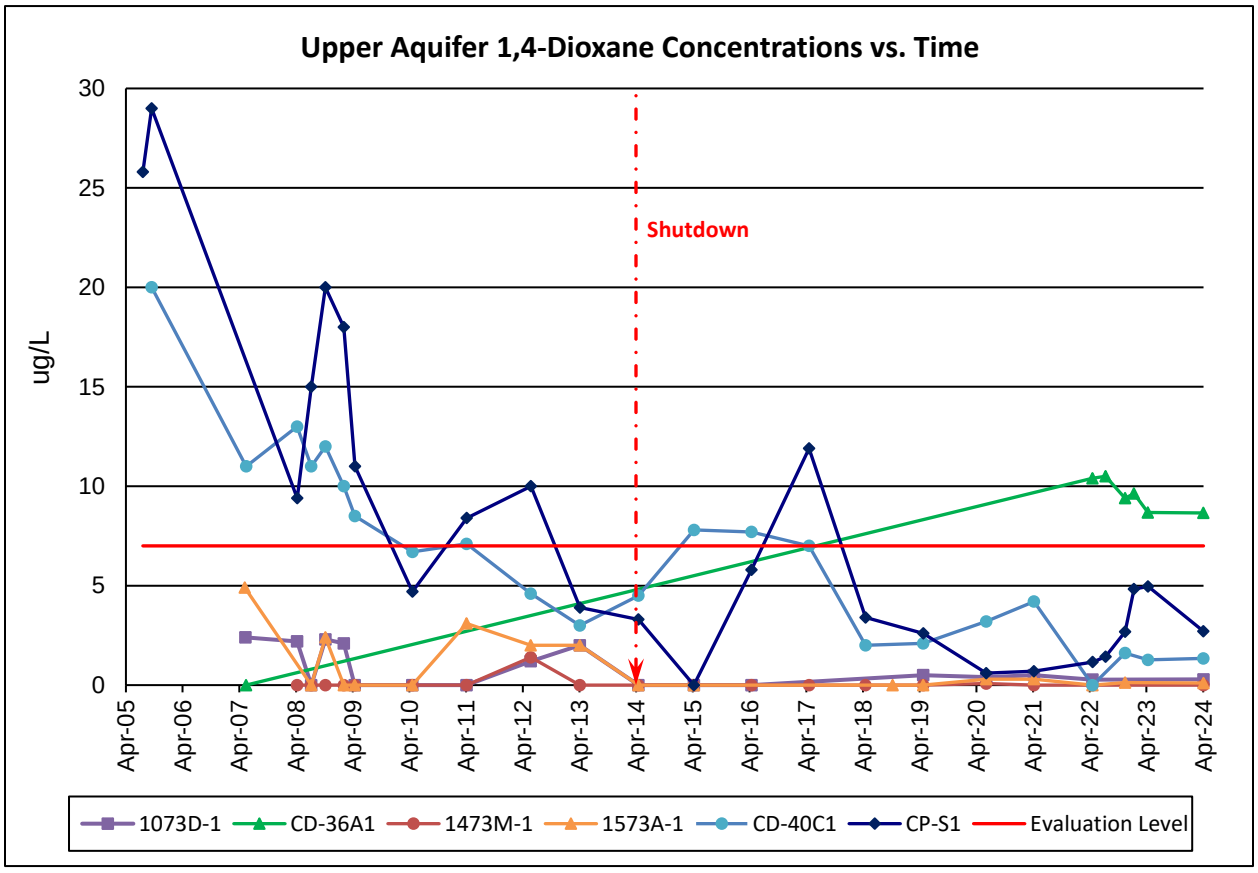


Table 3-8 Upper Aquifer Well Concentrations: Summary of 5-year/1-year Differences

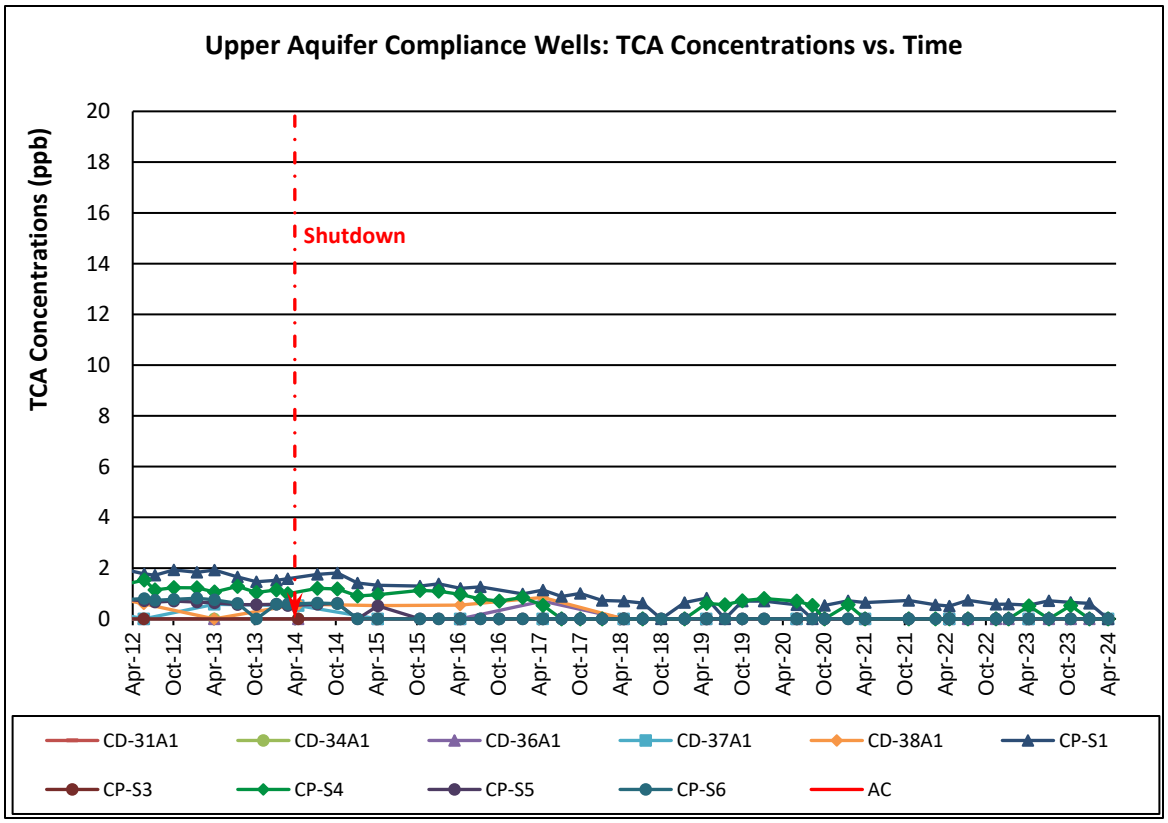
StationID	Aquifer	Program	Analyte	2019 Results	2023 Results	Current Year Results	5-Year Difference	1-Year Difference	Units
1573A-1	upper	CCM	TCA	1.42	0.8	0.6	-0.82	-0.2	ug/L
1573A-1	upper	CCM	DCA	0.97	0.53	0	-0.97	-0.53	ug/L
1573A-1	upper	CCM	DCE	0.54	0	0	-0.54	0	ug/L
1573A-1	upper	CCM	MC	0	0	0	0	0	ug/L
1573A-1	upper	CCM	PCE	0	0	0	0	0	ug/L
1573A-1	upper	CCM	TCE	0.73	0.57	0	-0.73	-0.57	ug/L
1573A-1	upper	CCM	VC	0	0	0	0	0	ug/L
CD-31A1	upper	CCM	TCA	0	0	0	0	0	ug/L
CD-31A1	upper	CCM	DCA	0	0	0	0	0	ug/L
CD-31A1	upper	CCM	DCE	0	0	0	0	0	ug/L
CD-31A1	upper	CCM	MC	0	0	0	0	0	ug/L
CD-31A1	upper	CCM	PCE	0	0	0	0	0	ug/L
CD-31A1	upper	CCM	TCE	0	0	0	0	0	ug/L
CD-31A1	upper	CCM	VC	0	0	0	0	0	ug/L
CD-34A1	upper	CCM	TCA	0	0	0	0	0	ug/L
CD-34A1	upper	CCM	DCA	0	0	0	0	0	ug/L
CD-34A1	upper	CCM	DCE	0	0	0	0	0	ug/L
CD-34A1	upper	CCM	MC	0	0	0	0	0	ug/L
CD-34A1	upper	CCM	PCE	0	0	0	0	0	ug/L
CD-34A1	upper	CCM	TCE	0	0	0	0	0	ug/L
CD-34A1	upper	CCM	VC	0	0	0	0	0	ug/L
CD-36A1	upper	CCM	TCA	0	0	0	0	0	ug/L
CD-36A1	upper	CCM	DCA	0	10.9	11	11	0.1	ug/L
CD-36A1	upper	CCM	DCE	0	1.85	1.76	1.76	-0.09	ug/L
CD-36A1	upper	CCM	MC	0	0	0	0	0	ug/L
CD-36A1	upper	CCM	PCE	0	0	0	0	0	ug/L
CD-36A1	upper	CCM	TCE	0	0	0	0	0	ug/L
CD-36A1	upper	CCM	VC	0	0	0	0	0	ug/L
CD-37A1	upper	CCM	TCA	0	0	0	0	0	ug/L
CD-37A1	upper	CCM	DCA	0	0	0	0	0	ug/L
CD-37A1	upper	CCM	DCE	0	0	0	0	0	ug/L
CD-37A1	upper	CCM	MC	0	0	0	0	0	ug/L
CD-37A1	upper	CCM	PCE	0	0	0	0	0	ug/L
CD-37A1	upper	CCM	TCE	0	0	0	0	0	ug/L
CD-37A1	upper	CCM	VC	0	0	0	0	0	ug/L
CD-38A1	upper	CCM	TCA	0	0	0	0	0	ug/L
CD-38A1	upper	CCM	DCA	0	0	0	0	0	ug/L
CD-38A1	upper	CCM	DCE	0	0	0	0	0	ug/L
CD-38A1	upper	CCM	MC	0	0	0	0	0	ug/L

StationID	Aquifer	Program	Analyte	2019 Results	2023 Results	Current Year Results	5-Year Difference	1-Year Difference	Units
CD-38A1	upper	CCM	PCE	0	0	0	0	0	ug/L
CD-38A1	upper	CCM	TCE	0	0	0	0	0	ug/L
CD-38A1	upper	CCM	VC	0	0	0	0	0	ug/L
CD-40C1	upper	CCM	TCA	1.33	0.58	0	**-1.33**	**-0.58**	ug/L
CD-40C1	upper	CCM	DCA	1.48	0.89	0.61	**-0.87**	**-0.28**	ug/L
CD-40C1	upper	CCM	DCE	1.06	0.98	0.67	**-0.39**	**-0.31**	ug/L
CD-40C1	upper	CCM	MC	0	0	0	0	0	ug/L
CD-40C1	upper	CCM	PCE	0	0	0	0	0	ug/L
CD-40C1	upper	CCM	TCE	0	0	0	0	0	ug/L
CD-40C1	upper	CCM	VC	0	0	0	0	0	ug/L
CP-S3	upper	CCM	TCA	0	0	0	0	0	ug/L
CP-S3	upper	CCM	DCA	0	0	0	0	0	ug/L
CP-S3	upper	CCM	DCE	0	0	0	0	0	ug/L
CP-S3	upper	CCM	MC	0	0	0	0	0	ug/L
CP-S3	upper	CCM	PCE	0	0	0	0	0	ug/L
CP-S3	upper	CCM	TCE	0	0	0	0	0	ug/L
CP-S3	upper	CCM	VC	0	0	0	0	0	ug/L
1473M-1	upper	CCM/res	TCA	0	N/A	N/A	N/A	N/A	ug/L
1473M-1	upper	CCM/res	DCA	0	N/A	N/A	N/A	N/A	ug/L
1473M-1	upper	CCM/res	DCE	0	N/A	N/A	N/A	N/A	ug/L
1473M-1	upper	CCM/res	MC	0	N/A	N/A	N/A	N/A	ug/L
1473M-1	upper	CCM/res	PCE	0	N/A	N/A	N/A	N/A	ug/L
1473M-1	upper	CCM/res	TCE	0	N/A	N/A	N/A	N/A	ug/L
1473M-1	upper	CCM/res	VC	0	N/A	N/A	N/A	N/A	ug/L
CD-03A1	upper	MFS	TCA	0	0	0	0	0	ug/L
CD-03A1	upper	MFS	DCA	0	0	0	0	0	ug/L
CD-03A1	upper	MFS	DCE	0	0	0	0	0	ug/L
CD-03A1	upper	MFS	MC	0	0	0	0	0	ug/L
CD-03A1	upper	MFS	PCE	0	0	0	0	0	ug/L
CD-03A1	upper	MFS	TCE	0	0	0	0	0	ug/L
CD-03A1	upper	MFS	VC	0	0	0	0	0	ug/L
CD-60A1	upper	MFS	TCA	0	0	0	0	0	ug/L
CD-60A1	upper	MFS	DCA	0	0	0	0	0	ug/L
CD-60A1	upper	MFS	DCE	0	0	0	0	0	ug/L
CD-60A1	upper	MFS	MC	0	0	0	0	0	ug/L
CD-60A1	upper	MFS	PCE	0	0	0	0	0	ug/L
CD-60A1	upper	MFS	TCE	0	0	0	0	0	ug/L
CD-60A1	upper	MFS	VC	0	0	0	0	0	ug/L
CD-61A1	upper	MFS	TCA	1.5	1.05	0	**-1.5**	**-1.05**	ug/L
CD-61A1	upper	MFS	DCA	0	0	0	0	0	ug/L
CD-61A1	upper	MFS	DCE	0	0	0	0	0	ug/L

StationID	Aquifer	Program	Analyte	2019 Results	2023 Results	Current Year Results	5-Year Difference	1-Year Difference	Units
CD-61A1	upper	MFS	MC	0	0	0	0	0	ug/L
CD-61A1	upper	MFS	PCE	0	0	0	0	0	ug/L
CD-61A1	upper	MFS	TCE	0	0	0	0	0	ug/L
CD-61A1	upper	MFS	VC	0	0	0	0	0	ug/L
CS-04A1	upper	MFS	TCA	0	0	0	0	0	ug/L
CS-04A1	upper	MFS	DCA	0.64	1.33	1.2	0.56	-0.13	ug/L
CS-04A1	upper	MFS	DCE	0	0	0	0	0	ug/L
CS-04A1	upper	MFS	MC	0	0	0	0	0	ug/L
CS-04A1	upper	MFS	PCE	0	0	0	0	0	ug/L
CS-04A1	upper	MFS	TCE	0.56	0.65	0.62	0.06	-0.03	ug/L
CS-04A1	upper	MFS	VC	0	0	0	0	0	ug/L
CP-S1	upper	SD	TCA	0.82	0.54	0	-0.82	-0.54	ug/L
CP-S1	upper	SD	DCA	1.53	1.34	0.95	-0.58	-0.39	ug/L
CP-S1	upper	SD	DCE	0	0	0	0	0	ug/L
CP-S1	upper	SD	MC	0	0	0	0	0	ug/L
CP-S1	upper	SD	PCE	0	0	0	0	0	ug/L
CP-S1	upper	SD	TCE	1.42	0.97	0.82	-0.6	-0.15	ug/L
CP-S1	upper	SD	VC	0	0	0	0	0	ug/L
CP-S4	upper	SD	TCA	0.61	0.51	0	-0.61	-0.51	ug/L
CP-S4	upper	SD	DCA	1.36	1.21	0	-1.36	-1.21	ug/L
CP-S4	upper	SD	DCE	0	0	0	0	0	ug/L
CP-S4	upper	SD	MC	0	0	0	0	0	ug/L
CP-S4	upper	SD	PCE	0	0.62	0	0	-0.62	ug/L
CP-S4	upper	SD	TCE	1.8	2.14	0	-1.8	-2.14	ug/L
CP-S4	upper	SD	VC	0	0	0	0	0	ug/L
CP-S5	upper	SD	TCA	0	0	0	0	0	ug/L
CP-S5	upper	SD	DCA	0	0	0	0	0	ug/L
CP-S5	upper	SD	DCE	0	0	0	0	0	ug/L
CP-S5	upper	SD	MC	0	0	0	0	0	ug/L
CP-S5	upper	SD	PCE	0	0	0	0	0	ug/L
CP-S5	upper	SD	TCE	0	0	0	0	0	ug/L
CP-S5	upper	SD	VC	0	0	0	0	0	ug/L
CP-S6	upper	SD	TCA	0	0	0	0	0	ug/L
CP-S6	upper	SD	DCA	0	0	0.68	0.68	0.68	ug/L
CP-S6	upper	SD	DCE	0	0	0	0	0	ug/L
CP-S6	upper	SD	MC	0	0	0	0	0	ug/L
CP-S6	upper	SD	PCE	0	0	0	0	0	ug/L
CP-S6	upper	SD	TCE	0	0	1.64	1.64	1.64	ug/L
CP-S6	upper	SD	VC	0	0	0	0	0	ug/L

Analytes that exceeded clean-up criteria this reporting period are displayed in **ORANGE**.
Increases in analyte concentrations are highlighted in **RED**.
Decreases in analyte concentrations are highlighted in **BLUE**.

Figure 3-7 Upper Aquifer Compliance Wells TCA Concentrations vs. Time



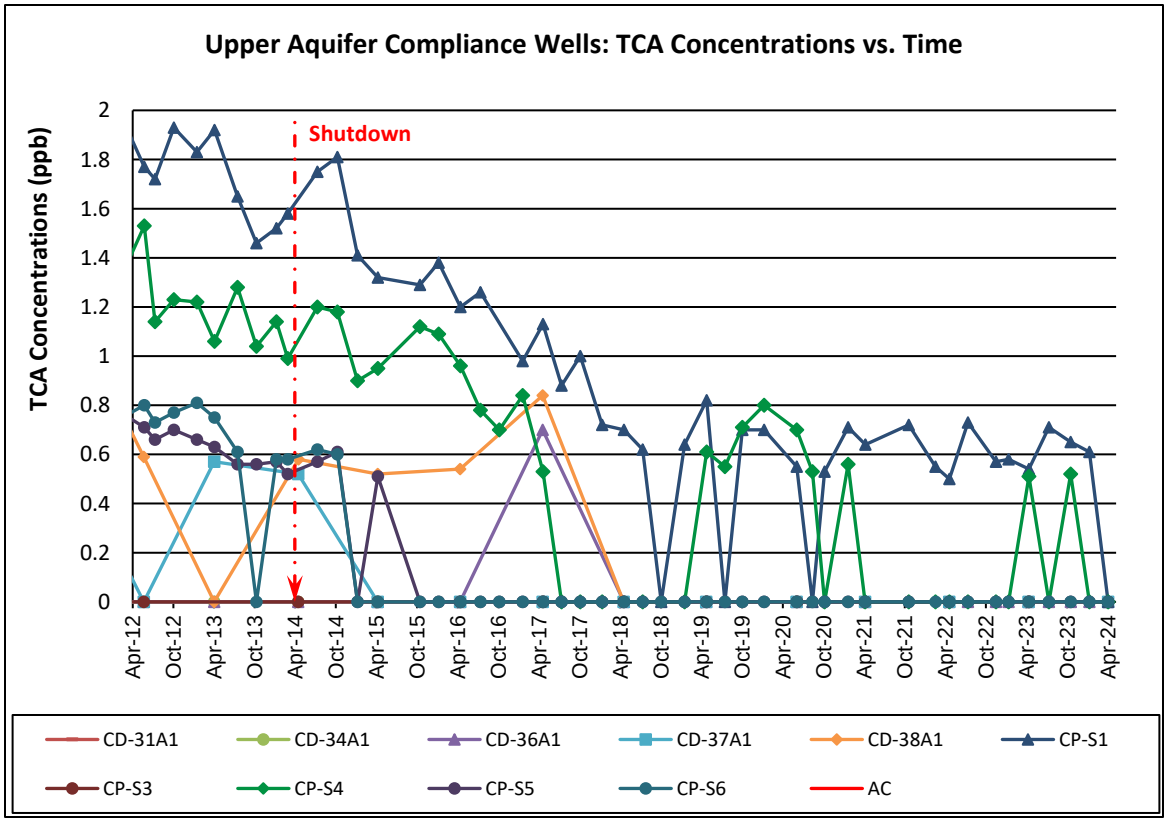
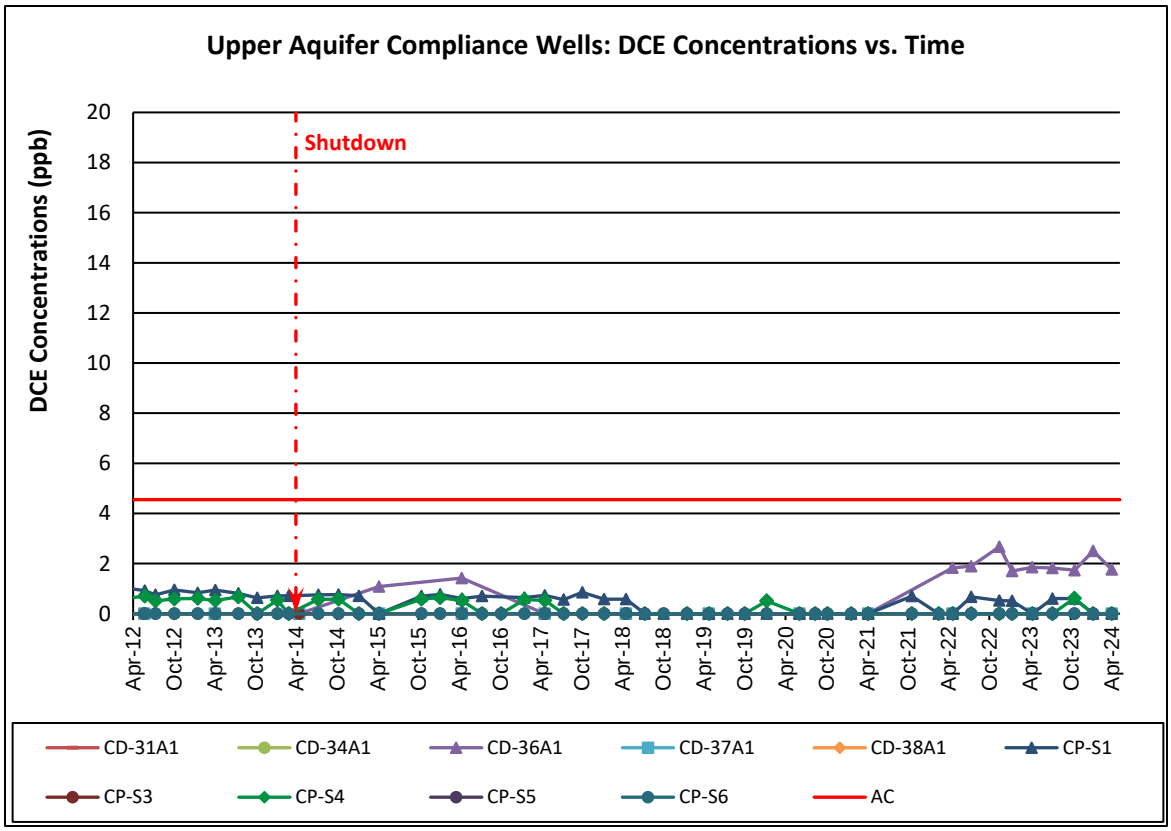


Figure 3-8 Upper Aquifer Compliance Wells DCE Concentrations vs. Time



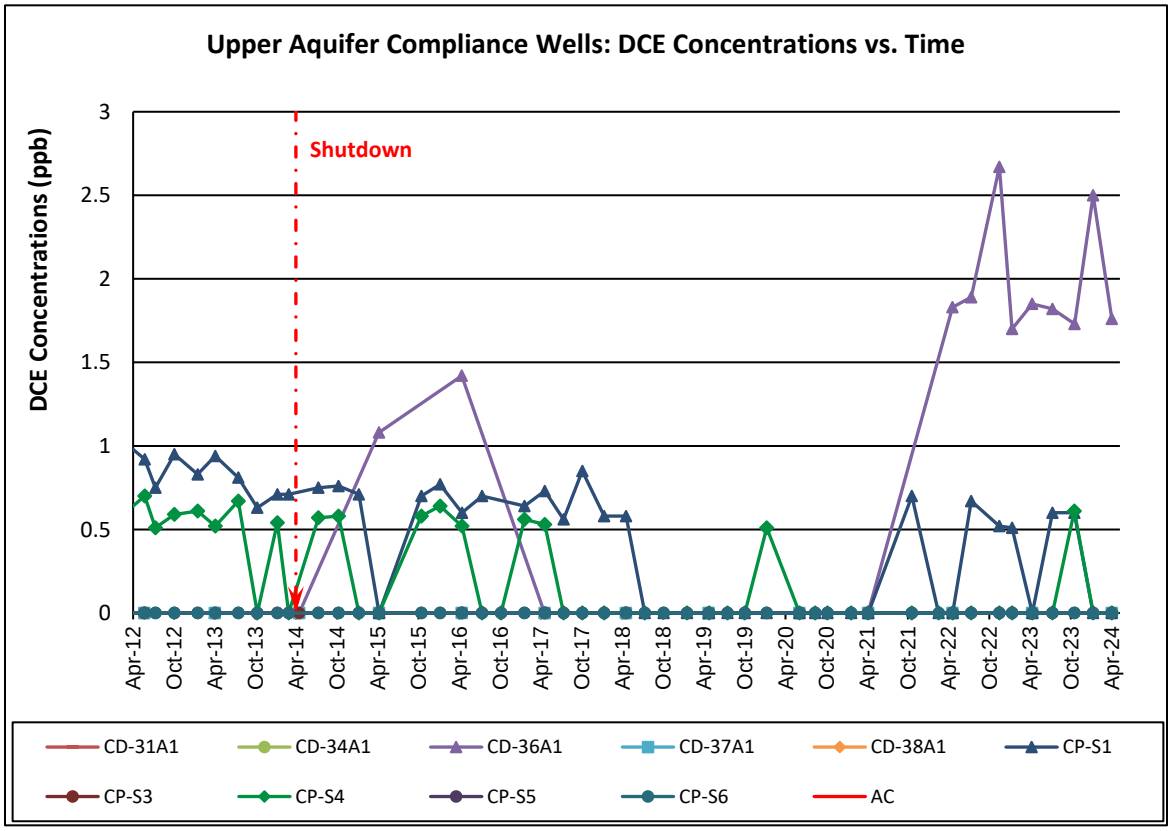
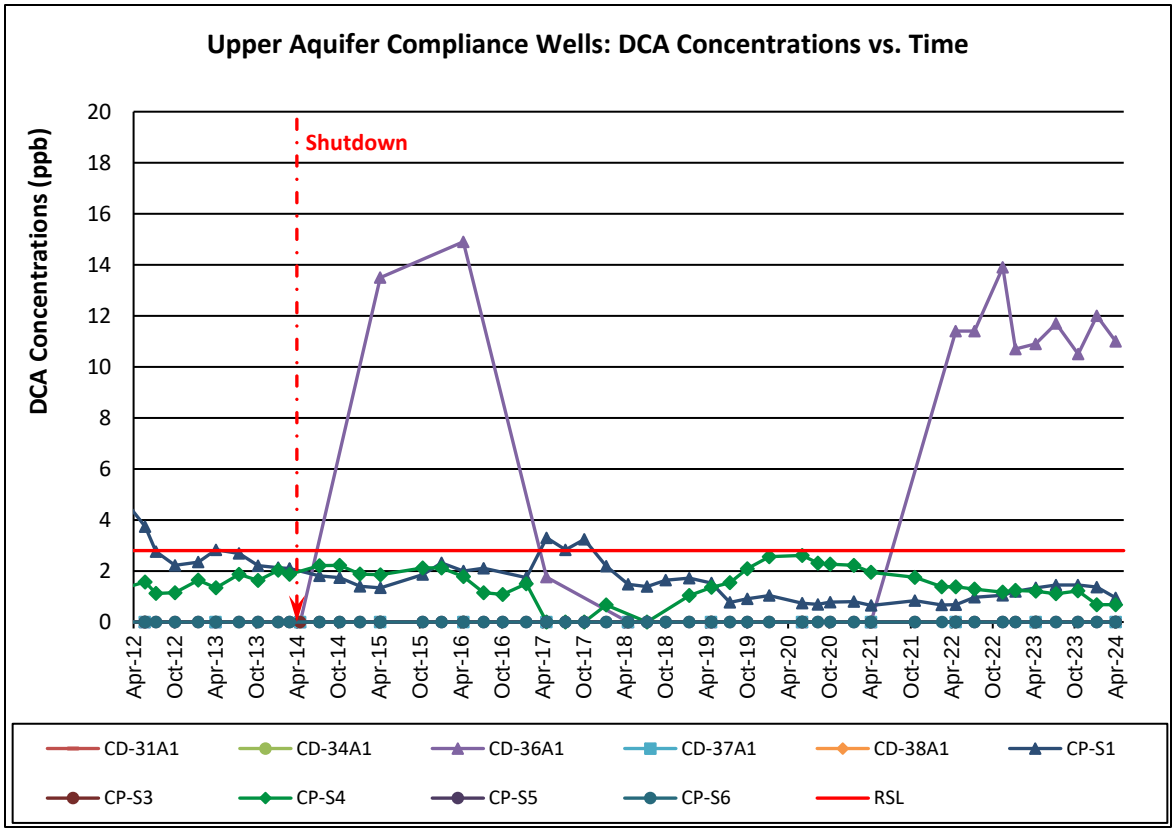


Figure 3-9 Upper Aquifer Compliance Wells DCA Concentrations vs. Time



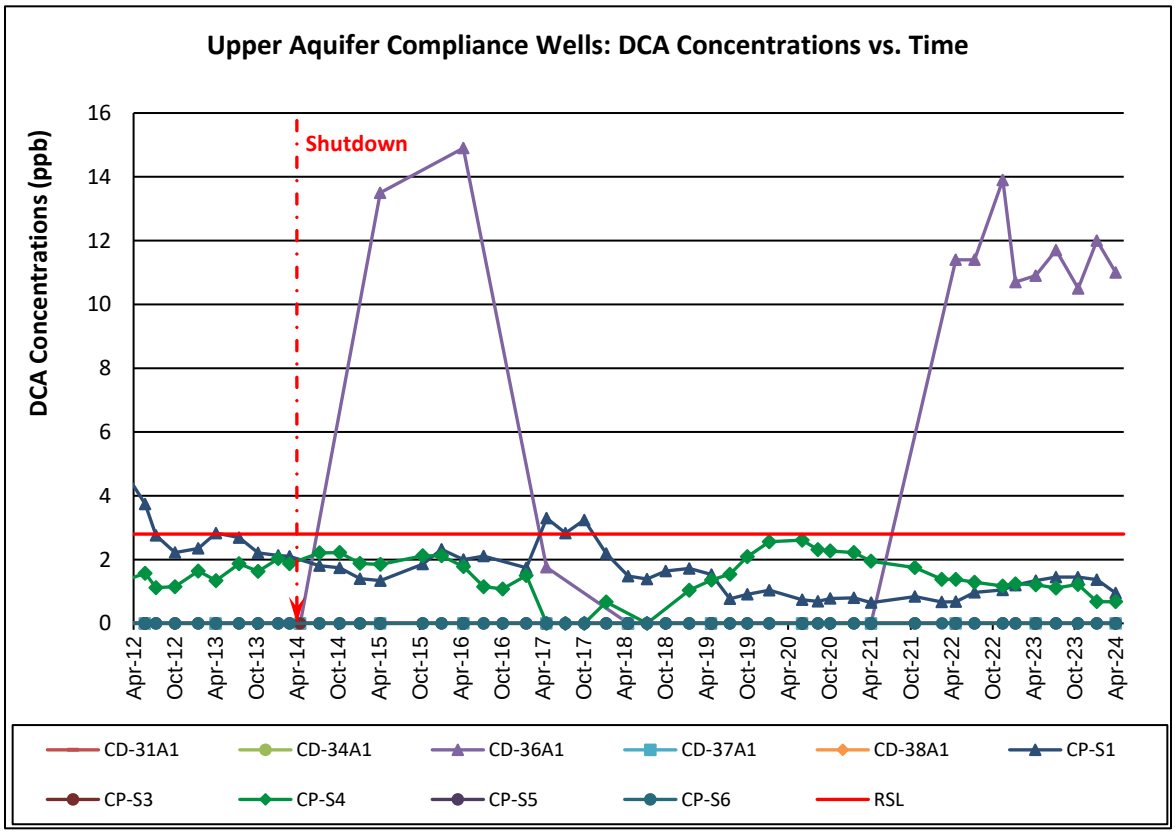
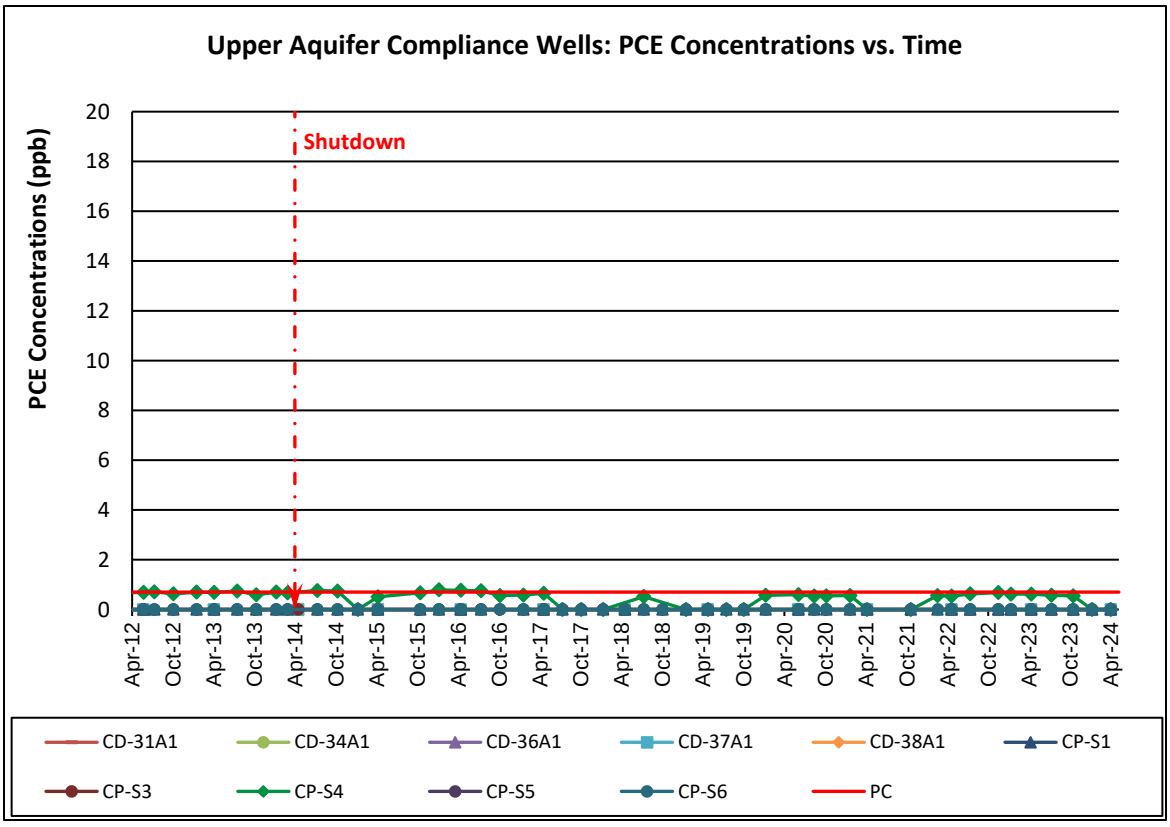


Figure 3-10 Upper Aquifer Compliance Wells PCE Concentrations vs. Time



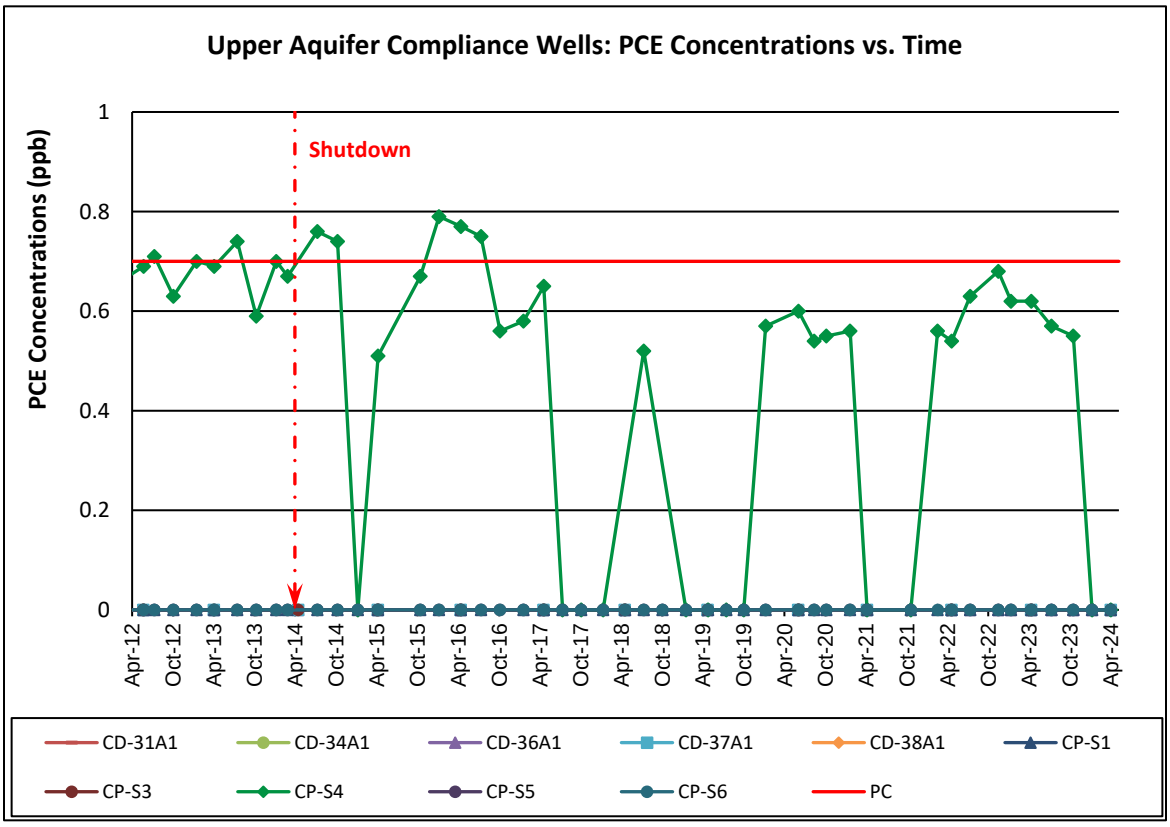
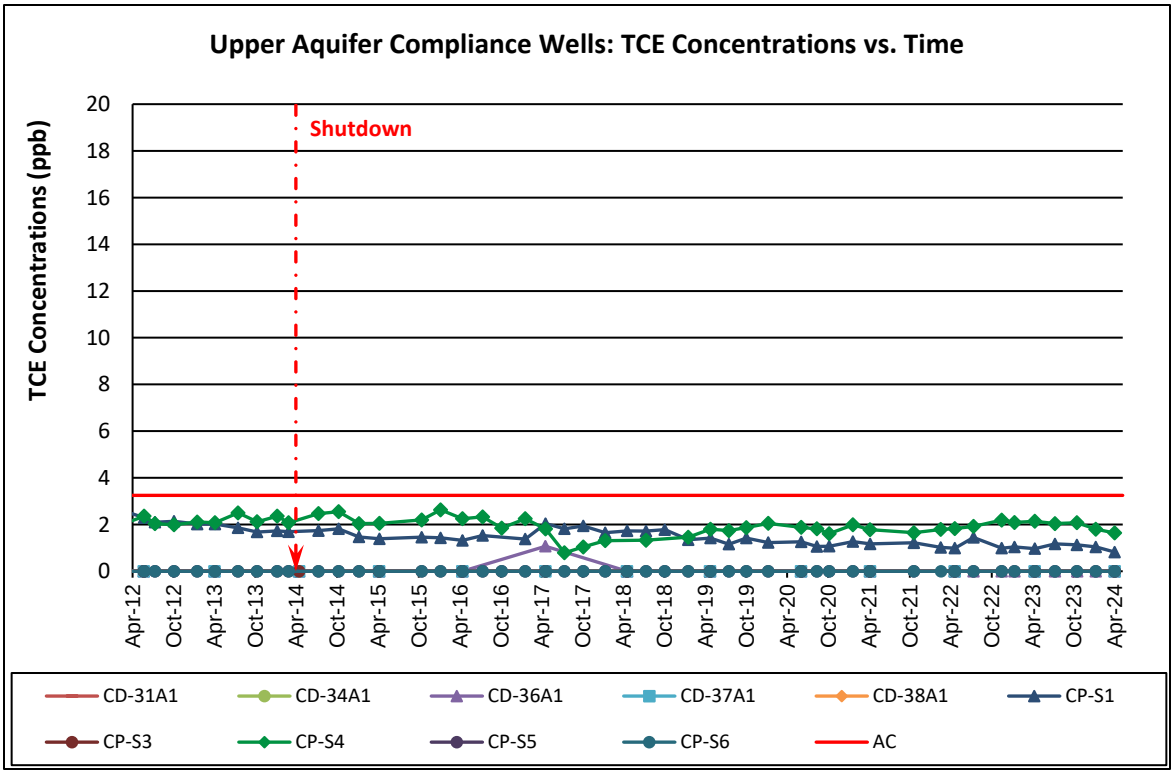
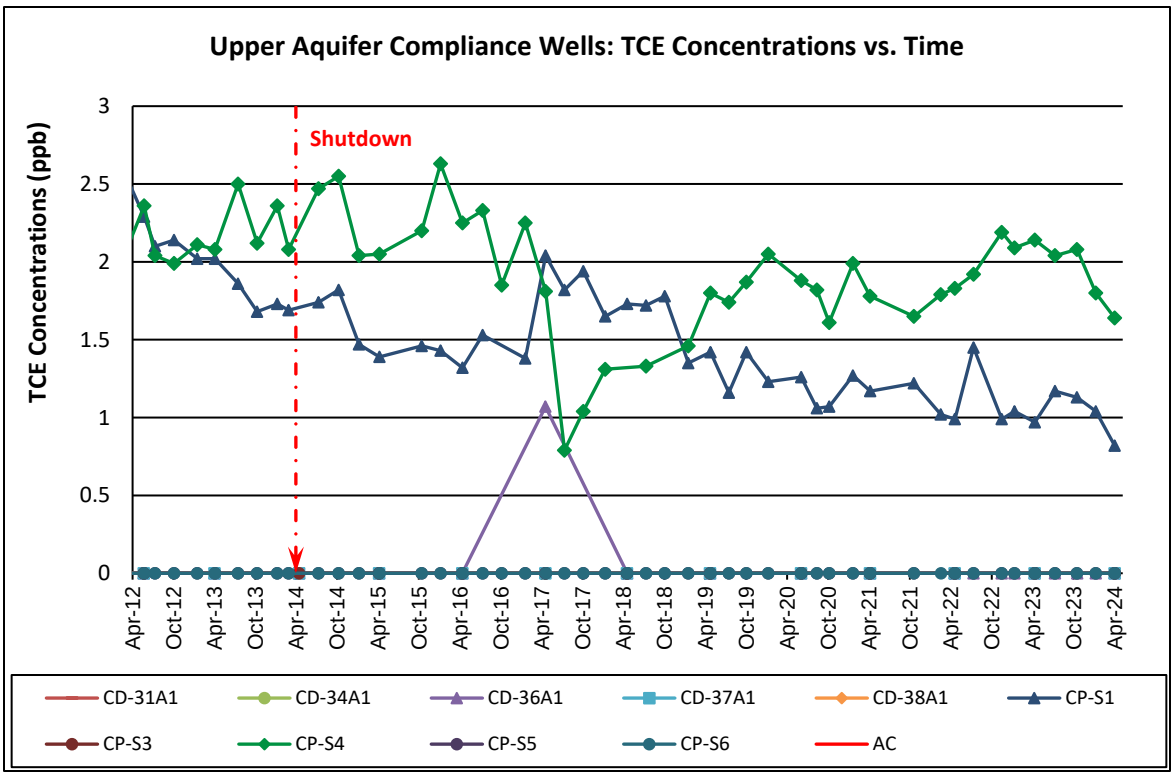


Figure 3-11 Upper Aquifer Compliance Wells TCE Concentrations vs. Time





For all of the COC concentrations vs. time graphs above, non-detection values from the laboratory are displayed as 0 ppb.

Figure 3-12 Upper Aquifer Estimated TCA Plume

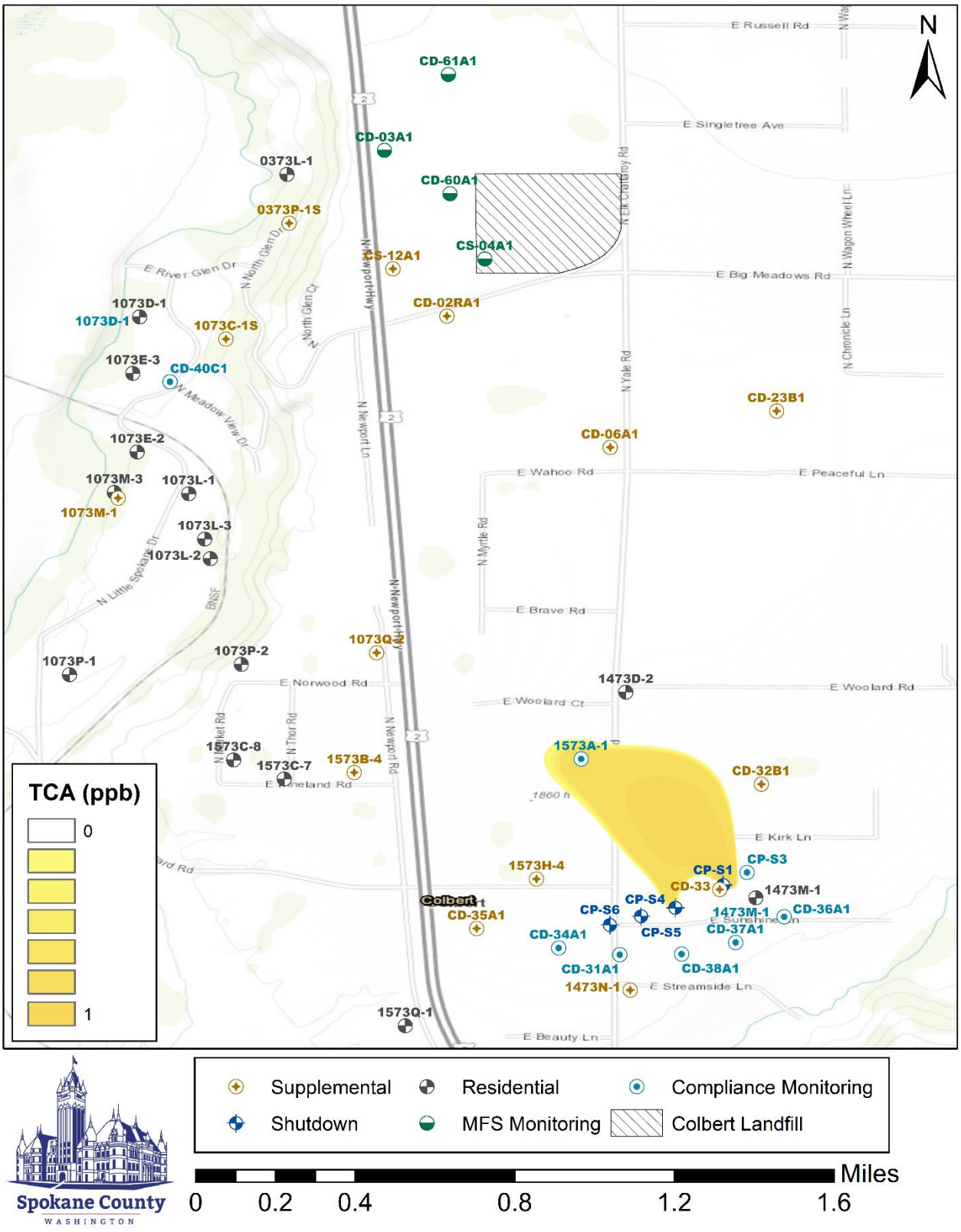


Figure 3-13 Upper Aquifer TCA Detections Map

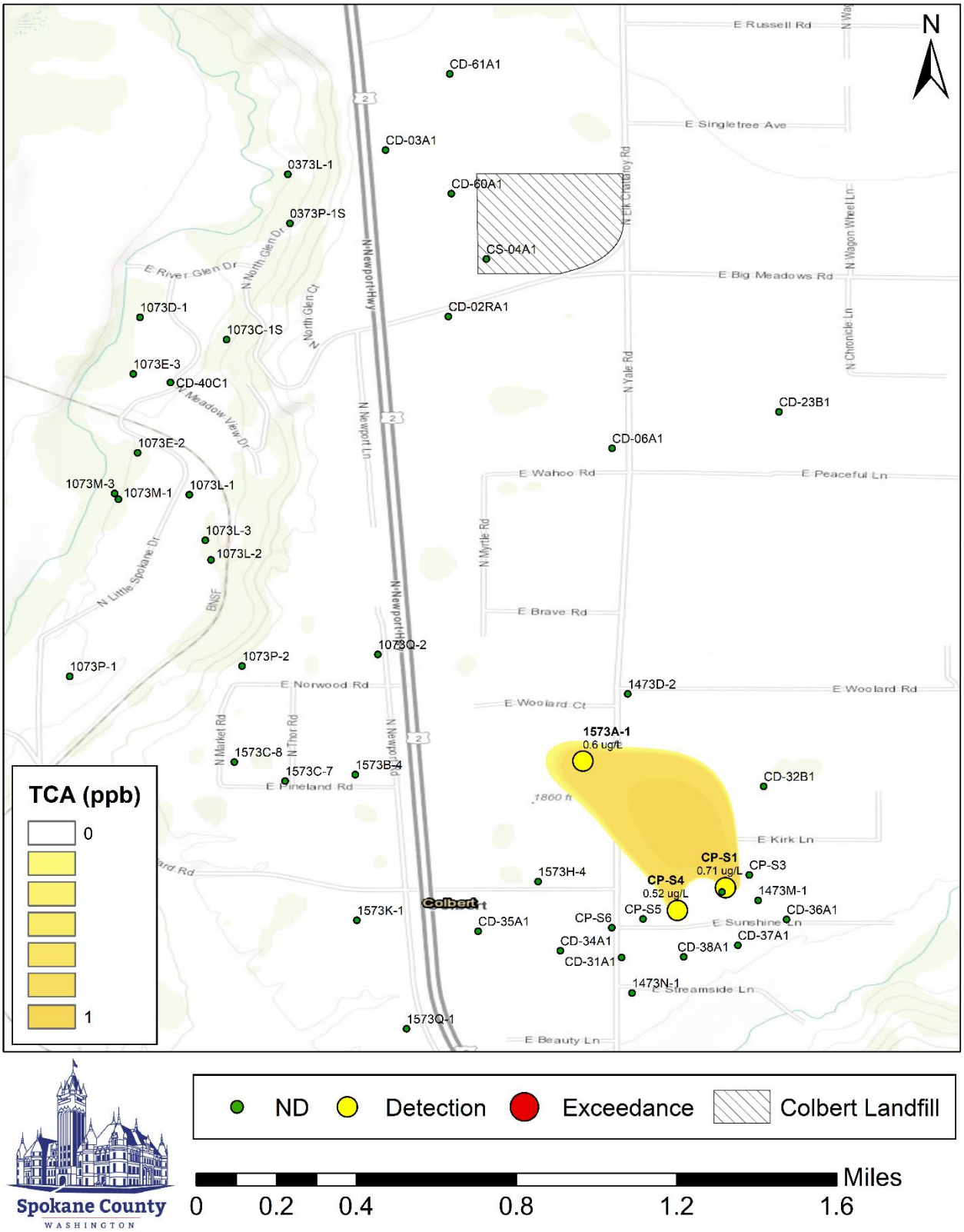


Figure 3-14 Upper Aquifer Estimated DCA Plume

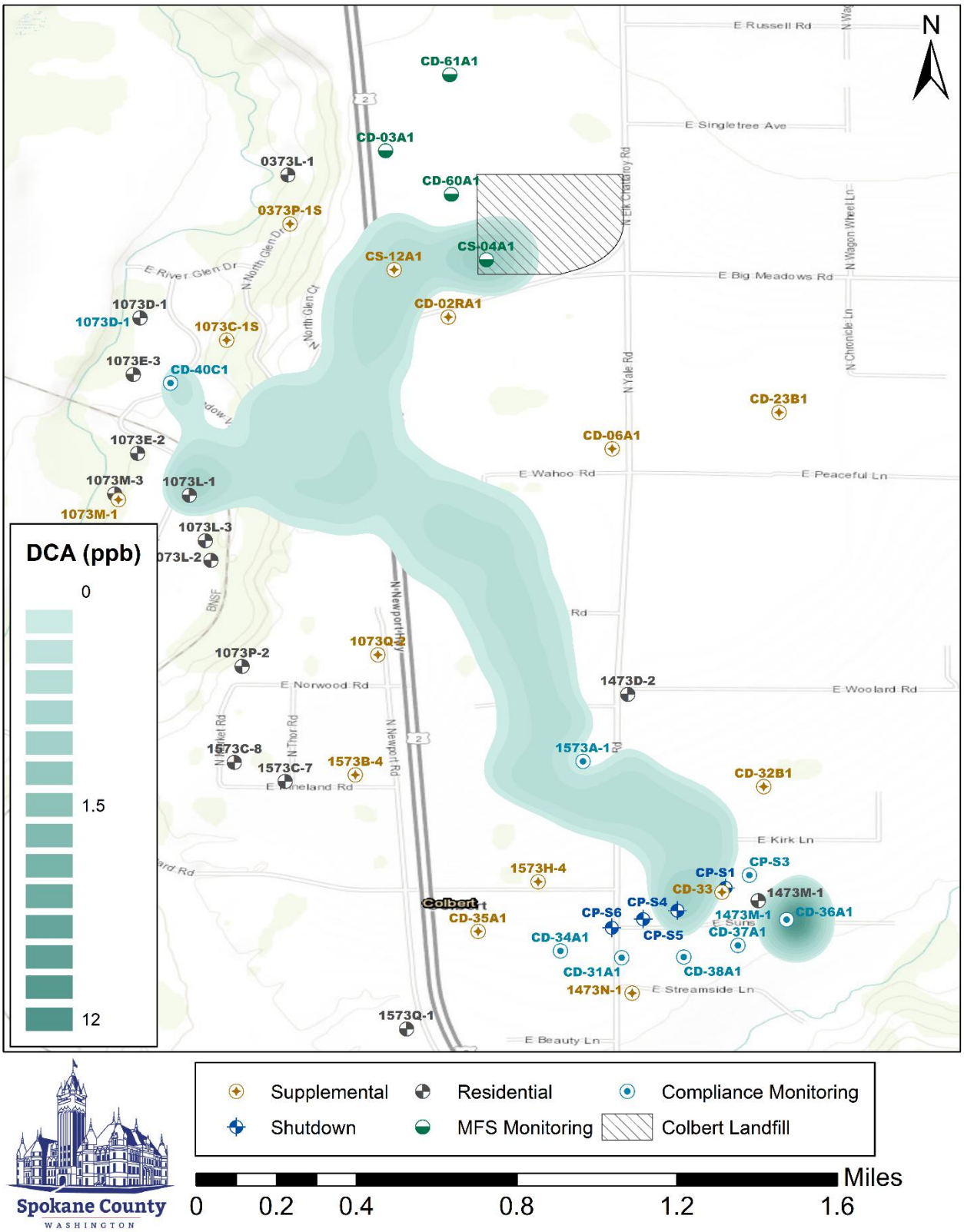


Figure 3-15 Upper Aquifer DCA Detections Map

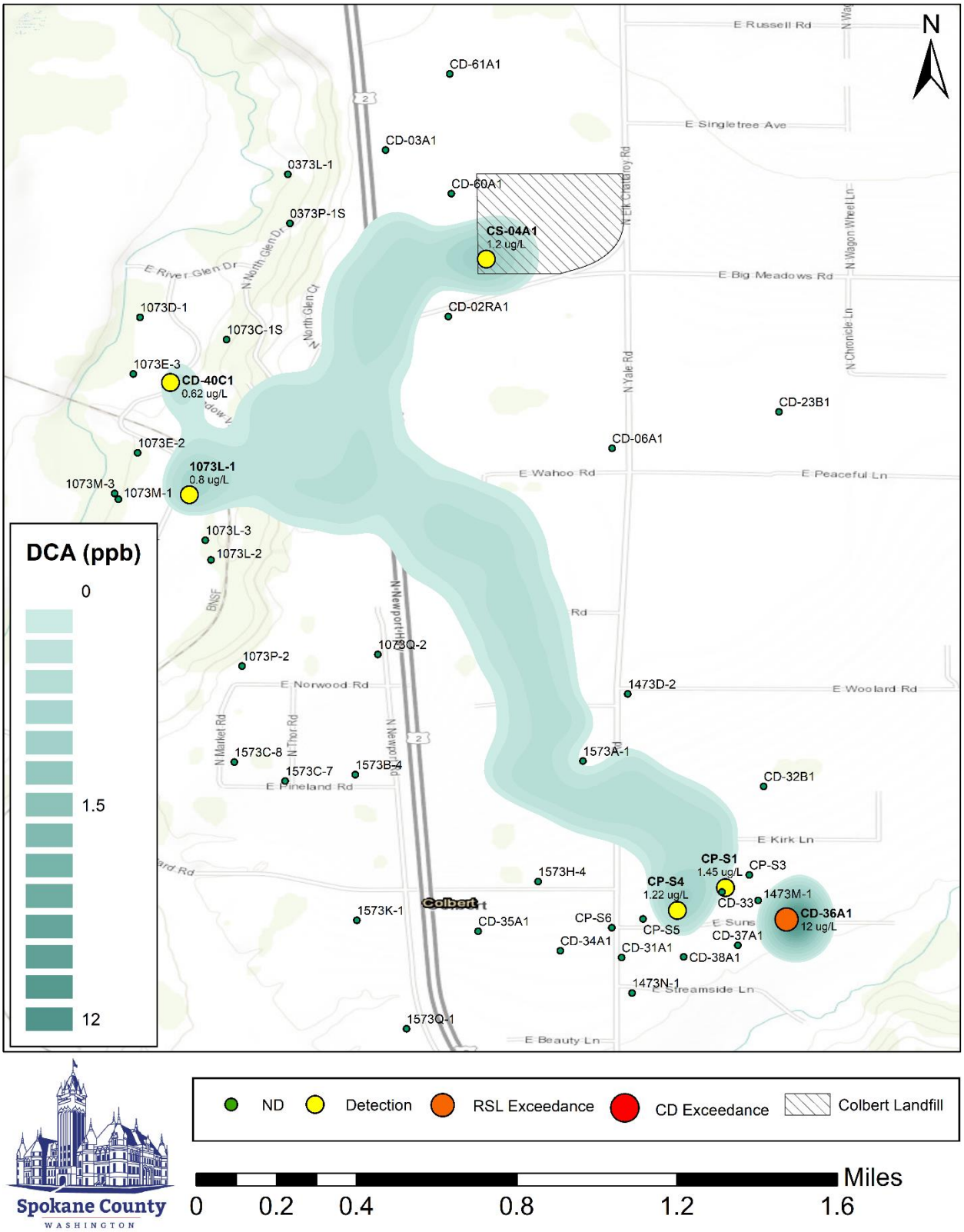


Figure 3-16 Upper Aquifer Estimated DCE Plume

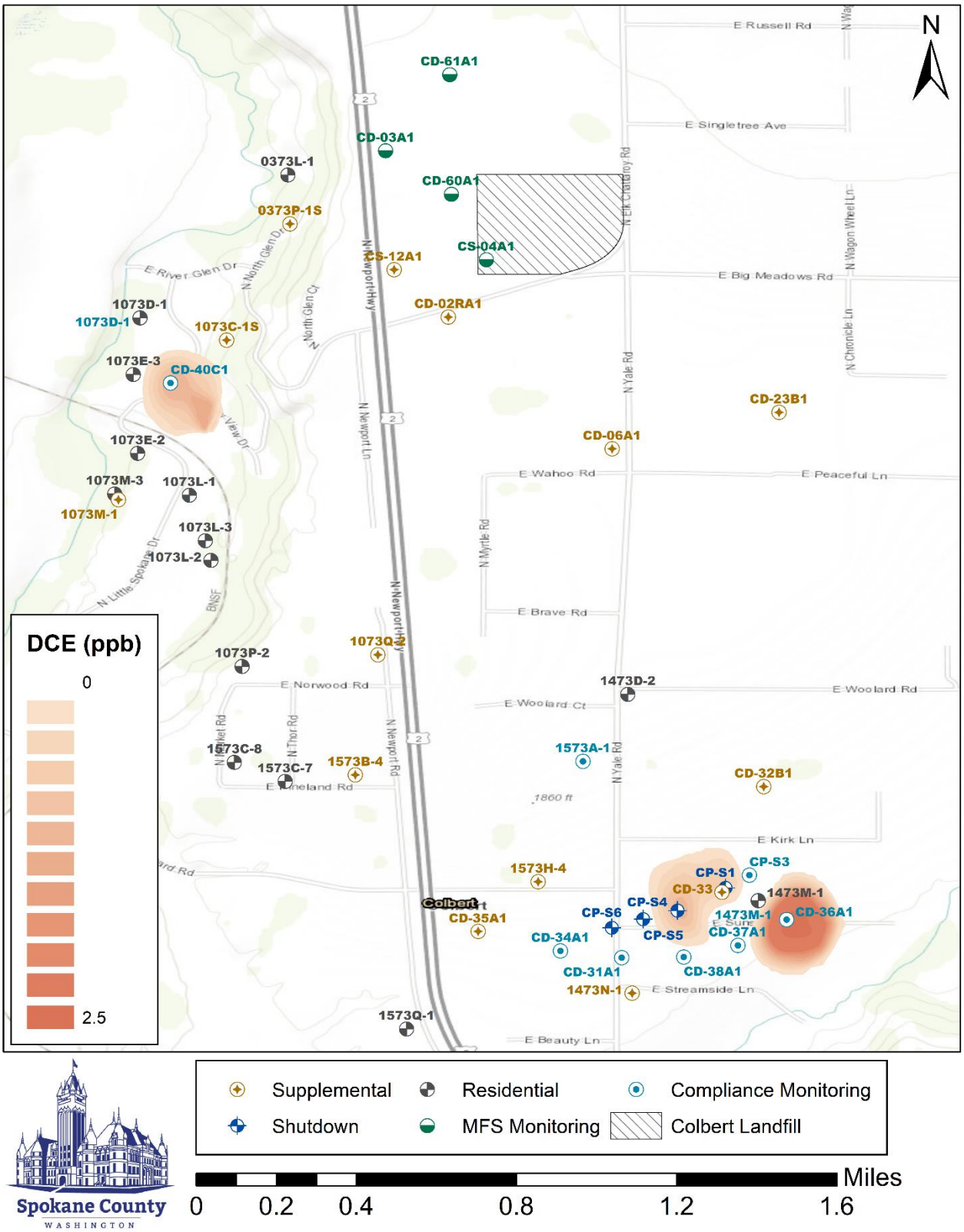


Figure 3-17 Upper Aquifer DCE Detections Map

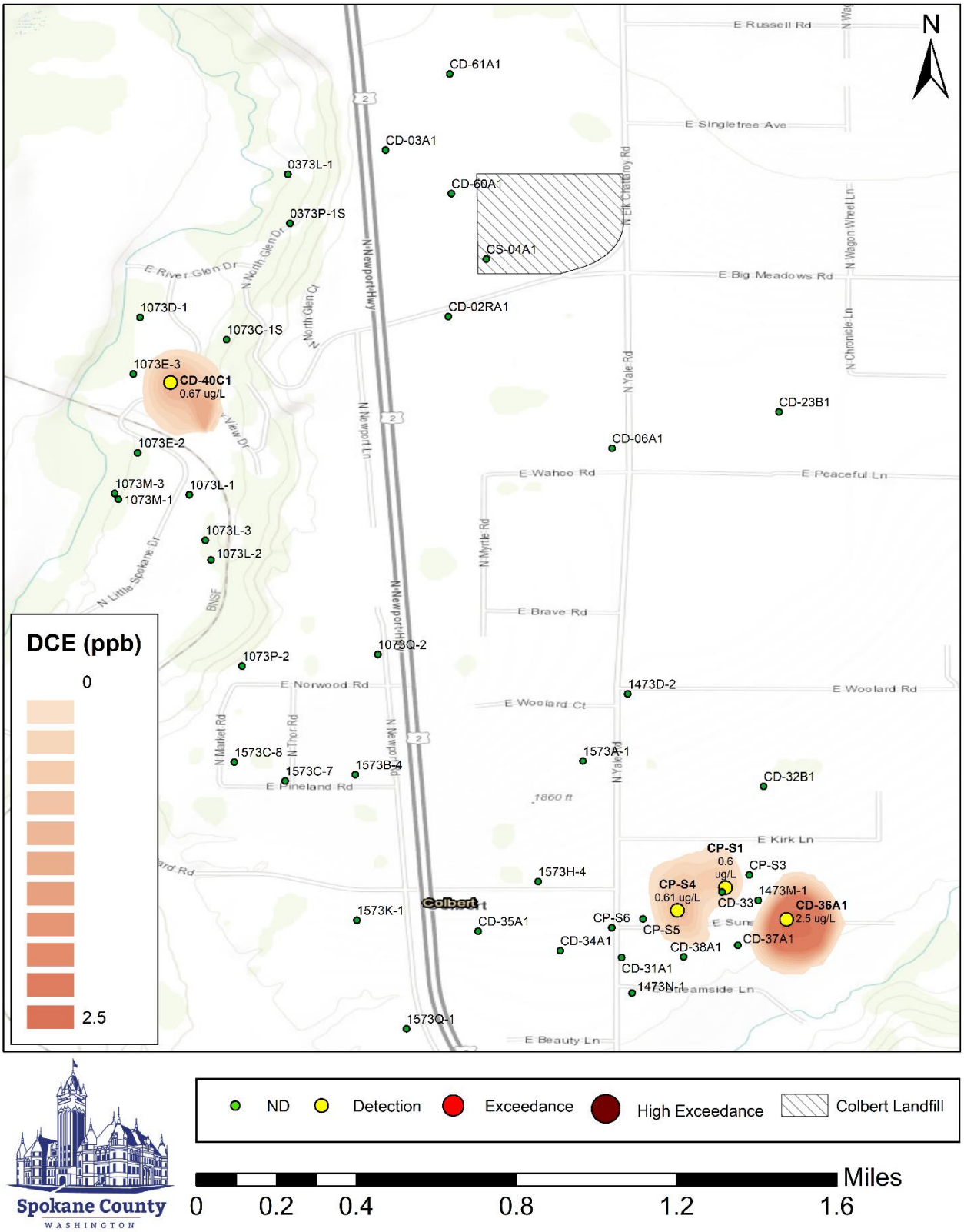


Figure 3-18 Upper Aquifer Estimated PCE Plume

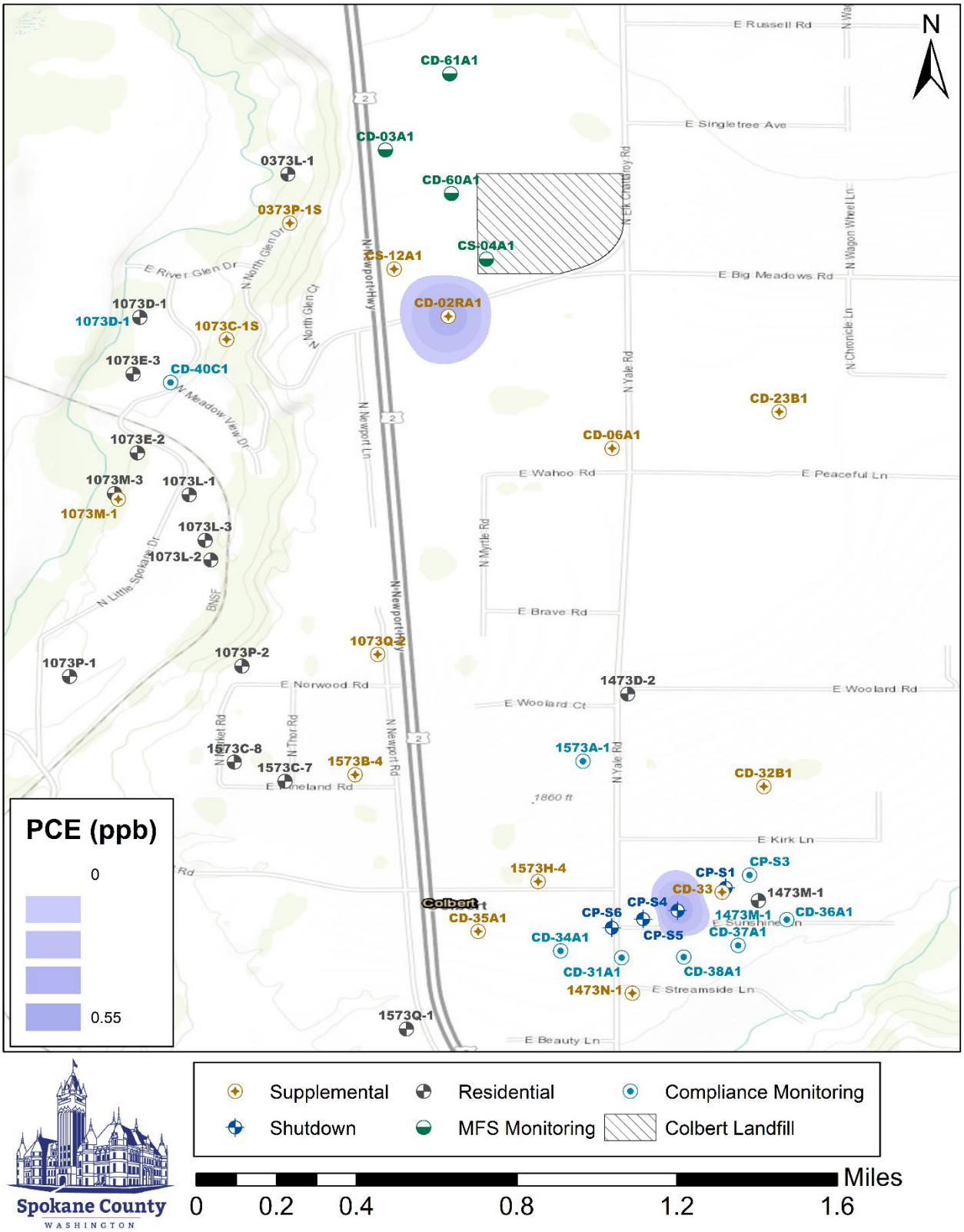


Figure 3-19 Upper Aquifer PCE Detections Map

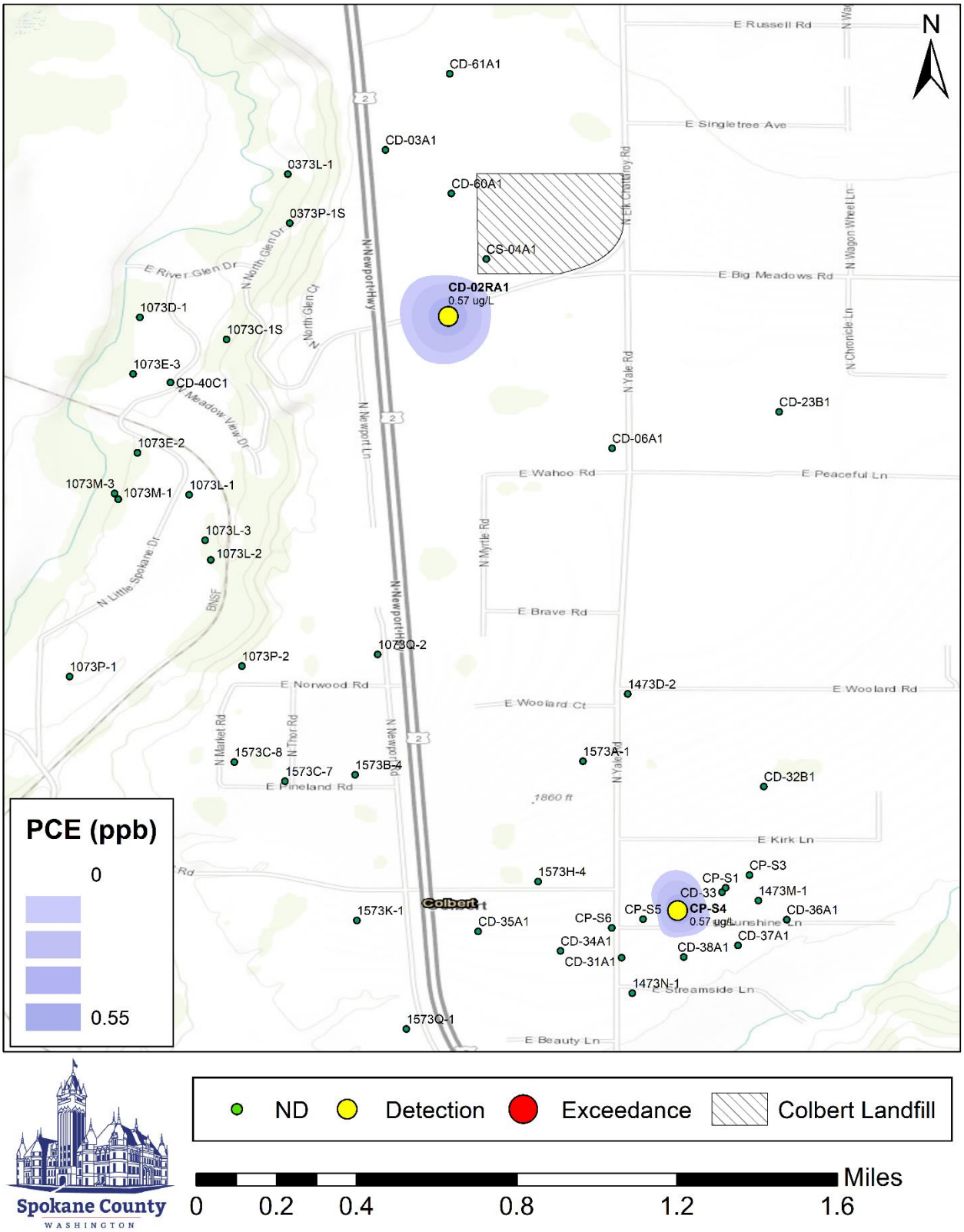


Figure 3-20 Upper Aquifer Estimated TCE Plume

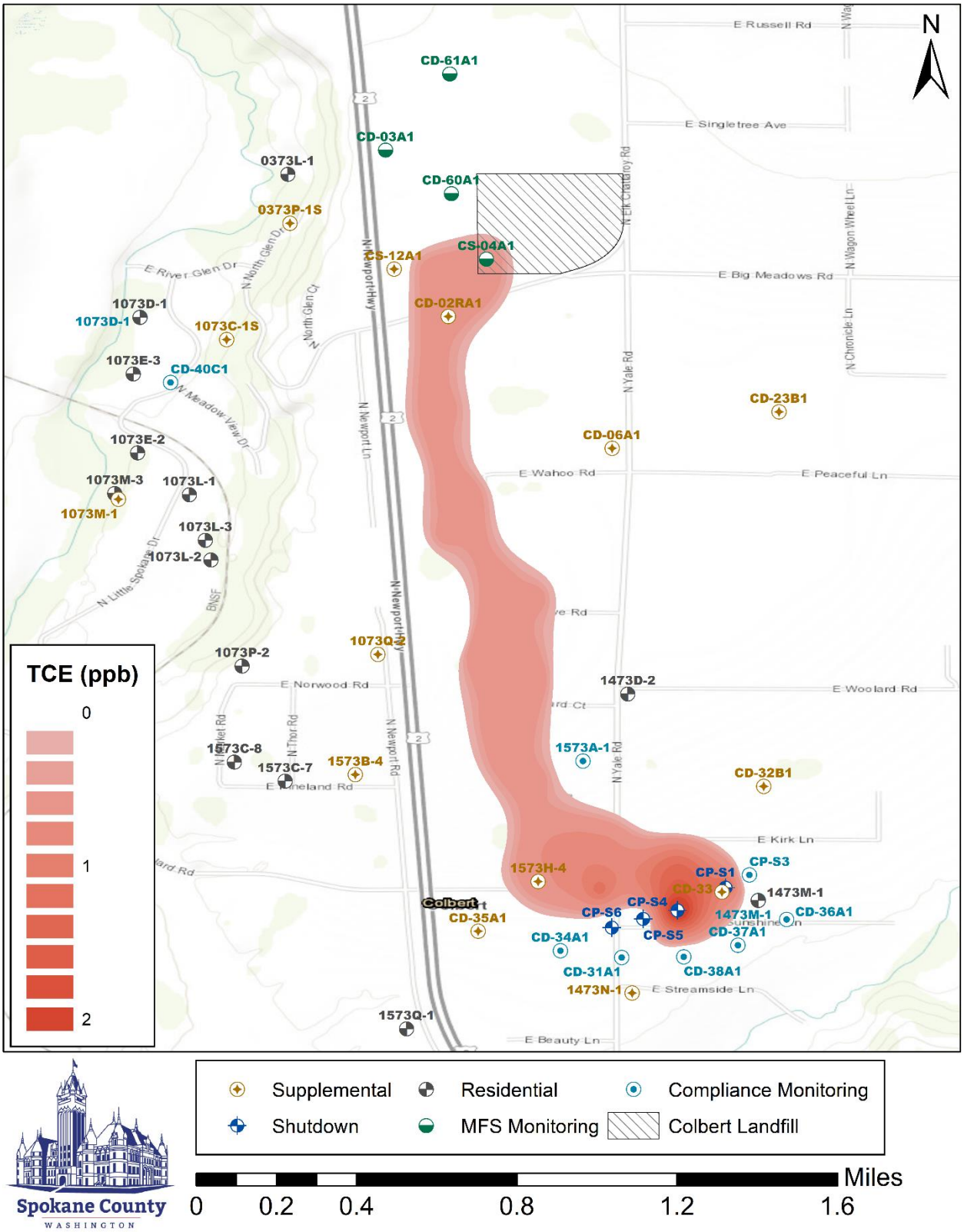


Figure 3-21 Upper Aquifer TCE Detections Map

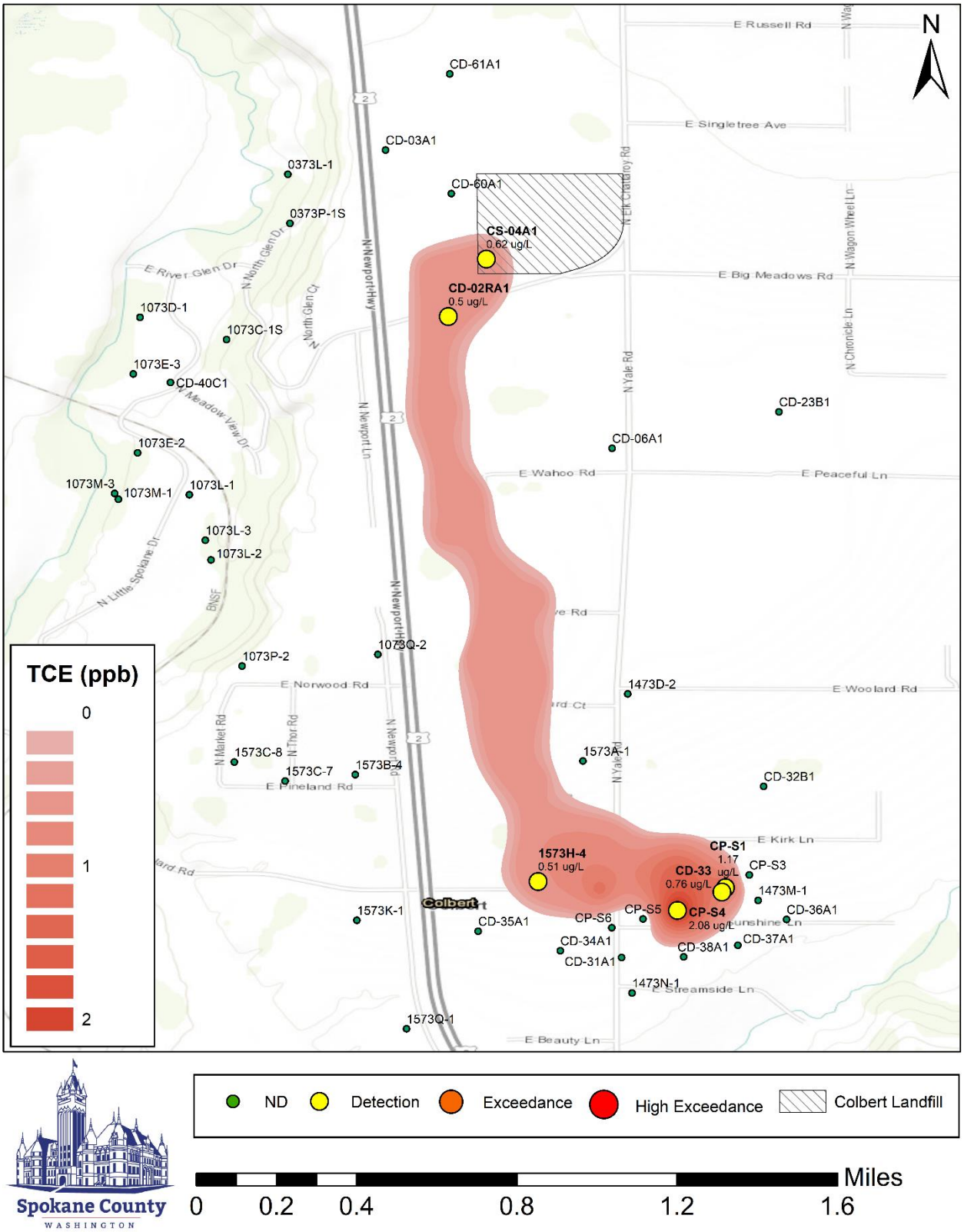


Figure 3-22 Upper Aquifer All Analytes Estimated Plume Map

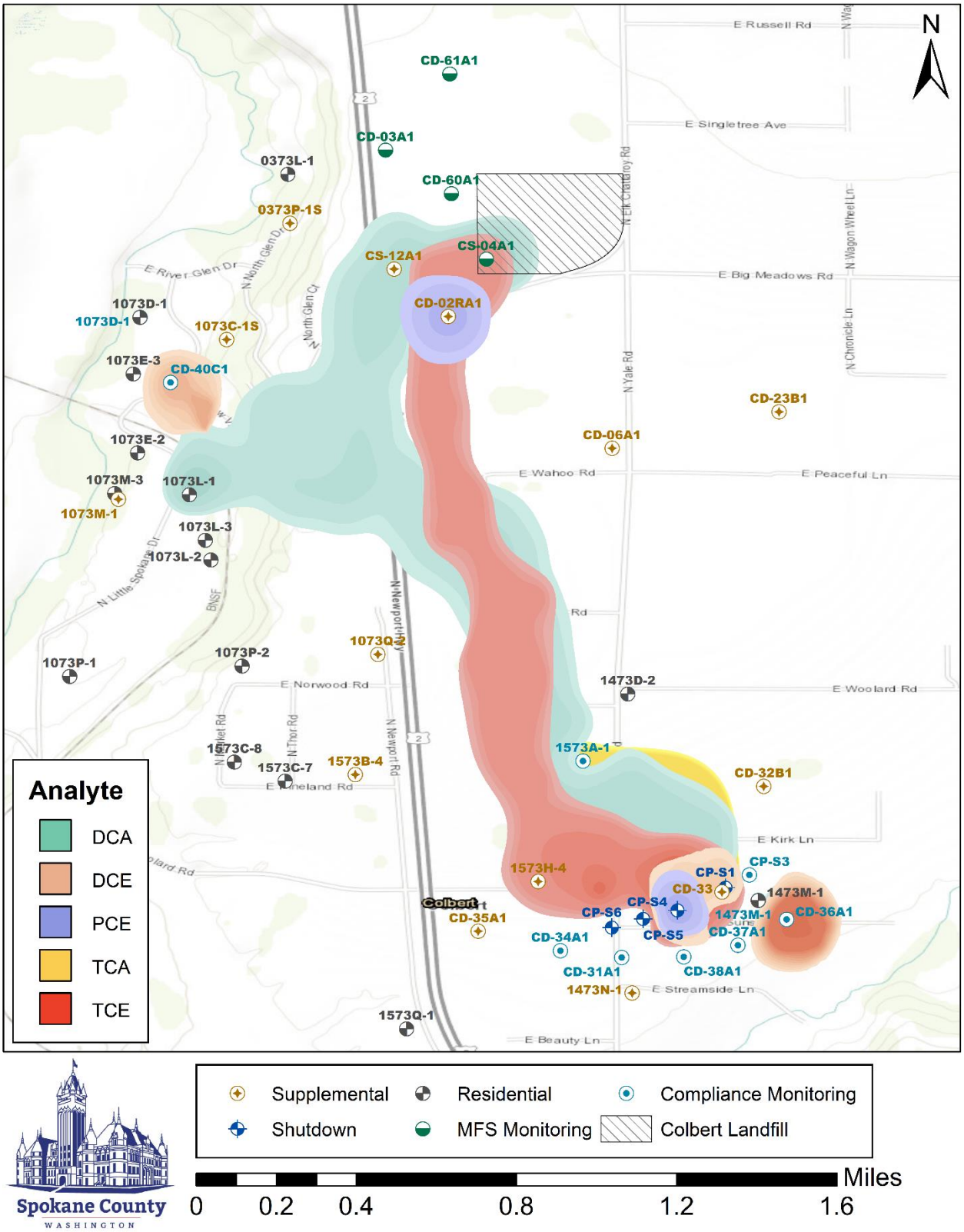
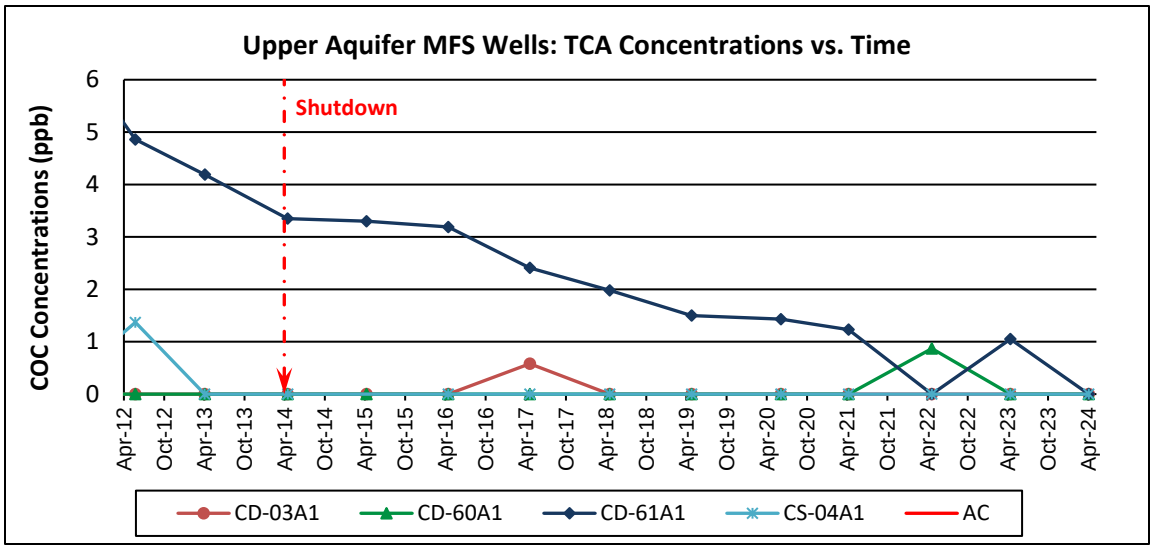
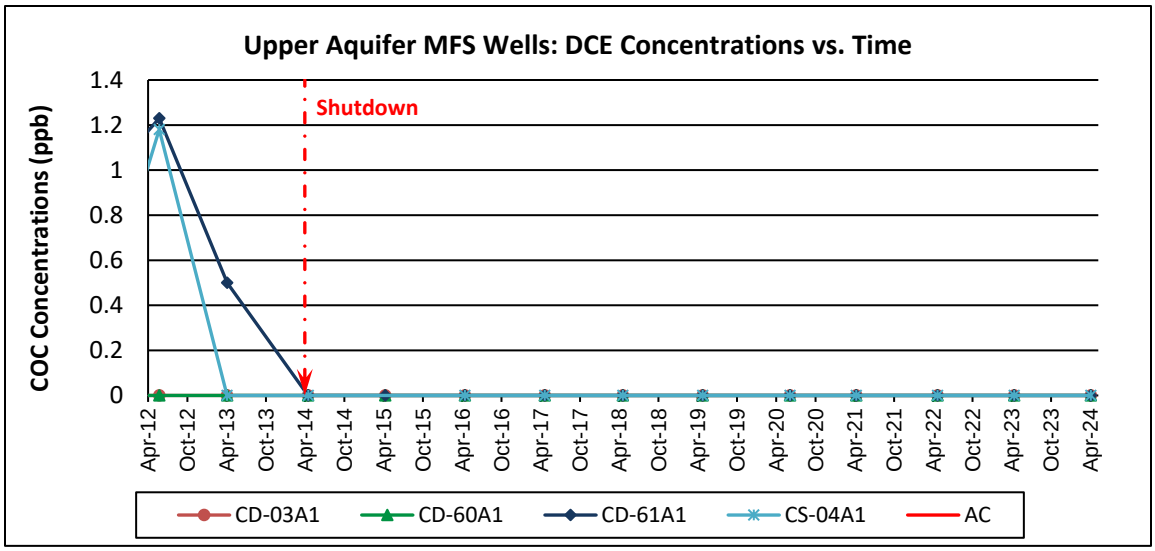


Figure 3-23 Upper Aquifer MFS Wells COC Concentrations vs. Time





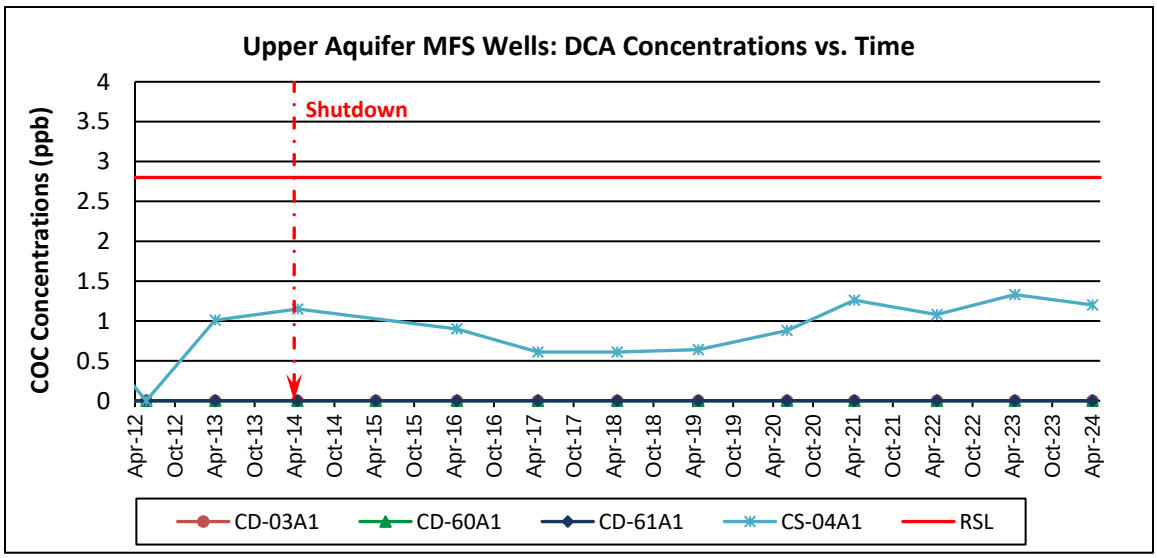


Figure 3-24 Upper Aquifer MFS Wells COC Concentrations vs. Time

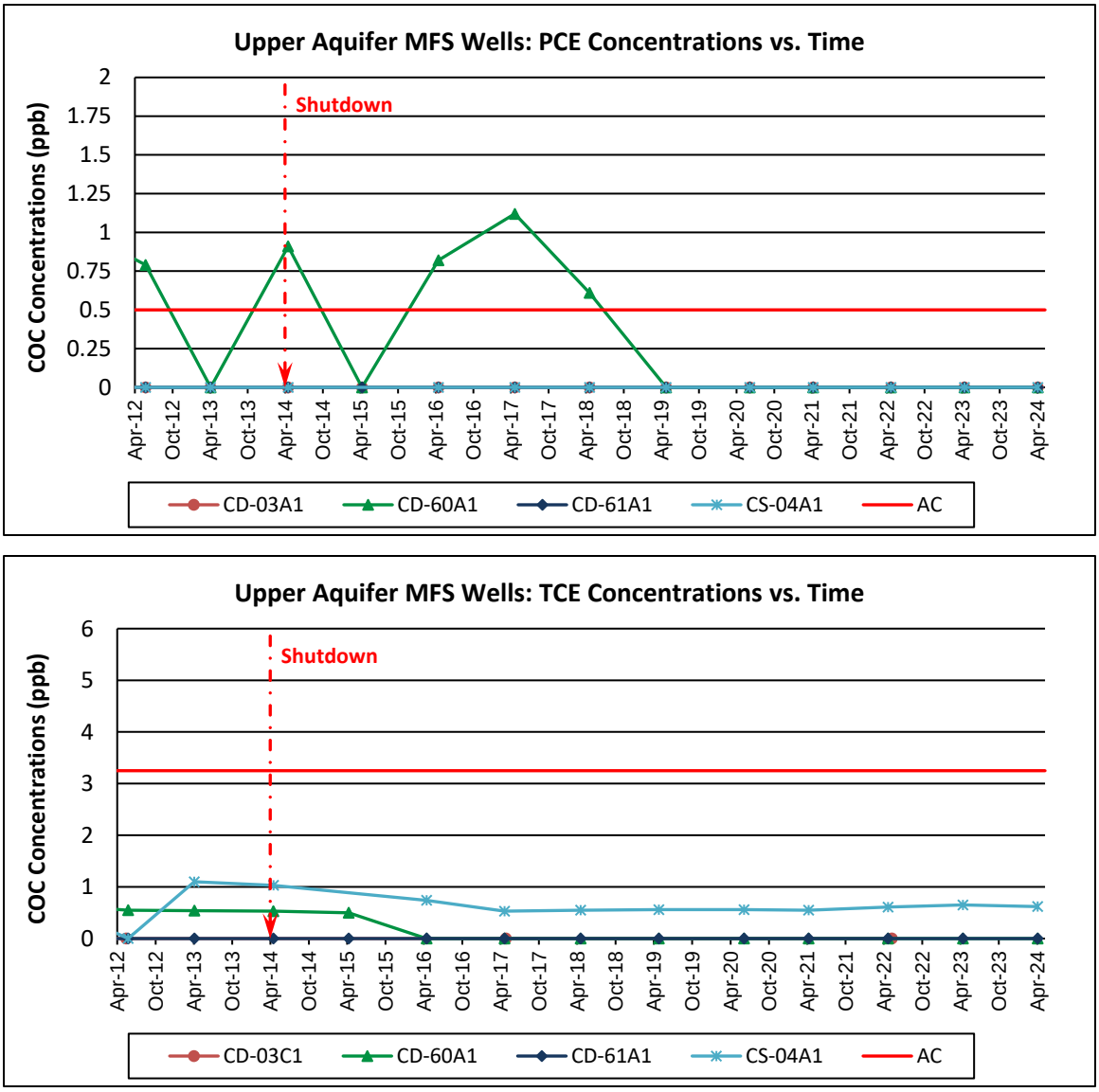
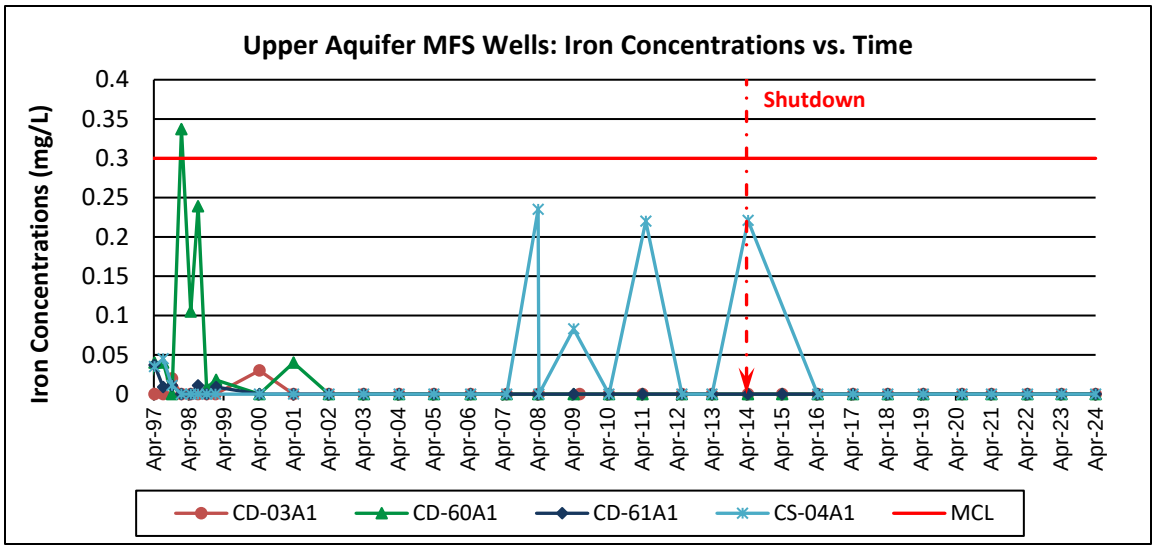
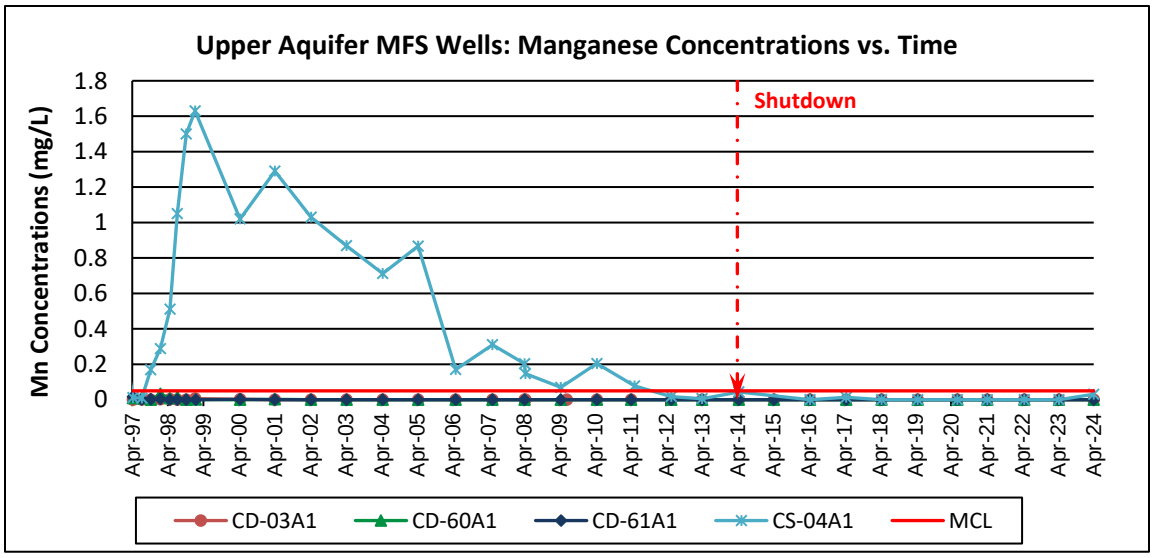


Figure 3-25 Upper Aquifer MFS Parameters vs. Time





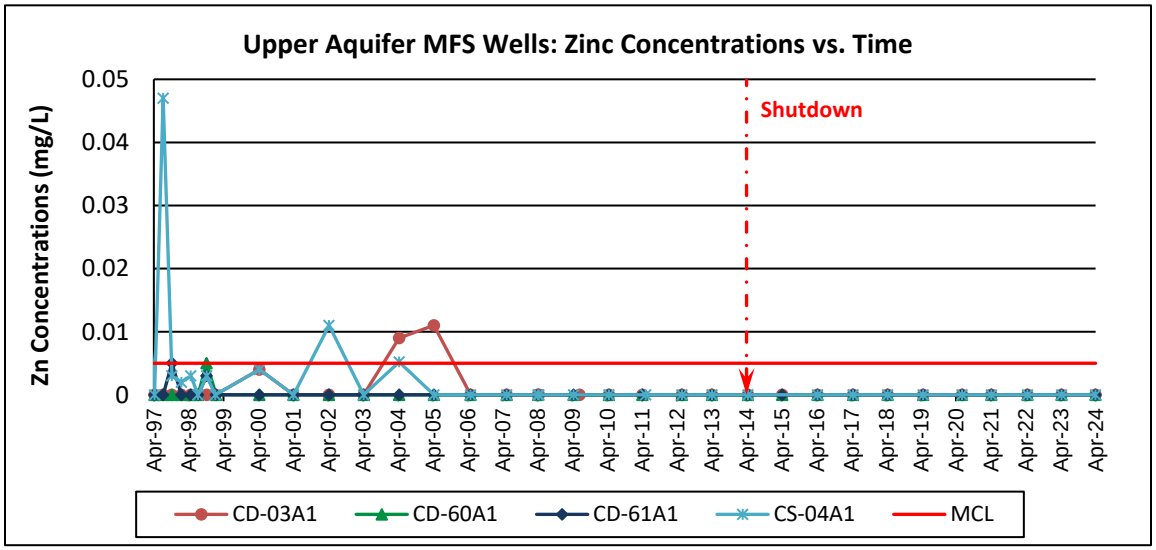
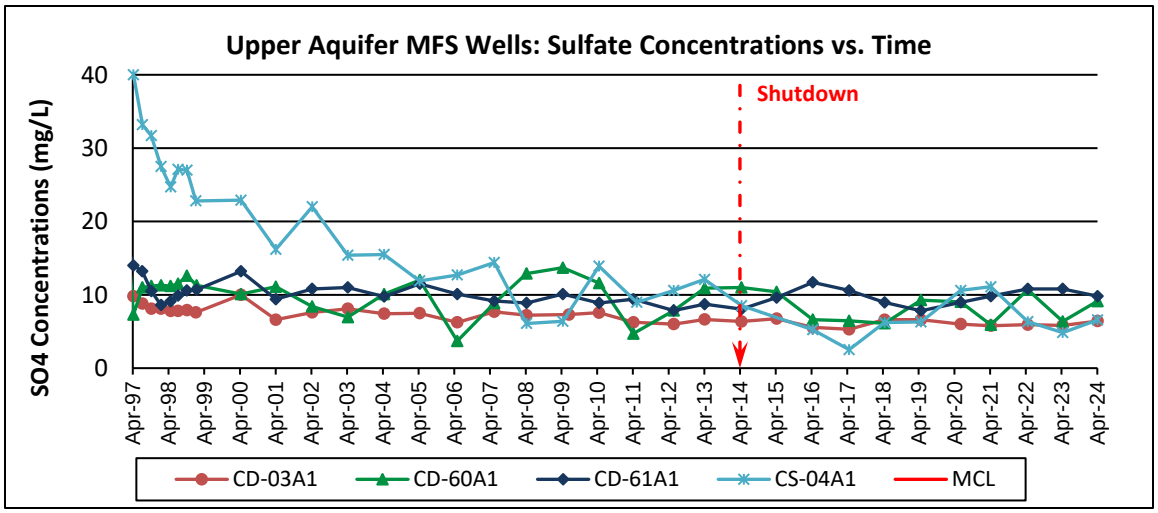
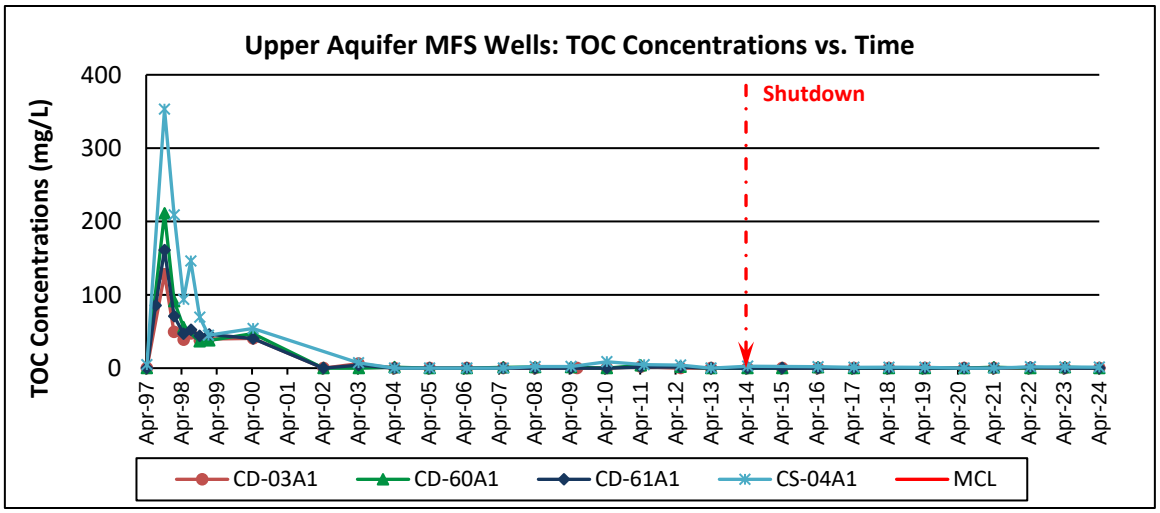
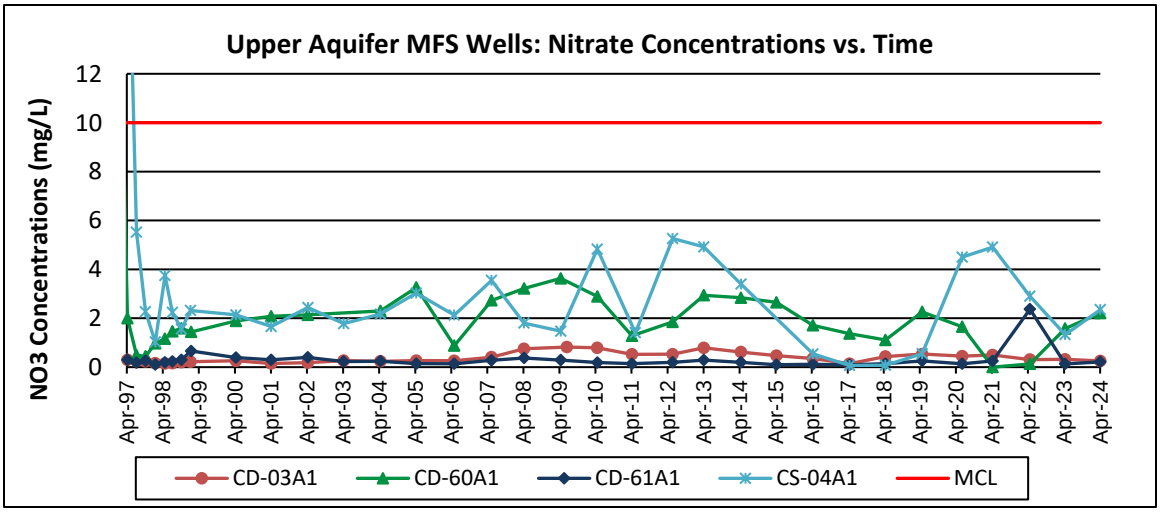


Figure 3-26 Upper Aquifer MFS Parameters vs Time







For all of the COC/analyte concentrations vs. time graphs above, non-detection values from the laboratory are displayed as 0 ppb.

Table 3-9 Summary Results for the Mann-Whitney Nonparametric Significance Test (2024)

	Level of Significance (p)	
Constituent	**Upper Aquifer**	***Lower Aquifer (1999)**
Chloride (Cl)	**1.49E-05**	**0.006**
Chemical Oxygen Demand (COD)	0.2413	0.48
Iron (FE)	0.1392	0.17
Manganese (MN)	0.08078	0.86
Ammonia (NH3)	0.516	0.42
Nitrite (NO2)	0.4174	1.13
Nitrate (NO3)	**8.14E-05**	0.08
Sulfate	0.4142	**0.0006**
Total Organic Carbon	0.7315	0.32
Zinc	0.07001	0.06

***** Lower aquifer results from January 1999 using CP-E2 and CD-48C2 analytical results for calculations.

Bold number indicates a level of significance under 0.05, test run as two-tailed method.

Figure 3-27 Box Plots for Background and Downgradient MFS Wells (2024)

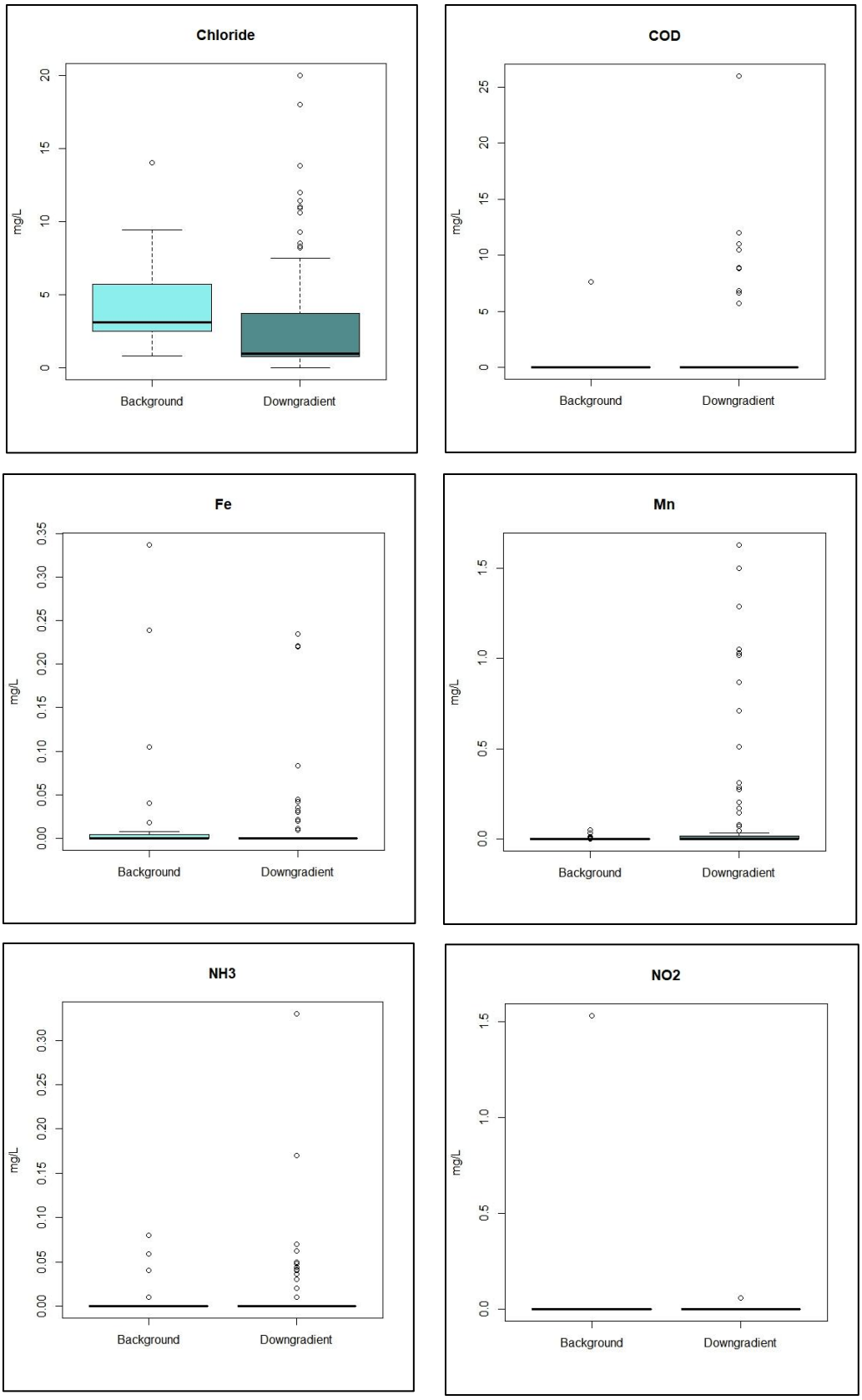
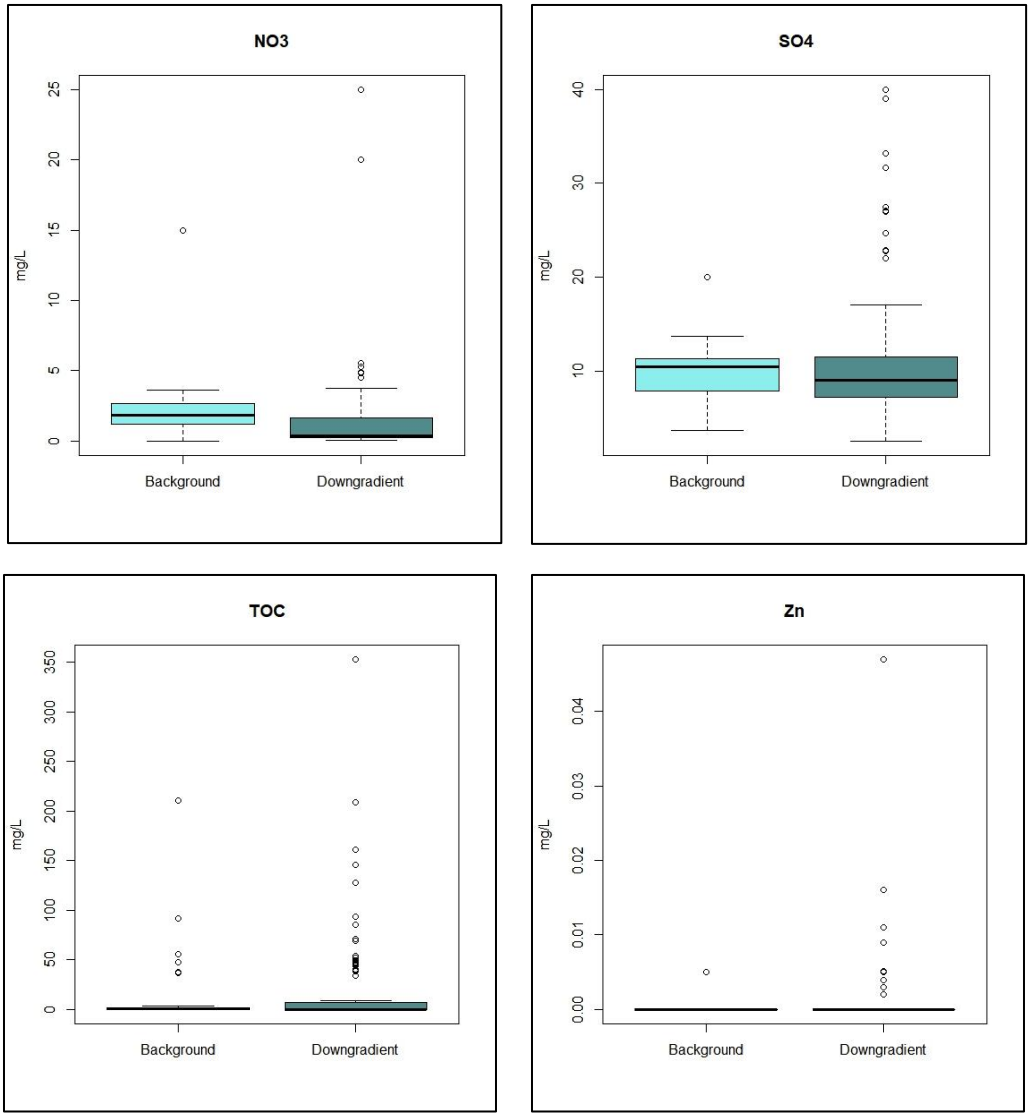


Figure 3-23 continued



4.0 Residential Program

4.1 Locations and Schedule

Current residential well sampling locations can be found in Figure 4-1. The residential sampling schedule is included in Table 4-1.

4.2 Monitoring Results and Criteria

Criteria for residential use wells were established in the Consent Decree. The Consent Decree states that if any residential well with a concentration over the evaluation criteria OR any residential well that has an average concentration over 65% of the evaluation criteria over 12 months, the county shall supply that residence with an alternative water source.

All residential well results were well below established criteria. Results from sampling are presented in Table 4-2. Time-series plots for wells with COC detections are shown in Figure 4-2 through Figure 4-4.

4.3 Data Evaluation

Only 1 residential well measured COC concentrations above the method detection limits for the 2023-2024 sampling year. Residential well 1073L-1 exhibited low detections of DCA (0.75 ppb to 0.8 ppb) during this reporting period.

4.4 Program Modifications

On a regular basis, the program schedule is re-evaluated to determine if any changes are needed. With the initiation of the Shut-down test, a re-evaluation was performed comparing plume maps and well locations as well as a list of residences connected to a public water supply. Some modifications to increase sampling in specific areas were made to the schedule to ensure a conservative approach concerning public health.

6 changes have been made to the schedule for the upcoming 2024-2025 sampling year. There were 3 decreases in the sampling schedule (1 decrease from semi-annual sampling to annual sampling, and 2 decreases to supplemental sampling), 1 increase from supplemental sampling to annual sampling, and 2 changes in the sampling months for residential wells to better distribute the amount sampled per month. Changes are not required by any documentation or work plan.

The 2024 residential well sampling schedule and changes to the program are presented in Table 4-1.

Figure 4-1 Residential Well Sampling Locations

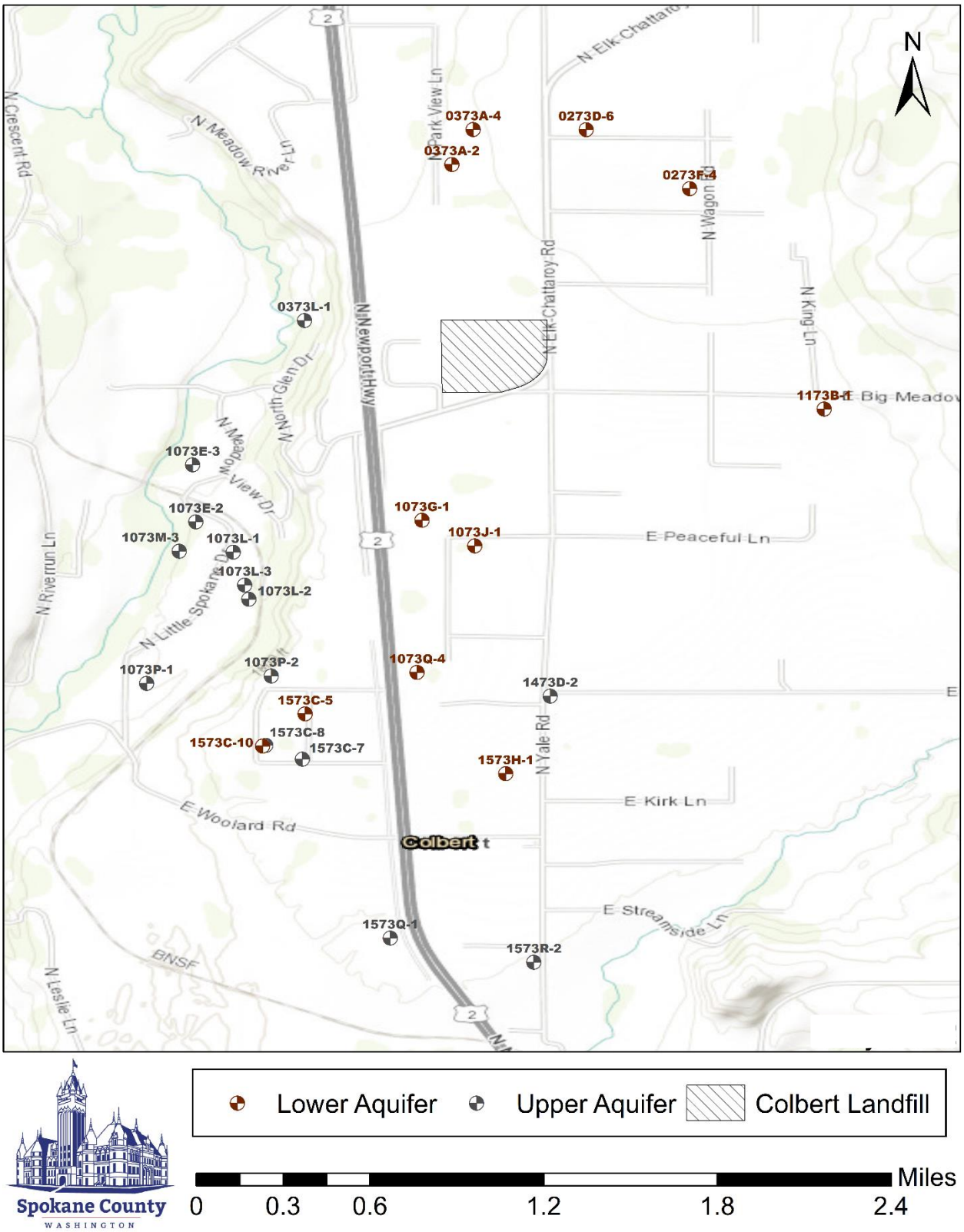


Table 4-1 Residential Well Sampling Schedule for Reporting Period

Colbert Residential Sampling Plan 2024

StationID	LastName	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Sched Comments
0273C-2	Jones/Schmidt	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Decreased to Supplemental Sampling.
0273C-3	Warden	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Decreased to Supplemental Sampling.
0273C-4	McQuesten	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Decreased to Supplemental Sampling.
0273D-6	Thornton	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	
0273F-4	Gander	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	
0373A-2	Resseman	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☑	Continue quarterly sampling.
0373A-4	Walker	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	
0373L-1	Sterling	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	Decreased to annual sampling (July).
1073D-1	Nerren	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	
1073E-2	Muglia	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	
1073E-3	Clark	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	
1073E-4	Carpenter	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	
1073G-1	Rux	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	
1073J-1	Raines	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	
1073L-1	Halpin	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	
1073L-2	Countryman	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	
1073L-3	Anderson	☐	☑	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	
1073L-4	Thomas	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Decreased to Supplemental Sampling.
1073M-1	Bertholf	☑	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	Decreased to Supplemental Sampling.
1073M-3	Lane	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	
1073P-1	Greenen	☐	☐	☐	☐	☑	☐	☐	☐	☐	☑	☐	☐	
1073P-2	Petrelli	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	
1073Q-4	NORTH MEADOWS W	☑	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	Decreased to annual sampling - January.
1173B-1	Bise	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Decreased to annual (December).
1473C-5	Overmyer	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Decreased to Supplemental Sampling.

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StationID	LastName	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Sched Comments
1473D-2	Wardian	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	
1473M-1	Richard	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	
1573C-10	Lake	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	Increased to annual sampling - June.
1573C-17	RESIDENT	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	Decreased to Supplemental Sampling.
1573C-5	Shelp	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	
1573C-7	Kirby	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	
1573C-8	Williams	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
1573H-1	Hunter	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	
1573Q-1	Saunder	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	Increased to annual sampling - July.
1573R-2	Bell	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	Decreased to annual sampling.

Changes made to the Colbert Residential Sampling Schedule

StationID	Still active?	Comments/changes - ColRes review on 12/14/2023
0373A-4	Yes	Decreased to Supplemental Sampling.
1073M-1	Yes	Increased to annual sampling.
1073P-1	Yes	Decreased to annual sampling in May.
1073Q-4	Yes	Changed from annual sampling in July to annual sampling in January.
1573C-10	Yes	Decreased to Supplemental sampling due to proximity to 1573C-5.
1573C-8	Yes	Changed from annual sampling in February to annual sampling in September.

Table 4-2 Residential Groundwater Monitoring Program Results

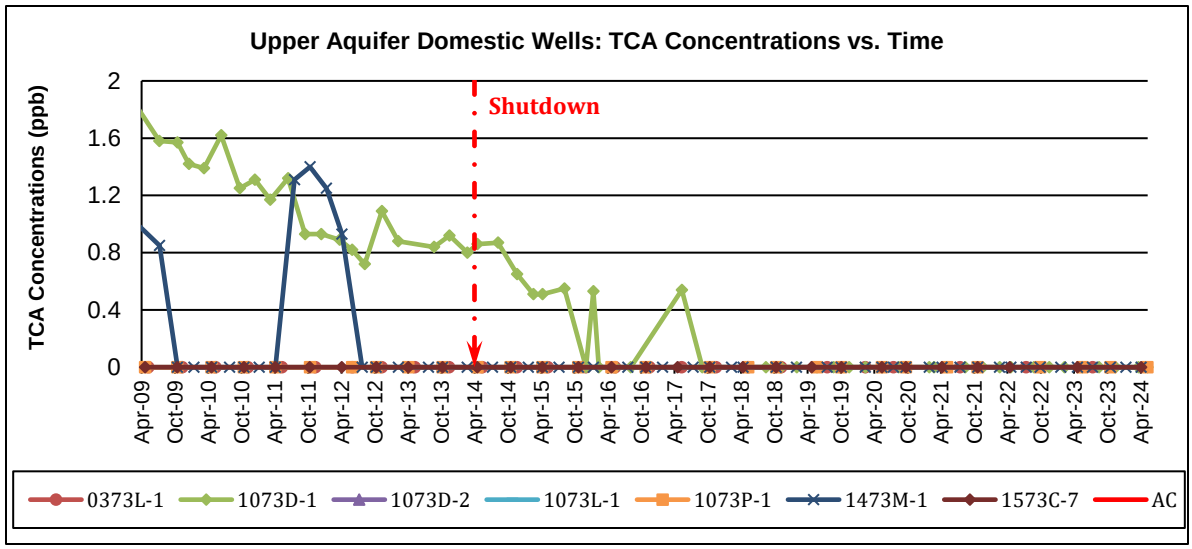
(June 2023 through April 2024)

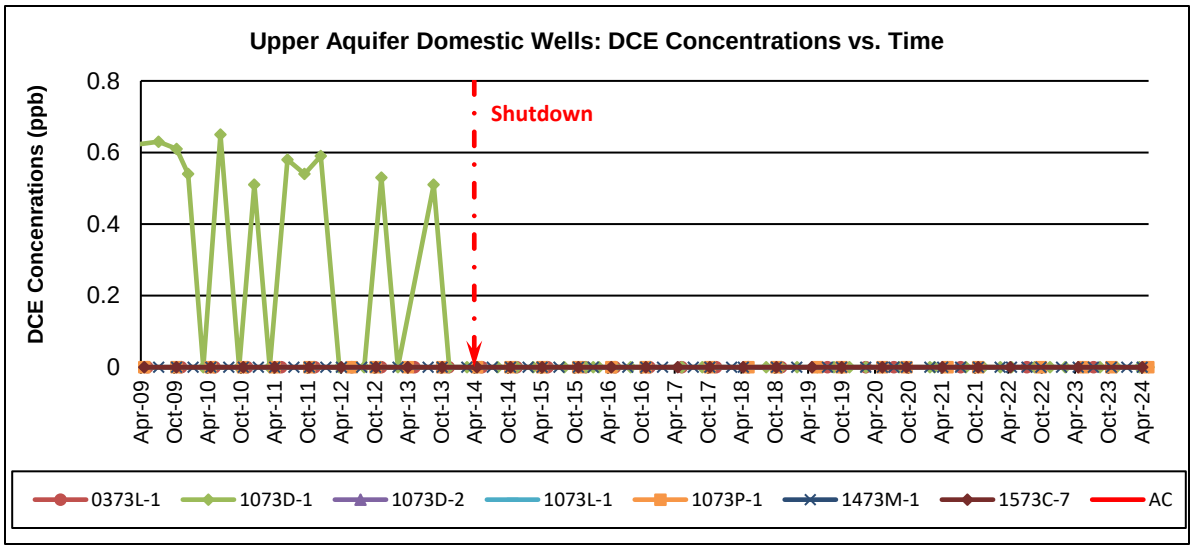
StationID	Aquifer	SampleDate	LastName	DCA	DCE	MC	PCE	TCA	TCE	VC
0273D-6	lower	9/14/2023	Thornton	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
0273F-4	lower	12/20/2023	Gander	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
0373A-2	lower	12/20/2023	Resseman	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
0373L-1	upper	7/12/2023	Sterling	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073D-1	upper	8/16/2023	Nerren	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073D-1	upper	11/14/2023	Nerren	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073D-1	upper	3/19/2024	Nerren	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073D-1	upper	5/8/2024	Nerren	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073E-2	upper	7/11/2023	Muglia	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073E-2	upper	10/17/2023	Muglia	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073E-2	upper	1/10/2024	Muglia	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073E-2	upper	4/3/2024	Muglia	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073E-3	upper	8/16/2023	Clark	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073E-3	upper	11/14/2023	Clark	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073E-3	upper	3/18/2024	Clark	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073E-3	upper	5/7/2024	Clark	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073G-1	lower	9/14/2023	Rux	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073G-1	lower	12/20/2023	Rux	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073G-1	lower	3/19/2024	Rux	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073J-1	lower	7/11/2023	Raines	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073J-1	lower	10/17/2023	Raines	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073J-1	lower	4/3/2024	Raines	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073L-1	upper	9/14/2023	Halpin	**0.8**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073L-1	upper	12/20/2023	Halpin	**0.75**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073L-1	upper	3/18/2024	Halpin	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073L-2	upper	7/11/2023	Countryman	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

StationID	Aquifer	SampleDate	LastName	DCA	DCE	MC	PCE	TCA	TCE	VC
1073L-2	upper	10/17/2023	Countryman	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073L-2	upper	1/10/2024	Countryman	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073L-2	upper	4/3/2024	Countryman	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073L-3	upper	8/16/2023	Anderson	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073L-3	upper	3/18/2024	Anderson	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073M-1	upper	7/11/2023	Bertholf	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073M-1	upper	1/9/2024	Bertholf	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073P-1	upper	10/17/2023	Greenen	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073P-1	upper	5/7/2024	Greenen	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073P-2	upper	9/14/2023	Petrelli	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073Q-4	lower	7/12/2023	NORTH MEADOWS WATER	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073Q-4	lower	1/9/2024	NORTH MEADOWS WATER	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1173B-1	lower	12/20/2023	Bise	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1473D-2	upper	8/16/2023	Wardian	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1473D-2	upper	11/14/2023	Wardian	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1473D-2	upper	3/18/2024	Wardian	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1473D-2	upper	5/8/2024	Wardian	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1473M-1	upper	7/11/2023	Richard	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1473M-1	upper	10/17/2023	Richard	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1473M-1	upper	1/10/2024	Richard	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1473M-1	upper	4/3/2024	Richard	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1573C-17	lower	4/3/2024	RESIDENT	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1573C-5	lower	8/16/2023	Shelp	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1573C-7	upper	4/3/2024	Kirby	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1573H-1	lower	3/18/2024	Hunter	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1573Q-1	upper	7/12/2023	Saunder	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1573R-2	upper	5/7/2024	Bell	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

***Bold** indicates a value greater than non-detection.

Figure 4-2 Upper Aquifer Residential Wells Concentrations vs Time





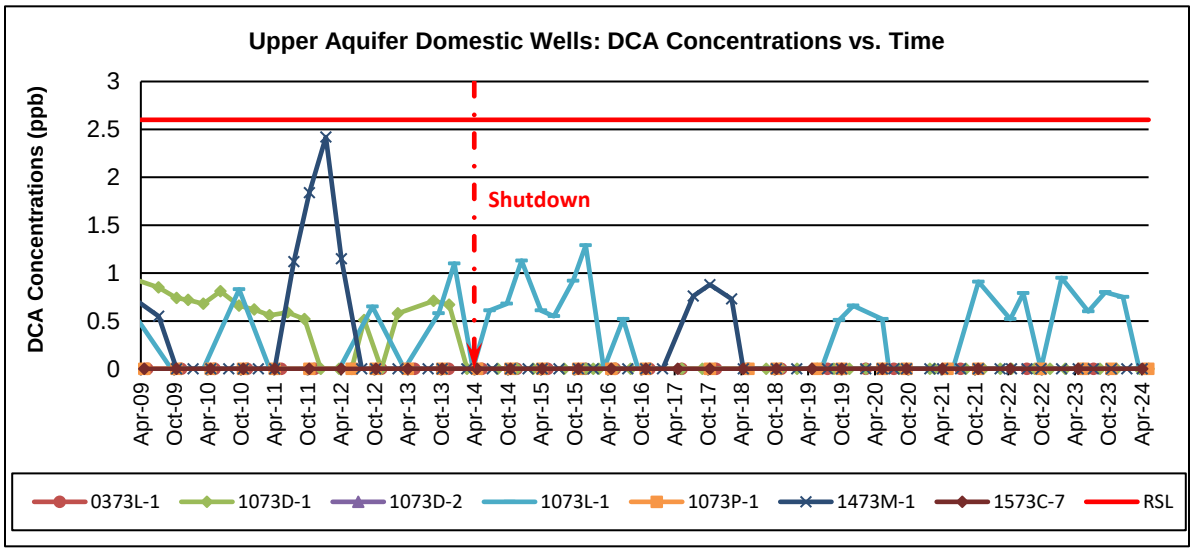
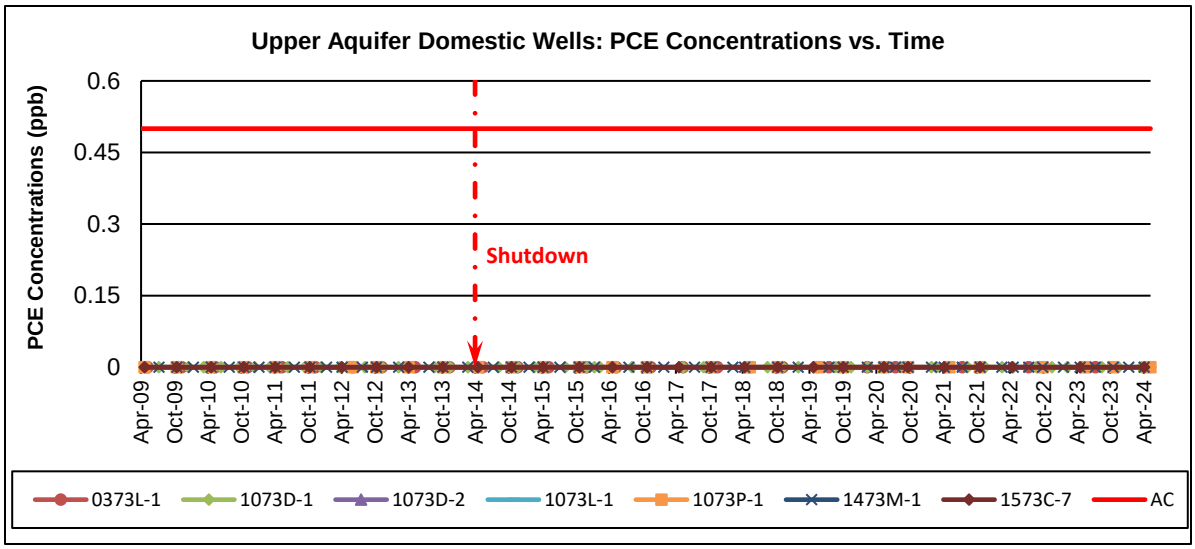


Figure 4-3 Upper Aquifer Residential Wells Concentrations vs Time



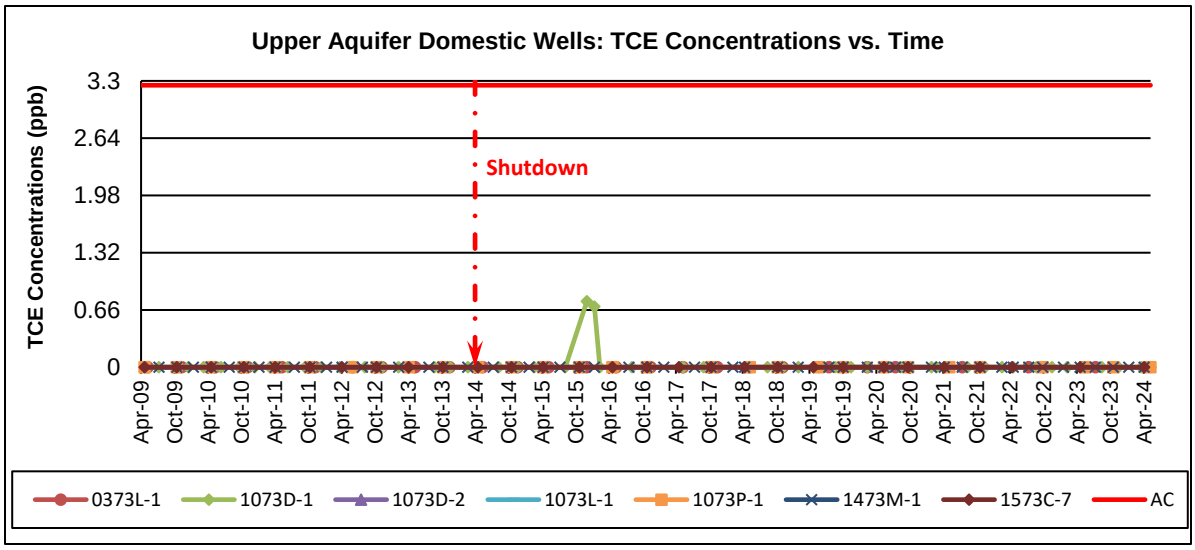
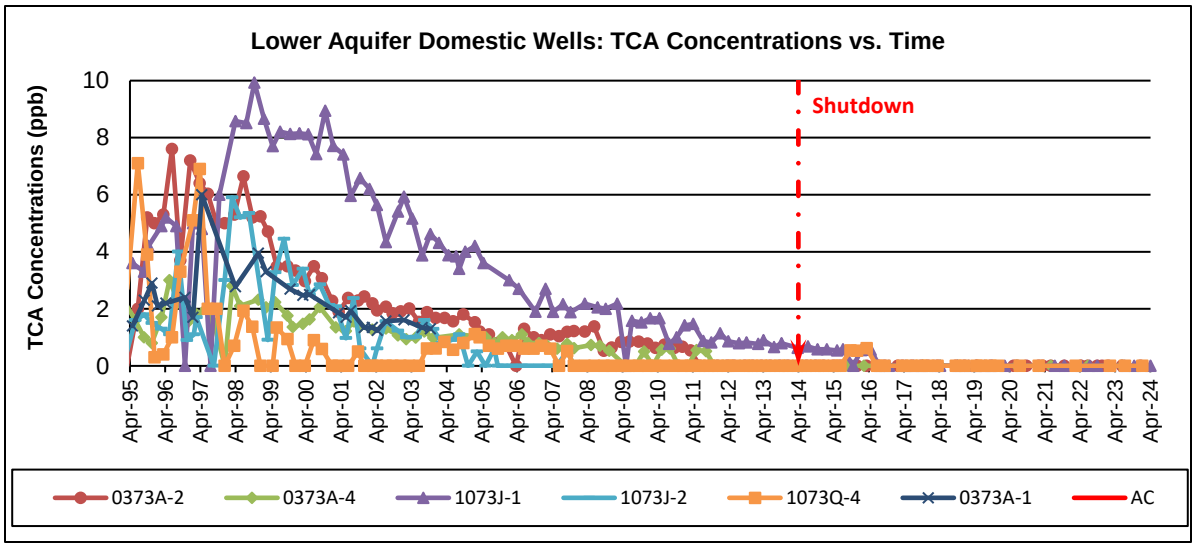
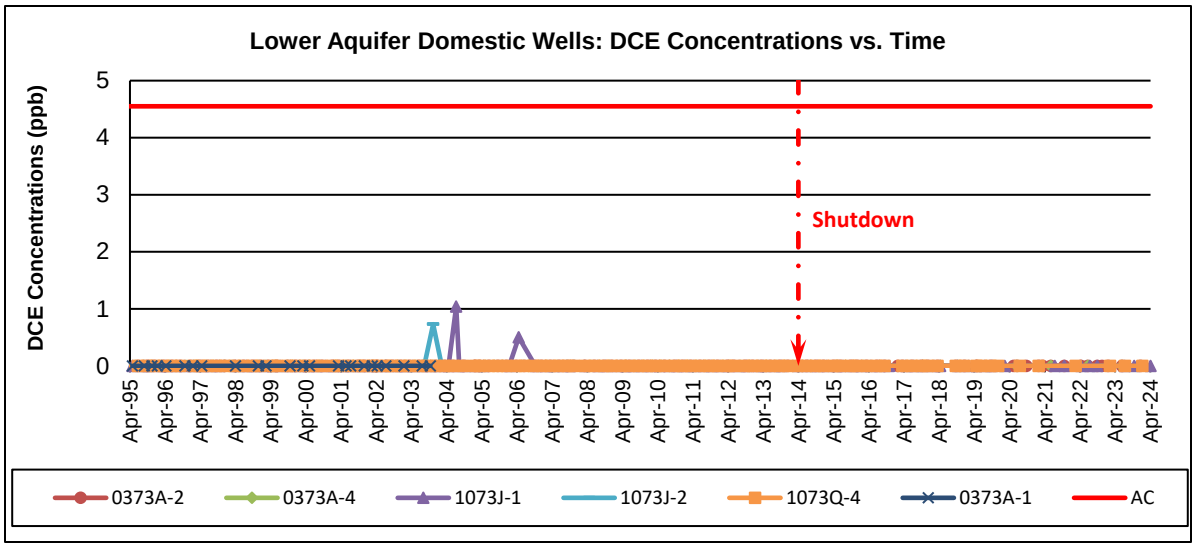


Figure 4-4 Lower Aquifer Residential Wells Concentrations vs Time





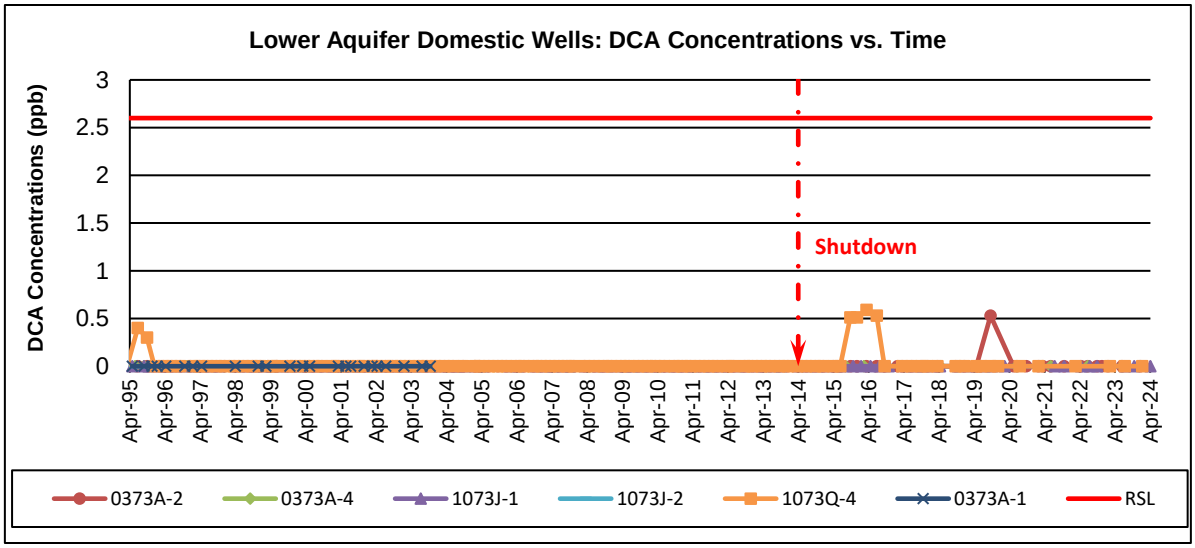
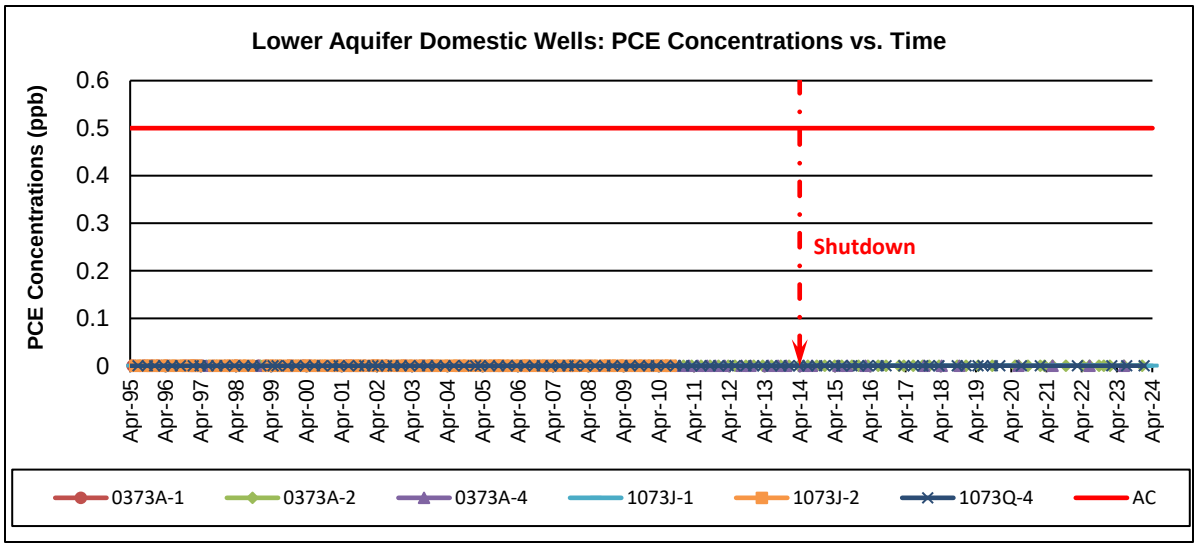
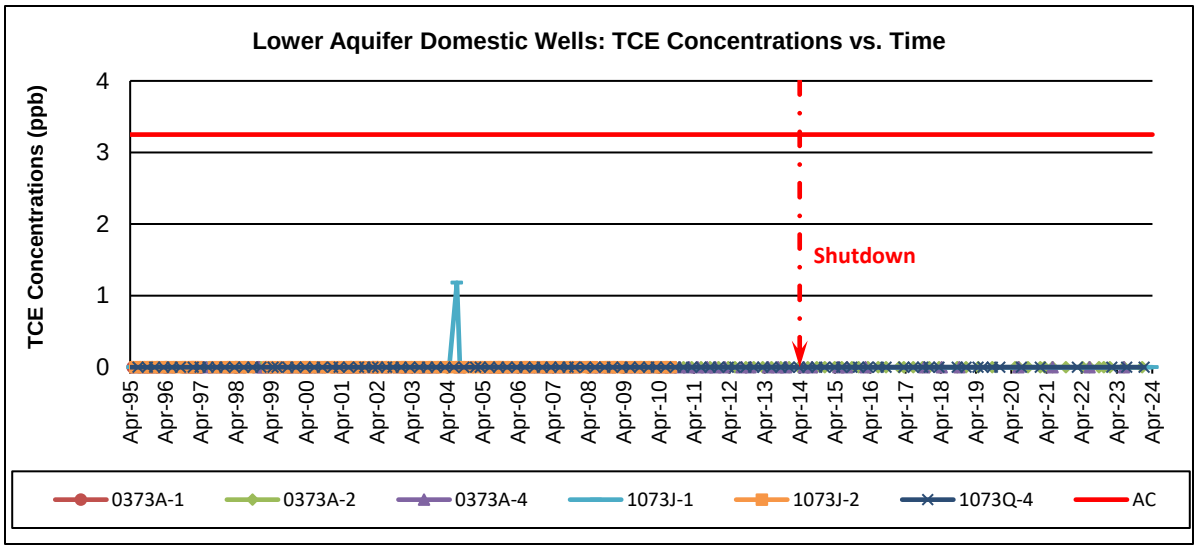


Figure 4-5 Lower Aquifer Residential Wells Concentrations vs Time





For all of the COC concentrations vs. time graphs above, non-detection values from the laboratory are displayed as 0 ppb.

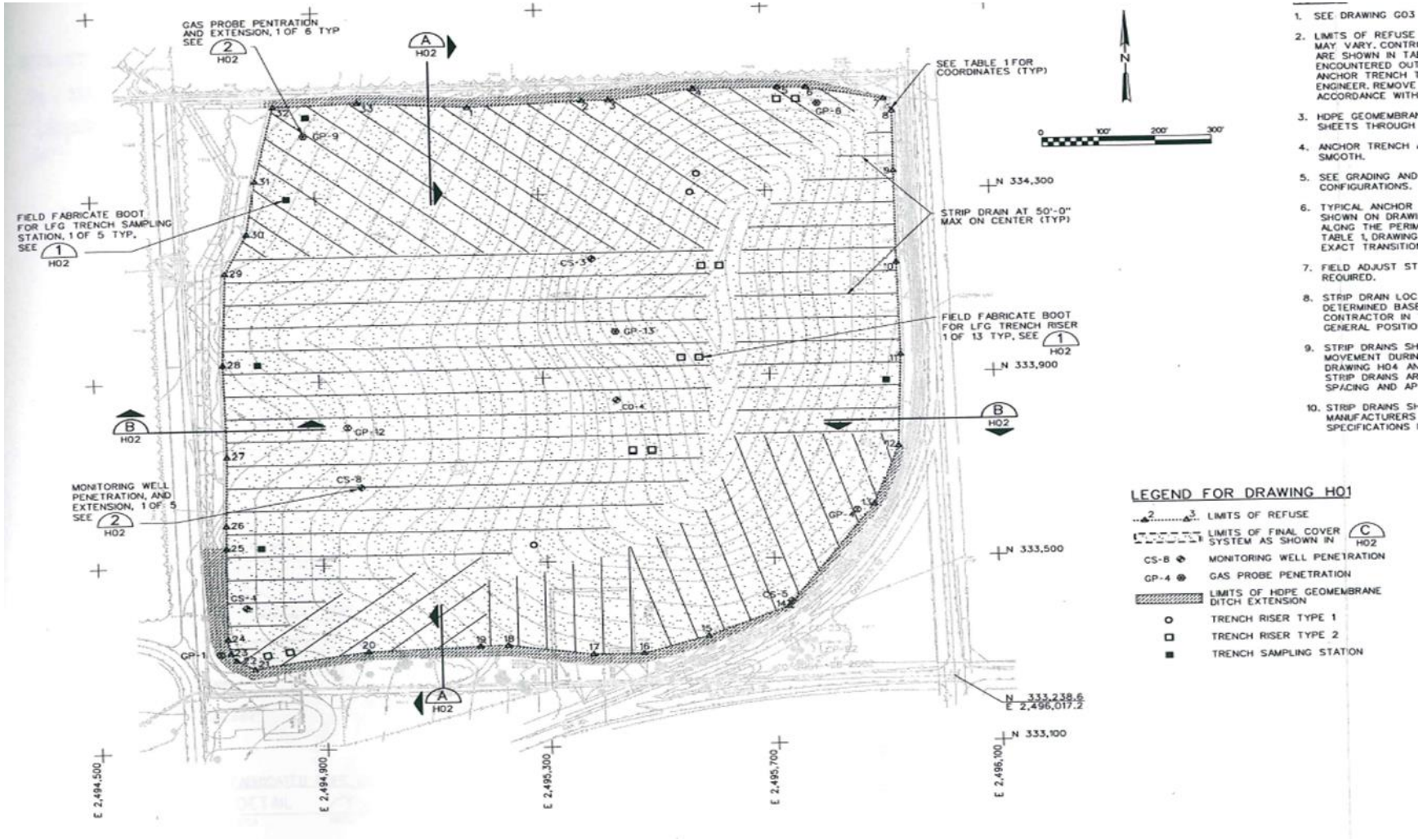
5.0 Colbert Landfill Gas System

5.1 Colbert Landfill Gas Collection System Summary

The landfill gas (LFG) system was installed to prevent off-site gas migration and to prevent the build-up of gas pressure. The Colbert Landfill gas collection system uses a combination of interior and perimeter gas collection trenches connected through a main gas manifold. The Colbert Landfill gas collection system is presented in Figure 5-1.

The gas is moved toward the control system with the use of a 15-hp blower (no VFD) at the main facility. Landfill condensate is collected in both an underground storage tank and an above-ground storage tank. The amount of gas collected from each area of the interior and perimeter system is controlled through valve adjustments in the trench riser wellhead assemblies installed in each of the gas collection trenches. The overall amount of vacuum available for gas collection in the manifold is controlled by valve adjustments at the main facility. The gas collection station includes a condensate knockout vessel, a gas exhauster, several carbon adsorber vessels, and an exhaust stack. The landfill gas is passed through the carbon adsorber (granular activated carbon, or GAC) vessels to remove VOCs and is then exhausted out of the stack. Monitoring is performed at sample ports before and after the carbon vessels, at each trench riser, and interior and perimeter gas probes.

Figure 5-1 Colbert Landfill Gas Collection System



5.2 Colbert Landfill Gas Monitoring

Monitoring for gas at the Colbert Landfill is performed at sample ports before and after the carbon vessels, at each trench riser, and at interior and perimeter gas probes. Spokane County personnel perform monthly monitoring of the gas probes and exhaust system, monthly condensate tank level checks, monthly gas fan maintenance (greasing, belt tension adjustments, etc.), and contaminant analyses on an annual basis (Method TO-15). TO-15 sampling is typically conducted in July or August during the reporting period. TO-15 results and the Colbert Landfill Perimeter Gas Probe results/summary are presented in Appendix A. In summary, there are only non-detections or very low concentrations of landfill gas at the perimeter gas probes.

The most recent Carbon vessel change-out was conducted on 9/1/2021, and the following landfill gas monitoring activities were conducted during this reporting period:

- Landfill gas sampling and analysis (Method TO-15) will be performed in July 2024.
- Monthly monitoring of gas probes and exhaust system.
- Monthly gas fan maintenance (greasing, belt tension adjustments, etc.)
- Quarterly monitoring of trench risers (June, October, February, and April).

County personnel reviewed the Colbert GAC system TO-15 results in July 2023, and the results indicated that the non-halogenated organic contaminants were still well below/not approaching their designated Small Quantity Emission Rates (SQERs). The County will collect TO-15 samples and review the data in July 2024 to determine if a changeout/recharge of the carbon system is necessary.

Monitoring:

The GAC carbon unit will be inspected monthly by County personnel. Landfill gas concentrations of CH4, CO2, O2, flow rate, and any pressure loss at the carbon adsorber unit will be measured and recorded regularly (if applicable). County personnel will conduct quarterly scheduled inspections to confirm that the TSU/2000S GAC unit is operating smoothly and check for signs of wear and tear and/or condensate accumulation. The TO-15 results will be evaluated regularly to determine when the carbon unit needs to be changed out/recharged.

Data Evaluation/Carbon Changeout:

County personnel will collect TO-15 samples annually to evaluate contaminant concentrations in comparison to their designated Small Quantity Emission Rates (SQERs). County personnel will evaluate the non-halogenated organics as indicators for breakthrough, with a heavier weight placed on contaminants with an “annual” averaging time (such as Ethyl Benzene). Once concentrations are approaching their designated SQERs, County personnel will coordinate the changing out/recharging of the carbon unit and fill out a “Spent Carbon Profile Form” (SCPF) to accommodate the TO-15 results. A “dip” sample will then be taken and sent to the company providing the carbon changeout so that the recharging can occur.

6.0 Landfill Operations and Maintenance

Spokane County personnel conduct O&M activities in accordance with the Colbert Landfill 1999 O&M Plan. From May 2023 through April 2024, the following O&M activities were conducted at the Colbert Landfill:

- Monthly inspections of the gas probes and exhaust system
- Monthly condensate tank levels/inspections
- Monthly gas fan maintenance (greasing, belt tension adjustments, etc.)
- Quarterly inspections of trench risers (June, October, February, and April).
- Cover and ditch weed control was ongoing throughout the growing season.

Additional O&M activities were conducted for the Colbert landfill gas system and the groundwater extraction system/extraction wells. The Colbert Landfill gas system monitoring and maintenance is described above in section 5.2. The landfill cover assessments/settlement marker surveying occur every 2 years, and are described below in section 6.1. Inspections for the P&T extraction wells are conducted on a quarterly basis. Extraction well inspection reports can be found in Appendix C and include (but are not limited to) the following:

- Sump evaluation: Hi-Float Alarm, cleaning, and pertinent notes.
- VFD evaluation: cleaning the filters, and inspecting wiring and components.
- Piping evaluation: exercising gate valves, inspecting piping, inspecting air/vac valve.
- Pit evaluation: inspection for leaks, checking for zero reading(s).
- PCP evaluation: inspecting wiring/relays/comp, checking indicator lights, and cleaning filters.
- Vault evaluation: inspecting ladder bolts/rungs/lower and upper lid bolts.
- Final inspections and other pertinent notes.

All additional relevant operations and maintenance documentation (field notes summarizing field activities and results, field sheets for sampling events within the reporting period, etc.) is presented in Appendix B. County personnel updated the Colbert O&M plan in March 2024 to keep the O&M plan up-to-date with the most current and relevant information.

6.1 Colbert Landfill Settlement

- Spokane County installed 10 new settlement markers (CSM10 – CSM19) in June 2019 across several known areas of concern to monitor settlement on the landfill. These settlement markers will be surveyed every 2 years, and will be monitored for any additional settling that might occur on the Colbert landfill.

Figure 6-1: Colbert Landfill Settlement Marker Locations

Spokane County conducted settlement marker surveys at the Colbert landfill on 12/22/2023. The next landfill settlement survey will occur in 2025. County personnel will be attending settlement survey training to learn how to survey the settlement markers in-house. The following table shows the difference in elevation for each settlement marker from 2021 to 2023:

Table 6-1: Settlement Elevation Summary

Settlement Marker ID	Elevation - 2023	Difference in Elevation from 2021		Difference in Elevation from 1999
CSM1	**1863.82**	**-0.026**	▼	-0.119
CSM2	**1865.23**	**-0.023**	▼	-0.086
CSM3	**1875.48**	**-0.023**	▼	-0.206
CSM4	**1869.00**	**-0.072**	▼	-0.324
CSM5	**1856.73**	**-0.032**	▼	-0.132
CSM6	**1856.95**	**-0.153**	▼	-0.481
CSM10	**1860.73**	**-0.025**	▼	N/A
CSM11	**1860.69**	**-0.185**	▼	N/A
CSM12	**1863.01**	**-0.115**	▼	N/A
CSM13	**1860.23**	**-0.262**	▼	N/A
CSM14	**1861.31**	**-0.178**	▼	N/A
CSM15	**1863.22**	**-0.122**	▼	N/A
CSM16	**1864.44**	**-0.149**	▼	N/A
CSM17	**1860.58**	**-0.076**	▼	N/A
CSM18	**1857.93**	**-0.143**	▼	N/A
CSM19	**1856.48**	**-0.085**	▼	N/A

7.0 Institutional Controls

The goal of Spokane County's Institutional Control (IC) Program is to ensure the protection of public health and the environment in the Colbert Landfill Superfund Site vicinity. Institutional Controls are defined as non-engineered instruments, such as administrative and legal controls, that help minimize the potential for human and ecological exposure to contamination and/or protect the integrity of the remedy. Although Spokane County's IC program has proven effective since its implementation, the County created an Institutional Control Implementation and Assurance Plan (ICIAP) in March 2021 to describe the process for recordable and enforceable controls, along with the key strategies to ensure the protection of public health and the environment in the area surrounding the Colbert Landfill. The ICIAP document can be found on the Spokane County Solid Waste website. The County will conduct the following activities to ensure the success of the Institutional Controls program:

- Generate Constituent of Concern (COC) plume maps using geospatial analysis to define plume boundaries/areas of concern.

- Report plume maps/boundaries to the SRHD to establish boundaries and areas of concern regarding potential well drilling. This will ensure that if an individual/organization is interested in drilling a new well or planning a well use change, the SRHD will have boundaries/areas of concern to reference.

- Coordinate with the Spokane Regional Health District (SRHD) to investigate any individuals/ interested in drilling wells or changing a well use in any areas of concern within the annual reporting period timeframe.

- Report plume maps/boundaries to the Washington Department of Ecology (Ecology) to establish boundaries and areas of concern regarding potential well drilling. This will ensure that if an individual/organization applies for a permit to drill a new well or change an established well's use, Ecology will have boundaries/areas of concern to reference.

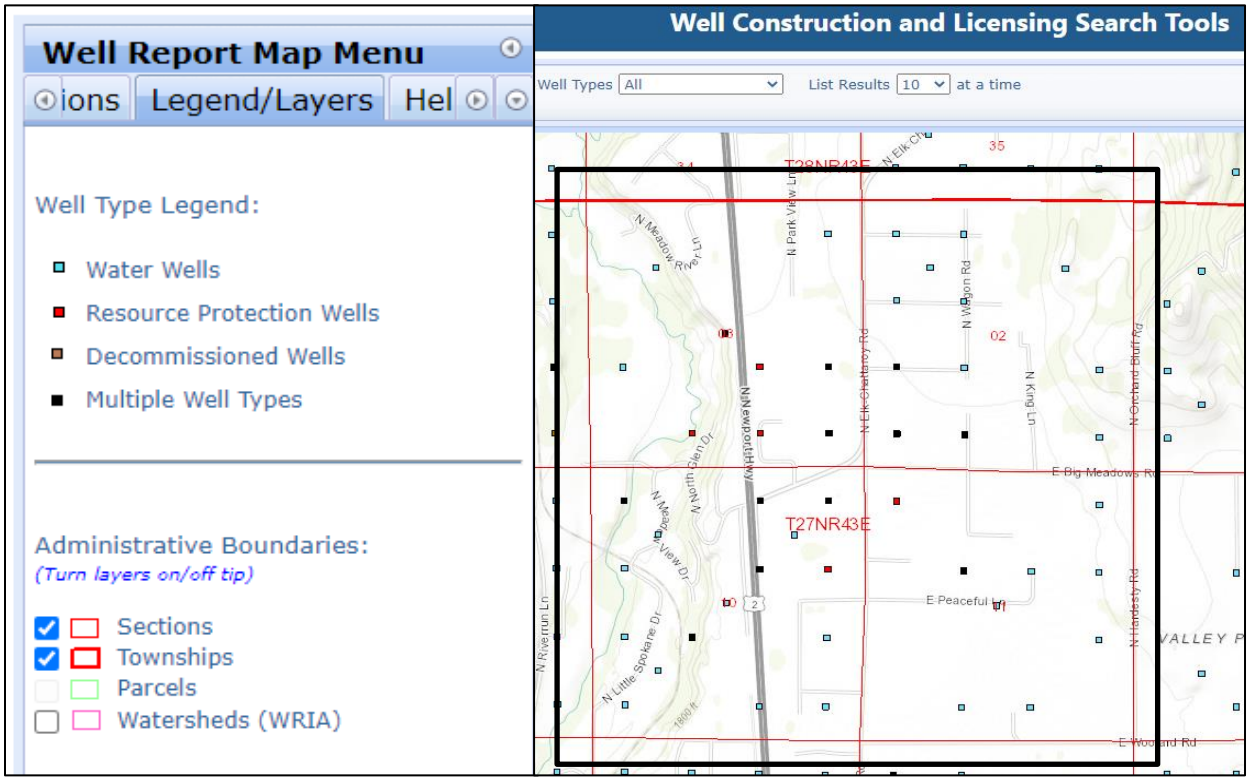
- Coordinate with Ecology to investigate any individuals/organizations interested in drilling wells or changing a well use in any areas of concern within the annual reporting period timeframe.

- Utilize the Well Construction and Licensing Search Tools to account for any new or unknown well construction that may have occurred near any areas of concern.

Records of IC Evaluation Activities for 2024

The following activities have been conducted/completed by Spokane County, Washington Department of Ecology, and Spokane Regional Health District personnel:

- Spokane County personnel consulted the contamination plume maps created for 2024 and used the Washington Department of Ecology's Well Construction and Licensing Search Tools to define a search area to evaluate for new well installs/well use changes:



Spokane County personnel reviewed the most recent well data based on the listed well completion date(s), the well report received date, and well type/proximity to the plumes/landfill. Using the same search boundaries that were used in 2022/2023, County personnel did not find any new domestic wells/well reports that were added to the Department of Ecology's Well Construction and Licensing Database since investigating in 2022. All of the domestic well locations were evaluated in relation to the upper and lower aquifer plume boundaries, and all of the domestic wells were outside of the contamination plume areas of concern.

The well reports that had "blank" well completion dates/well report received dates were also investigated, and included wells with the Well Report IDs: 209225 through 209232, 209885, 209896, 209897, 209898, 209899, 294656 through 294669, 294712, and 294713. All of these wells are either Spokane County-owned wells, wells on the Colbert Landfill residential monitoring program, or decommissioned.

- Spokane County personnel sent the 2024 contamination plume maps to the Washington Department of Ecology and the Spokane Regional Health District on 6/14/2024, and inquired about their findings regarding an evaluation for new well requests/well use changes in the Colbert Landfill vicinity. The Washington Department of Ecology evaluated the wells in the area and consulted the Well Drilling Coordinator, and found 2 new wells that were installed in 2023. After further inspection, both of the wells appear to be a significant distance away from the outer edges of the lower and upper aquifer plumes.

WE51561	12/23/2022	Accepted	Josh James	E Bernhill Road Colbert 99005	SE/SW--14-T27N/R43E	Spokane	NICHOLAS BOONE (3336)	JOYCO DRILLING	ERO	1
WE51562	12/23/2022	Accepted	Hudsonworx, LLC	5601 E Bernhill Colbert 99005	SW/SE--14-T27N/R43E	Spokane	NICHOLAS BOONE (3336)	JOYCO DRILLING	ERO	1

Download all 143 images | Download all 143 data records | Print this page | Need Help

Displaying well reports 126 → 143 of 143 | Sort results by: Well Completion Date | Results Per Page: 25

#	Well Details	Location Details
126. View PDF	Well Owner: **DAVE STEPHENS** Well Tag ID: ABZ590 Notice of Intent Number: W079896 Group Number: Not Applicable Well Report ID: 188227 Well Diameter: 6 in. Well Depth: 575 ft.	Tax Parcel Number: Well Address: County: SPOKANE Public Land Survey: NE-NE / S11 / T27N / R43E Well Type: Water / Subtype: Unknown Well Completion Date: 04-01-1999 Well Report Received Date: 04-29-1999
127. View PDF	Well Owner: **STEPHEN SUMMERS** Well Tag ID: AEQ269 Notice of Intent Number: W127635 Group Number: Not Applicable Well Report ID: 253842 Well Diameter: 6 in. Well Depth: 60 ft.	Tax Parcel Number: Well Address: BUCKEYE VALLEY ESTATES, SPOKANE County: SPOKANE Public Land Survey: SE-SE / S09 / T27N / R43E Well Type: Water / Subtype: Unknown Well Completion Date: 08-25-2000 Well Report Received Date:
128. View PDF	Well Owner: **NEWELL SOELTER** Well Tag ID: ABZ591 Notice of Intent Number: W044534 Group Number: Not Applicable Well Report ID: 308432 Well Diameter: 6 in. Well Depth: 187 ft.	Tax Parcel Number: Well Address: County: SPOKANE Public Land Survey: SW-NE / S11 / T27N / R43E Well Type: Water / Subtype: Unknown Well Completion Date: 11-01-2000 Well Report Received Date: 11-06-2000
129. View PDF	Well Owner: **PAUL & MARSHA PETERS**	Tax Parcel Number: 37094.9105 Well Address: 21319 BUCKEYE LAKE LANE #18A COLBERT 99005

8.0 References

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U.S. District Court, Eastern District of Washington. 1988. Consent Decree No. C-89-033-RJM. The Washington State Department of Ecology and The United States of America on behalf of the U.S. Environmental Protection Agency (plaintiffs) v. County of Spokane and Key Tronic Corporation (defendants). February 28.

Appendix A

Colbert Landfill Perimeter Gas Probe and TO-15 Results

COLBERT PERIMETER GAS MONITORING REPORT

Barometer: 30.02

Tech: M Terri **Calibration:** Zeroed CH4 to AB air -> CALGAS -> CH4 reading 14.7% cal to 15.0%; 14.9% cal to 15.0%; zeroed O2 to CALGAS -> O2 reading 20.7% AB air cal to 20.9% **FanFlow:** 42 **Weather** PC 40's

Equipment: Gem 500 #410

Location	Date	Time	CH4	CO2	O2	Balance	Static Press	Diff. Press.	Comments
CGP0001L	11/13/2023		0	2.7	16.9	80.4	0	0	
CGP0001L	6/10/2024		0	3	7	90	0	0	
CGP0001L	5/16/2024		0	2.9	15.8	81.3	0	-0.01	
CGP0001L	4/12/2024		0	2.7	16.9	80.4	0	-0.01	
CGP0001L	3/20/2024		0	2.5	17.1	80.4	0	0	
CGP0001L	2/7/2024		0	2.6	17.2	80.2	0	-0.02	
CGP0001L	12/11/2023		0	1.5	18.5	80	0	0	
CGP0001L	10/19/2023		0	3.3	17	79.7	0	0	
CGP0001L	9/22/2023		0	3.1	16.1	80.8	0	0	
CGP0001L	8/7/2023		0	3.4	7.2	89.4	0	0	
CGP0001L	7/17/2023		0	3.2	7.1	89.7	0	0	
CGP0001L	1/11/2024		0	1.7	18.3	80	0	0	
CGP0001U	8/7/2023		0	6.2	5.6	88.2	0	0	
CGP0001U	7/17/2023		0	5.8	5.5	88.7	0	0	
CGP0001U	5/16/2024		0	5.5	5.7	88.8	0	-0.01	
CGP0001U	9/22/2023		0	5.9	5.7	88.4	0	0	
CGP0001U	10/19/2023		0	6.7	5.6	87.7	0	0	
CGP0001U	11/13/2023		0	4.5	7.2	88.3	0	-0.01	
CGP0001U	1/11/2024		0	6.6	5.5	87.9	0	-0.01	
CGP0001U	2/7/2024		0	6.1	5.9	88	0	0	
CGP0001U	3/20/2024		0	5.8	5.9	88.3	0	0	
CGP0001U	4/12/2024		0	5.6	5.7	88.7	0	-0.01	
CGP0001U	6/10/2024		0	5.9	5.5	88.6	0	0	
CGP0001U	12/11/2023		0	6.4	5.7	87.9	0	0	
CGP0002L	5/16/2024		0	5.4	9.9	84.7	0	-0.02	
CGP0002L	8/7/2023		0	5.4	6.5	88.1	0	-0.01	
CGP0002L	9/22/2023		0	5.5	6.5	88	0	0	
CGP0002L	10/19/2023		0	6.3	6.1	87.6	0	-0.01	
CGP0002L	11/13/2023		0	6.8	5.5	87.7	0	-0.01	
CGP0002L	12/11/2023		0	6.9	5.6	87.5	0	-0.01	
CGP0002L	1/11/2024		0	7.1	5.1	87.8	0	-0.02	

COLBERT PERIMETER GAS MONITORING REPORT

Barometer: 29.37

Tech: CC **Calibration:** CH4 : 15% . CO2 : 15%, O2: 0%-20.9% **FanFlow:** 0 **Weather** Cloudy, 40-42F

Equipment: GEM 410

Location	Date	Time	CH4	CO2	O2	Balance	Static Press	Diff. Press.	Comments
CGP0002L	2/7/2024		0	7.1	5.5	87.4	0	0	
CGP0002L	6/10/2024		0	5.8	5.9	88.3	0	-0.03	
CGP0002L	4/12/2024		0	5.9	6.2	87.9	0	0	
CGP0002L	7/17/2023		0	5.4	6.4	88.2	0	0	
CGP0002L	3/20/2024		0	5.6	6.3	88.1	0	0	
CGP0002U	11/13/2023		0	2.1	17.8	80.1	0	-0.02	
CGP0002U	8/7/2023		0	1.6	19.3	79.1	0	0	
CGP0002U	1/11/2024		0	2.1	18.5	79.4	0	-0.01	
CGP0002U	7/17/2023		0	1.7	19	79.3	0	0	
CGP0002U	6/10/2024		0	1.9	18.1	80	0	-0.03	
CGP0002U	9/22/2023		0	1.6	17.9	78.5	0	-0.01	
CGP0002U	10/19/2023		0	1.7	19.4	78.9	0	-0.01	
CGP0002U	2/7/2024		0	2	18.3	79.7	0	0	
CGP0002U	3/20/2024		0	1.2	19.2	79.6	0	-0.01	
CGP0002U	4/12/2024		0	1.3	19.1	79.6	0	0	
CGP0002U	5/16/2024		0	1.8	18.9	79.3	0	0	
CGP0002U	12/11/2023		0	1.8	18.8	79.4	0	0	
CGP0003L	8/7/2023		0	8.4	5	86.6	0	0	
CGP0003L	3/20/2024		0	10.1	4	85.9	0	0	
CGP0003L	2/7/2024		0	10.1	4	85.9	0	0	
CGP0003L	1/11/2024		0	9.5	4.5	86	0	0	
CGP0003L	6/10/2024		0	8.6	4.4	87	0	0	
CGP0003L	12/11/2023		0	9.6	4.4	86	0	0	
CGP0003L	11/13/2023		0	9.3	4.3	86.4	0	0	
CGP0003L	7/17/2023		0	8.3	4.8	86.9	0	0	
CGP0003L	9/22/2023		0	8.1	5.2	86.7	0	0	
CGP0003L	4/12/2024		0	9.9	3.2	86.9	0	0	
CGP0003L	5/16/2024		0	9.1	2.9	82	0	-0.01	
CGP0003L	10/19/2023		0	9	4.7	86.3	0	-0.01	
CGP0003U	1/11/2024		0	1.5	18.9	79.6	0	0	
CGP0003U	5/16/2024		0	18	16.9	81.3	0	0	

COLBERT PERIMETER GAS MONITORING REPORT

Barometer: 30.01

Tech: Tech **Calibration:** Zeroed CH4 to AB air -> CALGAS Ch4 reading 14.9 cal to 15.0%; CO2 reading 14.8 cal to 15.0; zeroed O2 to Calgas -> O2 reading 20.8% to AB air cal to 20.9% **FanFlow:** 38 **Weather** Cloudy low 50's

Equipment: Gem 500 #410.

Location	Date	Time	CH4	CO2	O2	Balance	Static Press	Diff. Press.	Comments
CGP0003U	4/12/2024		0	1.5	18.6	79.9	0	-0.01	
CGP0003U	2/7/2024		0	1.2	18.7	80.1	0	0	
CGP0003U	12/11/2023		0	1.2	19.6	79.2	0	0	
CGP0003U	11/13/2023		0	1.7	18.1	80.2	0	0	
CGP0003U	10/19/2023		0	1.7	19.3	79	0	0	
CGP0003U	9/22/2023		0	2.7	17.1	80.2	0	-0.01	
CGP0003U	8/7/2023		0	2.1	18.2	79.7	0	0	
CGP0003U	7/17/2023		0	1.9	18.3	79.8	0	-0.02	
CGP0003U	6/10/2024		0	1.7	18.1	80.2	0	-0.01	
CGP0003U	3/20/2024		0	1.5	18.6	79.9	0	-0.02	
CGP0004L	5/16/2024		0	8.1	6.9	85	0	-0.01	
CGP0004L	11/13/2023		0	7.1	5.1	87.8	0	0	
CGP0004L	7/17/2023		0	4.8	6.4	88.8	0	0	
CGP0004L	8/7/2023		0	4.1	6.9	89	0	0	
CGP0004L	9/22/2023		0	4.5	6.5	89	0	-0.02	
CGP0004L	10/19/2023		0	5.4	6.4	88.2	0	0	
CGP0004L	12/11/2023		0	6.8	5.3	87.9	0	0	
CGP0004L	1/11/2024		0	7.1	5.2	87.7	0	0	
CGP0004L	2/7/2024		0	7.3	4.9	87.8	0	-0.01	
CGP0004L	4/12/2024		0	8.4	6.5	87.8	0	-0.01	
CGP0004L	6/10/2024		0	5.2	6	88.8	0	-0.01	
CGP0004L	3/20/2024		0	8.5	6.5	85	0	-0.01	
CGP0004U	12/11/2023		0	3.4	7	89.6	0	0	
CGP0004U	11/13/2023		0	3.7	6.9	89.4	0	-0.01	
CGP0004U	7/17/2023		0	3	7.3	89.7	0	0	
CGP0004U	8/7/2023		0	2.9	17.2	79.9	0	0	
CGP0004U	10/19/2023		0	3.2	17	79.8	0	0	
CGP0004U	5/16/2024		0	3.6	9.9	86.5	0	0	
CGP0004U	2/7/2024		0	3.8	6.6	89.6	0	-0.01	
CGP0004U	3/20/2024		0	3.7	21.2	75.1	0	-0.01	
CGP0004U	6/10/2024		0	3.2	7	89.8	0	-0.01	

COLBERT PERIMETER GAS MONITORING REPORT

Barometer: 30.01

Tech: Tech **Calibration:** Zeroed CH4 to AB air -> CALGAS Ch4 reading 14.9 cal to 15.0%; CO2 reading 14.8 cal to 15.0; zeroed O2 to Calgas -> O2 reading 20.8% to AB air cal to 20.9% **FanFlow:** 38 **Weather** Cloudy low 50's

Equipment: Gem 500 #410.

Location	Date	Time	CH4	CO2	O2	Balance	Static Press	Diff. Press.	Comments
CGP0004U	4/12/2024		0	3.9	6.9	89.2	0	-0.01	
CGP0004U	9/22/2023		0	3.7	15.8	80.5	0	0	
CGP0004U	1/11/2024		0	3.7	6.6	89.7	0	-0.01	
CGP0005L	5/16/2024		0	8.3	6.9	84.8	0	-0.02	
CGP0005L	3/20/2024		0	8	3.7	88.3	0	-0.02	
CGP0005L	2/7/2024		0	9.9	2	88.1	0	-0.01	
CGP0005L	1/11/2024		0	8.8	3.1	88.7	0	0	
CGP0005L	6/10/2024		0	5.1	5.5	89.4	0	0	
CGP0005L	12/11/2023		0	9.1	3.2	87.7	0	-0.01	
CGP0005L	10/19/2023		0	7	4.9	88.1	0	0	
CGP0005L	9/22/2023		0	5.5	16.1	78.4	0	-0.01	
CGP0005L	8/7/2023		0	5.1	6	88.9	0	-0.01	
CGP0005L	7/17/2023		0	4.8	5.8	89.4	0	-0.03	
CGP0005L	11/13/2023		0	7.4	4	88.6	0	-0.02	
CGP0005L	4/12/2024		0	8.1	4.1	87.8	0	-0.01	
CGP0005U	9/22/2023		0	1.7	18.2	80.1	0	0	
CGP0005U	4/12/2024		0	2.6	16.8	80.6	0	0	
CGP0005U	3/20/2024		0	2.3	17.1	80.6	0	0	
CGP0005U	2/7/2024		0	1.6	7	91.4	0	0	
CGP0005U	1/11/2024		0	1.9	17.4	80.7	0	0	
CGP0005U	6/10/2024		0	1.1	18.6	80.3	0	-0.04	
CGP0005U	12/11/2023		0	1.6	17.5	80.9	0	0	
CGP0005U	10/19/2023		0	1.8	18	80.2	0	-0.01	
CGP0005U	8/7/2023		0	1.3	19	79.7	0	-0.01	
CGP0005U	7/17/2023		0	1.2	18.4	80.4	0	0	
CGP0005U	5/16/2024		0	2.9	16.9	80.2	0	0	
CGP0005U	11/13/2023		0	2.2	16.8	81	0	-0.01	
CGP0007L	8/7/2023		0	0.8	20	79.2	0	-0.02	
CGP0007L	9/22/2023		0	1.8	19.2	79	0	-0.02	
CGP0007L	11/13/2023		0	1.1	19.3	79.6	0	0	
CGP0007L	10/19/2023		0	1.1	19.6	79.3	0	0	

COLBERT PERIMETER GAS MONITORING REPORT

Barometer: 29.7

Tech: CC **Calibration:** Calibrated CH4@15.0%, CO2@15.0%, and O2 to 0% and 20.9%. **FanFlow:** 0 **Weather** Cloudy, 35F

Equipment: Gem 500 #410

Location	Date	Time	CH4	CO2	O2	Balance	Static Press	Diff. Press.	Comments
CGP0007L	12/11/2023		0	1.2	19.3	79.5	0	0	
CGP0007L	6/10/2024		0	0.8	19.4	79.8	0	0	
CGP0007L	1/11/2024		0	1.1	19.2	79.7	0	0	
CGP0007L	2/7/2024		0	1.5	18.7	79.8	0	0	
CGP0007L	3/20/2024		0	1	19.2	79.8	0	0	
CGP0007L	7/17/2023		0	0.8	19.6	79.6	0	-0.01	
CGP0007L	5/16/2024		0	0.9	19	80.1	0	0	
CGP0007L	4/12/2024		0	1	19	80	0	0	
CGP0007U	11/13/2023		0	4.2	6.7	89	0	0	
CGP0007U	7/17/2023		0	2.7	16.8	80.5	0	-0.01	
CGP0007U	4/12/2024		0	5.1	5.9	89	0	-0.01	
CGP0007U	3/20/2024		0	4.6	6.4	89	0	0	
CGP0007U	2/7/2024		0	5.7	5.7	88.6	0	-0.01	
CGP0007U	1/11/2024		0	4.5	6.1	89.4	0	0	
CGP0007U	12/11/2023		0	4.9	6.2	88.9	0	0	
CGP0007U	10/19/2023		0	3.6	7.1	89.3	0	0	
CGP0007U	9/22/2023		0	1.1	20.2	78.7	0	0	
CGP0007U	8/7/2023		0	2.5	17.5	80	0	0	
CGP0007U	5/16/2024		0	5	9.1	85.9	0	-0.01	
CGP0007U	6/10/2024		0	3	7.2	89.8	0	0	
CGP0010L	8/7/2023		0	5.4	5.8	88.8	0	0	
CGP0010L	9/22/2023		0	6.1	4.7	89.2	0	-0.02	
CGP0010L	10/19/2023		0	6.3	5.4	88.3	0	0	
CGP0010L	12/11/2023		0	6.4	5.4	88.2	0	0	
CGP0010L	2/7/2024		0	5.7	5.6	88.7	0	0	
CGP0010L	3/20/2024		0	5.4	5.5	89.1	0	0	
CGP0010L	7/17/2023		0	5.2	5.5	89.3	0	0	
CGP0010L	5/16/2024		0	5.5	6.9	81.6	0	-0.01	
CGP0010L	11/13/2023		0	5.5	5.4	89.1	0	0	
CGP0010L	4/12/2024		0	5.5	5.4	89.1	0	-0.04	
CGP0010L	6/10/2024		0	5.1	5.5	89.4	0	-0.01	

COLBERT PERIMETER GAS MONITORING REPORT

Barometer: 30.11

Tech: MT **Calibration:** Zeroed CH4 to AB air CALGAS> Ch4 reading 14.7% cal to 15%; CO2 reading 14.9% cal to 15%; zeroed O2 to CALGAS-> O2 reading 20.8% AB air cal to 20.9% **FanFlow:** 41 **Weather** Partly Cloudy 30's

Equipment: Gem 500 #410

Location	Date	Time	CH4	CO2	O2	Balance	Static Press	Diff. Press.	Comments
CGP0010L	1/11/2024		0	6.4	5.4	88.3	0	0	
CGP0010U	9/22/2023		0	2.4	17.4	80.2	0	-0.01	
CGP0010U	3/20/2024		0	2.1	7.1	90.8	0	-0.01	
CGP0010U	8/7/2023		0	2.8	16.9	80.3	0	0	
CGP0010U	10/19/2023		0	3	16.7	80.3	0	0	
CGP0010U	11/13/2023		0	2.5	7.1	90.4	0	0	
CGP0010U	12/11/2023		0	2.3	17.3	80.4	0	0	
CGP0010U	6/10/2024		0	2.4	7	90.6	0	-0.01	
CGP0010U	1/11/2024		0	2.1	17.1	80.8	0	0	
CGP0010U	2/7/2024		0	2.3	7.2	90.5	0	0	
CGP0010U	5/16/2024		0	5.9	8.1	86	0	0	
CGP0010U	4/12/2024		0	2.6	7.6	89.8	0	0	
CGP0010U	7/17/2023		0	2.6	7.2	90.2	0	0	
CGP0011L	2/7/2024		0	0.4	20.1	79.5	0	0	
CGP0011L	7/17/2023		0	0.1	20.3	79.6	0	0	
CGP0011L	8/7/2023		0	0.3	20.2	79.5	0	0	
CGP0011L	9/22/2023		0	0.9	19.4	79.7	0	0	
CGP0011L	10/19/2023		0	0.7	19.5	79.8	0	0	
CGP0011L	11/13/2023		0	1.1	19	79.9	0	0	
CGP0011L	3/20/2024		0	0.9	18.5	80.6	0	0	
CGP0011L	4/12/2024		0	1.1	18.3	80.6	0	0	
CGP0011L	5/16/2024		0	0.7	18.9	80.4	0	0	
CGP0011L	6/10/2024		0	0.3	19.6	80.1	0	-0.02	
CGP0011L	1/11/2024		0	1	19.7	79.3	0	-0.01	
CGP0011L	12/11/2023		0	0.4	20	79.6	0	0	
CGP0011U	4/12/2024		0	3.5	6.8	89.7	0	0	
CGP0011U	8/7/2023		0	3.9	6.7	89.4	0	0	
CGP0011U	9/22/2023		0	3.1	15.7	81.2	0	0	
CGP0011U	10/19/2023		0	5.2	5.9	88.9	0	0	
CGP0011U	11/13/2023		0	3.2	7	89.7	0	0	
CGP0011U	12/11/2023		0	4.9	6.5	88.6	0	0	

COLBERT PERIMETER GAS MONITORING REPORT

Barometer: 30.11

Tech: MT

Calibration: Zeroed CH4 to AB air CALGAS> Ch4 reading 14.7% cal to 15%; CO2 reading 14.9% cal to 15%; zeroed O2 to CALGAS-> O2 reading 20.8% AB air cal to 20.9%

FanFlow: 41

Weather Partly Cloudy 30's

Equipment: Gem 500 #410

Location	Date	Time	CH4	CO2	O2	Balance	Static Press	Diff. Press.	Comments
CGP0011U	1/11/2024		0	5.1	6.6	88.3	0	0	
CGP0011U	3/20/2024		0	3.5	6.8	89.7	0	-0.02	
CGP0011U	5/16/2024		0	3.1	6.6	90.3	0	0	
CGP0011U	6/10/2024		0	3.5	6.5	90	0	-0.03	
CGP0011U	7/17/2023		0	3.6	6.6	89.8	0	-0.03	
CGP0011U	2/7/2024		0	3.7	7.3	89	0	0	

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8/8/2023
Mr. Mike Terris
Spokane County Utilities
22515 N. Elk Chattaroy Road

Colbert WA 99005

Project Name: COLBERT LANDFILL
Project #: COLBERT
Workorder #: 2308041

Dear Mr. Mike Terris

The following report includes the data for the above referenced project for sample(s) received on 8/1/2023 at Eurofins Air Toxics LLC.

The data and associated QC analyzed by TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics LLC. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Monica Tran at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Monica Tran

Project Manager

eurofins | Air Toxics

WORK ORDER #: 2308041

Work Order Summary

CLIENT:	Mr. Mike Terris Spokane County Utilities 22515 N. Elk Chattaroy Road Colbert, WA 99005	**BILL TO:**	Mr. Mike Terris Spokane County Utilities 22515 N. Elk Chattaroy Road Colbert, WA 99005
PHONE:	509-238-6607	**P.O. #**	
FAX:	509-238-6812	**PROJECT #**	COLBERT COLBERT LANDFILL
DATE RECEIVED:	08/01/2023	**CONTACT:**	Monica Tran
DATE COMPLETED:	08/08/2023		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	CGE-001-230727	TO-15	0.4 "Hg	1.5 psi
02A	CGI-003-230727	TO-15	4.7 "Hg	1.7 psi
03A	Lab Blank	TO-15	NA	NA
04A	CCV	TO-15	NA	NA
05A	LCS	TO-15	NA	NA
05AA	LCSD	TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 08/08/23

Technical Director

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP – 209222, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP – T104704434-22-18, UT NELAP – CA009332022-14, VA NELAP - 12240, WA ELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program) CA300005-017
Eurofins Environment Testing Northern California, LLC certifies that the test results contained in this report meet all requirements of the 2016 TNI Standard.

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LABORATORY NARRATIVE
EPA Method TO-15
Spokane County Utilities
Workorder# 2308041

Two 6 Liter Summa Canister samples were received on August 01, 2023. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

Dilution was performed on sample CGI-003-230727 due to the presence of high level target species.

Definition of Data Qualifying Flags

Ten qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

M - Reported value may be biased due to apparent matrix interferences.

CN - See Case Narrative.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: CGE-001-230727

Lab ID#: 2308041-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.56	44	2.8	220
Vinyl Chloride	0.56	7.5	1.4	19
Ethanol	5.6	18	10	34
2-Propanol	2.2	3.0	5.5	7.5
Toluene	1.1	1.2	4.2	4.5

Client Sample ID: CGI-003-230727

Lab ID#: 2308041-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	3.3	100	16	500
Freon 114	3.3	28	23	190
Vinyl Chloride	3.3	84	8.4	220
Chloroethane	13	70	35	180
Freon 11	3.3	14	18	79
1,1-Dichloroethene	3.3	19	13	75
Hexane	3.3	100	12	350
1,1-Dichloroethane	3.3	8.6	13	35
cis-1,2-Dichloroethene	3.3	120	13	460
Tetrahydrofuran	3.3	60	9.7	180
Cyclohexane	3.3	69	11	240
2,2,4-Trimethylpentane	3.3	48	15	220
Benzene	3.3	26	10	82
Heptane	3.3	100	14	430
Trichloroethene	3.3	4.4	18	23
Toluene	6.6	20	25	76
Chlorobenzene	3.3	14	15	64
Ethyl Benzene	3.3	470	14	2000
m,p-Xylene	6.6	760	29	3300
o-Xylene	3.3	69	14	300
Cumene	3.3	25	16	120
Propylbenzene	3.3	22	16	110
4-Ethyltoluene	3.3	42	16	210

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: CGI-003-230727

Lab ID#: 2308041-02A

1,3,5-Trimethylbenzene	3.3	44	16	220
1,2,4-Trimethylbenzene	3.3	130	16	650
1,4-Dichlorobenzene	3.3	39	20	240

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Client Sample ID: CGE-001-230727

Lab ID#: 2308041-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**91080425**	**Date of Collection:**	**7/27/23 10:20:00 AM**
Dil. Factor:	**1.12**	**Date of Analysis:**	**8/4/23 11:20 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.56	44	2.8	220
Freon 114	0.56	Not Detected	3.9	Not Detected
Chloromethane	5.6	Not Detected	12	Not Detected
Vinyl Chloride	0.56	7.5	1.4	19
1,3-Butadiene	0.56	Not Detected	1.2	Not Detected
Bromomethane	5.6	Not Detected	22	Not Detected
Chloroethane	2.2	Not Detected	5.9	Not Detected
Freon 11	0.56	Not Detected	3.1	Not Detected
Ethanol	5.6	18	10	34
Freon 113	0.56	Not Detected	4.3	Not Detected
1,1-Dichloroethene	0.56	Not Detected	2.2	Not Detected
Acetone	5.6	Not Detected	13	Not Detected
2-Propanol	2.2	3.0	5.5	7.5
Carbon Disulfide	2.2	Not Detected	7.0	Not Detected
3-Chloropropene	2.2	Not Detected	7.0	Not Detected
Methylene Chloride	5.6	Not Detected	19	Not Detected
Methyl tert-butyl ether	2.2	Not Detected	8.1	Not Detected
trans-1,2-Dichloroethene	0.56	Not Detected	2.2	Not Detected
Hexane	0.56	Not Detected	2.0	Not Detected
1,1-Dichloroethane	0.56	Not Detected	2.3	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.2	Not Detected	6.6	Not Detected
cis-1,2-Dichloroethene	0.56	Not Detected	2.2	Not Detected
Tetrahydrofuran	0.56	Not Detected	1.6	Not Detected
Chloroform	0.56	Not Detected	2.7	Not Detected
1,1,1-Trichloroethane	0.56	Not Detected	3.0	Not Detected
Cyclohexane	0.56	Not Detected	1.9	Not Detected
Carbon Tetrachloride	0.56	Not Detected	3.5	Not Detected
2,2,4-Trimethylpentane	0.56	Not Detected	2.6	Not Detected
Benzene	0.56	Not Detected	1.8	Not Detected
1,2-Dichloroethane	0.56	Not Detected	2.3	Not Detected
Heptane	0.56	Not Detected	2.3	Not Detected
Trichloroethene	0.56	Not Detected	3.0	Not Detected
1,2-Dichloropropane	0.56	Not Detected	2.6	Not Detected
1,4-Dioxane	2.2	Not Detected	8.1	Not Detected
Bromodichloromethane	0.56	Not Detected	3.8	Not Detected
cis-1,3-Dichloropropene	0.56	Not Detected	2.5	Not Detected
4-Methyl-2-pentanone	0.56	Not Detected	2.3	Not Detected
Toluene	1.1	1.2	4.2	4.5
trans-1,3-Dichloropropene	0.56	Not Detected	2.5	Not Detected
1,1,2-Trichloroethane	0.56	Not Detected	3.0	Not Detected
Tetrachloroethene	0.56	Not Detected	3.8	Not Detected
2-Hexanone	2.2	Not Detected	9.2	Not Detected

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Client Sample ID: CGE-001-230727

Lab ID#: 2308041-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**91080425**	**Date of Collection:**	**7/27/23 10:20:00 AM**
Dil. Factor:	**1.12**	**Date of Analysis:**	**8/4/23 11:20 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	0.56	Not Detected	4.8	Not Detected
1,2-Dibromoethane (EDB)	0.56	Not Detected	4.3	Not Detected
Chlorobenzene	0.56	Not Detected	2.6	Not Detected
Ethyl Benzene	0.56	Not Detected	2.4	Not Detected
m,p-Xylene	1.1	Not Detected	4.9	Not Detected
o-Xylene	0.56	Not Detected	2.4	Not Detected
Styrene	0.56	Not Detected	2.4	Not Detected
Bromoform	0.56	Not Detected	5.8	Not Detected
Cumene	0.56	Not Detected	2.8	Not Detected
1,1,2,2-Tetrachloroethane	0.56	Not Detected	3.8	Not Detected
Propylbenzene	0.56	Not Detected	2.8	Not Detected
4-Ethyltoluene	0.56	Not Detected	2.8	Not Detected
1,3,5-Trimethylbenzene	0.56	Not Detected	2.8	Not Detected
1,2,4-Trimethylbenzene	0.56	Not Detected	2.8	Not Detected
1,3-Dichlorobenzene	0.56	Not Detected	3.4	Not Detected
1,4-Dichlorobenzene	0.56	Not Detected	3.4	Not Detected
alpha-Chlorotoluene	0.56	Not Detected	2.9	Not Detected
1,2-Dichlorobenzene	0.56	Not Detected	3.4	Not Detected
1,2,4-Trichlorobenzene	2.2	Not Detected	17	Not Detected
Hexachlorobutadiene	2.2	Not Detected	24	Not Detected

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	93	70-130
1,2-Dichloroethane-d4	98	70-130
4-Bromofluorobenzene	97	70-130

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Client Sample ID: CGI-003-230727

Lab ID#: 2308041-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**91080426**	**Date of Collection:**	**7/27/23 10:50:00 AM**
Dil. Factor:	**6.61**	**Date of Analysis:**	**8/4/23 11:44 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	3.3	100	16	500
Freon 114	3.3	28	23	190
Chloromethane	33	Not Detected	68	Not Detected
Vinyl Chloride	3.3	84	8.4	220
1,3-Butadiene	3.3	Not Detected	7.3	Not Detected
Bromomethane	33	Not Detected	130	Not Detected
Chloroethane	13	70	35	180
Freon 11	3.3	14	18	79
Ethanol	33	Not Detected	62	Not Detected
Freon 113	3.3	Not Detected	25	Not Detected
1,1-Dichloroethene	3.3	19	13	75
Acetone	33	Not Detected	78	Not Detected
2-Propanol	13	Not Detected	32	Not Detected
Carbon Disulfide	13	Not Detected	41	Not Detected
3-Chloropropene	13	Not Detected	41	Not Detected
Methylene Chloride	33	Not Detected	110	Not Detected
Methyl tert-butyl ether	13	Not Detected	48	Not Detected
trans-1,2-Dichloroethene	3.3	Not Detected	13	Not Detected
Hexane	3.3	100	12	350
1,1-Dichloroethane	3.3	8.6	13	35
2-Butanone (Methyl Ethyl Ketone)	13	Not Detected	39	Not Detected
cis-1,2-Dichloroethene	3.3	120	13	460
Tetrahydrofuran	3.3	60	9.7	180
Chloroform	3.3	Not Detected	16	Not Detected
1,1,1-Trichloroethane	3.3	Not Detected	18	Not Detected
Cyclohexane	3.3	69	11	240
Carbon Tetrachloride	3.3	Not Detected	21	Not Detected
2,2,4-Trimethylpentane	3.3	48	15	220
Benzene	3.3	26	10	82
1,2-Dichloroethane	3.3	Not Detected	13	Not Detected
Heptane	3.3	100	14	430
Trichloroethene	3.3	4.4	18	23
1,2-Dichloropropane	3.3	Not Detected	15	Not Detected
1,4-Dioxane	13	Not Detected	48	Not Detected
Bromodichloromethane	3.3	Not Detected	22	Not Detected
cis-1,3-Dichloropropene	3.3	Not Detected	15	Not Detected
4-Methyl-2-pentanone	3.3	Not Detected	14	Not Detected
Toluene	6.6	20	25	76
trans-1,3-Dichloropropene	3.3	Not Detected	15	Not Detected
1,1,2-Trichloroethane	3.3	Not Detected	18	Not Detected
Tetrachloroethene	3.3	Not Detected	22	Not Detected
2-Hexanone	13	Not Detected	54	Not Detected

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Client Sample ID: CGI-003-230727

Lab ID#: 2308041-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**91080426**	**Date of Collection:**	**7/27/23 10:50:00 AM**
Dil. Factor:	**6.61**	**Date of Analysis:**	**8/4/23 11:44 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	3.3	Not Detected	28	Not Detected
1,2-Dibromoethane (EDB)	3.3	Not Detected	25	Not Detected
Chlorobenzene	3.3	14	15	64
Ethyl Benzene	3.3	470	14	2000
m,p-Xylene	6.6	760	29	3300
o-Xylene	3.3	69	14	300
Styrene	3.3	Not Detected	14	Not Detected
Bromoform	3.3	Not Detected	34	Not Detected
Cumene	3.3	25	16	120
1,1,2,2-Tetrachloroethane	3.3	Not Detected	23	Not Detected
Propylbenzene	3.3	22	16	110
4-Ethyltoluene	3.3	42	16	210
1,3,5-Trimethylbenzene	3.3	44	16	220
1,2,4-Trimethylbenzene	3.3	130	16	650
1,3-Dichlorobenzene	3.3	Not Detected	20	Not Detected
1,4-Dichlorobenzene	3.3	39	20	240
alpha-Chlorotoluene	3.3	Not Detected	17	Not Detected
1,2-Dichlorobenzene	3.3	Not Detected	20	Not Detected
1,2,4-Trichlorobenzene	13	Not Detected	98	Not Detected
Hexachlorobutadiene	13	Not Detected	140	Not Detected

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	95	70-130
1,2-Dichloroethane-d4	96	70-130
4-Bromofluorobenzene	79	70-130

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Client Sample ID: Lab Blank

Lab ID#: 2308041-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**91080406d**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/4/23 12:41 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.50	Not Detected	2.5	Not Detected
Freon 114	0.50	Not Detected	3.5	Not Detected
Chloromethane	5.0	Not Detected	10	Not Detected
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,3-Butadiene	0.50	Not Detected	1.1	Not Detected
Bromomethane	5.0	Not Detected	19	Not Detected
Chloroethane	2.0	Not Detected	5.3	Not Detected
Freon 11	0.50	Not Detected	2.8	Not Detected
Ethanol	5.0	Not Detected	9.4	Not Detected
Freon 113	0.50	Not Detected	3.8	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Acetone	5.0	Not Detected	12	Not Detected
2-Propanol	2.0	Not Detected	4.9	Not Detected
Carbon Disulfide	2.0	Not Detected	6.2	Not Detected
3-Chloropropene	2.0	Not Detected	6.3	Not Detected
Methylene Chloride	5.0	Not Detected	17	Not Detected
Methyl tert-butyl ether	2.0	Not Detected	7.2	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Hexane	0.50	Not Detected	1.8	Not Detected
1,1-Dichloroethane	0.50	Not Detected	2.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	Not Detected	5.9	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Tetrahydrofuran	0.50	Not Detected	1.5	Not Detected
Chloroform	0.50	Not Detected	2.4	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Cyclohexane	0.50	Not Detected	1.7	Not Detected
Carbon Tetrachloride	0.50	Not Detected	3.1	Not Detected
2,2,4-Trimethylpentane	0.50	Not Detected	2.3	Not Detected
Benzene	0.50	Not Detected	1.6	Not Detected
1,2-Dichloroethane	0.50	Not Detected	2.0	Not Detected
Heptane	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
1,2-Dichloropropane	0.50	Not Detected	2.3	Not Detected
1,4-Dioxane	2.0	Not Detected	7.2	Not Detected
Bromodichloromethane	0.50	Not Detected	3.4	Not Detected
cis-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
4-Methyl-2-pentanone	0.50	Not Detected	2.0	Not Detected
Toluene	1.0	Not Detected	3.8	Not Detected
trans-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected
2-Hexanone	2.0	Not Detected	8.2	Not Detected

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Client Sample ID: Lab Blank

Lab ID#: 2308041-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**91080406d**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/4/23 12:41 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	0.50	Not Detected	4.2	Not Detected
1,2-Dibromoethane (EDB)	0.50	Not Detected	3.8	Not Detected
Chlorobenzene	0.50	Not Detected	2.3	Not Detected
Ethyl Benzene	0.50	Not Detected	2.2	Not Detected
m,p-Xylene	1.0	Not Detected	4.3	Not Detected
o-Xylene	0.50	Not Detected	2.2	Not Detected
Styrene	0.50	Not Detected	2.1	Not Detected
Bromoform	0.50	Not Detected	5.2	Not Detected
Cumene	0.50	Not Detected	2.4	Not Detected
1,1,2,2-Tetrachloroethane	0.50	Not Detected	3.4	Not Detected
Propylbenzene	0.50	Not Detected	2.4	Not Detected
4-Ethyltoluene	0.50	Not Detected	2.4	Not Detected
1,3,5-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,2,4-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,3-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,4-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
alpha-Chlorotoluene	0.50	Not Detected	2.6	Not Detected
1,2-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,2,4-Trichlorobenzene	2.0	Not Detected	15	Not Detected
Hexachlorobutadiene	2.0	Not Detected	21	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	95	70-130
1,2-Dichloroethane-d4	97	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: CCV

Lab ID#: 2308041-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**91080403**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/4/23 11:00 AM**	

Compound	%Recovery
Freon 12	86
Freon 114	87
Chloromethane	92
Vinyl Chloride	95
1,3-Butadiene	90
Bromomethane	85
Chloroethane	91
Freon 11	84
Ethanol	92
Freon 113	88
1,1-Dichloroethene	89
Acetone	87
2-Propanol	93
Carbon Disulfide	94
3-Chloropropene	90
Methylene Chloride	88
Methyl tert-butyl ether	90
trans-1,2-Dichloroethene	88
Hexane	86
1,1-Dichloroethane	86
2-Butanone (Methyl Ethyl Ketone)	94
cis-1,2-Dichloroethene	96
Tetrahydrofuran	93
Chloroform	95
1,1,1-Trichloroethane	90
Cyclohexane	98
Carbon Tetrachloride	89
2,2,4-Trimethylpentane	94
Benzene	99
1,2-Dichloroethane	93
Heptane	102
Trichloroethene	91
1,2-Dichloropropane	95
1,4-Dioxane	101
Bromodichloromethane	95
cis-1,3-Dichloropropene	95
4-Methyl-2-pentanone	87
Toluene	96
trans-1,3-Dichloropropene	96
1,1,2-Trichloroethane	89
Tetrachloroethene	110
2-Hexanone	93

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Client Sample ID: CCV

Lab ID#: 2308041-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**91080403**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/4/23 11:00 AM**	

Compound	%Recovery
Dibromochloromethane	102
1,2-Dibromoethane (EDB)	99
Chlorobenzene	98
Ethyl Benzene	99
m,p-Xylene	98
o-Xylene	97
Styrene	95
Bromoform	100
Cumene	95
1,1,2,2-Tetrachloroethane	94
Propylbenzene	100
4-Ethyltoluene	102
1,3,5-Trimethylbenzene	99
1,2,4-Trimethylbenzene	100
1,3-Dichlorobenzene	103
1,4-Dichlorobenzene	102
alpha-Chlorotoluene	90
1,2-Dichlorobenzene	100
1,2,4-Trichlorobenzene	103
Hexachlorobutadiene	94

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	84	70-130
4-Bromofluorobenzene	94	70-130

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Client Sample ID: LCS

Lab ID#: 2308041-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**91080404**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/4/23 11:25 AM**	

Compound	%Recovery	Method Limits
Freon 12	78	70-130
Freon 114	77	70-130
Chloromethane	82	70-130
Vinyl Chloride	82	70-130
1,3-Butadiene	79	70-130
Bromomethane	74	70-130
Chloroethane	79	70-130
Freon 11	76	70-130
Ethanol	88	70-130
Freon 113	81	70-130
1,1-Dichloroethene	77	70-130
Acetone	78	70-130
2-Propanol	78	70-130
Carbon Disulfide	85	70-130
3-Chloropropene	82	70-130
Methylene Chloride	76	70-130
Methyl tert-butyl ether	84	70-130
trans-1,2-Dichloroethene	80	70-130
Hexane	83	70-130
1,1-Dichloroethane	81	70-130
2-Butanone (Methyl Ethyl Ketone)	88	70-130
cis-1,2-Dichloroethene	88	70-130
Tetrahydrofuran	92	70-130
Chloroform	88	70-130
1,1,1-Trichloroethane	86	70-130
Cyclohexane	94	70-130
Carbon Tetrachloride	86	70-130
2,2,4-Trimethylpentane	86	70-130
Benzene	95	70-130
1,2-Dichloroethane	88	70-130
Heptane	104	70-130
Trichloroethene	87	70-130
1,2-Dichloropropane	93	70-130
1,4-Dioxane	88	70-130
Bromodichloromethane	90	70-130
cis-1,3-Dichloropropene	93	70-130
4-Methyl-2-pentanone	84	70-130
Toluene	94	70-130
trans-1,3-Dichloropropene	90	70-130
1,1,2-Trichloroethane	87	70-130
Tetrachloroethene	108	70-130
2-Hexanone	87	70-130

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Client Sample ID: LCS

Lab ID#: 2308041-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**91080404**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/4/23 11:25 AM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	96	70-130
1,2-Dibromoethane (EDB)	87	70-130
Chlorobenzene	96	70-130
Ethyl Benzene	99	70-130
m,p-Xylene	95	70-130
o-Xylene	96	70-130
Styrene	93	70-130
Bromoform	97	70-130
Cumene	94	70-130
1,1,2,2-Tetrachloroethane	92	70-130
Propylbenzene	97	70-130
4-Ethyltoluene	98	70-130
1,3,5-Trimethylbenzene	96	70-130
1,2,4-Trimethylbenzene	97	70-130
1,3-Dichlorobenzene	99	70-130
1,4-Dichlorobenzene	96	70-130
alpha-Chlorotoluene	85	70-130
1,2-Dichlorobenzene	94	70-130
1,2,4-Trichlorobenzene	89	70-130
Hexachlorobutadiene	89	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	86	70-130
4-Bromofluorobenzene	94	70-130

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Client Sample ID: LCSD

Lab ID#: 2308041-05AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**91080405**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/4/23 11:49 AM**	

Compound	%Recovery	Method Limits
Freon 12	80	70-130
Freon 114	78	70-130
Chloromethane	85	70-130
Vinyl Chloride	85	70-130
1,3-Butadiene	81	70-130
Bromomethane	76	70-130
Chloroethane	81	70-130
Freon 11	77	70-130
Ethanol	91	70-130
Freon 113	82	70-130
1,1-Dichloroethene	78	70-130
Acetone	80	70-130
2-Propanol	81	70-130
Carbon Disulfide	87	70-130
3-Chloropropene	85	70-130
Methylene Chloride	78	70-130
Methyl tert-butyl ether	86	70-130
trans-1,2-Dichloroethene	82	70-130
Hexane	84	70-130
1,1-Dichloroethane	83	70-130
2-Butanone (Methyl Ethyl Ketone)	89	70-130
cis-1,2-Dichloroethene	89	70-130
Tetrahydrofuran	96	70-130
Chloroform	90	70-130
1,1,1-Trichloroethane	87	70-130
Cyclohexane	96	70-130
Carbon Tetrachloride	86	70-130
2,2,4-Trimethylpentane	89	70-130
Benzene	97	70-130
1,2-Dichloroethane	91	70-130
Heptane	105	70-130
Trichloroethene	89	70-130
1,2-Dichloropropane	94	70-130
1,4-Dioxane	93	70-130
Bromodichloromethane	90	70-130
cis-1,3-Dichloropropene	94	70-130
4-Methyl-2-pentanone	84	70-130
Toluene	95	70-130
trans-1,3-Dichloropropene	92	70-130
1,1,2-Trichloroethane	88	70-130
Tetrachloroethene	107	70-130
2-Hexanone	87	70-130

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Client Sample ID: LCSD

Lab ID#: 2308041-05AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**91080405**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/4/23 11:49 AM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	94	70-130
1,2-Dibromoethane (EDB)	97	70-130
Chlorobenzene	98	70-130
Ethyl Benzene	101	70-130
m,p-Xylene	99	70-130
o-Xylene	99	70-130
Styrene	93	70-130
Bromoform	95	70-130
Cumene	96	70-130
1,1,2,2-Tetrachloroethane	93	70-130
Propylbenzene	99	70-130
4-Ethyltoluene	101	70-130
1,3,5-Trimethylbenzene	99	70-130
1,2,4-Trimethylbenzene	98	70-130
1,3-Dichlorobenzene	99	70-130
1,4-Dichlorobenzene	98	70-130
alpha-Chlorotoluene	86	70-130
1,2-Dichlorobenzene	96	70-130
1,2,4-Trichlorobenzene	91	70-130
Hexachlorobutadiene	89	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	88	70-130
4-Bromofluorobenzene	96	70-130

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Analysis Request /Canister Chain of Custody

For Laboratory Use Only
PID: _____ Workorder #: 2308041

180 Blue Ravine Rd. Suite B, Folsom, CA 95630
Phone (800) 985-5955; Fax (916) 351-8279

Client: SPOKANE COUNTY
Project Name: COLBERT LANDFILL
Project Manager: AUSTIN S Project # COLBERT
Sampler: MIKE TERRIS
Site Name: COLBERT

Special Instructions/Notes:
CARBON UNIT IN USE CU-1

Turnaround Time (Rush surcharges may apply)
Standard X Rush _____ (specify)

Lab ID	Field Sample Identification(Location)	Can #	Flow Controller #	Start Sampling Information		Stop Sampling Information		Canister Vacuum/Pressure		Lab Use Only		Requested Analyses			
				Date	Time	Date	Time	Initial (in Hg)	Final (in Hg)	Receipt	Final (psig) Gas: N_2 / He	TO-15			
01A	CGE-001-230727	D227	1824	7/27/23	1000	7/27/23	1020	225	Ø			X			
02A	CGI-003-230727	N4874	2108	7/27/23	1030	7/27/23	1050	225	Ø			X			

Relinquished by: (Signature/Affiliation) MikeDavis/SPOKANE COUNTY	Date 7/27/2023	Time 1300	Received by: (Signature/Affiliation) EAtL	Date 8/1/23	Time 11:17
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time

Lab Use Only

Shipper Name: UPS | Custody Seals Intact? (Yes) No None

Sample Transportation Notice: Relinquishing signature on this document indicates that samples are shipped in compliance with all applicable local, State, Federal, and international laws, regulations, and ordinances of any kind. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Eurofins Air Toxics against any claim, demand, or action, of any kind, related to the collection, handling, of shipping of samples. D.O.T Hotline (800) 467-4922

Appendix B

Colbert Annual Sampling Field Sheets/Paperwork

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/02/24
Field Personnel: Craig Campbell
StationID: CP-S1
Weather: Clear, 36-71°F
Sample ID: CP-S1-240402
Purge Method: Disp. bailer, (Ded. Grundfos), Ded. Bladder, Ded. Bennett, Env. Tech ES 40, ~~Port. Grundfos~~, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: MS/MSD on Bottles

Well Depth: 103 — Screens from: 104 To 109 — Casing Size (in): 6

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
(6)	1.5
8	2.6

− Depth to Water: 80.75'

= Water Column Depth: 22.25 x Gallons per linear foot: 1.5 = Calc. Purge vol./casing vol.: 34 x3 well volumes = Total Purge Vol. (gal): 102

Purge Rate: 40gpm
Purge Begin Time: 1310

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1609	7240	7.46	575	10.9		Clear
1611	7320	7.46	580	10.6		Clear
1613	7400	7.46	583	10.4		Clear
Stabilization Criteria		+/- 0.1 unit	+/- 5%		0.38	(must meet criteria within 3 consecutive measurements)

Sample Time: 1615 (1554 MARKED)
QAQC Sample Time: 1615 (MARKED 1554)

Meters:

pH	Conductivity	Turbidity
Meter: ~~EcTestr Extech~~	Meter: EcTestr 11+	Hach 2100P
S/N 2307124	S/N 1312423	S/N 940700005619/
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	X
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	X
1-40mL Glass w/ HCL - TOC (SM 2540C)	

Comments: Started well in PM then sampled. MS/MSD taken here, VOC & Dioxane.

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/02/24
StationID: CP-S4
Sample ID: CP-S4 - 240402
QA/QC Sample ID: N/A

Field Personnel: Craig Campbell
Weather: Clear, 36-71°F
Purge Method: Disp. bailer, (Ded. Grundfos), Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve

Well Depth: 109
Screens from: To
Casing Size (in): 6

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
(6)	1.5
8	2.6

Depth to Water: NT 80'
Water Column Depth: 29.00 x Gallons per linear foot: 1.5 = Calc. Purge vol./casing vol.: 44 x3 well volumes = Total Purge Vol. (gal): 132

Purge Rate: 15gpm
Purge Begin Time: 1400

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1430	450	7.28	687	10.8		Clear
1432	480	7.31	690	10.5		Clear
1434	510	7.31	690	10.5		Clear
Stabilization Criteria		+/- 0.1 unit	+/- 5%		0.48	(must meet criteria within 3 consecutive measurements)

Sample Time: 1436 MARKED 1454
QAQC Sample Time: N/A

Meters:

pH	Conductivity	Turbidity
Meter: Extech PH100	Meter: EcTestr 11+	Hach 2100P
S/N 2307124	S/N 1312423	S/N 940700005619/
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	X
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	

Started well in PM then sampled.

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/02/24
Field Personnel: Craig Campbell
StationID: CP-S5
Weather: Clear, 36-71°F
Sample ID: CP-S5-240402
Purge Method: Disp. bailer, (Ded. Grundfos), Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: N/A

Well Depth: 101
Screens from: To
Casing Size (in): 6

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
(6)	1.5
8	2.6

Depth to Water: * NT
Water Column Depth: 21 x Gallons per linear foot: 1.5 = Calc. Purge vol./casing vol.: 32 x3 well volumes = Total Purge Vol. (gal): 96

Purge Rate: 25 gpm
Purge Begin Time: 0842

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1411	8225	7.33	705	12.0		Clear
1413	8275	7.34	710	11.8		Clear
1415	8325	7.34	717	11.7		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.34	(must meet criteria within 3 consecutive measurements)

Sample Time: 1417
QAQC Sample Time: N/A

Meters:

pH	Conductivity	Turbidity
Meter: Extech pH100	Meter: EcTestr 11+	Hach 2100P
S/N 2307124	S/N 1312423	(S/N 940700005619/)
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	*
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	

Started well in AM then sampled.

Comments: * WL NOT TAKEN USE 80' AS A MARKED LEVEL

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/02/24
StationID: CP-S6
Sample ID: CP-S6 -240402
QA/QC Sample ID: N/A

Field Personnel: Craig Campbell
Weather: Clear, 36-71°F
Purge Method: Disp. bailer, (Ded. Grundfos), Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve

Well Depth: 106 Screens from: To Casing Size (in): 6

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
(6)	1.5
8	2.6

− Depth to Water: 87.26'
= Water Column Depth: 18.74' x Gallons per linear foot: 1.5 = Calc. Purge vol./casing vol.: 29 x3 well volumes = Total Purge Vol. (gal): 87

Purge Rate: 40gpm
Purge Begin Time: 1425

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1448	920	7.34	781	11.0		Clear
1450	1000	7.34	788	10.8		Clear
1452	1080	7.34	790	10.6		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		~~0.70~~ 0.70	(must meet criteria within 3 consecutive measurements)

Sample Time: 1454 MARKED 1436
QAQC Sample Time: N/A

Meters:

pH	Conductivity	Turbidity
Meter: Exstech pH100	Meter: EcTestr 11+	Hach 2100P
S/N 2307124	S/N 1312423	S/N 940700005619
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	X
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	

Started well in pm then sampled.

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/02/24
Field Personnel: Craig Campbell
StationID: CP-E1
Weather: Clear, 36-41°F
Sample ID: CP-E1-240402
Purge Method: Disp. bailer, (Ded. Grundfos), Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: N/A

Well Depth: 257
Screens from: 235 To 258
Casing Size (in): 8

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
(8)	2.6

− Depth to Water: 184.12'
= Water Column Depth: 72.88 x Gallons per linear foot: 2.6 = Calc. Purge vol./casing vol.: 190 x3 well volumes = Total Purge Vol. (gal): 570

Purge Rate: 100gpm
Purge Begin Time: 1000

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1321	62,000	6.89	1032	13.1		Clear
1323	62200	6.90	1036	13.0		Clear
1325	~~62400~~ 20,500	6.90	1038	12.9		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.39	(must meet criteria within 3 consecutive measurements)

Sample Time: 1327
QAQC Sample Time: N/A

Meters:

pH	Conductivity	Turbidity
Meter: Extech PH100	Meter: EcTestr 11+	Hach 2100P
S/N 2307124	S/N 1312423	S/N 940700005619
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	X
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	

Started well in the AM then sampled.

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/02/24
Field Personnel: Craig Campbell
StationID: CP-E2
Weather: Clear, 36-71°F
Sample ID: CP-E2-240412
Purge Method: Disp. bailer, (Ded. Grundfos), Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: N/A

Well Depth: 188 Screens from: To Casing Size (in): 6

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
(6)	1.5
8	2.6

− Depth to Water: 151.07'
= Water Column Depth: 36.93 x Gallons per linear foot: 1.5 = Calc. Purge vol./casing vol.: 56 x3 well volumes = Total Purge Vol. (gal): 168

Purge Rate: 2 gpm
Purge Begin Time: 0756

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1523	894	7.10	980	13.8		Clear
1525	898	7.10	987	13.6		Clear
1527	902	7.11	990	13.6		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.44	(must meet criteria within 3 consecutive measurements)

Sample Time: 1529
QAQC Sample Time: N/A

Meters:

pH	Conductivity	Turbidity
Meter: Extech pH100	Meter: EcTestr 11+	Hach 2100P
S/N 2307124	S/N 1312423	(S/N 940700005619)
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	*
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	*
1-40mL Glass w/ HCL - TOC (SM 2540C)	

VOC's + 1,4 DIOXANE

Comments: Started well in AM then sampled.

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/02/24
Field Personnel: Craig Campbell
StationID: CP-E3
Weather: Clear 36-71°F
Sample ID: CP-E3-240402
Purge Method: Disp. bailer, (Ded. Grundfos), Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: N/A

Well Depth: 267
Screens from: To
Casing Size (in): 8

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
(8)	2.6

− Depth to Water: 183.27
= Water Column Depth: 83.73 x Gallons per linear foot: 2.6 = Calc. Purge vol./casing vol.: 218 x3 well volumes = Total Purge Vol. (gal): 654

Purge Rate: 100gpm
Purge Begin Time: 0914

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1144	15000	7.04	827	13.1		Clear
1146	15200	7.06	836	12.8		Clear
1148	15400	7.06	840	12.7		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.53	(must meet criteria within 3 consecutive measurements)

Sample Time: 1150
QAQC Sample Time: N/A

Meters:

pH	Conductivity	Turbidity
Meter: Extech pH100	Meter: EcTestr 11+	Hach 2100P
S/N Z307124	S/N 1312423	(S/N 940700005619)
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	*
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	

Started well in AM then sampled.

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/02/24
StationID: CP-W1
Sample ID: CP-W1-240402
QA/QC Sample ID: N/A

Field Personnel: Craig Campbell
Weather: Clear, 36-71°F
Purge Method: Disp. bailer, (Ded. Grundfos), Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve

Well Depth: 300
Screens from: 280 To 300
Casing Size (in): 8

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
(8)	2.6

Depth to Water: 133 175.03'
Water Column Depth: 124.97 x Gallons per linear foot: 2.6 = Calc. Purge vol./casing vol.: 325 x3 well volumes = Total Purge Vol. (gal): 975

Purge Rate: 125gpm
Purge Begin Time: 0925

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1206	20125	7.80	465	11.9		Clear
1208	20375	7.80	464	11.8		Clear
1210	20625	7.80	465	11.7		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.35	(must meet criteria within 3 consecutive measurements)

Sample Time: 1212
QAQC Sample Time: N/A

Meters:

pH	Conductivity	Turbidity
Meter: Extech PH100	Meter: EcTestr 11+	Hach 2100P
S/N 2307124	S/N 1312423	(S/N 940700005619/)
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	X
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	

Started well in AM then sampled.

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/02/24
Field Personnel: Craig Campbell
StationID: CP-W2
Weather: Clear, 36-71°F
Sample ID: CP-W2-240402
Purge Method: Disp. bailer, (Ded. Grundfos,) Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: CD-52-240402

Well Depth: 280
Screens from: To
Casing Size (in): 8

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
(8)	2.6

Depth to Water: 170.62
Water Column Depth: 109.38 x Gallons per linear foot: 2.6 = Calc. Purge vol./casing vol.: 285 x3 well volumes = Total Purge Vol. (gal): 855

Purge Rate: 150gpm
Purge Begin Time: 0948

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1247	26850	7.67	512	11.7		Clear
1249	27150	7.66	516	11.5		Clear
1251	27450	7.66	518	11.4		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.53	(must meet criteria within 3 consecutive measurements)

Sample Time: 1253
QAQC Sample Time: 1300

Meters:

pH	Conductivity	Turbidity
Meter: Extech pH100	Meter: EcTestr 11+	Hach 2100P
S/N 2307124	S/N 1312423	(S/N 940700005619/)
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	*
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	

* DUPE TAKEN HERE VOCS ONLY

Comments: Started well in AM then sampled.

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/02/24
Field Personnel: Craig Campbell
StationID: CP-W3
Weather: Clear, 36-71°F
Sample ID: CP-W3-240402
Purge Method: Disp. bailer, (Ded. Grundfos,) Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: N/A

Well Depth: 281.5
Screens from: To
Casing Size (in): 8

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
(8)	2.6

Depth to Water: 172.22
Water Column Depth: 109.28 x Gallons per linear foot: 2.6 = Calc. Purge vol./casing vol.: 285 x3 well volumes = Total Purge Vol. (gal): 855

Purge Rate: 150gpm
Purge Begin Time: 0934

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1227	25950	7.28	788	11.9		Clear
1229	26250	7.28	793	11.8		Clear
1231	26550	7.29	796	11.7		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.4	(must meet criteria within 3 consecutive measurements)

Sample Time: 1233
QAQC Sample Time:

Meters:

pH	Conductivity	Turbidity
Meter: Extech PH100	Meter: EcTestr 11+	Hach 2100P
S/N 2307124	S/N 13124-3	(S/N 940700005619/)
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	*
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	*
1-40mL Glass w/ HCL - TOC (SM 2540C)	

VOC'S + 1,4 DIOXANE

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 4-2-24
Field Personnel: GF
StationID: CD-41C1
Weather: Clear, 40°
Sample ID: CD-41C1 - 240402
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: NA

Well Depth: 233
Screens from: 214 To 233
Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

− Depth to Water: 177.56
= Water Column Depth: 55.44 x Gallons per linear foot: 0.26 (4.4) use 15.0 = Calc. Purge vol./casing vol.: 15.0 x3 well volumes = Total Purge Vol. (gal): 45

Purge Rate: 2.0
Purge Begin Time: 0931

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
0939	15	7.92	435	11.7		Clear
0947	30	7.93	428	11.7		Clear
0955	45	7.95	426	11.9		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.09	(must meet criteria within 3 consecutive measurements)

Sample Time: 0956
QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: EC Testr11+	~~Hach 2100P~~ Apera
S/N 476432	S/N 7810	~~S/N 940700005619~~ 81003
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	*
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 4-2-24
Field Personnel: GF
StationID: CD-41C2
Weather: clear, 40°
Sample ID: CD-41C2 - 240402
Purge Method: Disp. bailer, Ded. ~~Grundfos~~, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: NA

Well Depth: 291
Screens from: 271 To 291
Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

− Depth to Water: 178.02

= Water Column Depth: 112.98 x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 29.4 use 30 x3 well volumes = Total Purge Vol. (gal): 90

Purge Rate: 2.9
Purge Begin Time: 0853

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
0904	30	8.01	437	11.5		Clear
0915	60	8.03	438	11.5		Clear
0926	90	8.05	436	11.4		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.05	(must meet criteria within 3 consecutive measurements)

Sample Time: 0927
QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: EC Testr 11+	~~Hach 2100P~~ Apera
S/N 476432	S/N 7810	S/N ~~940700005619~~ 81003
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	X
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 4-2-24
Field Personnel: GF
StationID: CD-41C3
Weather: clear, 40°
Sample ID: CD-41C3 -240402
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: NA

Well Depth: 403
Screens from: 384 To 403
Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

− Depth to Water: 178.14'

= Water Column Depth: 224.86 -x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 58.5 use 59 x3 well volumes = Total Purge Vol. (gal): 177

Purge Rate: 2.9
Purge Begin Time: 0947

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
0908	59	7.82	487	11.4		clear
0929	118	7.87	491	11.6		clear
0951	177	7.88	489	11.7		clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.08	(must meet criteria within 3 consecutive measurements)

Sample Time: 0951
QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: EC testr11+	Apera ~~Hach 2100P~~
S/N 476432	S/N 7810	~~S/N 940700005619~~ 81003
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	*
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 4-2-24
Field Personnel: GF
StationID: CD-42C1
Weather: clear, 58°
Sample ID: CD-42C1 - 240402
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES-40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: NA

Well Depth: 227
Screens from: 208 To 227
Casing Size (in): 2.5
Depth to Water: 174.57
Water Column Depth: 52.43 x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 13.6 use 14 x3 well volumes = Total Purge Vol. (gal): 42

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Purge Rate: 2.0
Purge Begin Time: 1111

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1118	14	7.35	500	12.6		Clear
1125	28	7.36	496	12.6		Clear
1132	42	7.86	494	12.5		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.04	(must meet criteria within 3 consecutive measurements)

Sample Time: 1133
QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: EC Testr 11+	Apera Hach 2100P
S/N 476432	S/N 7810	~~S/N 940700005619~~ 81003
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 4-2-24

Field Personnel: GF

StationID: CD-42C2

Weather: clear 45°

Sample ID: CD-42C2 -240402

Purpose Method: Disp. bailer, Ded. Grundfos (circled), Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve

QA/QC Sample ID:

Well Depth: 312

Screens from: 293 **To** 312

Casing Size (in) 2.5

− **Depth to Water:** 175.45

= **Water Column Depth:** 136.55 **x** **Gallons per linear foot:** 0.26 = **Calc. Purge vol./casing vol.:** 35.5 use 36.0 **x3** **well volumes** = **Total Purge Vol. (gal)** 36/108

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Purge Rate 2.7

Purge Begin Time 1022

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1036	36	7.91	495	12.0		Clear
1050	72	7.92	497	12.2		clear
1104	108	7.91	498	12.3		clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.02	(must meet criteria within 3 consecutive measurements)

Sample Time: 1105

QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: ECTestr11+	~~Hach 2100P~~ Apera
S/N 476432	S/N 7810	~~S/N 940700005619/~~ 81003
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

Analysis	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	*
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 4-2-24 | Field Personnel: GF

StationID: CD-42C3 | Weather: clear 53°

Sample ID: CD-42C3 - 240402 | Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve

QA/QC Sample ID: NA

Well Depth: 402 | Screens from: 383 To 402 | Casing Size (in): 2.5

− Depth to Water: 174.07'

= Water Column Depth: 227.93 x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 59.3 use 60 x3 well volumes = Total Purge Vol. (gal): 180

Purge Rate: 2.2 | Purge Begin Time: 1019

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1047	60	7.97	419	12.2		Clear
1115	120	7.97	423	12.5		Clear
1143	180	7.98	428	12.6		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.06	(must meet criteria within 3 consecutive measurements)

Sample Time: 1144 | QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: EC testr 11 +	~~Hach 2100P~~ Apery
S/N 476432	S/N 7810	~~S/N 940700005619~~ 81003
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	*
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 4-2-24 | Field Personnel: GF

StationID: CD-43C1 | Weather: Clear, 56

Sample ID: CD-43C1-240402 | Purge Method: Disp. bailer, ~~Ded. Grundfos~~, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, ~~Port. Grundfos~~, Port. Bennet, PDB, Hydrasleeve

QA/QC Sample ID: NA

Well Depth: 230 | Screens from: 211 To 230 | Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

− Depth to Water: 171.60

= Water Column Depth: 58.38 x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 15.2 use 16.0 x3 well volumes = Total Purge Vol. (gal): 48

Purge Rate: 2.3 | Purge Begin Time: 1305

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1312	16	7.96	471	11.5		Clear
1319	32	7.97	470	11.5		Clear
1326	48	7.98	475	11.3		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.09	(must meet criteria within 3 consecutive measurements)

Sample Time: 1327 | QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: EC tester 11+	Apera ~~Hach 2100P~~
S/N 470432	S/N 7810	~~S/N 9407000056190~~ 81003
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	*
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 4-2-24
Field Personnel: GF
StationID: CD-43C2
Weather: clear, 56
Sample ID: CD-43C2 -240402
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES ~~40~~, ~~Port. Grundfos~~, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: NA

Well Depth: 299
Screens from: 280 To 299
Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Depth to Water: 171.28
Water Column Depth: 127.72 x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 33.2 use 34 x3 well volumes = Total Purge Vol. (gal): 102

Purge Rate: 3.2
Purge Begin Time: 1223

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1234	34	7.96	382	12.5		Clear
1245	68	8.02	391	11.3		clear
1256	102	8.03	392	11.0		clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.08	(must meet criteria within 3 consecutive measurements)

Sample Time: 1257
QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: Ectestr 11+	~~Hach 2100P~~ Aqua
S/N 476432	S/N 7810	~~S/N 940700005619/~~ 81003
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	X
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 4-2-24
Field Personnel: GF
StationID: CD-43C3
Weather: Clear, 56
Sample ID: CD-43C3 -240402
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: NA

Well Depth: 401
Screens from: 382 To 401
Casing Size (in): 2.5
Depth to Water: 170.88
Water Column Depth: 230.12 x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 59.8 use 60.0 x3 well volumes = Total Purge Vol. (gal): 180
Purge Rate: 3.2
Purge Begin Time: 1222

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1241	60	7.89	319	12.2		Clear
1300	120	7.93	317	12.3		Clear
1319	180	7.94	320	12.3 (MT)		CLEAR
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.04	(must meet criteria within 3 consecutive measurements)

Sample Time: 1321
QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: EC testr 11 +	Apera ~~Hach 2100P~~
S/N 476432	S/N 7810	~~S/N 940700005619~~/ 81003
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	*
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 4-2-24

Field Personnel: GF

StationID: CD-48C1

Weather: mstly cldy 38°

Sample ID: CD-48C1

Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve

QA/QC Sample ID: NA

Well Depth: 243

Screens from: 220.5 To 240.5

Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Depth to Water: 177.57'

Water Column Depth: ____ - ____ x ____ = ____ x3 well volumes = ____

Gallons per linear foot:

Calc. Purge vol./casing vol.:

Total Purge Vol. (gal)

Purge Rate

Purge Begin Time

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
			Sample			
Stabilization Criteria:		+/- 0.1 unit	+/- 5%			(must meet criteria within 3 consecutive measurements)

X NM

Sample Time:

QAQC Sample Time:

Meters:

pH	Conductivity	Turbidity
Meter:_____	Meter:_____	Hach 2100P
S/N_____	S/N_____	S/N 940700005619/_____
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	*
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	

Comments: * Pump Kept Failing shortly after starting need to replace

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 4-2-24 **Field Personnel:** GF

StationID: CD-48C2 **Weather:** misfly clear

Sample ID: CD-48C2 - 240402F **Purge Method:** Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve

QA/QC Sample ID: NA

Well Depth: 302 **Screens from:** 279.7 **To** 299.7 **Casing Size (in)** 2.5

Depth to Water: 177.46'

Water Column Depth: 124.54 x **Gallons per linear foot:** 0.26 = **Calc. Purge vol./casing vol.:** 32.4 (0.33) x3 **well volumes** = **Total Purge Vol. (gal)** 99

Purge Rate 2.9 **Purge Begin Time** 0732

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
0744	33	7.79	473	11.2		clear
0756	66	7.79	471	11.1		clear
0808	99	7.79	479	11.2		clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.18	(must meet criteria within 3 consecutive measurements)

Sample Time: 0809 **QAQC Sample Time:** NA

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: EC testr 11+	Apera Hach 2100P
S/N 476432	S/N 7810	~~S/N 940700005619~~ 81003
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	*
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 4/2/24
Field Personnel: GF
StationID: CD-48C3
Weather: mstly clear, 38
Sample ID: CD-48C3 - 240402
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: NA

Well Depth: 386
Screens from: 374 To 384
Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

− Depth to Water: 177.29'
= Water Column Depth: 208.71 -x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 55 x3 well volumes = Total Purge Vol. (gal): 165

Purge Rate: 3.1
Purge Begin Time: 0730

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
0748	55	7.73	497	11.3		Clear
0806	110	7.72	489	11.4		Clear
0824	165	7.74	491	11.3		clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.02	(must meet criteria within 3 consecutive measurements)

Sample Time: 0825
QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: ECTestr11+	Apera ~~Hach 2100P~~
S/N 476437	S/N 7810	~~S/N 940700005610~~/ 81003
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	*
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 4-2-24
Field Personnel: GF
StationID: CD-49
Weather: mstly clear, 60°
Sample ID: CD-49 – 240402
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES-40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: NA

Well Depth: 241.5
Screens from: 218 To 238
Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

– Depth to Water: 167.69
= Water Column Depth: 78.81 -x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 19.2 use 20 per vol x3 well volumes = Total Purge Vol. (gal): 60

Purge Rate: 2.0
Purge Begin Time: 1350

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1400	20	7.86	511	12.2		Clear
1410	40	7.84	508	12.8		Clear
420	60	7.85	502	12.7		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.09	(must meet criteria within 3 consecutive measurements)

Sample Time: 1421
QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: Ectesterllt	Apera ~~Hach 2100P~~
S/N 476432	S/N 7810	~~S/N 940700005619/~~ 81003
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	*
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 4/2/2024
Field Personnel: M. TERRIS
StationID: CP-S3
Weather: SLI CLOUDY 54°F
Sample ID: CP-S3 -240402
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: - NA-

Well Depth: 99
Screens from: To
Casing Size (in): 6IN

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Depth to Water: 86.41
Water Column Depth: 12.59 x Gallons per linear foot: 1.5 = Calc. Purge vol./casing vol.: 20GAL 18.88 x3 well volumes = Total Purge Vol. (gal): 60 GAL

Purge Rate: 1.33GPM
Purge Begin Time: 0910

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
0927	20GAL	7.46	641	11.9		RUSTY
0944	40 GAL	7.44	644	11.7		CLEAR
0959	60 GAL	7.43	644	11.6		CLEAR
Stabilization Criteria:	VOL	+/- 0.1 unit	+/- 5%		0.81	(must meet criteria within 3 consecutive measurements)

Sample Time: 1000
QAQC Sample Time: -NA-

Meters:

pH	Conductivity	Turbidity
Meter: EXTECH 100	Meter: ECTestr11+	Hach 2100P
S/N 2307121	S/N 24B	S/N 940700005619/
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	*
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 4/2/2024
StationID: CD-31A1
Sample ID: CD-31A1-240402
QA/QC Sample ID: NA

Field Personnel: M. TERRIS
Weather: SLI CLOUDY 45°F
Purge Method: Disp. bailer, Ded. Grundfos, (Ded. Bladder), Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve

Well Depth: 110
Screens from: 103 To 108
Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
(2.5)	(0.26)
4	0.66
6	1.5
8	2.6

Depth to Water: 93.49'
Water Column Depth: 16.51' x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 4.29:4.5 x3 well volumes = Total Purge Vol. (gal): 13.5 GAL

Purge Rate:
Purge Begin Time: 0815

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
0829	4.5 GAL	7.66	644	11.1		CLEAR
0844	9.0 GAL	7.65	646	10.9		CLEAR
0859	13.5 GAL	7.65	647	10.8		CLEAR
Stabilization Criteria:	√ OK	+/- 0.1 unit	+/- 5%		0.23	(must meet criteria within 3 consecutive measurements)

Sample Time: 0900
QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: EXTECH 100	Meter: ECTestr 11+	Hach 2100P
S/N 2307121	S/N 24B	(S/N 940700005619/)
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	*
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 4/2/2024
Field Personnel: M. TERRIS
StationID: CD-34A1
Weather: SLI CLOUDY
Sample ID: CD-34A1-240402
Purge Method: Disp. bailer, Ded. Grundfos, (Ded. Bladder), Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: NA

Well Depth: 110
Screens from: 100 To 110
Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
(2.5)	(0.26)
4	0.66
6	1.5
8	2.6

− Depth to Water: 97.81
= Water Column Depth: 12.19 x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 3.16=35 x3 well volumes = Total Purge Vol. (gal): 10.5 GAL

Purge Rate:
Purge Begin Time: 0720

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
0733	3.5 GAL	7.45	582	11.2		CLEAR
0747	7.0 GAL	7.47	579	11.0		CLEAR
0759	10.5 GAL	7.47	578	10.9		CLEAR
Stabilization Criteria:	√ GOOD	+/- 0.1 unit	+/- 5%		0.32	(must meet criteria within 3 consecutive measurements)

Sample Time: 0800
QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: EXTECH 100	Meter: ECTestr 1H	Hach 2100P
S/N 2307121	S/N 248	(S/N 940700005619/)
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420 IN LAB

Lab Analysis:(Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	X
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 4/2/2024
Field Personnel: M. TERRIS
StationID: CD-36A1
Weather: CLEAR 72°F
Sample ID: CD-36A1-240402
Purge Method: Disp. bailer, Ded. Grundfos, (Ded. Bladder), Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: -NA

Well Depth: 102
Screens from: To
Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
(2.5)	(0.26)
4	0.66
6	1.5
8	2.6

Depth to Water: 90.26
Water Column Depth: 11.74 x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 3.05:35 x3 well volumes = Total Purge Vol. (gal): 10.5

Purge Rate:
Purge Begin Time: 1330

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1345	3.5 GAL	7.59	584	11.9		CLEAR
1402	7.0 GAL	7.56	584	11.7		CLEAR
1414	10.5 GAL	7.55	584	11.7		CLEAR
Stabilization Criteria:	Vol	+/- 0.1 unit	+/- 5%		0.59	(must meet criteria within 3 consecutive measurements)

Sample Time: 1415
QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: EXTECH 100	Meter: ECTestr11+	Hach 2100P
S/N 2307121	S/N 24B	S/N 940700005619/
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	*
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	*
1-40mL Glass w/ HCL - TOC (SM 2540C)	

VOC'S AND 1,4 DIOXANE

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 4/2/2024
StationID: CD-37A1
Sample ID: CD-37A1-240402
QA/QC Sample ID: NA

Field Personnel: M. TERRIS
Weather: CLEAR 68°F
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve

Well Depth: 104
Screens from: To
Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Depth to Water: 90.71
Water Column Depth: 13.29 x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 3.45=35 x3 well volumes = Total Purge Vol. (gal): 10.5

Purge Rate:
Purge Begin Time: 1230

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1244	3.5GAL	7.36	661	11.2		CLEAR
1259	7.0GAL	7.35	665	10.9		CLEAR
1314	10.5GAL	7.37	665	10.9		CLEAR
Stabilization Criteria:	VOL	+/- 0.1 unit	+/- 5%		0.21	(must meet criteria within 3 consecutive measurements)

Sample Time: 1315
QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: EXTECH 100	Meter: ECTestr 11+	Hach 2100P
S/N 2307121	S/N 24B	S/N 940700005619/
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	*
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 4/2/2024
Field Personnel: M. TERRIS
StationID: CD-38A1
Weather: CLEAR 56°F
Sample ID: CD-38A1-240402
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: -NA-

Well Depth: 111
Screens from: To
Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Depth to Water: 90.87
Water Column Depth: 20.13 x Gallons per linear foot: 2.6 = Calc. Purge vol./casing vol.: 5.23:55 x3 well volumes = Total Purge Vol. (gal): 16.5

Purge Rate:
Purge Begin Time: 1012 ~~1021~~

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1033	5.5GAL	7.64	566	10.7		CLEAR
1047	11.0GAL	7.61	568	10.6		CLEAR
1105	16.5GAL	7.62	570	10.6		CLEAR
Stabilization Criteria:	VOL	+/- 0.1 unit	+/- 5%		0.22	(must meet criteria within 3 consecutive measurements)

Sample Time: 1110
QAQC Sample Time: NA-

Meters:

pH	Conductivity	Turbidity
Meter: EXTECH 100	Meter: ECTestr 11+	Hach 2100P
S/N 2307121	S/N 243	S/N 940700005619/
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	X
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 4/2/2024
Field Personnel: M. TERRIS
StationID: CD-40C1
Weather: P. CLOUDY 74°F
Sample ID: CD-40C1-240402
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: CD-50-240402

Well Depth: 46
Screens from: 36 To 46
Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Depth to Water: 8.79
Water Column Depth: 37.21' x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 9.67→10 x3 well volumes = Total Purge Vol. (gal): 30 GAL

Purge Rate: 0.5 GPM
Purge Begin Time: 1430

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1449	10 GAL	7.99	547	10.9		CLEAR
1509	20 GAL	8.01	551	10.9		CLEAR
1529	30 GAL	8.02	553	10.7		CLEAR
Stabilization Criteria:	VOL	+/- 0.1 unit	+/- 5%		0.17	(must meet criteria within 3 consecutive measurements)

Sample Time: 1530
QAQC Sample Time: 1600

Meters:

pH	Conductivity	Turbidity
Meter: EXTECH100	Meter: ECTestr11+	Hach 2100P
S/N 2307121	S/N 248	S/N 940700005619/
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	*
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	*
1-40mL Glass w/ HCL - TOC (SM 2540C)	

* DUPE TAKEN HERE

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 4-3-24
Field Personnel: GF
StationID: CD-44C1
Weather: Cldy, 52°
Sample ID: CD-44C1 -240403
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: NA

Well Depth: 200
Screens from: 187 To 197
Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Depth to Water: 174.42
Water Column Depth: 25.58 x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 6.7 use 7.0 x3 well volumes = Total Purge Vol. (gal): 21.0

Purge Rate: slow recovery well
Purge Begin Time: 0922

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
0936	3.5	7.62	457	13.3		Clear
0947	7.0	7.70	452	14.5		Clear
1002	10.5	7.73	446	14.4		Clear
1017	14.0	7.71	448	14.6		Clear
1030	17.5	7.73	447	15.0		Clear
1042	21.0	7.67	449	14.6		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.19	(must meet criteria within 3 consecutive measurements)

Sample Time: 1043
QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: Eclestra 11+	Apera ~~Hach 2100P~~
S/N 476432	S/N 7810	~~S/N 9407000056194~~ 81003
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	X
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 4-3-24
Field Personnel: GF
StationID: CD-44C2
Weather: Cldy, 52°
Sample ID: CD-44C2 - 240403
QA/QC Sample ID: NA
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve

Well Depth: 247
Screens from: 228 To 247
Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Depth to Water: 173.96
Water Column Depth: 73.04 x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 19 x3 well volumes = Total Purge Vol. (gal): 57

Purge Rate: 2.3
Purge Begin Time: 1022

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1031	19	7.53	436	12.1		Clear
1040	38	7.54	443	11.5		Clear
1049	57	7.56	442	11.8		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.08	(must meet criteria within 3 consecutive measurements)

Sample Time: 1051
QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: Ectestr 11+	Apera ~~Hach 2100P~~
S/N 476432	S/N 7810	~~S/N 940700005619~~ 81003
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	X
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 4-3-24 | Field Personnel: GF

StationID: CD-44C3 | Weather: Cldy, 52°

Sample ID: CD-44C3 -240403 | Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve

QA/QC Sample ID: NA

Well Depth: 292 | Screens from: 282 To 292 | Casing Size (in): 2.5

− Depth to Water: 173.91'

= Water Column Depth: 118.09 -x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 31 x3 well volumes = Total Purge Vol. (gal): 93

Purge Rate: ~~30.7~~ use 31 3.1 | Purge Begin Time: 0929

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
0944	31	7.62	422	12.2		clear
0950	62	7.60	427	12.7		clear
1014	93	7.58	430	12.6		clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.27	(must meet criteria within 3 consecutive measurements)

Sample Time: 1015 | QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: EC testr11+	~~Hach 2100P~~ Apera
S/N 476432	S/N 7810	~~S/N 940700005619~~/ 81003
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	X
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 4-3-24
Field Personnel: GF
StationID: CD-45C1
Weather: Cldy, 49°
Sample ID: CD-45C1 - 240403
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: NA

Well Depth: 200
Screens from: 187 To 197
Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Depth to Water: 170.92
Water Column Depth: 29.08 x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 7.6 use 8.0 x3 well volumes = Total Purge Vol. (gal): 24

Purge Rate: 1.2
Purge Begin Time: 0829

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
0836	8	7.61	492	10.8		Clear
0844	16	7.62	493	10.7		Clear
0852	24	7.64	491	10.8		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.09	(must meet criteria within 3 consecutive measurements)

Sample Time: 0856
QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: ECTestr11+	Aperia ~~Hach 2100P~~
S/N 476432	S/N 7810	~~S/N 940700005619~~/ 81003
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	*
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 4-3-24
Field Personnel: GF
StationID: CD-45C2
Weather: Cldy, 50°
Sample ID: CD-45C2 -240403
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: NA

Well Depth: 247
Screens from: 222 To 246
Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Depth to Water: 171.44
Water Column Depth: 75.56 x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 19.6 use 20.0 x3 well volumes = Total Purge Vol. (gal): 60

Purge Rate: 2.6
Purge Begin Time: 0805

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
0813	20	7.50	445	11.2		Clear
0821	40	7.52	449	11.2		Clear
0829	60	7.53	447	11.3		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.07	(must meet criteria within 3 consecutive measurements)

Sample Time: 0831
QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: EC testr/1f	~~Hach 2100P~~ Apera
S/N 476432	S/N 7810	~~S/N 940700005619~~ 81003
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	X
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 4-3-24
Field Personnel: GF
StationID: CD-45C3
Weather: Cldy, 48°
Sample ID: CD-45C3 -240403
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: NA

Well Depth: 339
Screens from: 325.2 To 335.2
Casing Size (in): 2.5
− Depth to Water: 171.99'
= Water Column Depth: 167.01 x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 43.4 use 44 x3 well volumes = Total Purge Vol. (gal): 132

Purge Rate: 3.1
Purge Begin Time: 0802

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
0817	44	7.84	367	11.6		Clear
0832	88	7.91	366	11.3		Clear
0847	132	7.92	363	10.9		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.09	(must meet criteria within 3 consecutive measurements)

Sample Time: 0851
QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: EC testr11+	Apera Hach 2100P
S/N 476432	S/N 7810	~~S/N 940700005619~~ 81003
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	X
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	

Comments:

COLBERT LANDFILL ~~SUPPLEMENTAL~~ GROUNDWATER SAMPLING

Date: 4-3-24 ~~Address/Phone:~~ Field Personnel: GF

StationID: CD-21C3 Weather: Cldy, 50

SampleID: CD-21C3 - 240403

QA/QC Sample ID: NA

Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve

Dedicated Pump?: NO

PURGE INFORMATION

Screens from: 283 To 292

Press. Tank Vol: (if applicable) NA

Well Depth:	302				
− Depth to Water:	187.33'				
= Water Column Depth:	114.67	x Gallons per linear foot: 0.26	= Calc. Purge vol./casing vol.: 29.8 use 30.0	Estimated Total Purge Vol. (gal): 90	Approx. Depth of Non-Ded. Equip: NA

Purge Rate: 1.8 gpm Purge Begin Time: 1125

Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
3	0.38
4	0.66
6	1.50

FIELD PARAMETERS

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1142	30	7.30	858	13.1		Clear
1159	60	7.28	857	13.1		Clear
1216	90	7.26	859	13.0		Clear
Stabilization Criteria		+/- 0.1 unit	+/- 5%		0.07	(must meet criteria within 3 consecutive measurements)

Sample Time: 1217 QAQC Sample Time: NA

METERS

pH	Conductivity	Turbidity
pH Testr Extech	TDS Testr ECTestr11+	Apera ~~Hach 2100P~~
S/N 476432	S/N 7810	S/N ~~940700005619~~ 81003
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)		Bottle Batch #
X	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	~~2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)~~	

Comments:

Added to list on 5/11/2022, don't know much about the well.

*grundfos pump flow max @ 1.8 gpm @ 38+ Hz

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 4/3/2024
StationID: CD-60A1
Sample ID: CD-60A1-240403
QA/QC Sample ID: MS/MSD

Field Personnel: M. TERRIS
Weather: CLOUDY 49°F
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve

Well Depth: 96.2
Screens from: To
Casing Size (in):
Depth to Water: 80.00
Water Column Depth: 16.2 x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 4.25 GAL x3 well volumes = Total Purge Vol. (gal): 15 GAL

Purge Rate:
Purge Begin Time: 0815

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
0825	5 GAL	7.09	531	10.4		CLEAR
0834	10 GAL	7.07	534	10.4		CLEAR
0844	15 GAL	7.07	533	10.4		CLEAR
Stabilization Criteria:	√OK	+/- 0.1 unit	+/- 5%		0.13	(must meet criteria within 3 consecutive measurements)

Sample Time: 0845
QAQC Sample Time: AS SAMPLE

Meters:

pH	Conductivity	Turbidity
Meter: EXTECH 100	Meter: EcTestr11	Hach 2100P
S/N 2307121	S/N 24B	S/N 940700005619/
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	*
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	*
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	*
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	*
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	*

*MS/MSD

Comments: OVER PURGED THIS IS ONLY A 2" @ 0.17 NOT 0.26

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 4/3/24
Field Personnel: M. TERRIS
StationID: CD-61A1
Weather: CLOUDY 49°F
Sample ID: CD-61A1 -240403
Purge Method: Disp. bailer, (Ded. Grundfos), Ded. Bladder, Ded. Bennett, Env. Tech ES-40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: CD-51-240403

Well Depth: 75.9
Screens from: To
Casing Size (in)
− Depth to Water: 69.12'
= Water Column Depth: 6.78' x Gallons per linear foot: 0.17 = Calc. Purge vol./casing vol.: 1.15=3 x3 well volumes = Total Purge Vol. (gal): 9 GAL
Purge Rate
Purge Begin Time: 0930

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
0903	3 GAL	7.54	421	10.9		CLEAR
0948	6 GAL	7.56	419	10.9		CLEAR
0958	9 GAL	7.56	418	10.8		CLEAR
Stabilization Criteria:	√ OK	+/- 0.1 unit	+/- 5%		0.18	(must meet criteria within 3 consecutive measurements)

Sample Time: 1000
QAQC Sample Time: 0930

Meters:

pH	Conductivity	Turbidity
Meter: EXTECH 100	Meter: ECTestr11+	Hach 2100P
S/N 2307121	S/N 248	S/N 940700005619/
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	*
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	*
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	*
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	*
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	*

* DUPE TAKEN HERE

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 4/3/2024
StationID: CD-03A1
Sample ID: CD-03A1-240403
QA/QC Sample ID: -NA-

Field Personnel: M. TERRIS
Weather: CLOUDY 50S

Purge Method: Disp. bailer, Ded. Grundfos, (Ded. Bladder), Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve

Well Depth: 98
Screens from: 70 To 90
Casing Size (in): 2

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

− Depth to Water: 71.48'
= Water Column Depth: 26.52' x Gallons per linear foot: 0.17 = Calc. Purge vol./casing vol.: 4.5 GAL x3 well volumes = Total Purge Vol. (gal): 13.5 GAL

Purge Rate:
Purge Begin Time: 1030

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1044	4.5 GAL	7.66	349	10.1		CLEAR
1059	9.0 GAL	7.69	351	9.9		CLEAR
1114	13.5 GAL	7.70	351	10.0		CLEAR
Stabilization Criteria:	VOL	+/- 0.1 unit	+/- 5%		0.29	(must meet criteria within 3 consecutive measurements)

Sample Time: 1115
QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: EXTECH100	Meter: ECTestr11+	Hach 2100P
S/N 2307121	S/N 248	S/N 940700005619
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	*
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	*
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	*
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	*
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	*

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 4/3/2024
Field Personnel: M. TERRIS
StationID: CS-04A
Weather: CLOUDY 52°F
Sample ID: CS-04A1 -240403
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: - NA

Well Depth: 89.51 Screens from: To Casing Size (in):
– Depth to Water: NA 86'
= Water Column Depth: 4.51' x Gallons per linear foot: 0.17 = Calc. Purge vol./casing vol.: 0.77=1GAL x3 well volumes = Total Purge Vol. (gal): 3GAL

Purge Rate:
Purge Begin Time: 1145

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1152	1GAL	6.76	701	11.1		CLEAR
1159	2GAL	6.74	700	10.9		CLEAR
1206	3GAL	6.73	697	10.9		CLEAR
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.47	(must meet criteria within 3 consecutive measurements)

Sample Time: 1210
QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: EXTECH100	Meter: ECTestr11+	Hach 2100P
S/N 237121	S/N 248	S/N 940700005619/
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

	Bottle Batch #
3-40ml Glass w/ MA/AA - VOC's (524.3)	*
1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	*
1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	*
1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	*
2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
1-40mL Glass w/ HCL - TOC (SM 2540C)	*

Comments: UNABLE TO GET WATERLEVEL USING 85' AS A BENCH MARK

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 4/3/2024
StationID: 1573A-1
Sample ID: 1573A-1 - 240403
QA/QC Sample ID:

Field Personnel: M. TERRIS
Weather: CLOUDY 50S
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve COLRES

Well Depth: 105
Screens from: To
Casing Size (in): 6

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Depth to Water: 94.22
Water Column Depth: 10.78' x Gallons per linear foot: 1.5 = Calc. Purge vol./casing vol.: 20 GAL 16.17 x3 well volumes = Total Purge Vol. (gal): 60 GAL

Purge Rate: 12 GPM
Purge Begin Time: 1300

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1310	120 GAL	7.50	498	12.1		CLEAR
1320	240 GAL	7.54	496	11.9		CLEAR
1329	360 GAL	7.51	495	11.7		CLEAR
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.19	(must meet criteria within 3 consecutive measurements)

Sample Time: 1330
QAQC Sample Time:

Meters:

pH	Conductivity	Turbidity
Meter: EXTECH 100	Meter: ECTestIH	Hach 2100P
S/N 237121	S/N 248	S/N 940700005619/
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

		Bottle Batch #
X	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4-COD/Ammonia (410.4/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
X	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	
	1-40mL Glass w/ HCL - TOC (SM 2540C)	

Comments:

Colbert Residential Field Data Sheet

27-Mar-24

Well **1073D-1**

TC	TA		**Home Phone**	**Work Phone**
R	R	David Nerren N. 22115 Meadow View Dr. Colbert Wa 99005	(509) 998-9671	

Last Sample Date 11/14/2023 **Sample I.D.** 2073D-1-231114

FIELD PARAMETERS	**Previous**	**Current**	**Sample Date**	4/3/2024
			Sample Time	1530
pH		8.00	**Start Purge**	1500
Cond (uMhos)		362	**End Purge**	1533
Temp		10.3°C	**Rate (gpm)**	13 GPM
SWL (Feet)		3.15'	**Purge Vol (gal)**	429 GAL

PURGE VOLUME CALCULATIONS

				Casing Size	**Gal/Foot**
Total Depth (ft)	76	**Casing Vol (gal)**	107.8=110G	**2"**	**0.16**
SWL (ft)	3.15'	**Casing Vol X 3**	330GAL	**4"**	**0.65**
Water Column (ft)	72.85'	**PT Vol (gal)**	20	**6"**	**1.47**
Casing Size (in)	6	**Total Vol (gal)**	350GAL	**8"**	**2.61**

Previous Sample Point Hose bib in pump house

Special Instructions Special Equipment: Plastic Y, Teflon Tubing, purge hose; GATE CODE: 9876

Comment This is a dupe ID taken with 1073D-1-231114

* 1,4 DIOXANE ONLY, MT JUST SAMPLED HERE 2 WEEK AGO FOR VOCS 5243

MT SAMPLE NEXT TO SHOP OUT BY WELL PUMP SHED FROM YARD HYDRANT. FILLED 2-60ml 1,4 DIOXANE FOR 522 BY ANATEK LAB IN MOSCOW ID

* NEW ID 1073D-1-240403 W/ COLBERT ANNUAL SAMPLE

IF CANNOT TAKE WL, ENTER ASSUMED READING HERE: *1*

Colbert Residential Field Data Sheet

27-Mar-24

Well **1473M-1**

TC **TA**
R R Jonathan Richard
N 19826 Yale Road

Colbert Wa 99005

Home Phone **Work Phone**
(509) 954-3762

Last Sample Date 1/10/2024 **Sample I.D.** 1473M-1-240110

FIELD PARAMETERS	Previous	Current		Sample Date 4/3/2024
				Sample Time 1435
pH	7.74	7.65		Start Purge 1400
Cond (uMhos)	541	563		End Purge 1437
Temp	10.6	10.9°C		Rate (gpm) 8.5 GPM
SWL (Feet)		NT		Purge Vol (gal)

PURGE VOLUME CALCULATIONS

				Casing Size	Gal/Foot
Total Depth (ft)	105	Casing Vol (gal)	36.75 ≈ 40	2"	0.16
SWL (ft)	80'	Casing Vol X 3	120 GAL	4"	0.65
Water Column (ft)	25'	PT Vol (gal)	100	6"	1.47
Casing Size (in)	6	Total Vol (gal)		8"	2.61

Previous Sample Point Hose bib front of house

Special Instructions TEFLON SPLITTER

SAMPLED W/ COLBERT ANNUAL SAMPLE

Comment MS/MSD taken here filled 2 extra sets of VOC's

* DIOXANE + VOC'S WERE SAMPLED RD. (522 & 5243)

- MT SAMPLE FROM HOSE BIB FRONT of HOUSE, FILLED 3-40 ml VOC'S FOR 5243 + 2-60ml VOC'S FOR 1,4DIOXANE BY ANATEK LAB IN MOSCOW ID

- NEW ID 1473M-1-240403

IF CANNOT TAKE WL, ENTER ASSUMED READING HERE: 80'

Colbert Residential Field Data Sheet

~~27-Mar-24~~ 03-Apr-24

Well **1073L-2**

TC	TA		Home Phone	Work Phone
R	R	Steve Countryman N 21202 Little Spokane River D Colbert Wa 99005	(509) 466-2232	

Last Sample Date 1/10/2024 **Sample I.D.** 2073L-2-240110

FIELD PARAMETERS	Previous	Current		
			Sample Date	04/03/24
			Sample Time	0825
pH		7.99	Start Purge	0803
Cond (uMhos)		318	End Purge	0824
Temp		10.3	Rate (gpm)	12gpm
SWL (Feet)		NT 12'	Purge Vol (gal)	252

PURGE VOLUME CALCULATIONS

				Casing Size	Gal/Foot
Total Depth (ft)	67	Casing Vol (gal)	81	2"	0.16
SWL (ft)	12	Casing Vol X 3	243	4"	0.65
Water Column (ft)	55	PT Vol (gal)	N/A 100	(6")	1.47
Casing Size (in)	6	Total Vol (gal)	243	8"	2.61

Previous Sample Point

Special Instructions Splitter; Teflon tubing.

Comment Dupe ID taken with 1073L-2-240110

* Sampled at bypass: 12gpm

$$12\overline{)243} = 20 \text{ r } 03 \Rightarrow 21 \text{ min}$$

* Unknown activity, no resident present.

* Sample ID: 1073L-2-240403, 3-40mL VOC, MA/AA

IF CANNOT TAKE WL, ENTER ASSUMED READING HERE: 12'

Colbert Residential Field Data Sheet

~~27-Mar-24~~ 03-Apr-24

Well 1073E-2

TC **TA**
R R Gabe/Amanda Muglia
N 21611 Little Spokane Drive

Colbert Wa 99005

Home Phone (509) 724-9511 **Work Phone**

Last Sample Date 1/10/2024 **Sample I.D.** 1073E-2-240110

FIELD PARAMETERS	**Previous**	**Current**		**Sample Date**	04/03/24
				Sample Time	0917
pH	8.12	8.01		**Start Purge**	0855
Cond (uMhos)	316	368		**End Purge**	0916
Temp	10.3	9.4		**Rate (gpm)**	8 gpm
SWL (Feet)	13.17	NT 12		**Purge Vol (gal)**	168

PURGE VOLUME CALCULATIONS				**Casing Size**	**Gal/Foot**
Total Depth (ft)	84	**Casing Vol (gal)**	106	**2"**	**0.16**
SWL (ft)	12	**Casing Vol X 3**	318	**4"**	**0.65**
Water Column (ft)	72	**PT Vol (gal)**	+ 60	**6"**	**1.47**
Casing Size (in)	6	**Total Vol (gal)**	378**	**8"**	**2.61**

Previous Sample Point Hose bib front of house

Special Instructions TEFLON SPLITTER

Comment Was going to run dupe here, but it looks lik eit was taken here last time I sampled, so I swtiched locations

** Active well, purged 1 volume + PT then sampled

$\left(\frac{(106+60)}{8}\right) = 20.75 \Rightarrow 21$ min

* Sample ID: 1073E-2-240403, 3-40mL VOC, MA/AA

IF CANNOT TAKE WL, ENTER ASSUMED READING HERE: 12'

Colbert Residential Field Data Sheet

~~27-Mar-24~~ 03-Apr-24

Well 1573C-7

TC **TA**
R R Kevin/Sandy Kirby
N 20303 Thor Road

Colbert Wa 99005

Home Phone (206) 794-0221 **Work Phone**

Last Sample Date 4/19/2023 **Sample I.D.** 1573C-7-230419

FIELD PARAMETERS	Previous	Current		Sample Date	04/03/24
				Sample Time	1018
pH	7.72	7.37		Start Purge	1002
Cond (uMhos)	549	718		End Purge	1017
Temp	10.7	10.7		Rate (gpm)	10 gpm
SWL (Feet)	80.12	NT 80		Purge Vol (gal)	150

PURGE VOLUME CALCULATIONS

				Casing Size	Gal/Foot
Total Depth (ft)	125	Casing Vol (gal)	67	2"	0.16
SWL (ft)	NT 80	Casing Vol X 3	201	4"	0.65
Water Column (ft)	45	PT Vol (gal)	20	6"	1.47
Casing Size (in)	6	Total Vol (gal)	288**	8"	2.61

Previous Sample Point Hose bib in pump house

Special Instructions DO NOT TAKE WATER LEVEL HERE TO MANY WIRES IN WELL REQUE

Comment MT Filled 3-40mL vocs w/MA-AA for 524.3 by anatek lab in moscow ID. New ID 1573C-7-230419

* Call before sample. Attack Dog on site.

** Active well, purged 1 vol + PT then sampled

$\left(\frac{(67+20)}{10}\right) \Rightarrow 9 \text{ min} \Rightarrow 15 \text{ min}$

* Sample ID: 1573C-7-240403, 3-40mL VoC MA/AA

IF CANNOT TAKE WL, ENTER ASSUMED READING HERE: 80

Colbert Residential Field Data Sheet

~~27-Mar-24~~
03-Apr-24

Well **1573C-17**

TC **TA**
R R RESIDENT
20518 N. Thor Rd.

COLBERT Wa 99005

Home Phone **Work Phone**

Last Sample Date 4/19/2023 **Sample I.D.** 1573C-17-230419

FIELD PARAMETERS	**Previous**	**Current**		**Sample Date**	04/03/24
				Sample Time	1106
pH	8.08	8.01		**Start Purge**	1040
Cond (uMhos)	438	455		**End Purge**	1105
Temp	10.5	10.3		**Rate (gpm)**	8gpm
SWL (Feet)	160	NT 160		**Purge Vol (gal)**	200

PURGE VOLUME CALCULATIONS				**Casing Size**	**Gal/Foot**
Total Depth (ft)	260	**Casing Vol (gal)**	147	**2"**	**0.16**
SWL (ft)	160	**Casing Vol X 3**	441	**4"**	**0.65**
Water Column (ft)	100	**PT Vol (gal)**	+ 50	**6"**	**1.47**
Casing Size (in)	6	**Total Vol (gal)**	491**	**8"**	**2.61**

Previous Sample Point Yard Hydrant next to the pump house.

Special Instructions YARD HYDRANT IN FRONT OF HOUSE.

Comment Could not take SWL, assumed 160'. Active well, purged 15 min then sampled.

** Active well, purged 1 vol + PT then sampled.

$\frac{(147+50)}{8} = 24.6 \Rightarrow 25$ min

* Sample ID: 1573C-17-240403, 3-40mL VOC, MA/AA

IF CANNOT TAKE WL, ENTER ASSUMED READING HERE: 160'

Colbert Residential Field Data Sheet

~~27-Mar-24~~
03-Apr-24

Well 1073J-1

TC **TA**
R R Jack Raines
E 4024 Wahoo Road

Colbert Wa 99005

Home Phone (406) 239-6383 **Work Phone**

Last Sample Date 10/17/2023 **Sample I.D.** 1073J-1-231017

FIELD PARAMETERS	Previous	Current		Sample Date	04/03/24
				Sample Time	1256
pH	7.96	7.82		Start Purge	1240
Cond (uMhos)	471	457		End Purge	1255
Temp	11.7	11.3		Rate (gpm)	12gpm
SWL (Feet)	NT 160	NT 160'		Purge Vol (gal)	195

PURGE VOLUME CALCULATIONS

				Casing Size	Gal/Foot
Total Depth (ft)	280	Casing Vol (gal)	177	2"	0.16
SWL (ft)	160	Casing Vol X 3	531	4"	0.65
Water Column (ft)	120	PT Vol (gal)	N/A 30	(6")	1.47
Casing Size (in)	6	Total Vol (gal)	531**	8"	2.61

Previous Sample Point Hose bib at front gate

Special Instructions TEFLON SPLITTER

Comment New owner; Jack Raines 406-239-6383 updated DB

* Sampled at Blue yard hydrant, SE corner of property, near house. Installed in October of 2023. No PT, straight off well

** Active well, sampled 1 vol then sampled

$\frac{177}{12}$ $12\overline{)177} = 14.75 \Rightarrow 15$ min

* Sample ID: 1073J-1-240403, 3-40mL VOC, MA/AA

IF CANNOT TAKE WL, ENTER ASSUMED READING HERE: 160'

Colbert Residential Field Data Sheet

27-Mar-24

Well 1073D-1

TC R **TA** R

David Nerren
N. 22115 Meadow View Dr.

Colbert Wa 99005

Home Phone (509) 998-9671 **Work Phone**

Last Sample Date 11/14/2023 **Sample I.D.** 2073D-1-231114

FIELD PARAMETERS	Previous	Current	Sample Date 4/3/2024
			Sample Time 1530
pH		8.00	Start Purge 1500
Cond (uMhos)		362	End Purge 1533
Temp		10.3°C	Rate (gpm) 13 GPM
SWL (Feet)		3.15'	Purge Vol (gal) 429 GAL

PURGE VOLUME CALCULATIONS

				Casing Size	Gal/Foot
Total Depth (ft)	76	Casing Vol (gal)	107.8=110G	2"	0.16
SWL (ft)	3.15'	Casing Vol X 3	330 GAL	4"	0.65
Water Column (ft)	72.85'	PT Vol (gal)	20	6"	1.47
Casing Size (in)	6	Total Vol (gal)	350GAL	8"	2.61

Previous Sample Point Hose bib in pump house

Special Instructions Special Equipment: Plastic Y, Teflon Tubing, purge hose; GATE CODE: 9876

Comment This is a dupe ID taken with 1073D-1-231114

* 1,4 DIOXANE ONLY, MT JUST SAMPLED HERE 2 WEEK AGO FOR VOCS 5243

MT SAMPLE NEXT TO SHOP OUT BY WELL PUMP SHED FROM YARD HYDRANT. FILLED 2-60ml 1,4 DIOXANE FOR 522 BY ANATEK LAB IN MOSCOW ID

* NEW ID 1073D-1-240403 W/ COLBERT ANNUAL SAMPLE

IF CANNOT TAKE WL, ENTER ASSUMED READING HERE: 1

Colbert Residential Field Data Sheet

27-Mar-24

Well **1473M-1**

TC **TA**
R R Jonathan Richard
N 19826 Yale Road

Colbert Wa 99005

Home Phone **Work Phone**
(509) 954-3762

Last Sample Date 1/10/2024 **Sample I.D.** 1473M-1-240110

FIELD PARAMETERS	Previous	Current		Sample Date	4/3/2024
				Sample Time	1435
pH	7.74	7.65		Start Purge	1400
Cond (uMhos)	541	563		End Purge	1437
Temp	10.6	10.9°c		Rate (gpm)	8.5 GPM
SWL (Feet)		NT		Purge Vol (gal)	

PURGE VOLUME CALCULATIONS

				Casing Size	Gal/Foot
Total Depth (ft)	105	Casing Vol (gal)	36.75 ~ 40	2"	0.16
SWL (ft)	80'	Casing Vol X 3	120 GAL	4"	0.65
Water Column (ft)	25'	PT Vol (gal)	100	6"	1.47
Casing Size (in)	6	Total Vol (gal)		8"	2.61

Previous Sample Point Hose bib front of house

Special Instructions TEFLON SPLITTER

SAMPLED W/ COLBERT ANNUAL SAMPLE

Comment MS/MSD taken here filled 2 extra sets of VOC's

* DIOXANE + VOC'S WERE SAMPLED RD. (522 & 5243)

- MT SAMPLE FROM HOSE BIB FRONT OF HOUSE, FILLED 3-40 ml VOC'S FOR 5243 + 2-60ml VOC'S FOR 1,4DIOXANE BY ANATEK LAB IN MOSCOW ID

- NEW ID 1473M-1-240403

IF CANNOT TAKE WL, ENTER ASSUMED READING HERE: 80'

Program 3160106 was uploaded goto the SLC, and node address changed from 01 to 06. After placing to run, commyrication to the control room was reestablished. So currently, E-1 and W-3 are under remote control from the plant.

1/2/24 DG on site - Noticed the building sump was full enough that float should have activated pump. Found pump controls in both the control room controls and electrical room CP in off position (or neutral). Put both sets of Controls into Auto position. Pump came on. I checked Batch & Air Stripper containment areas. The bldg sump pump was blasting an open end hose into AS area. That sump then filled and pump emptied into parking lot.

1/3/24 (WED) SC 0700 OC 1300
WEATHER: CLOUDY 40S LT RAIN AM TECH: M. TERRIS
* MEETING W/DEB LOOKING @ PROJECTS UPCOMING
* WENT TO MICA WEEKLY
* MT HAD A DOCTORS APT PM

1/4/24 (THURS) SC 0700 OC 1630
WEATHER: CLOUDY 40S
TECH: M. TERRIS
* PREP COLBENT QT SAMPLE RD NEXT WEEK + COLNES
* QT EXTRACTION WELL MAINT / CHECK LIST
PLEASE SEE SHEET ATTACH

1/5/24 (FRI) BE 0700 OE 1630
TECH: M. TERRIS WEATHER: P. CLOUDY 40S

* MT WEEKLY DRIVE AROUND AREA/SITE NOTHING OUT OF ORDINARY WAS OBSERVED
- WEEKLY PLANT MAINT/CLEANING
- WEEKLY GAS FLOW 130FT/40SCFM @ 129°C & COM

* TECHS: M. TERRIS
DATE(S): ~~1/4/2024/5/24~~

EXTRACTION WELL MAINTENANCE QUARTERLY INSPECTION 1/4/24 - 1/5/24 AM

TASK	MAINTENANCE	CP-S1	CP-S4	CP-S5	CP-S6	CP-E1	CP-E2	CP-E3	CP-W1	CP-W2	CP-W3
SUMP:											
	VERIFY HI FLOAT ALARM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	CLEAN AS NEEDED (SHOPVAC)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:	NOTE CLEANING OUT SUMP SA. APRIL/OCT										
VFD:											
	CLEAN FILTER	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT WIRING/COMPONENTS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:	ALL FILTERS CLEAN/INSPECTED										
PIPING:											
	EXERCISE GATE VALVE (2X)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT PIPING FOR LEAKS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT AIR/VAC VALVE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:	LOOKED FOR LEAKS WHILE SAMPLING (NO LEAKS)										
PIT:											
	INSPECT FOR LEAKS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK ZERO READING	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NOTES:	INSPECT FOR LEAKS WHILE SAMPLING										
PCP:											
	CLEAN (SHOPVAC)	SEMI-ANNUAL APRIL/OCT									
	INSPECT ALL WIRING/RELAYS/COMP	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK INDICATOR LIGHTS/REPLACE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK SLC/KE CARD LIGHTS BATT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	TURN FAN TO WARM/COOL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CLEAN FILTERS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK/TIGHTEN ALL CABLES/RADIO	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	DESSICANT CHANGE OUT	ALL DESSICANT IS IN GOOD SHAPE									
	UPS BATTERY CHECK	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:	* CHANGE OUT DESSICANT IN APRIL/OCT ONLY										
VAULT:											
	CLEAN AND INSPECT (SHOPVAC)	SEMI-ANNUAL APRIL/OCT									
	INSPECT LADDER BOLTS/RUNGS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT LID BOLTS UPPER/LOWER	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK/TIGHTEN MAGNET WELL/LID	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:											
FINAL:											
	RESET RADIO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	RESET WELL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	IS PIT OPEN?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	IS GATE VALVE OPEN?	C	C	C	C	C	C	C	C	C	C

(ONLY OPEN WHEN SAMPLING)

EXTRA NOTES: ALL IN ALL VAULTS LOOK GREAT

(4)

1/8/2024 (MON) Se 0700 Oe 1630
TECH: MT/CC/GF WEATHER: CLOUDY MID 20'S AM

* MT/CC/GF ON SITE TO GET QT WATERLEVELS AT/AROUND SITE. PLEASE SEE QT WATERSHEETS FOR MORE DETAILS

1/9/2024 (TUES) Se 0530 Oe 1630
TECH: MT/CC/GF WEATHER: CLOUDY 30'S AM

COLBERT QT SAMPLE WAS TAKEN TODAY:

LOCATION	SAMPLE ID	TIME	5243	TECH	COMM
CP-S1	CP-S1-240109	1220	*	CC	MS/MSD
CP-S4	CP-S4-240109	1145	*	CC	
CP-S5	CP-S5-240109	1100	*	CC	
CP-S6	CP-S6-240109	1035	*	CC	
CP-E1	CP-E1-240109	0825	*	MT	
CP-E2	CP-E2-240109	1020	*	MT	
CP-E3	CP-E3-240109	0905	*	MT	
CP-W1	CP W1-240109	0955	*	MT	
CP-W2	CP-W2-240109	0845	*	MT	DUPE HOLD
" DUPE	CD-50-240109	0830	*	MT	DUPE ID
CP-W3	CP-W3-240109	0930	*	MT	
CD-49	CD-49-240109	0853	*	GF	
CD-36A1	CD-36A1-240109	1255	*	GF	
CD-43C1	CD-43C1-240109	0929	*	GF	
CD-21C3	CD-21C3-240109	1101	*	GF	

COLBERT TRIPS (2)

* MT HELD SAMPLES OVER NIGHT WILL SHIP ON 1/10/24 W/ COLRES SAMPLES COLLECTED

* MT HAD TO PLOW EARLY THIS AM 3" OF SNOW OVERNIGHT

1/10/24 (WED) SE 0600 OE 1630
TECH: MT/GF WEATHER: CLOUDY → P. CLOUDY 30'S
LT SNOW & TIMES

MT SAMPLED COURES ON 1/9/24 & 1/10/24

LOCATION	SAMPLE ID	DATE	TIME	WL	COMM
BERTHOLF	1073M-1-240109	1/9	1305	10.99	
N. MEADOWS	1073Q-4-240109	1/9	1430	NT	
MUGLIA (ROLLEN)	1073E-2-240100	1/10	1000	13.17	
RICHARD	1473M-1-240110	1/10	0900	NT	MS/MSD
COUNTRYMAN	1073L-2-240110	1/10	1100	NT	DODE
" DUPE	2073L-2-240110	1/10	1030		DODE (1)

COURES TRIPS (2)

GF/MT PACKED ALL SAMPLES TAKEN ON 1/9/24 AND 1/10/24 INTO 1 COOLER #4 WITH SEPERATE COC (COLBERT GT) (COURES$ AND WITH 8 DOUBLE BAG REG. WET ICE PACKS. FOLLOWING NORMAL PROTOCOL IN DOING SO. MT HAND DEL. COOL #4 TO UPS FOR OVERNIGHT TO ANATEK LAB IN MOSCOW ID ON 1/11/24 AM

* MT WORK ON HEAT TRACE TO OUTSIDE SUMP AREA FOUND THAT IT WAS JUST THE LIGHT BULB BURNED OUT REPLACED BULB IN ALL LIGHTS IN PROCESS AREA (HEAT TRACE LIGHT SWITCH AND FAN SYSTEM) ALL ARE IN WORKING ORDER NOW

Entry for 11/10/24 CC

W-1 SLC troubleshooting was conducted. On first inspection, CPU fault was flashing and KE card was flashing ~~ACE~~ ASC, indicating it has not been configured. Upon connection to the SLC, it was found that program 3180105 had been running, ort despite attempts to go online using all available nodes with the UIC, I could not o online. Local identifiers specified W-1 s running 3180109 @ node address 2. SLC as defaulted, and reprogrammed with 3180109) node 2. The KE card needs to be onfigured, but SLC is running.

:-2 SLC troubleshooting was conducted. On first nspection, CPU fault was flashing and KE card ights were nominal. Upon connection to the LC, no device registered in RSLinx, and all attempts to go online failed. SLC was efaulted, and program 3180104 @ node address 10 was uploaded per local identifiers. Upon reprogramming, CPU fault cleared, but would not run because one of the 4 channel ~~id~~ input cards had been removed. After reconnecting the KE card, communication lights were flashing normally. We need to replace the input card before we can place the SLC in run mode. KE card appears working. Time was spent searching for the ~~ACCESS~~ ASCII configuration software for KE cards.

(50)

1/18/2024 (THURS) SE 0530 E 1500 (300PM)
TECH: M. TERRIS
WEATHER: CLEAR FRIG -1 THIS AM 20°F PM

- MT PLOWED AM

- DOWNLOAD GMS REPORT FROM LAST WEEK COPY/FILED... GOT BUSY LAST WEEK TO DOWNLOAD MADE SURE EVERYTHING WAS UPDATED (MT)

- SHOP FOR SUPPLIES

1/19/2024 (FRI) SE 0715 OE 1645
TECH: M. TERRIS
WEATHER CLOUDY SNOW 22°FT

* MT PLOWED THIS AM
X GA BLOW RT 375CFM @ 10.9L Ø COND
* SHOPPING FOR SUPPLIES COSTCO/HOME DEPOT
* CLEANED PLANT/OFFICE
* DRIVED AROUND AREA AND SITE NOTHING OUT OF THE ORDINARY WAS OBSERVED

1/22/24
CC

Rain/36-41°F, 29.4F

- Nothing unusual observed during the perimeter site tour.
- 4" male to female adapter for the NTS/ floor drain tank was brought over and is ready for installation. Located on aux. desk in MT's office.
- Troublshooting on E-3 was conducted. Upon inspection, it was found that the 12OV power supply is bad, and needs to

be replaced before proceeding further. Part # 1746-F2 per AB.
- Troubleshooting on S-6 was conducted. Upon inspection, SLC was faulted, and could not be connected on local node. Upon connecting with RSLinx, it was found that the processor was in default status and needed to be uploaded. Program 3180011 was uploaded @ Node 11. Upon running, SLC faulted out, and would not run. It was decided to default the SLC once again. After defaulting and uploading 3180011 @ Node 11, program ran normally. Currently SLC is running, with KE cards displaying nominal. The modem however is missing, and needs to be replaced.
- Troubleshooting on S-1 was conducted. Upon inspection, SLC was faulted. Upon connecting with RSLinx, it was found program 3180191 was running @ node 8. I uploaded and saved the program. Upon clearing the fault, processor would not run, displaying math overflow major fault (20f). It was elected to default the processor, and upload the existing program onto it. After upload, problem persisted and would not run. It was elected to default the processor, and upload program 3180108 @ node 8. After upload, problem persisted. It is likely that the SLC processor is bad, or memory module is bad. Further troubleshooting is required. Processor is currently in remote program mode. I will investigate this error, and add both the processor and memory module to the required parts list.

11|23|24
MT, CC

Rain, 33-38°F, 29.75F
↑ 3mph

- All extraction well and site PLC parts were inventoried, in preparation for SLC 500

52)

System repairs. Current parts list is below.

500

1 – 1746 – NIO4I – Combination I/O Module, used, untested

1 – 1747 – L524 – SLC Processor Unit, No M2 Module, new

1 – 1747 – L524 – SLC Processor Unit, w/M2 Module, used

1 – 1746 – NI4 – Analog Input Module, used, untested

1 – 1746 – NI4 – Analog Input Module, used, untested

1 – 1746- NIO4I – Combination 1/O Module, new, on spare rack

1 – 1747 – KE – DH485/RS-232C Interface Module, new, on spare rack

1 – 1746 – IA16 – 120VAC Input Module, new, on spare rack

1 – 1746 – OA16 – 120VAC Triac Output Module, new, on spare rack

1 – 1746- A10 – 10 Slot Rack, SLC 500, new, on spare rack

1 – 1747 – KE – DH485/RS232C Interface Module, used, no battery

1 -1746- NI4 - Analog input module, used, untested

5

1 – 1771 – OW16B – Output Module

1 – 1771 – IFE – Analog Input Module

1 – 1784 – PKTX – PCI Communication Card

1 – 1771 – OFE2 – B – Analog Output Module

1 – 1771 – OAD – 12 to 120VAC Output Module

1 – 1771 – IAD – B – DC Input Module

1 – 1771 – P7 – B – 120/240 Power Supply

- Cables were located for KE card config (null-modem RS-232C), and modem programming (Esteem custom cable).
- Troubleshooting on S-5 was conducted. Upon inspection, it was found that the power supply unit was bad, and was not able to power up the SLC. It needs to be replaced before troubleshooting can continue.
- Troubleshooting on S-4 was conducted. Upon inspection, CPU Fault light was flashing. Attempts to connect to node 9 had failed, and SLC could not be seen on RS Linx. SLC was power cycled to no

effect. SLC was then defaulted, and still could not be seen in RS Linx. The SLC was removed from the chassis and reseated, still to no effect. Incoming voltage was verified at 125.3 VAC. According to the SLC 500 O:M manual, it is likely the CPU has a major fault that is hardware related, or a component connecting to the chassis has a hardware malfunction. Troubleshooting will continue by changing out the SLC with a new part.

- A 1746-NI4 Analog input module was found on top of the PCP cabinet in S-4. It will be added to the list of parts. It is used, and untested.
- Summary of Status of Extraction Wells:

- W-1 - KE Card needs to be configured/replaced.
- W-2 - Running normally, ready for modem config.
- W-3 - Running normally, connected on freewave.
- E-1 - Running normally, connected on freewave.
- E-2 - SLC/PKE running normally, needs new input card.
- E-3 - Needs new power supply unit.
- S-1 - Needs new SLC, processor/M2 module, or I/O card.
- S-2 - Needs new SLC, processor/M2 module
- S-5 - Needs new power supply unit
- S-6 - Running normally. Ready for modem config.

* MT SAMPLED NORTH T.S. SUMP THIS AM pH 5.32 LIQUID DEPTH 6.15' OR 75" 2-DAY RUSH ON SAMPLES (PLEASE SEE FIELD NOTE BOOK FOR MORE DETAILS

* MT DRAINED BOTH BATCH/TOWER SUMPS MADE SURE BOTH ARE IN WORKING ORDER.

(54)

1/24/2024 (WED) SC0700 OE1630
WEATHER CLOUDY/FOG AM LOW 30S CLOUDY RAIN PM LOW 40S
TECH: M. TERRIS

* MT ON VACATION THE NEXT 2 WEEKS MAKING SURE PLANT IS IN WORKING ORDER

* GAS FLOW TAKEN THIS MORNING FLOW WAS @ 32 SCFM (LOW) MT DRAINED COND FROM EFF GAS LINE (7 GALS) RECHECKED FLOW 1 HOUR LATER IT WAS UP TO NORMAL RANGE @ ~~48~~ 43 SCFM OR 138 FT/MIN

* MT CLEANED OUT SHOP IN PREP FOR ~~for~~ SECTION STAFF MEETING ON 1/25

* MT FUEL TRUCK UP, LEFT PLOW ON TRUCK JUST INCASE OF SNOW EVENT

* MT CHANGE OUT BOILDING FILTERS

* MT DROVE AROUND AREA/SITE NOTHING OUT OF THE ORDINARY WAS OBSERVED. FENCE ON EAST SIDE OF LANDFILL HAS BEEN FIXED. PICTURES ON COMPUTER.

* MT STOP AND RECEIVED A QUOTE FOR A LIFT TO CLEAN/SPOT PAINT TOWER/BATCH TANK

$1960/DAY $5730/WEEK

- Troubleshooting on E-2 was conducted, Input module 1746-NI4 was removed, and parts onhand, all 3 of our backups, were tried and were found to be faulty, with all cards displaying 20h math overflow error bit. When the card is removed, the error bit goes away, so we are still in need of a working input card. Removing inputs has no effect
- Troubleshooting on S-1 was conducted, Backup SLC was installed and configured, but

error still persisted. Removing inputs from the input module had no effect. When removing the card, error 20h goes away, indicating the input module is bad. SLC can not be placed into Run unless the card is replaced.
- Troubleshooting on S-4 was conducted. The SLC was changed out, yet the problem persisted. Inputs were removed from the input module, and the SLC was able to run, indicating that one of the inputs is faulty, and is causing the major 20h error. Currently, SLC is running normally and is ready for modem configuration.
- While at S-4, it was noticed that the modem had been moved outside of the control cabinet in order to accomodate an RF cable that was too short to make it into the cabinet. The modem was relocated, and antenna cable left detached. We will have to order a longer RF cable so we can reach the modem inside of the cabinet.
- All parts that were tested today were labeled. SLC verified as working. All 3 1746-NI4 input modules were bad. troubleshoot
- Work summary: status: S-4 needs an ip ~~needs~~, E-2 needs an input module, S-4 is ready for modem config.

1-25-2024 cldy - 30's
GF, CC, MT on rac in FL!

- Onsite today for full section mtg @ 1100. Prior to this mtg CC & GF to meet w/ AS about Colbert GW & GA gas probe sampling. We also discussed Marshall Landfill.
- Parts 1746-NI4 and 1746-P2 were located and priced on ebay, $122.00, $179.00 respectively. We are currently waiting on purchasing to add ebay into our pcard program before we can purchase. I will follow up

and attempt the order tomorrow.

11/29/24 — Ptly Cldy, 33-52°F, 29.75S
CC

- Nothing unusual observed during the perimeter site tour.
- Received cooler shipped to us from SVL as return post analysis.
- Received and unpacked box, HCl VOA case, 3 MA/AA VOA cases, trip blanks.
- Traveled to W-2 in an attempt to pull the configuration data from the KE card in preparation for config of KE card in W-1. After spending time configuring hyperterminal, I was still unable to connect to the KE Card @ W-2 in order to pull the configuration data off of it. I will repeat todays trials at E-2 to see if I have better luck Connecting. What most likely is occurring is the Config port has been configured differently than the manuals defaults, so I am unable to connect because settings in hyperterminal have to match settings of the config.
- Jumper configuration was set at W-1 for KE card. Config is still needed.
- CD-49 needs to be resampled tomorrow for Austin, so I spent some time getting ready.

01/30/24 — Cldy/Fog, 34-47°F, 37°F@1000, 29.65F, ↓ 3mph
CC

- Nothing Unusual observed during the perimeter site tour.
- Resampling of CD-49 was conducted, 3x40mL MA/AA, 524.3 with trip blanks. Cooler 101 packed under standard protocol and shipped

to Anatek Moscow via UPS. Sample ID CD-49-240130.
- All paperwork and data entry was completed for the CD-49 resample, and all records, physical and digital, were stored in their respective locations.
- Approximately 2 gallons of condensate was drained from the stack condensation relief valve.
- Weekly flow rate was measured at 91 ft/min or 28.21 cfm.
- Traveled to UPS to deliver cooler 101 for shipment to Anatek.

01.13.24 — Cldy, 36-44°F, 40°F@0900, 29.53F, 6 4mph
CC

- Nothing unusual observed during the perimeter site tour.
- After reviewing the 1747-KE user manual, the KE configuration port appears to require a straight cable (1-1, 2-2 ... 9-9) when looking at the wiring diagram. After failing to connect with this cable, it was elected to make a crossover cable with the existing straight cable, with new pinout (1-1), (2-3), (3-2), (4-6), (5-5), (6-4), (7-8), (8-7), (9-9). It was elected to try this as the description in the manual specified the drawing used a DTE perspective for the DCE connector, which was a bit confusing. After making the cable, I was able to connect to the config port of W-2, and place it into default settings.
- I traveled to E-2 and attempted to pull the configuration data. With all attempts, pulling the configuration data failed, so something is amiss with the configuration port. I elected to leave it alone, as it has correctly configured DF1:DH485. If

Connection proves difficult, after modem configuration, I will default it by clearing the RAM and then reconfigure when the required settings are found.

12/01/24
CC

Rain/Cloudy, 35-47°F, 43°F@1600
29.27 F, ↙ 2mph

Nothing unusual observed during the perimeter site tour.
Searched the plant O;M manuals for the required KE card settings. In volume VI there was a 1747-KE card user's manual that had the DF1 protocol and DH485 protocol settings highlighted/circled. No info could be found on the DF1 port settings.
Traveled to E-2 to attempt to pull the settings off of the KE card. I was able to connect to the config port, but all attempts to configure failed, as the screen would lock up as soon as the main menu was displayed.
It was elected to travel to W-2 and enter the configuration settings found in the manual. All DF1 port settings were pulled off of the dip switch RS-232 settings on the modem. After configuration, the SLC was placed in run mode, and is now ready for modem config. For a full list of settings, please see the printed list on the next page. The word document generated is saved as "1747-KE card settings on Craig Campbell's laptop. File was also emailed so it will be archived. Network was not responding to save it there. Edit, file saved to Deathstar/cerebro/Landfill/Colbert.

1747-KE Card Settings: Extraction Wells

Config Port

- Baudrate = 1200
- Bits per Character = 8
- Parity = N
- Stop Bits = 1
- Handshaking = S (Xon/Xoff)

DF1 Port

- Baudrate = 9600
- Bits/character = 8
- Parity = N
- Stop Bits = 1

DH-485 Port

- Node Address = SLC 500 Node Address
- Maximum Node Address = 31
- Message Timeout = 5000ms
- Pass Through = Enabled
- Baud Rate = 19200

DF1 Protocol

- Half/Full Duplex = Full (F)
- Duplicate Packet Detection = Enabled (E)
- Checksum = BCC (B)
- Constant Carrier Detect = Disabled (D)
- Modem Init String = No Change (Blank)
- Embedded Response Detect = Auto-Detect Embedded Response (A)
- Ack Timeout = 300 x 5mS (300)
- ENQ Retries = 7
- NAK Received Retries = 7

02/07/24 Cloudy, 37-44°F, 29.35S, ~~NZ~~
CC

- Nothing unusual observed during the perimeter site tour. Roads are relatively dry. Ditches are relatively dry. Fence-lines intact. Some areas of water collecting on the cover but nothing out of the ordinary.
- New parts for extraction well PCBs have come in, in preparation for restoring radio communication. 2 power supplys (E-3, S-5) and 2

Analog -- input cards (E-2, S-1). All parts were factory sealed and are unused, 30 day warranty/return policy.
- Analog input card was installed in E-2. After install, with inputs disconnected, program was able to enter into run mode. KE lights normal. E-2 is now ready for modem config.
- After connecting inputs into the installed Analog input card in E-2, program faulted out and would not run. This indicates that one of the inputs is misconfigured or is damaged. We can still connect without these inputs, but we will have to troubleshoot before normal operation can commence.
- Power supply was installed in E-3. After install, power was restored and all cards powered up. Upon connecting to RS Link, it was found the processor was in default, and did not have a program uploaded onto it, or it was lost. Program 3180108 was installed for node 7. After install, the processor was able to run. KE card lights are normal. E-3 is now ready for Modem Config.
- Approximately 1/4 gallons of condensation was drained from the stack condensation ~~relief~~ relief valve.
- Flow was measured at 102 ft/min, or 31.62 cfm.
- Vaccum cleaner was reassembled after cleaning the tank and filter assembly (Lindsay).
- Monthly probe data was collected for the month of February, and file CP240207.csv was saved onto Mikes computer (Desktop). I did not have time to enter it into the database, properly. Mike, can you please enter it and create reports.

CONT. 2/8/24 (MT)

- Power supply was changed out in S-5. Upon changing the power supply, all modules and processor powered on, with SLC 500 run light off, CPU fault lit, and KE — lights normal. — Upon connecting to the SLC, it was discovered that a program was currently installed, with processor set @ node 30. Program was uploaded onto laptop and saved. Upon clearing the fault, processor would not run. Since our C&I manual specifies — node 12 for S-5, node — was changed in the software and the processor was power cycled to initiate the change. After node change, processor still would not run, displaying error 20h. Inputs were removed @ the analog input module (N14), and once removed, program was able to run, indicating there is a problem with one of the inputs or the NI4 module is not configured properly. Further troubleshooting is needed before nominal operation, but the well is ready for modem config, as SLC and KE cards are nominal.
- Analog input module (N14) was installed in S-1. After installation, processor was able to run, with KE lights normal, so it is ready for modem config. When inputs are — connected to the NI4 module, the processor faults out, indicating there is a problem with one of the inputs or the (N14) Analog input config. Further trouble shooting is required.
- Work was conducted on modem config. I was unable to connect the master modem to my PC, as Utility Software was unable to connect to the modem. I will investigate cabling and pinouts tomorrow to ensure we have the right cable.

2/9/24 (FRI) 0700 0930
TECH: M. TERRIS MT START OF ON CALL.
WEATHER: CLOUDY LOW 40's MT ON CALL

* MT ✓ SUMP. MADE SURE AT NORMAL LEVELS

* MT DROVE AROUND AREA/SITE NOTHING OUT OF THE ORDINARY WAS OBSERVED

* MT D.D MONTHLY GAS FAN MAINT.
- PLEASE SEE MONTHLY LOG. FOR MORE DETAILS

* MT ORDERED BOTTLES for UPCOMING SAMPLING

* WEEKLY CLEANING/TRASH & COLBERT.

- Purchased a new set of composite sole work boots, as my old ones are completely shot (sole is peeling off of shoe). CC
- Spent some time trying available cables for PC connection to the Utility Software. All failed. It may be that the DB-9 connector cannot be used for the configuration software, and I may have to order an RS-232 (25 pin connection for my PC. The Dell has a 25 pin connection, but it is set for LPT communication and not RS-232. I sent an E-mail to Dan Tolley @ ESTeem requesting the proper pinout configuration to USE in order to get down to DB-9, as the user manual has very little information on how to correctly construct a cable.

02/12/24 Rain, 29-40°F, 35°F@0800
CC, MT on CTR 29.62F, 12 mph

- All DB25 to DB9 cables onsite were tested

and pinouts for each cable were determined. Cables were identified, labeled, and pinout results labeled onto the bag holding the cable.

- ESTeem President Dan Talley sent me a schematic detailing the required pinouts we need to connect our Dell field laptop to the ESTeem Model 85/95 modems. According to his data, we have the appropriate cable on-hand, so our difficulties connecting must be another issue.
- Master radio was connected via utility terminal emulation. Upon connection, test utilities would not function. It was elected to attempt to connect after inputting the Factory Default command. After defaulted, CMD prompt and logic verification readout displayed on the terminal.
- Despite factory reset, modem displays it is operating on the correct frequency @ 72.800 mHz.
- Immitter test was conducted, and during test, both Tx, Rx, and T/E lights were active during node polls, with T/E light holding solid, set to node 10. After several retries, it was found node 10 is connecting.
- Node 7 was also able to connect. If addressing is consistent with SLC addresses, modem is connecting with E-2 and E-3, but is unable to connect with all others.
- When connection was attempted to S-1 (node 8), no connection was present. Connection to S-1 trough E-2 (node 10) as a repeater, Connection was successful, So we are getting connectivity to the south system, but only S-1.
- All attempts to connect to S-4, S-5, S-6 using routing through E-2 and S-1 were unsuccessful.

- Traveled to south system to verify dipswitch settings. If settings are correct, and modem is powered on, I will pull the modem for config check here at the plant.
- After radio reset (Full power cycle) @ W-1, Connectivity to W-1 was sucessful to master radio.
- Upon inspection at S-6, it was found that the modem had been removed. A modem with a local identifier for E-3 was located in the plant controls cabinet, and was reprogrammed for use @ S-6.
- Master radio was programmed for AB full duplex, RTS/CTS, 6 Retries, Repeating from E-2 to S-1, S-4 to S-1, Master radio mode on. Config was saved under Bay module 1.

2-13-24 WEATHER: FOG/LOW CLDS AM; P.C PM
TECH: M TERRIS S.C 0700 0.C 1630
C CAMPBELL

* MT RAN DOWN ORDERED NEW DECK PLATE FOR SAMPLE TRAILER HASKINS STEEL → WILL BE READY FOR PICK-UP ON 2-15-24 MT WILL START TAKING WOOD OFF OF TRAILER IN SHOP (2X6)

* Work was conducted on the radio project. Radios from E-2, S-1, S-4, S-5, S-6 were brought into the plant for testing/configuration. It was found that all modems are functioning, and are able to connect to available addresses from the plant. Errors in addressing were present on the modems, and all appeared to be addressed in decimal, when PLC message blocks are addressed in octal. This could explain why we were having difficulty

Connecting to the south system, in the past, as message blocks would not be sent to the appropriate locations and routing configurations would be invalid. Each modem was configured with its corresponding octal address, and modems were placed in the field for testing. Tests revealed connectivity from the master to all well locations other than S-6 (Address 13). Routing to South system wells can be done through S-1 (Address, 10. A configuration summary was created that details the programming of all radios.

Addressing Summary

- ESTeem Radios are addressed in Octal.
- SLC 500 are addressed in Decimal.
- PLC5 message program blocks are addressed in Octal.

Well S-1: 08 Decimal, 10 Octal
Well S-4: 09 Decimal, 11 Octal
Well S-5: 12 Decimal, 14 Octal
Well S-6: 11 Decimal, 13 Octal
Well E-1: 06 Decimal, 06 Octal
Well E-2: 10 Decimal, 12 Octal
Well E-3: 07 Decimal, 07 Octal
Well W-1: 02 Decimal, 02 Octal
Well W-2: 04 Decimal, 04 Octal
Well W-3: 03 Decimal, 03 Octal

Master Radio Config:	Command Description
ADD 1	Sets the Master address to 1
RET 6	Sets number of retries to 6 before moving onto the next block.
PLC_MAST ON	Assigns Modem to Master, Plant PLC, channel 0.
RTS_CTS ON	Software Flow Control / Hardware Handshaking OFF
REPECONF 14,10,1	S-5 repeating through S-1 to master radio.
REPECONF 11,10,1	S-4 repeating through S-1 to master radio.
REPECONF 13,10,1	S-6 repeating through S-1 to master radio.
A_BCTRL FULL_BCC:SA	Allen Bradley Full Duplex Modem Control Mode and save to MM1.

- Modem Configuration saved on memory module #1 (MM1).
- In order to connect to the utility software after config, the modem must be defaulted by entering FA <ENTER> in the terminal. Characters will not be displayed.
- To restore the program, enter REST 1 at the CMD: prompt.

South System Radio Config	Command Description
ADD XXX	Well's Octal address. XXX signifies the octal address.
SETC 10, 1	Sets Master Radio destination address to 1, with repeating through S-1.
RET 6	Sets the number of retries to 6 before moving onto the next block.
A_BCTRL FULL_BCC:SA	Allen Bradley Full Duplex Modem Control Mode, and save to MM1.

S-1 and local wells Only!	Command Description
ADD XXX	Well's Octal address. XXX signifies the octal address.
SETC 1	Sets Master Radio destination address to 1.
RET 6	Sets the number of retries to 6 before moving onto the next block.
A_BCTRL FULL_BCC:SA	Allen Bradley Full Duplex Modem Control Mode, and save to MM1.

Connection Audit Results:

High Gain Master Setting @ 72.800 MHz

2- yes (W-1)
4- yes (W-2)
7- yes (E-3)
12-yes (E-2)
10-yes (S-1)
11-yes, (10,11)
13-no
14-yes (10,14)

2-14-2024 (WED) Se 0700 Oe 1630
STAFF: MT/CC WEATHER: MOSTLY CLEAR COOL 30'S

* MT WORK ON COLBERT SAMPLE TRAILER REMOVING FLOOR DECK IN & PREP FOR STEEL FLOORING

* MT ORG TOOL BOX IN SHOP.

* MT DID GAS FAN MAINT THIS AM
*PLEASE SEE GAS FAN MAINT SHEET IN GAS BOOK

* MT RECORDED GAS FLOW 36.12 SCFM @ 11.7°C 2 GAL OF COND IN EFF GAS LINE EMPTIED.

- KE card settings were pulled off of S-6 and S-1. I was expecting the DH-485 node addresses to need to be changed, but both node addresses for the KE cards were set to 5, which happens to be the Chassis module address. Before proceeding further with the KE card configs, I am going to start work on connecting the master radio to the PLC5, to see if changing the modem addresses was enough to get communication restored, now that all SLC's and modems are configured per the Site O&M manual.

02-23-24 (Fri) Se 0700 OE 1530
GF ON-CALL WEATHER: FOG 30's AM PC PM 40's
TECHS: M.T.

- GAS FLOW READING @ 97 FT/MN = 30.07 SCFM
  GAS TEMP 50°F = 10°C W/5 GAL COND IN EFF GAS LINE

- PREP TRAILER (COLBERT) for PAINT WILL NEED TO LOOK for STEEL RIM for TRAILER TIRES LOOK IN GOOD SHAPE BUT RIMS HAVE A FEW RUST/CRACKS NOT SAFE

- TRASH/ WITH WEEKLY CLEAING PERFORM

- MT DROVE AROUND AREA/SITE NOTHING OUT OF THE ORDINARY WAS OBSERVED

- BATCH SUMP HIGH FLOAT SEEMS NOT TO BE WORKING HAD TO LOWER SUMP MANUALLY WILL NEED REPAIRED.

- LOOKED INTO WHY I HAVE NOT RECEIVED MY BOTTLE ORDER for MICA NEXT MONTH. CRYSTAL W/SUC SAID THEY WILL BE DEL. NEXT WEEK.

- DROVE OUT TO MARSHAL LOOK AROUNDS SITE INSPECTION.

02/26/24 Cloudy, 28-42°F, 32°F @ 0800
CC 29.68R, → 10mph

- Spent some time searching all of our floppy/CD disks in an attempt to locate a more recent version of the ESTeem Utility Software, as the version we have on disk does not include the Utility for Modem setup, which is needed for correctly programming the

Regeconf function. A disk was found, but was not read in both windows 2000 and win XP.
- Spent some time studying how the Regeconf function works, and reviewed the ESTeem Allen Bradley Engineering report. After review, it states that the ESTeem modems can be configured for decimal addressing, even though our PLC 5/30 is addressed in octal. The conversion is done by the modem, so they suggest addressing in decimal if configured for an SLC 5001/1747-KE.
- Determined a Regeconf config that would give us S-4, S-5, S-6 repeating through S-1, with direct connects for all but E-2, which will have to be re-addressed to a value 5.
- Went out into the field to retrieve all South system modems for reconfig using the new addressing.
- Traveled to E-1 to verify KE card addressing config. For E-1, KE card DH485 address was 10, and at W-3, KE card DH485 address was 2. Both of these do not correlate with their respective network addresses, so it is possible that the SLC500 node address overrides the DH485 node address set in the KE card config.
- A connectivity test was conducted after placing radios back into the field. All connections successful as configured in Regeconf except for S-6. We are now ready to connect the master radio to the PLC.
- If connection proves successful, I will need to update the O:M manual with this config, as the information contained within it is not accurate to the ESTeem Allen Bradley engineering report.
- Updated the ESTeem radio config sheet. Please see next page for current config.

Addressing Summary

- ESTeem Remote Radios are addressed in Decimal.
- ESTeem Master Radio is addressed in Octal
- SLC 500s are addressed in Decimal.
- PLC5 message program blocks are addressed in Octal.

Well S-1: 08 Decimal, 10 Octal
Well S-4: 09 Decimal, 11 Octal
Well S-5: 12 Decimal, 14 Octal
Well S-6: 11 Decimal, 13 Octal

Well E-1: 06 Decimal, 06 Octal
Well E-2: 10 Decimal, 12 Octal
Well E-3: 07 Decimal, 07 Octal

Well W-1: 02 Decimal, 02 Octal
Well W-2: 04 Decimal, 04 Octal
Well W-3: 03 Decimal, 03 Octal

Master Radio Config:	Command Description
ADD 1	Sets the Master address to 1
RET 6	Sets number of retries to 6 before moving onto the next block.
PLC_MAST ON	Assigns Modem to Master, Plant PLC, channel 0.
RTS_CTS ON	Software Flow Control
REPECONF 8	S-4, S-5, S-6 Repeating through S-1,with all other wells connecting direct
A_BCTRL FULL_BCC:SA	Allen Bradley Full Duplex Modem Control Mode and save to MM1.

- Modem Configuration saved on memory module #1 (MM1).
- In order to connect to the utility software after config, the modem must be defaulted by entering FA <ENTER> in the terminal. Characters will not be displayed.
- To restore the program, enter REST 1 at the CMD: prompt.

South System Radio Config	Command Description
ADD XXX	Well's Decimal address. XXX signifies the decimal address.
SETC 8, 1	Sets Master Radio destination address to 1, with repeating through S-1.
RET 6	Sets the number of retries to 6 before moving onto the next block.
A_BCTRL FULL_BCC:SA	Allen Bradley Full Duplex Modem Control Mode, and save to MM1.

S-1 and local wells Only!	Command Description
ADD XXX	Well's Decimal address. XXX signifies the decimal address.
SETC 1	Sets Master Radio destination address to 1.
RET 6	Sets the number of retries to 6 before moving onto the next block.
A_BCTRL FULL_BCC:SA	Allen Bradley Full Duplex Modem Control Mode, and save to MM1.

Connection Audit Results @ 72.800-MHz – High Gain

W-1: Yes
W-2: Yes
W-3: On Freewave

E-1: On Freewave
E-2: Yes
E-3: Yes

S-1: Yes
S-4: Yes
S-5: Yes
S-6: No

- Nothing unusual observed during the perimeter site tour.

02/27/24 Cloudy, 28-41°F, 29.6F
CC, MT.

- Troubleshooting on radio system was conducted. A cable was constructed to interconnect between the PLC/5/30A PLC and the ESTeem model radios (25 pin to 25 pin), (2-2), (3-3), (4-4) (5-5), (6-6), (7-7), (8-8), with pin 1 of ESTeem connector connected to ground and discontinuous to the PLC/5 connector end. Several different options were selected in the Channel config of the 3180 PLC/5 program and the results were the same in that W-Z was the only well able to establish communication. The Model 95 was the Modem used as the Master and according to Deb, the Model 95 may not be able to be used, as she has had a lot of difficulty getting it to connect.

02/28/24
CC

28-43°F, Cldy/Rain,
29.69 ↓, ↑14mph

- Lightning arrestor, modem power supply, modem and associated cables were pulled from S-6 for installation into the control cabinet.
- Lightning arrestor, modem & power supply were installed into the control cabinet and UHF cable connected for S-6 modem.
- S-6 modem was configured for master radio.
- Using O:M settings, connectivity to W-2 was established, but no connectivity elsewhere.
- Reprogrammed modem for no repeat function and no RTS_CTS. Results were much better, with good connectivity to E-2 and W-2.
- Traveled to W-1 and E-3. At both locations, modem is displaying normal lights, but is not transmitting, so there may be an issue with the KE card or KE card settings at these locations.
- Numbers in the PLC's channel status look great. Ratio of sent and received messages is nearly identical, no Received NAKS.

* MT WORKED ON T.S. LANE SIGN THAT GOT RAN OVER LAST WEEK. MT TOOK OLD SIGN OFF PLACED ON A PERM STAND ADDED WHEEL TO MOVE EASILY

* LOOKED FOR PARTS FOR FLOAT RUN SUMP.

2/29/2024 Se 0700
Tech. MT/CC Weather: RAIN UPPER 40s AM
RAIN MID 30s PM

- Input card in E-2 was troubleshooted. Inputs 501-502, channel 1, 506, DF1, channel 3 and 508, 509, channel 4, 503, 504, channel 2 were removed. Dip switches for 1783-IM4 card were changed to ON, to match those of W-2, which are verified to be working. Inputs for channel 2 and channel 4 were successfully connected, while inputs for channel 1 and channel 3 faulted out the PLC, regardless of DIPswitch settings. In control room, both VFD speed and level were present, so we need to determine why our pressure and flow inputs aren't working.
- Traveled to S-1 to investigate connection issue. Modem connect, T/E, Receive and transmit lights are working and are active, but the DF1 light on the KE card remains inactive. Based upon modem lights, my best guess is we are getting connection, but a problem exists with DF1 communication from the modem, or from KE card to the SLC. I am going to pull the KE card from E-2 and move it to S-1 to see if the issue resolves as next step, to verify whether or not the KE card is the issue.
- Traveled to E-3. Modem lights are active, similar to S-1. Traveled to W-1, and modem lights are active, similar to S-1. No DF1 communication getting to the KE card.
- Spent some time reviewing toggle bits for RS Logix 5, in an attempt to figure out how to toggle the Comm fault on and off.
- Installed S-6 KE card into S-1. Still no DF1 communication, with Com fault lit in the control room.

3/19/2024 (TUES) SC0700 OC1640
WEATHER: MOSTLY CLEAR 505 AM 705 PM
TECH: M. TERRIS

COLRES:

THE FOLLOWING COLRES LOCATIONS WERE SAMPLED:

LOCATION	(2024) DATE	SAMPLE ID	TIME	WL	COMM
ANDERSON	3-18	1073L-3-240318	1050	NT	*'
CLARK	3-18	1073E-3-240318	1135	10.05'	
HALPIN	3-18	1073L-1-240318	1255	NT	MS/MSD
HUNTER	3-18	1573H-1-240318	1430	NT	
WARDIAN	3-18	1473D-2-240318	1510	NT	
RUX	3-19	1073G-1-240319	1020	173.89'	
NERREN	3-19	1073D-1-240319	1115	2.98'	DUPE HERE
"DUPE	3-19	2073D-1-240319	1030		DUPE ID
TRIPS	3-19	COLRES TRIPS			

*' MR ANDERSON DID NOT FIX HIS PIPE MT WAS ABLE TO STILL SAMPLE FROM YARD HYDRANT NEXT TO SHOP/GARAGE. DID TALK TO MR ANDERSON, HE SAID HE WOULD TRY TO GET IT FIXED.

* MR. NERREN TOOK LOCK OFF OF PUMP HOUSE PER MY REQUEST TO SAMPLE.

- MT PACKED ALL SAMPLES ABOVE INTO COOLER #1001 ALONG W/8 DOUBLE BAGGED REG. WET ICE. MT FOLLOWED NORMAL PROTOCOL DURING SHIPPMENT. MT HAND DEL COOLER #1001 TO UPS FOR OVERNIGHT TO ANATEK IN MOSCOW ID ON 3/20/24 AM

- MT TURNED ALL HEAT TRACE TO PLANT/GAS SYSTEM.

Scale: 1 square =

4/2/2024 (TUES) Se 0630 Oe 1700

TECH: MT/CC/GF WEATHER: SLI CLOUDY 30'S AM
P.C' 60S/70S PM

* COLBERT - ANNUAL SAMPLE BEGAN TODAY

GF: CLUSTER: CD-41, CD-42, CD-43 & CD-48+CD-49
MT: SOUTH SYSTEM
CC: EXTRACTION SYSTEM
- ALL SAMPLES, SAMPLED TODAY HELD OVERNIGHT IN REFER @ COLBERT

4/3/2024 (WED) Se 0630 Oe 1657
TECH. MT/CC/GF WEATHER: CLOUDY 50S

* CONT W/ SAMPLING COLBERT ANNUAL ROUND

GF: CD-44 & CD-45 CLUSTERS + CD-21C3
MT: CD-60A1, CD-61A1, CD-3A11 & CS-4
CC: COOLERS WELLS

MT PACKED ALL TOC, AMMONIA, CONVENT. & METALS INTO COOLER #4 ALONG WITH 8 DOUBLE BAGGED NEG. WET ICE PACKS SINCE THE CONVENTIONALS HAVE A 48 HR. HOLDING TIME FOR CD-60A1, CD-61A1, CD-3A1 & CS-4A1. CC HAND DEL. COOLER #4 TO UPS FOR PRIORITY OVERNIGHT TO SVL ON 4/4/24 AM

ALL VOCS, 1,4 DIOXANES WERE HELD OVERNIGHT UNTIL 4/4/24 TO BE SHIP IN 1 BATCH W/ TRIP BLANKS

Scale: 1 square = _____

4-2-2024

MT PACKED ALL SAMPLES TODAY FOR OUR ANNUAL SAMPLING

COLBERT ANNUAL GROUNDWATER SAMPLING MATRIX 2024

WELL ID	PARAMETERS:	VOLATILES	TOC	COD / AMMONIA	CHLORIDE / NITRATE NITRITE / SULFATE	MANGANESE / IRON ZINC	1, 4 Dioxane
	CONTAINERS:	3-40 ml	1-40 ml	1 - 500 ml POLY BOTTLE	1 - 500 ml POLY BOTTLE	1 - 500 ml POLY BOTTLE	2- 60ml AMBER GLASS
	PRESERVATION:	MA/AA to pH<2	HCL to pH<2	H2SO4 to pH<2	UNPRESERVED	HNO3 to pH<2 FIELD FILTERED	Na2SO4 to pH<2
	ANALYTICAL METHOD:	524.3	SM 2540C	410.1/ 350.1	300.0 / 300.0 354.1 / 300.0	6010	522
WELL ID	SAMPLE ID						
CD-31A1	CD-31A1-YYMMDD	X					
CD-34A1	CD-34A1-YYMMDD	X					X
CD-36A1	CD-36A1-YYMMDD	X					
CD-37A1	CD-37A1-YYMMDD	X					
CD-38A1	CD-38A1-YYMMDD	X					
CP-S3	CP-S3-YYMMDD	X					X
CD-40C1	CD-40C1-YYMMDD	X					
CD-41C1	CD-41C1-YYMMDD	X					
CD-41C2	CD-41C2-YYMMDD	X					
CD-41C3	CD-41C3-YYMMDD	X					
CD-42C1	CD-42C1-YYMMDD	X					
CD-42C2	CD-42C2-YYMMDD	X					
CD-42C3	CD-42C3-YYMMDD	X					
CD-43C1	CD-43C1-YYMMDD	X					
CD-43C2	CD-43C2-YYMMDD	X					
CD-43C3	CD-43C3-YYMMDD	X					
CD-44C1	CD-44C1-YYMMDD	X					
CD-44C2	CD-44C2-YYMMDD	X					
CD-44C3	CD-44C3-YYMMDD	X					
CD-45C1	CD-45C1-YYMMDD	X					
CD-45C2	CD-45C2-YYMMDD	X					
CD-45C3	CD-45C3-YYMMDD	X					
CD-48C1	CD-48C1-YYMMDD	X	(NO SAMPLE PUMP FAILURE)				
CD-48C2	CD-48C2-YYMMDD	X					
CD-48C3	CD-48C3-YYMMDD	X					
CP-S1	CP-S1-YYMMDD	X					X
CP-S4	CP-S4-YYMMDD	X					
CP-S5	CP-S5-YYMMDD	X					
CP-S6	CP-S6-YYMMDD	X					
CP-E1	CP-E1-YYMMDD	X					
CP-E2	CP-E2-YYMMDD	X					X
CP-E3	CP-E3-YYMMDD	X					
CP-W1	CP-W1-YYMMDD	X					
CP-W2	CP-W2-YYMMDD	X					
CP-W3	CP-W3-YYMMDD	X					X
CD-03A1	CD-03A1-YYMMDD	X	X	X	X	X	
CS-04A1	CS-04A1-YYMMDD	X	X	X	X	X	
CD-60A1	CD-60A1-YYMMDD	X	X	X	X	X	
CD-61A1	CD-61A1-YYMMDD	X	X	X	X	X	
Dupe (CD-40)	CD-50-YYMMDD	X					X
Dupe (CP-W2)	CD-52-YYMMDD	X					
Dupe (CD-61A1)	CD-51-YYMMDD	X	X	X	X	X	
CP-S1	MS/MSD	X					X
CD-60A1	MS/MSD	X	X	X	X	X	
NERREN (COLRES)	1073D-1-YYMMDD	~~X~~ 3/24 SAMPLING					X
RICHARD (COLRES)	1473M-1-YYMMDD	X					X
JOHNSON (COLRES)	1573A-1-YYMMDD	X					X
CD-49	CD-49-YYMMDD	X					
CD-21C3	CD-21C3-YYMMDD	X					

* ALL VOCS WERE PLACED INTO COOLER # 8, NORMAL PROTOCOL WAS FOLLOWED

* ALL COLRES & 1,4 DIOXANE SAMPLES WERE PLACED INTO COOLER # 13 NORMAL PROTOCOL WAS FOLLOWED

— PLEASE SEE FIELD SHEET FOR MORE DETAILS EACH LOCATION

Scale: 1 square =

Rite in the Rain

5/13/24 (CONT)

THE FOLLOWING LOCATIONS WERE SAMPLED 5/7/24 & 5/8/24

LOCATION	S. ID	TIME	VOCS	1,4 DIOX.	COMM
1073E-3	1073E-3-240507	1030	*		COLRES
1573R-2	1573R-2-240507	1330	*		COLRES
1073P-1	1073P-1-240507	1500	*		COLRES
1473D-1	1473D-1-240508	1000	*		MS/MSD-COLRES
1073D-1-	1073D-1-240508	1130	*		COLRES
"DUPE	2073D-1-240508	1100	*		DUPE ID - COLRES
COLRES TRIP (2)					NEW PUMP
CD-48C1-	CD-48C1-240508	1230	*		RESAMPLE-COL
CP-W3	CP-W3-240508	1330	*	*	RESAMPLE-COL

COLBERT TRIP (2) VOCS (1) 1,4 DIOXANE

* PIT PACKED COOLER #21 WITH ALL SAMPLE ABOVE WITH 6 DOUBLE BAGGED REG. WET ICE PACKS WITH 3 SEPARATE COC (COLRES; VOCS, COLBERT VOCS + 1,4 DIOXANE W-3) CC HAND DEL COOLER #21 TO UPS FOR OVERNIGHT SHIPPING TO ANATEK LAB IN MOSCOW ID

DOING PAPER WORK TODAY FOUND A CLERICAL ERROR ON ME.

CP W3-240508 WAS MIS LABELED ON COC FOR BOTH VOCS COC AND 1,4 DIOXANE COC AS CD-W3-240508 MT EMAILED LABS WITH THIS ERROR.

6/6/24 (THURS) SE 0700 OR 1700
WEATHER: MOSTLY CLEAR 60'S AM
TECHS: M. TERRIS

* FINISHING UP SAMPLE COURES 6/24
2 LOCATIONS LEFT TO SAMPLE.

* AM MT CLEAR EXTRA DESK IN OFFICE
REMOVED ALL CONTENTS MOVED TO
FILE SHOP.

THE FOLLOWING LOCATIONS WERE SAMPLED:

LOCATION	SAMPLE ID	DATE	TIME	VOCS	COMM
RESSEMAN	0373A-2-240605	6/5	1000	*	MS/MSD
WALKER	0373A-4-240605	6/5	1100	*	
ROX	1073G-1-240605	6/5	1145	*	
LAKE	1573C-10-240605	6/5	1300	*	
LANE	1073M-3-240605	6/5	1345	*	
HALPIN	1073L-1-240606	6/6	1000	*	DUPE Item
" DUPE	2073L-1-240606	6/6	1100	*	DUPE ID

COURES TRIPS (2)

* MT PACKED ABOVE SAMPLES INTO COOLER #21
ALONG W/ 7 DOUBLE BAG REG. WET ICE PACKS
TO KEEP SAMPLES AT/BELOW 4° WHILE BEING
SHIP. MT HAND DEL. COOLER #21 UPS FOR
OVERNIGHT TO ANATEK FOR A DEL ON 6/7

* MT RAN UP TO MILL. GF fix ~~DOOR~~
BATHROOM FAN, NEED TO BE INSTALLED.

Scale: 1 square = _____

Appendix C

Extraction Well Inspections/Maintenance Checklists

TECHS: MT/CC

DATE(S): 4/5 & 4/6/23

EXTRACTION WELL MAINTENANCE

TASK	MAINTENANCE	CP-S1	CP-S4	CP-S5	CP-S6	CP-E1	CP-E2	CP-E3	CP-W1	CP-W2	CP-W3
SUMP:											
	VERIFY HI FLOAT ALARM					NA	NA	NA	NA	NA	NA
	CLEAN AS NEEDED (SHOPVAC)					✓	✓	✓	✓	✓	✓
NOTES:											
VFD:											
	CLEAN FILTER					✓	✓	✓	✓	✓	✓
	INSPECT WIRING/COMPONENTS					✓	✓	✓	✓	✓	✓
NOTES:	NEED NEW FAN W1, E-1 E-3 FAN W-3 OK PUT NEW PLUMBING										
PIPING:											
	EXERCISE GATE VALVE (2X)					OV ✓	OV	✓	OV	OV ✓	OV
	INSPECT PIPING FOR LEAKS					✓	✓	✓	✓	✓	✓
	INSPECT AIR/VAC VALVE					✓	✓	✓	✓	✓	✓
NOTES:											
PIT:											
	INSPECT FOR LEAKS					✓	✓	✓	✓	✓	✓
	CHECK ZERO READING					NA	A (NA)	A (NA)	A (NA)	A (NA)	A (NA)
NOTES:											
PCP:											
	CLEAN (SHOPVAC)					✓	✓	✓	✓	✓	✓
	INSPECT ALL WIRING/RELAYS/COMP					✓	✓	✓	✓	✓	✓
	CHECK INDICATOR LIGHTS/REPLACE					✓	✓	✓	✓	✓	✓
	CHECK SLC/KE CARD LIGHTS BATT					✓	✓	✓	✓	✓	✓
	TURN FAN TO WARM/COOL					✓	✓	✓	✓	✓	✓
	CLEAN FILTERS					✓	✓	✓	✓	✓	✓
	CHECK/TIGHTEN ALL CABLES/RADIO					✓	✓	✓	✓	✓	✓
	DESSICANT CHANGE OUT					✓	✓	✓	✓	✓	✓
	UPS BATTERY CHECK					✓	✓	✓	✓	✓	✓
NOTES:	ALL VFS & SLC Battery changed + UPS										
VAULT:											
	CLEAN AND INSPECT (SHOPVAC)					✓	✓	✓	✓	✓	✓
	INSPECT LADDER BOLTS/RUNGS					✓	✓	✓	✓	✓	✓
	INSPECT LID BOLTS UPPER/LOWER					✓	✓	✓	✓	✓	✓
	CHECK/TIGHTEN MAGNET WELL/LID					✓	✓	✓	✓	✓	✓
NOTES:											
FINAL:											
	RESET RADIO					NA ✓	NA	NA	NA	NA	N/A
	RESET WELL					NA ✓	Y	Y	Y	Y	Y
	IS PIT OPEN?					Y	N	Y	Y	Y	Y
	IS GATE VALVE OPEN?					Y	Y	Y	Y	Y	Y

EXTRA NOTES:

TECHS: MT/CC
DATE(S): 4/5 & 4/6/23

EXTRACTION WELL MAINTENANCE

X X X X

TASK	MAINTENANCE	CP-S1	CP-S4	CP-S5	CP-S6	CP-E1	CP-E2	CP-E3	CP-W1	CP-W2	CP-W3
SUMP:											
	VERIFY HI FLOAT ALARM	NA	NA	NA	NA						
	CLEAN AS NEEDED (SHOPVAC)	✓	✓	✓	✓						
NOTES:											
VFD:											
	CLEAN FILTER	✓	✓	✓	✓						
	INSPECT WIRING/COMPONENTS	✓	✓	✓	✓						
NOTES:											
PIPING:											
	EXERCISE GATE VALVE (2X)	✓	✓	✓	✓						
	INSPECT PIPING FOR LEAKS	✓	✓	✓	✓						
	INSPECT AIR/VAC VALVE	✓	✓	✓	✓						
NOTES:											
PIT:											
	INSPECT FOR LEAKS	✓	✓	✓	✓						
	CHECK ZERO READING	✓	✓	✓	✓						
NOTES:											
PCP:											
	CLEAN (SHOPVAC)	✓	✓	✓	✓						
	INSPECT ALL WIRING/RELAYS/COMP	✓	✓	✓	✓						
	CHECK INDICATOR LIGHTS/REPLACE	**	***	✓	*						
	CHECK SLC/KE CARD LIGHTS BATT	✓	✓	✓	✓						
	TURN FAN TO WARM/COOL	✓	✓	✓	✓						
	CLEAN FILTERS	✓	✓	✓	✓						
	CHECK/TIGHTEN ALL CABLES/RADIO	✓	✓	✓	✓						
	DESSICANT CHANGE OUT	✓	✓	✓	✓						
	UPS BATTERY CHECK	✓	✓	✓	✓						
NOTES:											
VAULT:											
	CLEAN AND INSPECT (SHOPVAC)	✓	✓	✓	✓						
	INSPECT LADDER BOLTS/RUNGS	✓	✓	✓	✓						
	INSPECT LID BOLTS UPPER/LOWER	✓	✓	✓	✓						
	CHECK/TIGHTEN MAGNET WELL/LID	✓	✓	✓	✓						
NOTES:											
FINAL:											
	RESET RADIO	✓	✓	✓	✓						
	RESET WELL	✓	✓	✓	✓						
	IS PIT OPEN?	Y/N	Y/N	N	Y/N						
	IS GATE VALVE OPEN?	Y/N	Y/N	N	Y/N						

* S5 - VFD in off position upon entry.
* S1 - VFD Case fans/hum on after power cycle, VFD controller in remote

€ S6 - check valve leaking, allowing back flow, slight.
* S1 - Check valve leaking, allowing slight back flow (0.2gpm)

PCP: * S5 - UPS dead upon entry.
S5 -

* No lock on S4
All UPS & SLC Batteries Changed
*S6 - Power on, Fail lights out
**S1 - Power on lights on
***S4 - Power on lights on

NOTES: No Vault fan in S6, No Vault Fan S4

EXTRA NOTES:
WL's @ S-1 = 80.92 NO WL @ S-4
S-5 =
S-6 = 87.45

TECHS: M. TERRIS
DATE(S): 7/20/23

EXTRACTION WELL MAINTENANCE
QUARTERLY INSPECTION

ANNUAL MAINT

TASK	MAINTENANCE	CP-S1	CP-S4	CP-S5	CP-S6	CP-E1	CP-E2	CP-E3	CP-W1	CP-W2	CP-W3
SUMP:											
	VERIFY HI FLOAT ALARM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CLEAN AS NEEDED (SHOPVAC)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:	✓FLOAT OUT MAKE SURE WORKING ORDER NO WAY TO VERIFY FLOAT NO COMM W/PLANT										
VFD:											
	CLEAN FILTER	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT WIRING/COMPONENTS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:	ANNUAL CLEANING FILTER USED AIR TO CLEAN										
PIPING:											
	EXERCISE GATE VALVE (2X)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT PIPING FOR LEAKS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT AIR/VAC VALVE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:	NO LEAKS NOTED @ ANY LOCATION										
PIT:											
	INSPECT FOR LEAKS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK ZERO READING	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:	ZERO PRESSURE @ EACH LOCATION VERIFIED										
PCP:											
	CLEAN (SHOPVAC)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT ALL WIRING/RELAYS/COMP	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK INDICATOR LIGHTS/REPLACE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK SLC/KE CARD LIGHTS BATT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	TURN FAN TO WARM/COOL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CLEAN FILTERS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK/TIGHTEN ALL CABLES/RADIO	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	DESSICANT CHANGE OUT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	UPS BATTERY CHECK	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:	USED SHOP-VAC / CLEANED ALL FILTER SOAP/WATER										
VAULT:											
	CLEAN AND INSPECT (SHOPVAC)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT LADDER BOLTS/RUNGS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT LID BOLTS UPPER/LOWER	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK/TIGHTEN MAGNET WELL/LID	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:											
FINAL:	WORKING ON THIS										
	RESET RADIO	NO RADIO COMM W/PLANT									
	RESET WELL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	IS PIT OPEN?	O	O	O	O	O	O	O	O	O	O
	IS GATE VALVE OPEN?	C	C	C	C	C	C	C	C	C	C

ALL IN ALL VAULTS LOOK GOOD.

EXTRA NOTES: ANY MAINT. NEEDS TO BE DONE WILL BE DONE QT.

TECHS: CC

DATE(S): 10/02/23, 10/05/23

EXTRACTION WELL MAINTENANCE

TASK	MAINTENANCE	CP-S1	CP-S4	CP-S5	CP-S6	CP-E1	CP-E2	CP-E3	CP-W1	CP-W2	CP-W3
SUMP:											
	VERIFY HI FLOAT ALARM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	CLEAN AS NEEDED (SHOPVAC)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:											
VFD:											
	CLEAN FILTER	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT WIRING/COMPONENTS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:											
PIPING:											
	EXERCISE GATE VALVE (2X)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT PIPING FOR LEAKS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT AIR/VAC VALVE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:											
PIT:											
	INSPECT FOR LEAKS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK ZERO READING	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:	E-1: 3.0-6.0@0,										
PCP:											
	CLEAN (SHOPVAC)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT ALL WIRING/RELAYS/COMP	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK INDICATOR LIGHTS/REPLACE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK SLC/KE CARD LIGHTS BATT	✓	✓	✓	✓	✓	✓	✓	✓	✓*	✓
	TURN FAN TO WARM/COOL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CLEAN FILTERS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK/TIGHTEN ALL CABLES/RADIO	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	DESSICANT CHANGE OUT	✓*	✓*	✓*	✓	✓	✓	✓	✓	✓	✓
	UPS BATTERY CHECK	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:	1-SLC Dead!, W-2, SLC Faulted, W-1, Yellow light dead - E-2, SLC-Faulted-E-2, SLC Dead, E-3. SLC Faulted, Modem missing - S6. SLC Dead, S5, SLC Faulted-S4, SLC Faulted S1										
VAULT:											
	CLEAN AND INSPECT (SHOPVAC)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT LADDER BOLTS/RUNGS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT LID BOLTS UPPER/LOWER	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK/TIGHTEN MAGNET WELL/LID	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:	No Vault exhaust - S6										
FINAL:											
	RESET RADIO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	RESET WELL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	IS PIT OPEN?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	IS GATE VALVE OPEN?	No	No	No	No	No	No	No	No	No	Yes

EXTRA NOTES:

TECHS: M. TERRIS

DATE(S): ~~1/4/2024/1/5/24~~

EXTRACTION WELL MAINTENANCE
QUARTERLY INSPECTION

1/4/24 - 1/5/24 AM

TASK	MAINTENANCE	CP-S1	CP-S4	CP-S5	CP-S6	CP-E1	CP-E2	CP-E3	CP-W1	CP-W2	CP-W3
SUMP:											
	VERIFY HI FLOAT ALARM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	CLEAN AS NEEDED (SHOPVAC)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:	NOTE CLEANING OUT SUMP SA. APRIL/OCT										
VFD:											
	CLEAN FILTER	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT WIRING/COMPONENTS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:	ALL FILTERS CLEAN/INSPECTED										
PIPING:											
	EXERCISE GATE VALVE (2X)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT PIPING FOR LEAKS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT AIR/VAC VALVE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:	LOOKED FOR LEAKS WHILE SAMPLING (NO LEAKS)										
PIT:											
	INSPECT FOR LEAKS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK ZERO READING	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NOTES:	INSPECT FOR LEAKS WHILE SAMPLING										
PCP:											
	CLEAN (SHOPVAC)	SEMI-ANNUAL				APRIL/OCT					
	INSPECT ALL WIRING/RELAYS/COMP	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK INDICATOR LIGHTS/REPLACE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK SLC/KE CARD LIGHTS BATT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	TURN FAN TO WARM/COOL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CLEAN FILTERS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK/TIGHTEN ALL CABLES/RADIO	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	DESSICANT CHANGE OUT	ALL DESSICANT IS IN GOOD SHAPE									
	UPS BATTERY CHECK	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:	* CHANGE OUT DESSICANT IN APRIL/OCT ONLY										
VAULT:											
	CLEAN AND INSPECT (SHOPVAC)	SEMI-ANNUAL				APRIL/OCT					
	INSPECT LADDER BOLTS/RUNGS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT LID BOLTS UPPER/LOWER	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK/TIGHTEN MAGNET WELL/LID	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:											
FINAL:											
	RESET RADIO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	RESET WELL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	IS PIT OPEN?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	IS GATE VALVE OPEN?	C	C	C	C	C	C	C	C	C	C

(ONLY OPEN WHEN SAMPLING)

EXTRA NOTES: ALL IN ALL VAULTS LOOK GREAT

TECHS: M. TERRIS
DATE(S): 4/4/24 – 4/5/24

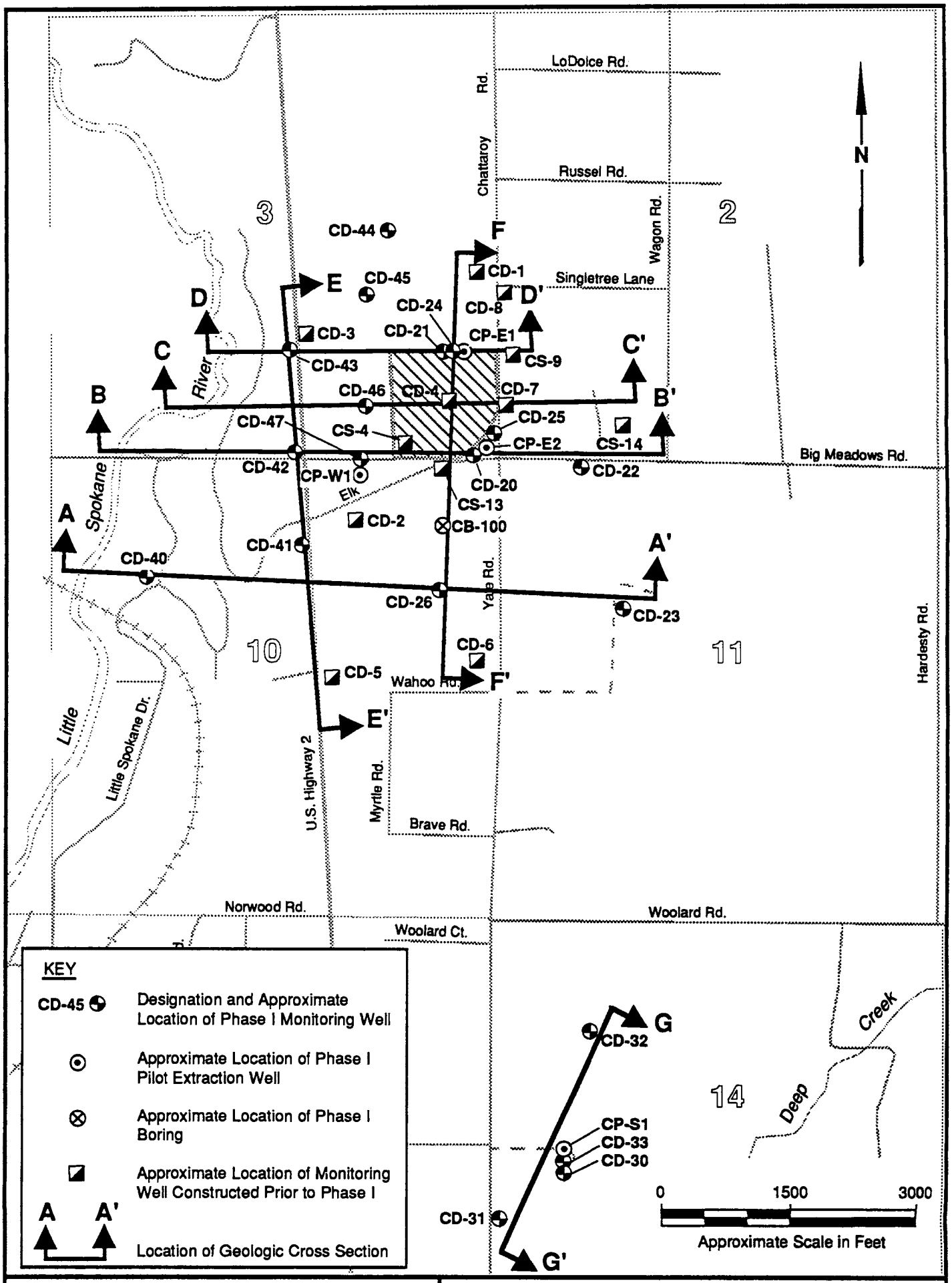
EXTRACTION WELL MAINTENANCE

TASK	MAINTENANCE	CP-S1	CP-S4	CP-S5	CP-S6	CP-E1	CP-E2	CP-E3	CP-W1	CP-W2	CP-W3
SUMP:											
	VERIFY HI FLOAT ALARM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	CLEAN AS NEEDED (SHOPVAC)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:											
VFD:											
	CLEAN FILTER	✓	✓	✓	✓	✓	NA	✓	✓	✓	✓
	INSPECT WIRING/COMPONENTS	✓	✓	✓	✓	✓	NA	✓	✓	✓	✓
NOTES:		CP-E2 VFD HASN'T WORKED FOR 5 YEAR NEW DESSICANT IN EACH VFD									
PIPING:											
	EXERCISE GATE VALVE (2X)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT PIPING FOR LEAKS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT AIR/VAC VALVE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:											
PIT:											
	INSPECT FOR LEAKS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK ZERO READING	~~A~~	~~A~~	~~A~~	~~A~~	A	A	~~A~~	A	~~A~~	A
NOTES:											
PCP:							X'				
	CLEAN (SHOPVAC)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT ALL WIRING/RELAYS/COMP	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK INDICATOR LIGHTS/REPLACE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK SLC/KE CARD LIGHTS BATT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	TURN FAN TO WARM/COOL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CLEAN FILTERS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK/TIGHTEN ALL CABLES/RADIO	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	DESSICANT CHANGE OUT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	UPS BATTERY CHECK	✓	✓	✓	✓	'23	✓	✓	'23	✓	'23
NOTES:		X' CP-E2 LOW WLS LIGHT IS ON				NEW UPS BATT.			SLK BATT IN '23		
VAULT:											
	CLEAN AND INSPECT (SHOPVAC)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT LADDER BOLTS/RUNGS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT LID BOLTS UPPER/LOWER	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK/TIGHTEN MAGNET WELL/LID	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:											
FINAL:											
	RESET RADIO	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	RESET WELL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	IS PIT OPEN?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	IS GATE VALVE OPEN?	C	C	C	C	C	C	C	C	C	C

EXTRA NOTES:

Appendix D

Colbert Landfill Hydrogeologic Cross-sections



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Geologic Cross Section Location Map

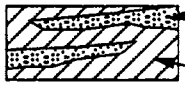
124-01.61 Spokane Co./Colbert Landfill/RD/RA Phase I /Final Engineering Report 12/91

Figure ER-4.1

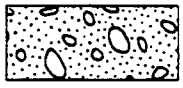
KEY TO GEOLOGIC CROSS SECTIONS

Fluvial sands, silts and gravels

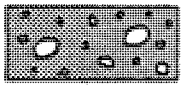
Upper Sand/Gravel Unit (Unit A), composed of gravelly, fine to coarse sand



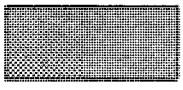
Lacustrine Unit (Unit B), composed of silt and clay with interbedded fine sand



Lower Sand/Gravel Unit (Unit C), composed of gravelly, fine to coarse sand

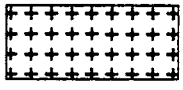


Weathered Latah Subunit (Unit D_1), composed of gravelly (basalt) silt and clayey silt

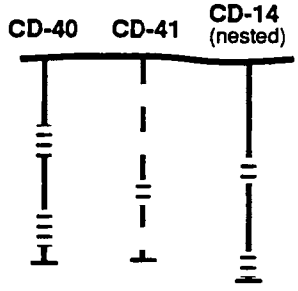


Latah Formation (Unit D), composed of silt, clayey silt and fine sand

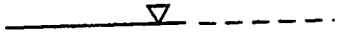
Basalt Unit (Unit E), composed of highly fractured to massive Basalt rock



Granite Unit (Unit F), composed of Pre-Tertiary granitic rock, highly weathered with zones encountered during Phase I



Approximate location and number of monitoring well cluster, with screen intervals shown for individual monitoring wells. Projected boring logs have dashed lines. Nested wells are noted, and screen intervals shown.

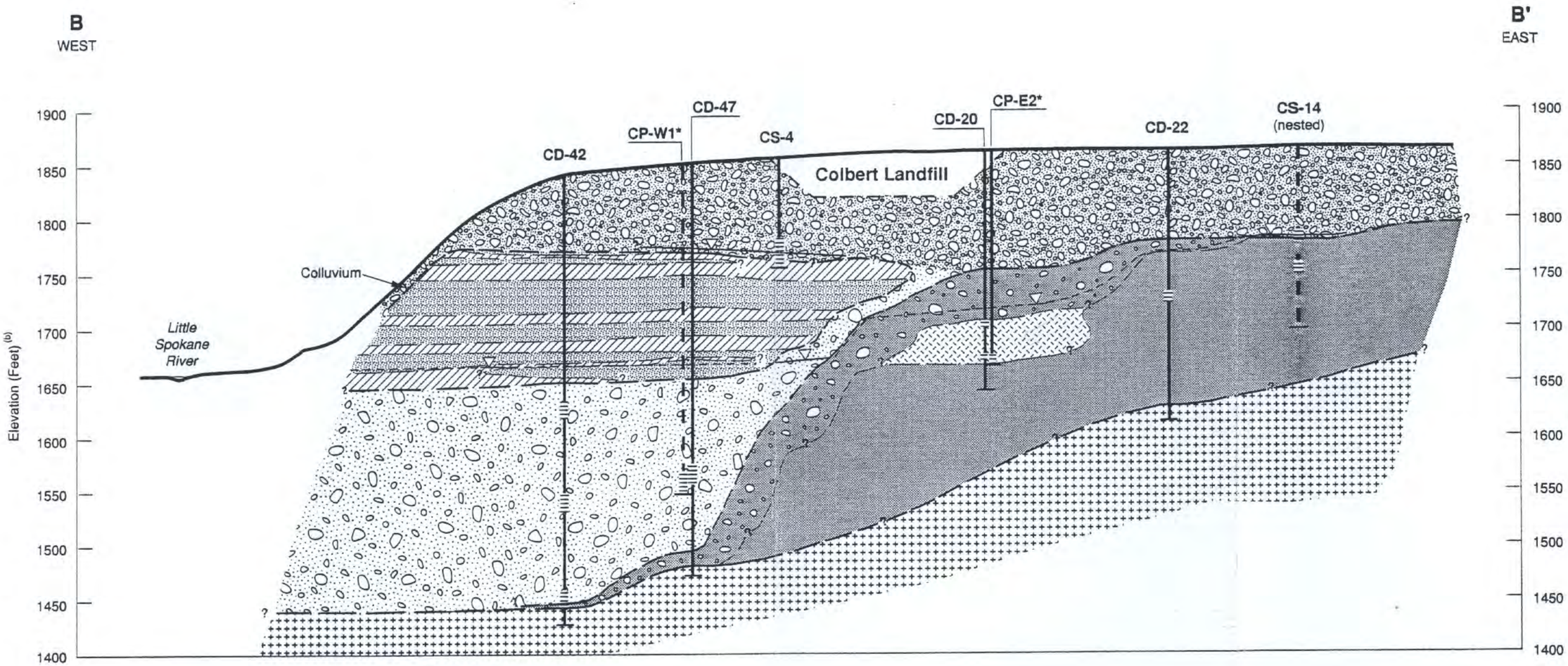


Ground water elevation line, dashed when representing a piezometric surface in a confined aquifer

Contact between stratigraphic units; question marks indicate contact projection based on limited data

LANDAU ASSOCIATES, INC.	Key to Geologic Cross Sections

Figure ER-4.2



Notes: a) Subsurface profiles shown have been generalized from data obtained during Phase I and other Site investigations. Variations between this profile and the actual soil conditions may be encountered. The boring logs and the discussion in the text of this Report must be referenced for a proper understanding of the nature of subsurface materials.

b) All elevations in feet above mean sea level (MSL) based on 1929, National Geodetic Vertical Datum.

* Pilot Well included in cross section to show screen interval, geologic information is based on adjacent monitoring well boring data.

0 600 1200
Approximate Scale in Feet
Vertical Scale Exaggeration: 6x

LANDAU ASSOCIATES, INC.

Geologic Cross Section B-B'

Figure ER-4.4

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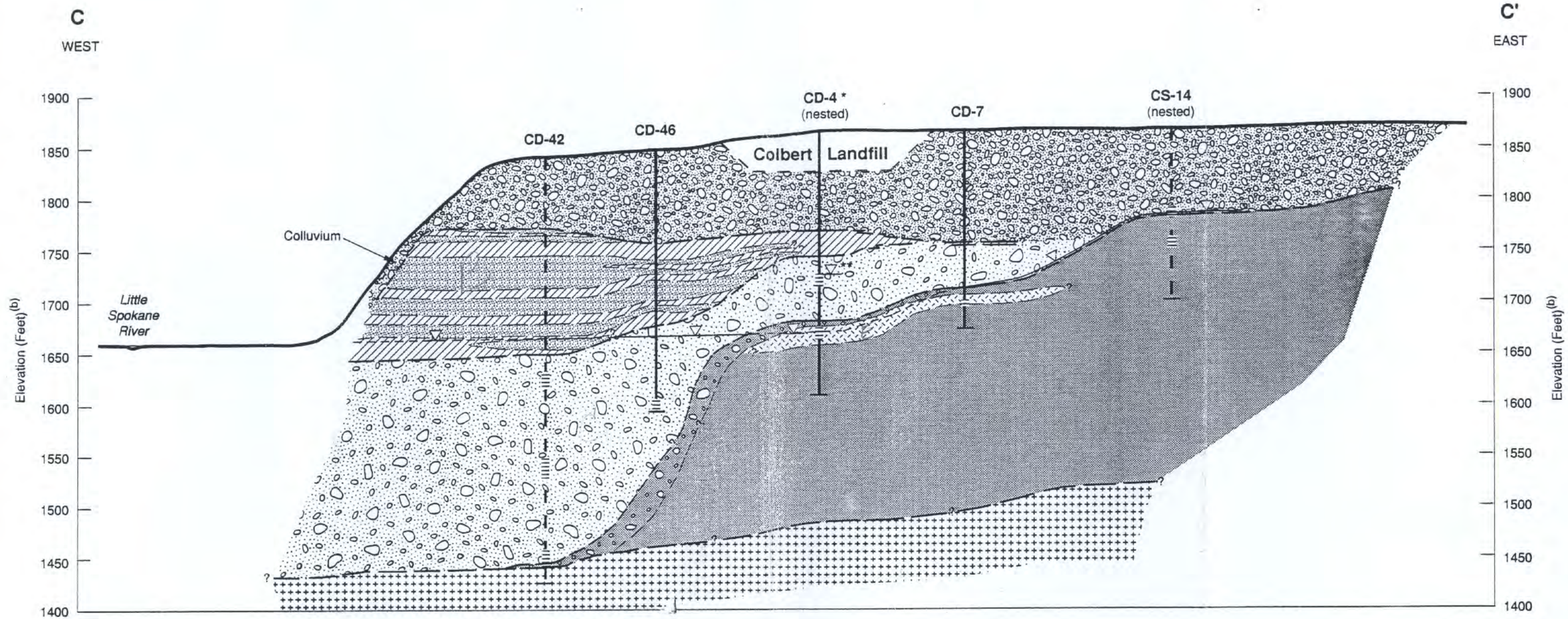


Notes: a) Subsurface profiles shown have been generalized from data obtained during Phase I and other Site investigations. Variations between this profile and the actual soil conditions may be encountered. The boring logs and the discussion in the text of this Report must be referenced for a proper understanding of the nature of subsurface materials.

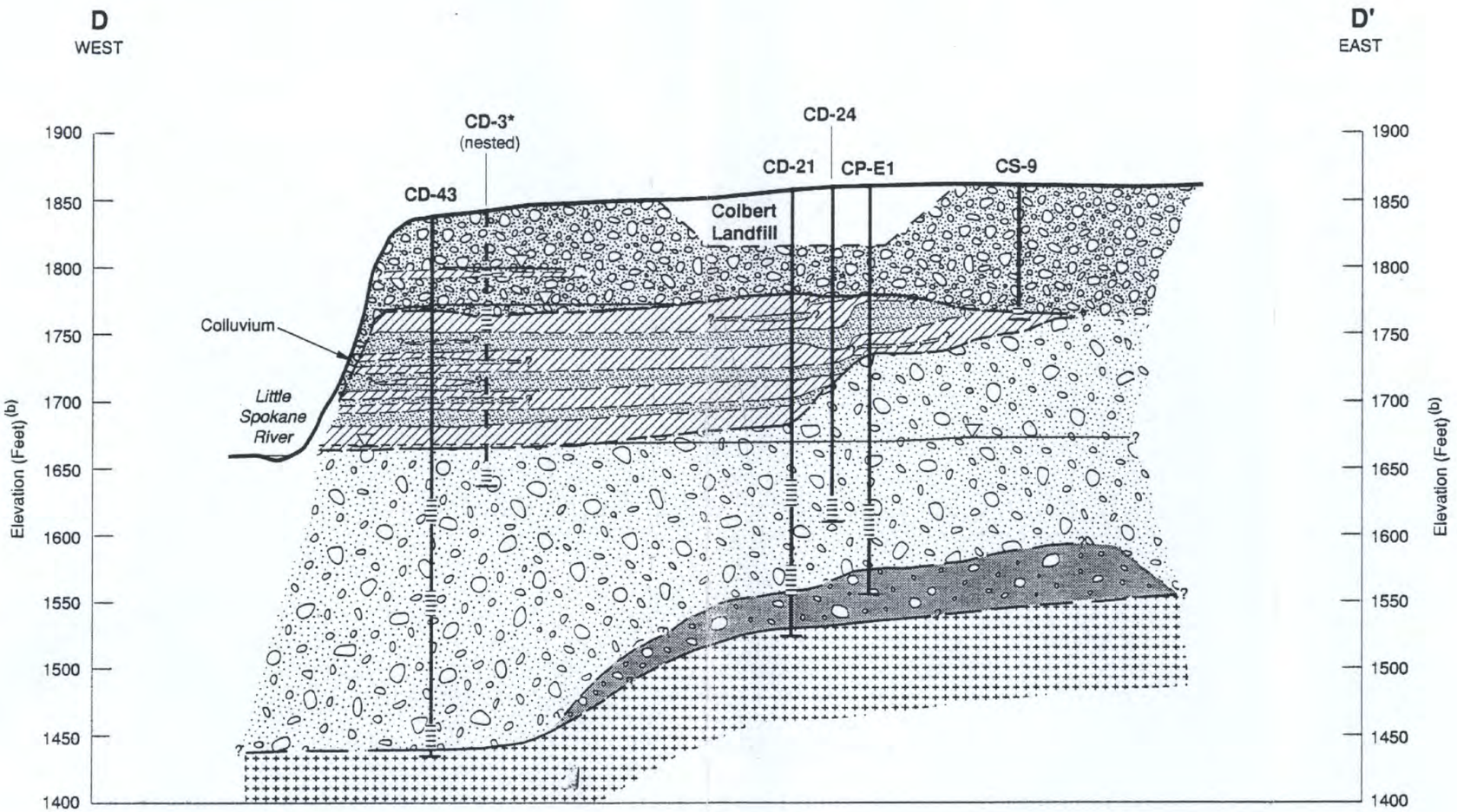
b) All elevations in feet above mean sea level (MSL) based on 1929, National Geodetic Vertical Datum.

* Well drilled by air rotary; detailed geology not identified in Lacustrine Aquitard Unit.
** Ground water in CD-4(U) appears to be perched. However, an underlying aquitard is not identified on the boring log.

LANDAU ASSOCIATES, INC.

Geologic Cross Section C-C'

Figure ER-4.5



Notes: a) Subsurface profiles shown have been generalized from data obtained during Phase I and other Site investigations. Variations between this profile and the actual soil conditions may be encountered. The boring logs and the discussion in the text of this Report must be referenced for a proper understanding of the nature of subsurface materials.

b) All elevations in feet above mean sea level (MSL) based on 1929, National Geodetic Vertical Datum.

0 600 1200
Approximate Scale in Feet
Vertical Scale Exaggeration: 6x

* Well drilled by air rotary; detailed geology in Lacustrine Aquitard Unit based on CD-43 boring data.

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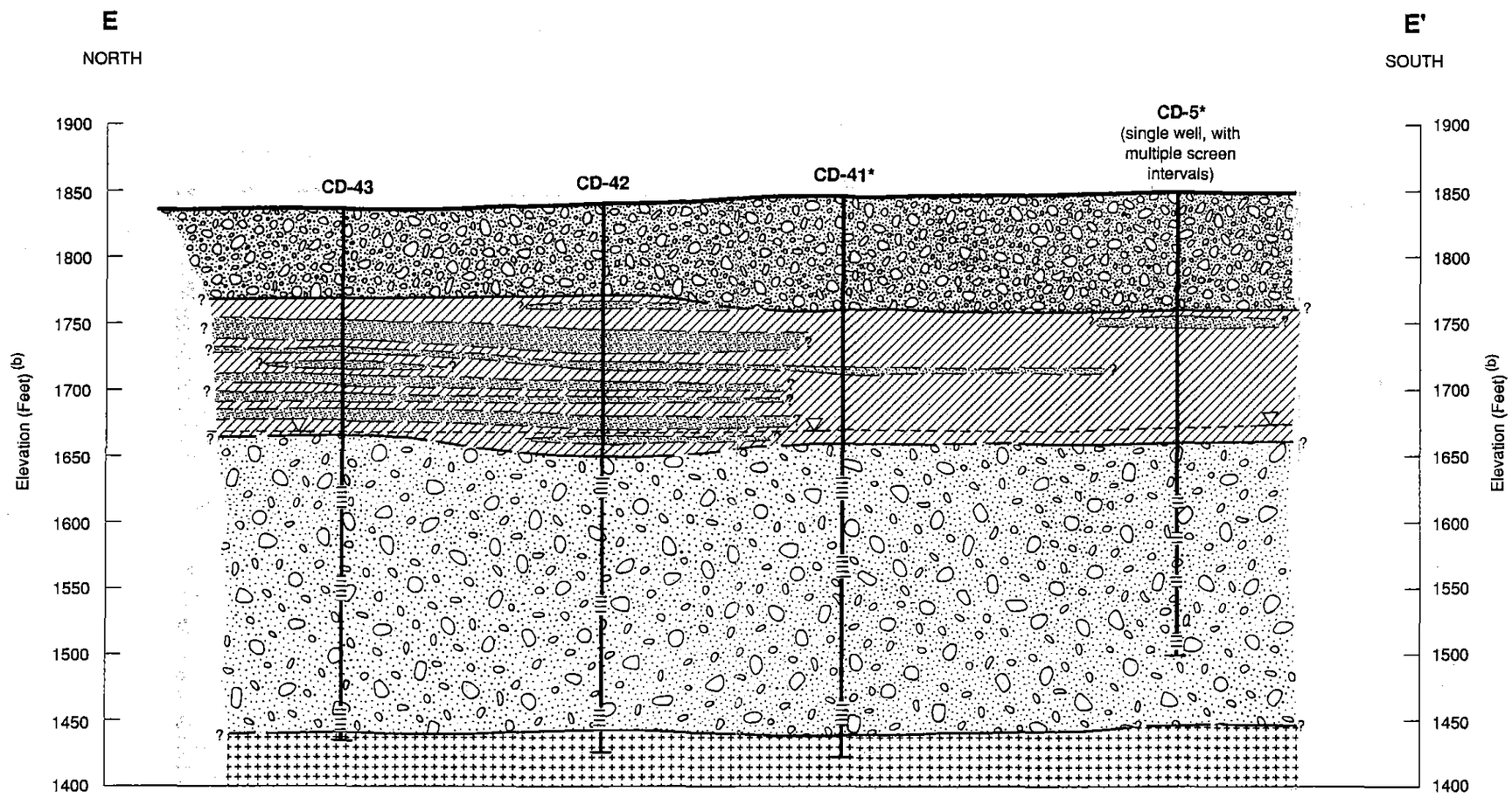
LANDAU ASSOCIATES, INC.

Geologic Cross Section D-D'

Figure ER-4.6



Notes: a) Subsurface profiles shown have been generalized from data obtained during Phase I and other Site investigations. Variations between this profile and the actual soil conditions may be encountered. The boring logs and the discussion in the text of this Report must be referenced for a proper understanding of the nature of subsurface materials.

b) All elevations in feet above mean sea level (MSL) based on 1929, National Geodetic Vertical Datum.

0 600 1200
Approximate Scale in Feet
Vertical Scale Exaggeration: 6x

* Well drilled by air rotary; detailed geology not identified in Lacustrine Aquitard Unit.

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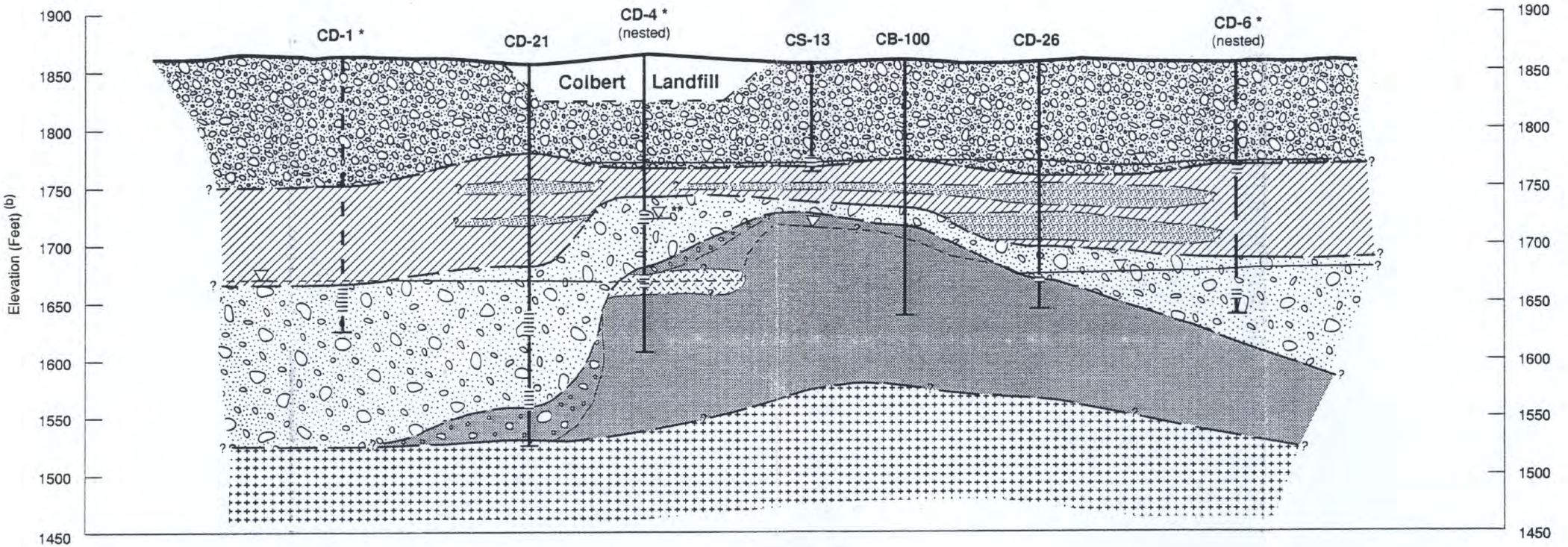
LANDAU ASSOCIATES, INC.

Geologic Cross Section E-E'

Figure ER-4.7

F

NORTH



F'

SOUTH

Notes: a) Subsurface profiles shown have been generalized from data obtained during Phase I and other Site investigations. Variations between this profile and the actual soil conditions may be encountered. The boring logs and the discussion in the text of this Report must be referenced for a proper understanding of the nature of subsurface materials.

b) All elevations in feet above mean sea level (MSL) based on 1929, National Geodetic Vertical Datum.

0 600 1200

Approximate Scale in Feet

Vertical Scale Exaggeration: 6x

* Well drilled by air rotary; detailed geology not identified in Lacustrine Aquitard Unit.

** Ground water in CD-4(U) appears to be perched. However, an underlying aquitard is not identified on the boring log.

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LANDAU ASSOCIATES, INC.

Geologic Cross Section F-F'

Figure ER-4.8