Tennessee Valley Authority
Colbert Fossil Plant
Groundwater Incident 93-6-4

GROUNDWATER MONITORING REPORT
April 2015

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July 27, 2015

DOCUMENT CERTIFICATION

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LIST OF ACRONYMS

ADEM	Alabama Department of Environmental Management
AP1	Ash Pond 1
AP4	Ash Pond 4
AP5	Ash Pond/Stack 5
bgs	below ground surface
btoc	below top of casing
CCP	Coal Combustion Products
COF	Colbert Fossil Plant
CSM	Conceptual Site Model
DI	deionized water
ft msl	feet above mean sea level
GPM	gallons per minute
HSI	Hydrogeologic Site Investigation
LPM	liters per minute
MCL	Maximum Contaminant Level
MCP	Metal Cleaning Pond
ORP	oxidation reduction potential
NTU	Nephelometric Turbidity Units
PSV	Preliminary Screening Value
RSL	Regional Screening Levels
TVA	Tennessee Valley Authority
WQG	Water Quality Goal

1. INTRODUCTION

This report contains the semiannual groundwater assessment monitoring results for samples collected under Groundwater Incident # 93-06-04 for the TVA Colbert Fossil Plant (COF). A site location map is included on Figure 1. Samples were collected from April to 7 to 16, 2015 from 24 of 25 designated monitoring wells at COF, one of which is a privately owned well (P8) located off site. Well CA11A, CA29BR, and CA31A were either dry, or purged dry and did not recover overnight, and could not be sampled. Water level readings were taken on April 7, 2015. The wells were sampled in accordance with the approved groundwater monitoring plan (2004), and the letter from ADEM dated October 30, 2008 specifying the chemicals of concern and other requirements for the semi-annual reports. Following review of the data from the sampling dates mentioned above, analysis for some parameters was missing. Resampling occurred on June 15, 16 and 17, 2015, to obtain samples to analyze the missing parameters. The wells sampled were: MC5A, CA9R, P8, CA31A, CA30B, CA20A, CA5, CA11, MC1, MC4, CA29AR, and CA6. Well CA9R was bailed dry, and though it recovered overnight, the volume of water recovered was still insufficient to fill all the sample bottles or take field readings, so the water is considered not to be representative of the groundwater in the aquifer.

1.1 GROUNDWATER MONITORING NETWORK

The groundwater monitoring program involves semiannual (April and October) sampling of 25 monitoring wells; 24 located on the COF site and one off-site private well. The monitoring wells that are a part of the current groundwater compliance monitoring are as follows:

CA5	CA19B	CA29BR
CA6	CA20A	CA30B
CA9R	CA20B	CA31A
CA11	CA21B	MC1
CA11A	CA22B	MC4
CA12A	CA27BR	MC5A
CA16	CA28B	MC5C
CA17A	CA29AR	P8
CA17B		

Compliance monitoring well locations are depicted on Figure 2. Private Well P2 had previously been included in the groundwater sampling network, but was properly closed on January 30, 2014. The well closure report was submitted to Alabama Department of Environmental Management (ADEM) with a cover letter dated April 17, 2014, in accordance with the Consent Order referenced in the next section. Included in the 24 wells sampled are monitoring results for three wells associated with COF Ash Pond 4. These wells were installed or rehabilitated in 2010 in connection with a voluntary coal ash impoundment monitoring program initiated by the Utility Solid Waste Activities Group (USWAG). They are designated as: Well 17B, Well CA30B and Well CA31A. Samples from these three monitoring wells have been analyzed for the same sample constituents required by Alabama Department of Environmental Management (ADEM) under the Groundwater Incident 93-6-4 monitoring program. Sample collection and laboratory analysis were performed in accordance with the Alabama Environmental Investigation and Remediation Guidance (ADEM, 2005a) and the facility Groundwater Monitoring Plan (TVA, 2004). Since the time these wells were installed under the voluntary program, they have been incorporated into the Consent Order discussed in the next section.

The chemicals of potential concern (COPC) are trace metals associated with coal-combustion byproduct landfills and impoundments, as listed in Table 1. Table 1 also includes the general chemistry, field parameters and analytical methods used. Field and laboratory analytical results from the April and October sampling are reported to ADEM semi-annually.

1.2 CONSENT ORDER 20-CV-2013-900123

Consent Order No. 20-CV-2013-900123 between TVA and ADEM was issued on May 13, 2013. One of the required actions of the consent order, which was mentioned above, was the closing of private Well P2 and submittal of associated plans and schedules.

Wells CA17B, CA30B and CA31A, downgradient of Ash Pond 4, were installed or rehabilitated in 2010 as part of a voluntary groundwater monitoring program. These wells are now monitored as they relate to the May 13, 2013 Consent Order with ADEM, to evaluate groundwater trends related to Ash Pond 4. Additionally, well CA17A is downgradient of Ash Pond 4, and has been monitored historically as part of GW Incident 93-6-4. As required by the Consent Order, if the data from these wells does not reflect an overall downward trend after five years, TVA will submit a closure plan for Ash Pond 4 to ADEM.

Additionally, if seepage is identified and corrective action taken during the reporting period, TVA is required to include that information with these semi-annual reports. Seepage inspections, since the last groundwater report submittal for October 2014, have not identified any seeps.

2. URS CONCEPTUAL SITE MODEL (CSM)

An extensive hydrogeologic investigation was performed by URS in several phases to support the COF Ash Stack 5 closure and potential landfill expansion in the former Ash Pond 5 area. The first phase began June 29, 2010 and the last phase concluded January 10, 2013. The hydrogeological CSM is a tool used to describe, in summary fashion, the behavior of groundwater on site. The model is used to depict the current understanding of the various factors that control where groundwater occurs. This includes how it flows at the site and how contaminants migrate through the subsurface. The CSM for Ash Stack 5 and the surrounding area has been excerpted from Part D of the Hydrogeological Site Investigation from the Industrial Waste Permit Application – Ash Stack 5 and is presented below. The permit application was submitted to ADEM on June 23, 2014.

2.1 Native Residual Soils

The thicknesses of unconsolidated materials are highly variable. Depth to rock from soil borings and test pits across the site show that the depth to rock varies from about 1.5 feet to 77 feet. The top of rock is an irregular surface with numerous pinnacles and cutters caused by differential solution activity and weathering of the limestone. The soils are susceptible to development of desiccation cracks that can extend to tens of feet below ground surface and allow a rapid path for water infiltration through the soil column. The soil column is also often interrupted by the presence of large “float” blocks of rock, which impede the downward percolation of groundwater; and collapse voids that can be filled with soft, re-deposited clays and silts that tend to retain or “perch” infiltrating water.

2.2 Weathered Bedrock/Epikarst

In the lower part of the soil column, float blocks and collapse voids are more common and become intermingled with, and eventually transition to, weathered bedrock. The weathered limestone bedrock has abundant fractures and rounded surfaces, resulting in significant porosity and permeability through which infiltrating water can percolate, or in which it can become trapped or perched. This combined zone of weathered rock and voids in the deep soil or shallow bedrock is often referred to as the “epikarst”

zone, particularly where it has the ability to retain and/or transmit groundwater. This zone generally ranges in thickness from 10 to 30 feet but its limits are highly subjective, depending on the observer and on the method of observation (i.e. what method is used to drill, sample, excavate, or otherwise look at the soil and rock).

2.3 Bedrock/Karst

The predominant bedrock at the site is the Tuscumbia Limestone, which is characterized by light to medium gray, fine- to medium-grained fossiliferous (primarily crinoid stems), cherty limestone. Chert occurs as light gray to dark bluish gray, sub-rounded nodules in layers throughout the unit. Cherty layers are laterally discontinuous, and no site-wide marker beds exist in the formation. Horizontal fractures along bedding planes are the most common fracture orientation. Two distinct sets of high-angle fractures were measured on outcrops at the site. The dominant set strikes about N50°E. The second set has N50°W trend. Both sets are near vertical. Solution activity has been observed throughout the site, including in outcrops along the adjacent Tennessee River.

Weathered bedrock includes any fractures or bedding plane partings that are enhanced by dissolution of the bedrock. These features can extend to great depth in the bedrock and comprise the caves and karst conduits that are the primary flow paths and storage space for groundwater on site. For practical purposes, the top of competent bedrock is generally identified as the depth at which soil drilling and/or sampling tools (auger, split spoon sampler, or other) can no longer be advanced by standard methods.

Top of rock may be encountered at the ground surface or at depths in excess of 70 feet. In adjacent borings (separated by only a few feet) it is not uncommon to have the depth to top of rock vary by 10 feet or more. In karst environments, the deep bedrock cuts are referred to as “grikes” or more commonly “cutters”; whereas the higher parts are referred to as “clints”, if they are relatively flat-topped, and “pinnacles” if they are relatively sharp. Generally speaking, the top of rock on site can be described as a “pinnacle and cutter” surface.

The bedrock is largely hard, intact, massively-bedded limestone with some layers that have abundant chert nodules or wavy layers. The rock has little or no primary porosity (i.e. the rock is dry) but it is relatively susceptible to the development of secondary porosity. Secondary porosity is the pore space created by openings in the rock such as fractures and solution cavities. Solution cavities are observed in the rock on site as small vugs in the rock matrix or as connected passageways ranging in size from partings along bedding planes and fracture surfaces, to caves up to 20 feet in height. Solution cavities occur at various depths below the water table on site (i.e. in saturated conditions), ranging in elevation from near 414 ft. msl down to 341 ft. msl. The vertically larger (taller) cavities have been found at greater depths whereas the porosity at shallower depths is dominated by small, bedding-plane cavities.

Data from onsite wells and from observations elsewhere in the vicinity suggest that many of the secondary porosity features may be oriented parallel or subparallel to the dominant fracture traces on site. The fracture traces generally run north-northeast and west-northwest in a conjugate set. As a result, the conduit system likely consists of a series of many parallel passages in a rectangular pattern. Those conduits along the stronger fracture traces are likely to be more developed than others. Figure 3 depicts the dominant fracture traces and conjugate sets identified at COF, along with the conceptual potentiometric surface map generated from the URS hydrogeological study and evaluation of the groundwater surface.

2.4 Hydrogeology

Groundwater occurs in the residual soil and in the Tuscumbia Limestone. Wells installed in areas of thick soil, below elevation 414 ft. msl typically contain water. Wells screened in soil above that elevation are generally dry. Locally, wells may intersect a zone of perched groundwater above an unfractured layer of bedrock. Eight of the monitoring wells are completed in unconsolidated residual and/or alluvial overburden and 17 wells are completed in the underlying Tuscumbia Limestone bedrock. A summary of general information pertaining to network monitoring wells, such as well

construction information, location, year of installation, etc., is presented in Table 2. Wells CA5, CA6, CA11, CA11A, and P8 are designated upgradient or background monitoring wells. The basis for selection of the upgradient/background wells is provided in Appendix A of the facility Groundwater Monitoring Plan (TVA, 2004). The remaining wells are generally situated in the vicinity of coal-combustion byproduct (CCB) management units associated with the COF plant. Discussion of Well CA6 as a background well will be discussed in Sections 4.1.2 and 4.3.1.

Regionally, the aquifer that underlies the site is part of the Tuscumbia-Fort Payne Aquifer. On site, the aquifer has an unconfined to semi-confined potentiometric surface at an elevation of 415 to 421 ft. msl. This aquifer appears to be hydraulically connected to and partially controlled by the water level in Pickwick Reservoir and Cane Creek. The normal pool elevation of Pickwick Reservoir is between approximately 408 and 414 ft. msl.

Precipitation recharges the Tuscumbia-Fort Payne Aquifer by infiltration through the soil overburden and through exposed solution features such as sinkholes, caves, and disappearing streams. Regionally, groundwater flows toward the Tennessee River. Groundwater movement in the bedrock aquifer (i.e. in the karst conduits) is similar to water flow in a three-dimensional complex of interconnected pipes. The size, shape, and orientation of the conduits control the flow of water. Larger conduits will have a greater storage and transmission capacity; smaller conduits will have potentially higher flow rates and gradients. Some conduits will be well-connected, while others may not.

Ultimately, the conduits in the onsite aquifer all drain to and are hydraulically connected to the Tennessee River. The hydraulic gradient on site is highly variable over time and at different locations, but the general flow of groundwater is from the aquifer into the river. This is because the terrace on which the site is located receives significant rainfall each year and much of it infiltrates the ground surface without running off via surface streams. That rainfall infiltration recharges the aquifer, raising

water levels, and driving groundwater flow into the river. The October 2013 and April 2014 Groundwater Reports for COF include a hydrograph graphically illustrating the interconnectivity of wells CA6, CA9R, CA11 and CA21B with precipitation, groundwater and the river.

Figure 3 illustrates the concept of interconnected karst conduit flow toward the river based on potentiometric surface data collected on June 18, 2012. This data set was selected because it captures the equilibrium or "baseline" condition: where the river is stable and there have been no recent rainfall events to create temporary fluctuations in water levels. Flow is generally along select pathways trending north-northeast with connecting flow from west-northwest passageways. There is relatively little hydraulic gradient across the site in the connected conduits, and wells that do not intercept conduits are illustrated as being perched outside the conduits with relatively higher water levels. Conceptually, groundwater flow along these passageways is through a series of parallel conduits that occupy the general vicinity of the indicated passage, and not necessarily through a singular trunk conduit. The potentiometric surface, using the groundwater elevations taken just prior to sampling on April 6, 2015 for the bedrock aquifer, is shown on Figure 4.

The discharge of groundwater into the river likely occurs at a series of submerged springs in the riverbed. No springs have been identified through site surveys. This is likely an indication that there are numerous small springs emanating from many karst conduits, rather than one large spring, which would be more easily detected.

2.5 Contaminant Migration

This CSM was developed in part using the distribution of water quality between wells as an indication of groundwater flow paths. Ionic compound concentrations in wells with strong communication to the aquifer tend to fluctuate dramatically when flow conditions transition between recharge/discharge events and baseline conditions. This is generally believed to result from dilution of high baseline concentrations by influx of fresh rainfall recharge.

Groundwater flow and contaminant migration may not follow a singular path. Because of the relatively low gradient in the portions of the aquifer that respond fast, groundwater may follow distributary (divergent) paths in the network before ending up at the river. This may allow for the relatively high ion concentrations at multiple wells on the northwest corner of the inactive Ash Pond 5, even though the wells do not appear to fall on a singular groundwater flow path.

3. SAMPLING METHODS

3.1 WELL DEPTH AND WATER LEVEL MEASUREMENTS

Well depth and water level measurements were performed at all monitoring wells on April 7, 2015. Data recorded on field sheets during monitoring of each well are reproduced in Appendix A. Depth to water surface from the top of each reference point (e.g., top of well casing) was measured and recorded to the nearest 0.03 feet with an electronic water level indicator. The bottom depth of the well was measured with a weighted tape or plunker. Groundwater depth to water and elevations are included in Table 3. The volume of water in the well was computed for purposes of estimating well purging requirements. The electronic water level probe and plunker were cleaned between measurements using deionized (DI) water.

3.2 WELL HEAD PREPARATION

Prior to lowering sampling equipment into a well, a large sheet of clean plastic was spread around the well as a ground cover to minimize the potential for equipment contamination caused by ground contact. Immediately prior to placing a pump into the well, the outside of the pump and the first few feet of tubing were rinsed with DI water. Wells equipped with dedicated pumps (e.g., CA16) required no well preparations.

3.3 SAMPLING METHODS

Monitoring well sampling methods, purge rate, and field data results are shown on Table 4. For relatively productive wells, either a bladder pump or variable-speed submersible pump was used to purge the well bore of stagnant water prior to sample collection. The pump intake was carefully lowered to a point below the water surface. As the well was purged, the pump was lowered as the water level declines to ensure stagnant water above well screen was removed, with a minimum of three well volumes of water was removed from the well. Micropurging involved purging a well at rates up to 0.16 gallons per minute (GPM) (or approximately 0.6 liter per minute [LPM]) to stability of certain field parameters, independent of a target well volume. Purge rates during this sampling event were generally in the range of 0.08 to 0.50 GPM (or approximately 0.3 to 1.8 LPM), depending on well yield characteristics.

Field parameters (e.g., temperature, pH, dissolved oxygen, specific conductivity, oxidation-reduction potential (ORP) and turbidity) were continuously monitored while purging using a calibrated Hydrolab® flow-through cell system to avoid air contact. Initial readings of the field parameters along with time, pumping rate, and water level were recorded as purging progressed and after each well volume was pumped from the well. Well purging continued until target of volume and/or field parameter stabilization, i.e., after three consecutive readings showing pH measurements within 0.1 units, temperature within approximately 0.5 degree-F, conductivity within approximately 10%, and turbidity below 5 nephelometric turbidity units (NTU). Low-yielding wells were pumped or bailed dry and allowed to recharge sufficiently before attempting to collect samples. Wells CA11A, CA29BR, and CA31A were either dry, or purged dry and did not recover overnight, and could not be sampled.

In Table 4, seven of the wells had turbidity exceeding 5 NTUs; the highest at 150 NTU. The results from wells CA5, CA9R, CA17B, CA19B, CA20A, CA21B, and CA28B may be impacted by the higher solids. Sampling procedures dictate taking a second, filtered sample if the turbidity exceeds 5 NTUs. The laboratory results in Appendix B show both the filtered and dissolved metals for these wells.

Once each well was adequately purged, samples were collected in the appropriate sample containers for laboratory analysis of the constituents listed in Table 1. Samples were collected directly from the pump discharge. In the case of low-yielding wells, a new disposable Teflon bailer was used to collect the sample. Clean gloves were worn while handling sampling equipment and containers. Care was taken to minimize sample aeration when filling containers. Any deviation from the sample collection protocol or other problem that might affect sample integrity was noted on the field data sheet. After each well was sampled, the sampling pump was rinsed and sampling lines purged with deionized water before sampling the next well. Specific sampling procedures and results for each well are provided on field data sheets presented in Appendix A.

3.4 SAMPLING METHOD FOR OFF-SITE PRIVATE WELL

Samples from the private well were collected from an outside water tap. Water lines were purged for at least 15 minutes after which monitoring of field parameters began. Purging continued until three consecutive measurements showed pH within 0.1 units, conductivity within 10%, and temperature within approximately 0.5 degree-F. Groundwater samples were then collected in appropriate containers.

3.5 FIELD QUALITY CONTROL SAMPLES

Field quality control samples were collected on April 8, 2015 as one pair of duplicate samples from well CA31A. On April 9, 2015 a set of field blanks and an equipment rinsate blank were collected after sampling Well MC5A. This is to confirm the adequacy of field equipment cleaning procedures between wells. A second set of field blanks and an equipment rinsate blank were collected on April 16, 2015 following the sampling of Well CA20B.

3.6 SAMPLE CONTAINERS AND PRESERVATION

All samples were placed in new certified containers and preserved in accordance with guidance provided in Appendix G of ADEM (2005a) for the parameters listed in Table 1.

3.7 SAMPLE HANDLING AND SHIPMENT

All sample containers were labeled with unique permanent sample identification numbers. Sample identification numbers were cross-referenced on all field sheets and on the sample custody form. Water samples and the original copy of the sample custody form were shipped via FedEx to the ESC Lab Sciences in Mt. Juliet, TN on both April 10, 2015 and April 16, 2015, as sampling was completed each week. Copies of completed sample custody records are given in Appendix B.

4. DISCUSSION OF RESULTS

Groundwater samples were analyzed by ESC in accordance with the laboratory methods listed in Table 1. All of ESC's analytical testing was performed within recommended sample holding times. No analytes were detected in the field or equipment blank samples. Following review of the data from the April 2015 sampling dates, analyses for some parameters were missing. Resampling occurred on June 15, 16 and 17, 2015, to obtain samples to analyze the missing parameters. The wells sampled were: MC5A, CA9R, P8, CA31A, CA30B, CA20A, CA5, CA11, MC1, MC4, CA29AR, and CA6. Well CA9R was bailed dry, and though it recovered overnight, the volume of water recovered was still insufficient to fill all the sample bottles or take field readings, so the water is considered not to be representative of the groundwater in the aquifer. That notwithstanding, all of the results provided by the laboratory are included in this report. Complete laboratory reports provided by ESC are presented in Appendix B. These reports contain analytical results, methods, reporting limits for each constituent, data qualifiers where applicable, and the chain of custody forms.

4.1 MONITORING WELL NETWORK

From the October 2013 Revised and Reissued Groundwater Report (dated August 8, 2014), URS provides the following analysis of the monitoring well network at COF based on the hydrogeology at the site. Portions of that analysis are provided below.

The occurrence and flow of groundwater on site is controlled by irregularly distributed karst conduits and other secondary porosity features. In karst aquifers of this sort, groundwater flow has a dual character. One in which there are open conduits that allow hydraulic pressure and/or groundwater flow to be communicated rapidly over long distances, but there are also poorly connected lesser conduits and vugs through which groundwater moves and hydraulic pressure is communicated much more slowly.

There is also a significant dichotomy in the character of groundwater recharge. In some areas, recharge from rainfall will infiltrate the soil and slowly percolate into the

aquifer, but in others it may pour directly into the aquifer via sinkholes, sinking streams, or deep desiccation cracks in the soil. Wells that see rapid rises in water level when it rains are screened in karst conduits and significant secondary porosity features. Wells that have a much slower response are in lesser conduits. The wells with rapid recharge were easily identified by spikes following rain events in the hydrographs included in the Hydrogeological Report for the COF Ash Stack 5 Landfill Permit Application from 2014. This permit application has since been withdrawn from ADEM.

As a rule, groundwater moves from areas of aquifer recharge to areas of discharge, but the dual character of groundwater flow has a significant influence on fate and transport.

- Slow moving waters will be relatively saturated (concentrated) in those ionic constituents that are common to the aquifer material (limestone and associated deposits), some of which are also common to the material disposed in the monitored facility.
- During extended dry periods, groundwater flow into the larger conduits and through the aquifer is dominated by seepage from the slower flow environment. As a result, the groundwater chemistry of base flow conditions is much closer to that of the water monitored by low-yielding wells (i.e. higher ionic concentrations).
- Groundwater flow in the larger conduits, where rapid flow dominates, is subject to wide swings in groundwater chemistry. As noted above, base flow conditions tend to have high concentrations of ions. In contrast, when there is active or recent recharge to the aquifer, the groundwater shifts toward the chemistry of the rainwater or surface water runoff that is rapidly entering sinkholes, sinking streams and other direct pathways to groundwater. This chemistry is much less concentrated in ionic constituents.

4.1.1 FAST HYDRAULIC RESPONSE WELLS

Historical groundwater elevation data shows spikes in wells CA21B and CA11 on May

3, May 6, May 11, and June 6, 2013, which are typical of wells that respond fast to rainfall. Groundwater elevation in CA21B was 417.19 ft. msl at 10:14 on June 6, 2013. At 12:14 on June 6, 2013, the groundwater elevation in CA21B had spiked to 457.07 ft. msl. This is an increase of 39.88 feet in only two hours. Boring log and purging information indicates that well CA20B responds fast.

4.1.2 MODERATE HYDRAULIC RESPONSE WELLS

Well CA6 demonstrates the characteristics of a well in moderate communication with the river. The difference between a fast and moderate well is evident in the hydrograph by the shape and timing of the increase in groundwater elevation in relation to the beginning of the event. Well CA21B responds with a very rapid increase in groundwater elevation yielding a vertical line as the leading edge of the peak. In well CA6, the water level begins to increase and it peaks at approximately the same time as CA11, but groundwater elevation increased slower as evident by the slope of the hydrograph line. Based on boring logs and purging information, wells CA16B and CA19B respond moderately.

4.1.3 SLOW HYDRAULIC RESPONSE WELLS

Several wells respond slowly to rain events and communicate very slowly to the river. Typically, these wells are set in the epikarst or in bedrock lacking any substantial secondary porosity features. Slow responding wells that are impacted take a very long time to communicate to the river.

The clearest example of a slow responding well is CA9R. Continuous long-term monitoring of CA9R indicates that this well responds very slowly, if at all, to changes in river elevation or rain events. The hydrograph for CA9R shows that it takes at least a month for the well to recover after a sampling event. This well is planned for closure and TVA will discuss with ADEM the need for and location of a replacement well.

4.2 ANALYTICAL RESULTS

The April 2015 groundwater monitoring results are summarized in Table 5.

Comparisons are provided of monitoring results to site WQGs. WQGs for most constituents consist of ADEM Preliminary Screening Values (PSVs) for tap water. Drinking water criterion has not been promulgated for boron, lithium, total phosphorus and molybdenum; therefore, no WQG comparisons are made for these parameters. Sample data exceeding WQGs are indicated by bolded values in Table 5.

To facilitate evaluation of WQG exceptions in a spatial context, Figures 5 through 11 present classed-post ("bubble") diagrams. The diagrams are for constituent data at each monitoring location for constituents exhibiting at least one WQG exception. In addition, time-series graphs of sample constituent data are provided in Appendix E to facilitate evaluation of temporal water quality trends in monitoring wells associated with Ash Pond 4, pursuant to section 18 of the Joint Motion for Entry of Consent Decree issued May 13, 2013.

4.3 ANALYTICAL RESULTS BY ANALYTE DETECTED ABOVE WATER QUALITY GOALS

4.3.1 AMMONIA

Ammonia was detected in well CA28B at 3.5 mg/L, which exceeds the WQG of 0.626 mg/L. In the last five years, ammonia has been consistently detected between 3.1 mg/L and 3.6 mg/L. Well CA28B was installed through ash, fully penetrating Ash Pond 1 into bedrock. Turbidity in this well was unusually high at 66.4 NTUs. Table 6 contains historical groundwater analytical data from 1982 to present.

4.3.2 ANTIMONY

Antimony was detected in wells CA9R (0.056 mg/L), MC1 (0.013), MC4 (0.0065 mg/L) and MC5A (0.008 mg/L), which exceed the WQG of 0.006 mg/L.

4.3.3 ARSENIC

Arsenic was detected in wells MC1 (0.058 mg/L), MC4 (0.045 mg/L) and MC5A (0.016 mg/L), which exceed the WQG of 0.01 mg/L.

4.3.4 IRON

Iron was detected in wells CA17B (16 mg/L), CA28B (19 mg/L), and CA31A (1.2 mg/L), which exceed the WQG of 1.10 mg/L. The elevated turbidity, which is likely

contributing to the WQG exceedances for the wells and the results of the dissolved iron analyses, are as shown below:

- CA17B 150 NTU 0.602 mg/L
- CA28B 66.4 NTU 10.8 mg/L

The increased iron in CA28B is likely caused by with the well installed through ash (see Section 4.3.1). For the other well, it has high turbidity with dissolved iron levels approximately half of the non-filtered iron level.

4.3.5 MANGANESE

Manganese was detected in wells CA17B (0.89 mg/L), CA21B (0.24 mg/L), CA28B (0.58 mg/L), CA29AR (0.17 mg/L), CA30B (2 mg/L), and MC5A (0.089 mg/L) which exceed the WQG of 0.088 mg/L. Some of the exceedances are likely due to turbidity for some wells as follows:

- CA17B 150 NTU
- CA21B 38.1 NTU
- CA28B 66.4 NTU

4.3.6 STRONTIUM

Strontium was detected in well CA6 at 3.3 mg/L, which exceeds the WQG of 2.2 mg/L. Well CA6 is a background and upgradient well indicating that the source of the strontium is either naturally occurring or from sources upgradient of the facility.

4.3.7 VANADIUM

Vanadium was detected in wells CA9R (0.0039 mg/L), CA20A (0.0058 mg/L), CA21B (0.007 mg/L), CA29AR (0.0042 mg/L), CA31A (0.004 mg/L), MC1 (0.044 mg/L), MC4 (0.0045 mg/L), and MC5A (0.03 mg/L; the same as the duplicate), which exceed the WQG of 0.0036 mg/L. The exceedances for three of the wells may be due to the elevated turbidity, as shown below. The dissolved vanadium results are also shown.

- CA9R 29.2 NTU 0.00359 mg/L
- CA20A 10 NTU non-detect
- CA21B 38.1 NTU non-detect

4.4 Analytical Results Discussed by Area

4.4.1 Background (CA5, CA6, CA11 and P8)

Background well CA5 responds slowly. Groundwater in well CA5 did not exceed any WQGs for this sampling event. Concentrations of iron and manganese tend to fluctuate with seasonal changes in groundwater elevation with higher concentrations in October and lower concentrations in April. In October, the water column is typically less than one foot whereas in April the water column averages 6.5 ft.

Wells CA6 and CA11 have very rapid hydraulic responses to changes in the aquifer. All results for well CA11 are below WQGs. Strontium is detected above the WQG in well CA6. Historical data shows that the amounts detected are nearly unchanged over the last five years, and as an upgradient well, may have off-site influences.

4.4.2 Ash Pond 1 (CA27BR and CA28B)

The only exceedance for ammonia was detected in well CA28B. Iron and manganese also show exceedances in CA28B. This well was installed through ash, fully penetrating Ash Pond 1 into bedrock. Ammonia concentrations have consistently been detected between 3.1 mg/L and 3.6 mg/L. Ammoniated ash was not placed in this area, so it is unlikely the ammonia comes from an ash source. Well CA27BR had exceedances for manganese and vanadium, but this is an upgradient well, so likely not impacted by ash. Manganese and vanadium could be naturally occurring, as there are no upgradient industrial sources anywhere near this well.

4.4.3 Ash Pond 4 (CA17A, CA17B, CA30B and CA31A)

Wells CA17A and CA31A respond very slowly to aquifer changes, if at all. Well CA17A was purged dry using a bailer. Well CA17B was sampled by mircopurging due to a limited water column. Even with mircropurging, the turbidity was 150 NTUs. Well CA17B appears to have a slow response to aquifer changes; however, there is not sufficient data to support this. Well CA17B exceeds the iron and manganese WQGs. This is consistent with results over the last five years. Well CA30B has a rapid hydraulic response to aquifer changes. The well exceeds the manganese WQG.

Manganese has been detected over the last five years ranging from 0.392 mg/L to 1.98 mg/L. Constituent time-series graphs for Ash Pond 4 monitoring wells are provided in Appendix E. Iron exceeded the WQG for iron in Well CA31A, but did not in the duplicate sample. The same was true for vanadium. Vanadium appears to be reflecting an overall downward trend, though data for recently installed wells CA17B, CA30B and CA31A are too limited at this time for meaningful evaluation of temporal trends.

4.4.4 Ash Pond 5 (CA9R, CA16, CA19B, CA20A, CA20B, CA21B AND CA22B)

As discussed in Section 4.1.3, well CA9R demonstrates a very slow hydraulic response to aquifer changes. Field water quality parameters stabilize quickly because no fresh water enters the well during purging or within 24 hours after purging. The water that comes into the well after purging is water that has been in storage in the sand pack. Historic trends indicate that antimony, iron and vanadium have remained consistent, though for this event, the iron did not exceed the WQG. The intent of purging a well is to ensure that samples are collected from the aquifer. Purge records and the hydrograph for this well indicate that samples are being collected from stagnant water, not groundwater within the aquifer. This well is planned for closure and TVA will discuss with ADEM the need for and location of a replacement well.

Wells CA16, CA19B show moderate responses to aquifer changes indicating that samples collected from these wells should be representative of the aquifer. Results for CA16, CA19B, CA20B, and CA22B do not exceed WQG for any sampled constituents. Well CA20A had one exceedance for vanadium. Well 21B shows exceedances for manganese and vanadium.

4.4.5 Former Metal Cleaning Pond (MC1, MC4, MC5A, MC5C, CA29AR AND CA29BR)

Wells MC1, MC4 and MC5A have exceedances for the following constituents at each well: antimony, arsenic, and vanadium. MC5A also has a manganese exceedance. The concentrations in these wells, which have a very slow hydraulic response, have been

consistent for an extended period. Deep well MC5C does not show any WQG exceedances. The manganese concentration of 0.17 mg/L at well CA29AR exceeds the WQG but is the lowest level in the history of the sampling (since 2004). Well 29AR also had a vanadium WQG exceedance. Use of the MCP was discontinued in 2007 and the facility has been closed in accordance with the ADEM-approved facility closure plan since 2011. Groundwater quality is expected to improve with the closure of this pond. There was insufficient water to sample CA29BR after bailing the well dry while purging it. It did not recover within 24 hours.

4.4.6 Private Well P8

There were no WQG exceedances for private well P8.

5. ANNUAL UPDATE ON CORRECTIVE ACTIONS

Two major projects are planned for corrective action, which will improve groundwater once fully implemented. The capping of Ash Stack 5 began in 2010, capping completed sections of the stack. The cap is a “Subtitle D” type cap with a synthetic membrane and vegetative cover. The ash stack will continue to be used until ash has stopped being generated. The plant is expected to stop generating power in April 2016, and the cap is expected to be completed in the fall of 2017.

Ash Pond 4 will continue to accept sluiced bottom ash until the plant shuts down in April 2016. Gradually, the pond will be filled until ash stops being sluiced, then final closure will begin in April 2016. An 18 inch compacted clay cap ($1x10^{-5}$), with six inches of vegetative cover will be constructed on Ash Pond 4 to reduce infiltration, and come into compliance with the new EPA Coal Combustion Residuals regulations. The final capping is expected to be completed in the fall of 2017, as well.

Additionally, closure of the Stilling Basin associated with Ash Stack 5 is planned. It is planned to have the same constructed cap as Ash Pond 4, and current plans are to have the cap completed in the fall of 2018.

6. SUMMARY/CONCLUSIONS

Groundwater flow is controlled by the secondary porosity features as is evident from the flow lines being parallel to the known joint sets (N50E and N50W). The net effect is groundwater discharging to the river. Because the occurrence and flow of groundwater on site is controlled by irregularly distributed karst conduits and other secondary porosity features, some wells in the monitoring network are in good hydraulic communication with the path of flow from recharge areas (sinkholes) to discharge areas (the river) whereas others exhibit slower hydraulic responses. Each well has been evaluated and categorized based on response to rain events and the rate at which it communicates with the river. This evaluation is based on currently available data.

Fast

- CA11
- CA20B
- CA21B

Moderate

- CA6
- CA16
- CA19B
- CA22B
- CA30B

Slow

- CA5
- CA9R
- CA11A(dry)
- CA12A
- CA17A
- CA17B
- CA20A
- CA27BR(dry)
- CA28B
- CA29AR
- CA29BR
- CA31A
- MC1
- MC4
- MC5A
- MC5C

While Well CA9R was not dry, the well does not recharge properly within 24 hours, and any samples taken are not expected to be representative of the aquifer.

April 2015 monitoring data for well network at COF exhibit WQG exceedances for the following constituents in at least one well: ammonia, antimony, arsenic, iron, manganese, strontium, and vanadium. Use of the MCP was discontinued in 2007 and the facility has

been closed in accordance with the ADEM-approved facility closure plan since 2011. Groundwater quality, in the vicinity of the pond, is expected to improve with this closure, as well as the anticipated closures and capping of Ash Pond 4 and Ash Stack 5.

All analytes exceeding the WQGs for this event had previously exceeded the WQGs at least one time. Analytical results are consistent with historical data.

The next two sampling events are planned for October 2015, with submittal of the report by December 31, 2015, and April 2016, with submittal of the report by June 30, 2016. The COPC, as shown on Table 1, will be sampled at each sampling event for the 25 wells listed in Section 1.1 of this report.

7. REFERENCES

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FIGURES

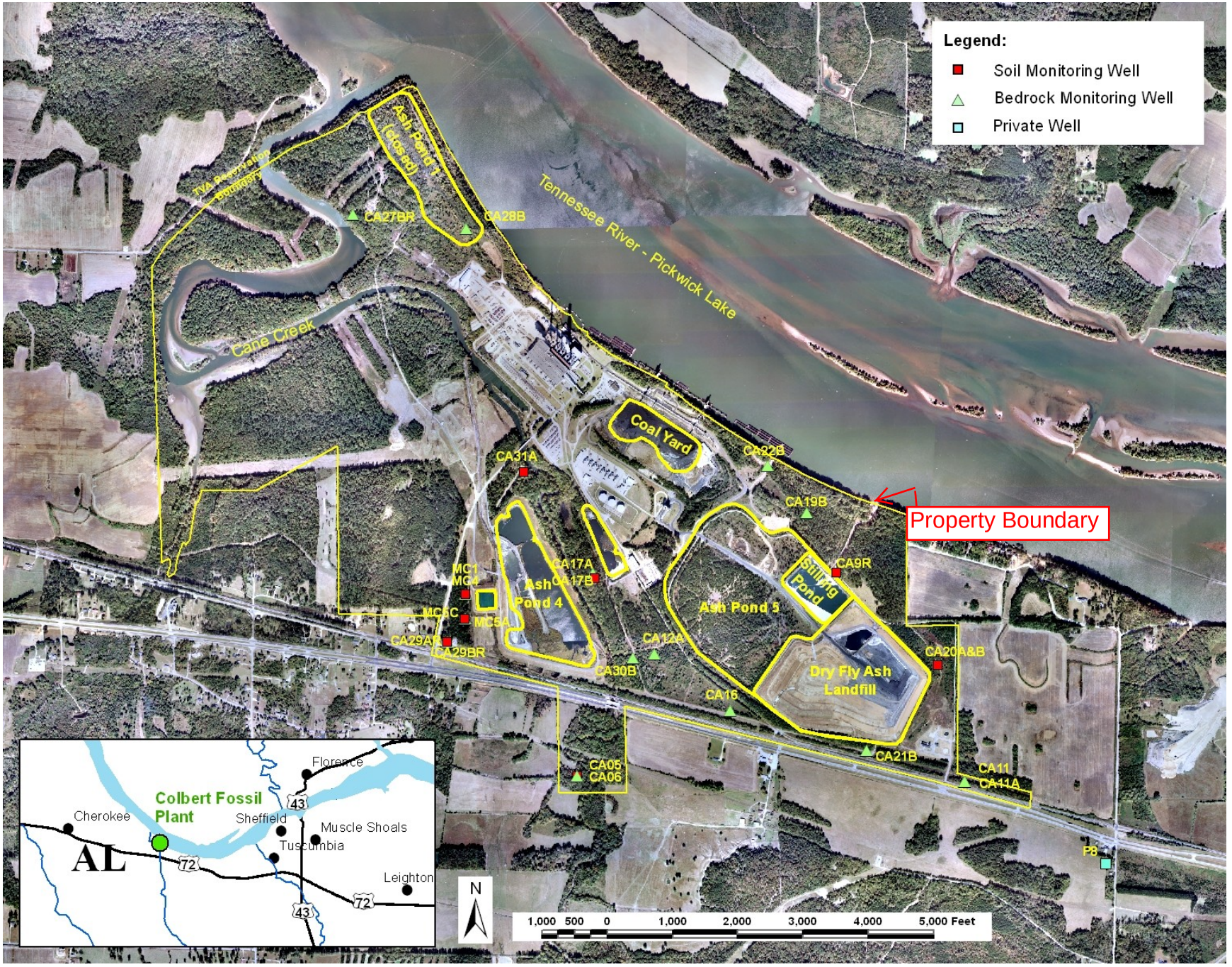


FIGURE 1. Colbert Fossil Plant Location Map



TENNESSEE VALLEY AUTHORITY
COLBERT FOSSIL PLANT

Compliance Monitoring Well Locations

DATE: 6/16/2014	FIGURE NO. 2
DRAWN BY: NMP	CHECKED BY: MGG
	JOB NO. 31843004

Legend

Semi-AnnualAssessment

Facility Boundary

N

0 750 1,500 3,000

Feet

BASE MAP SOURCE:
ESRI World Imagery

TENNESSEE VALLEY AUTHORITY
COLBERT FOSSIL PLANT

Conceptual Potentiometric Surface Map
June 18, 2012

DATE: 06/16/2014	FIGURE NO. 3
DRAWN BY: NMP	CHECKED BY: MGG
URS	JOB NO. 31843004

Legend

- Semi-Annual Assessment
- HSI
- arrow2
- Flow Direction
- Potentiometric Contour, ft msl
- Aerial Photo Interpretation Feature
- Aerial Photo Interpretation Lineament
- ERI Interpretation Lineament
- Facility Boundary

NOTE: Potentiometric line shape and location based on Conceptual Site Model.

0 350 700 1,400 Feet

N

BASE MAP SOURCE:
ESRI World Imagery, Copyright:© 2009 ESRI, i-cubed, GeoEye.

Karst Window

Caves (Approximate Location)

TENNESSEE RIVER

Former Sinkhole (Approximate Location)

CA22B 428.33

L1AW12 414.06

L1AW09 414.03

L1AW10 413.98

CA19B 414.11

CA17B 422.33

MC4 439.92

MC5A 437.5

MC5C 435.53

CA12A 420

CA30B 415.52

L1AW07 413.95

L1AW01 413.96

L1AW08 414.09

L1AW04 414.01

L1AW06 413.95

L1AW02 414.1

L1AW05 414.14

L1AW03 414.18

L1AW11 414.7

CA16 414.82

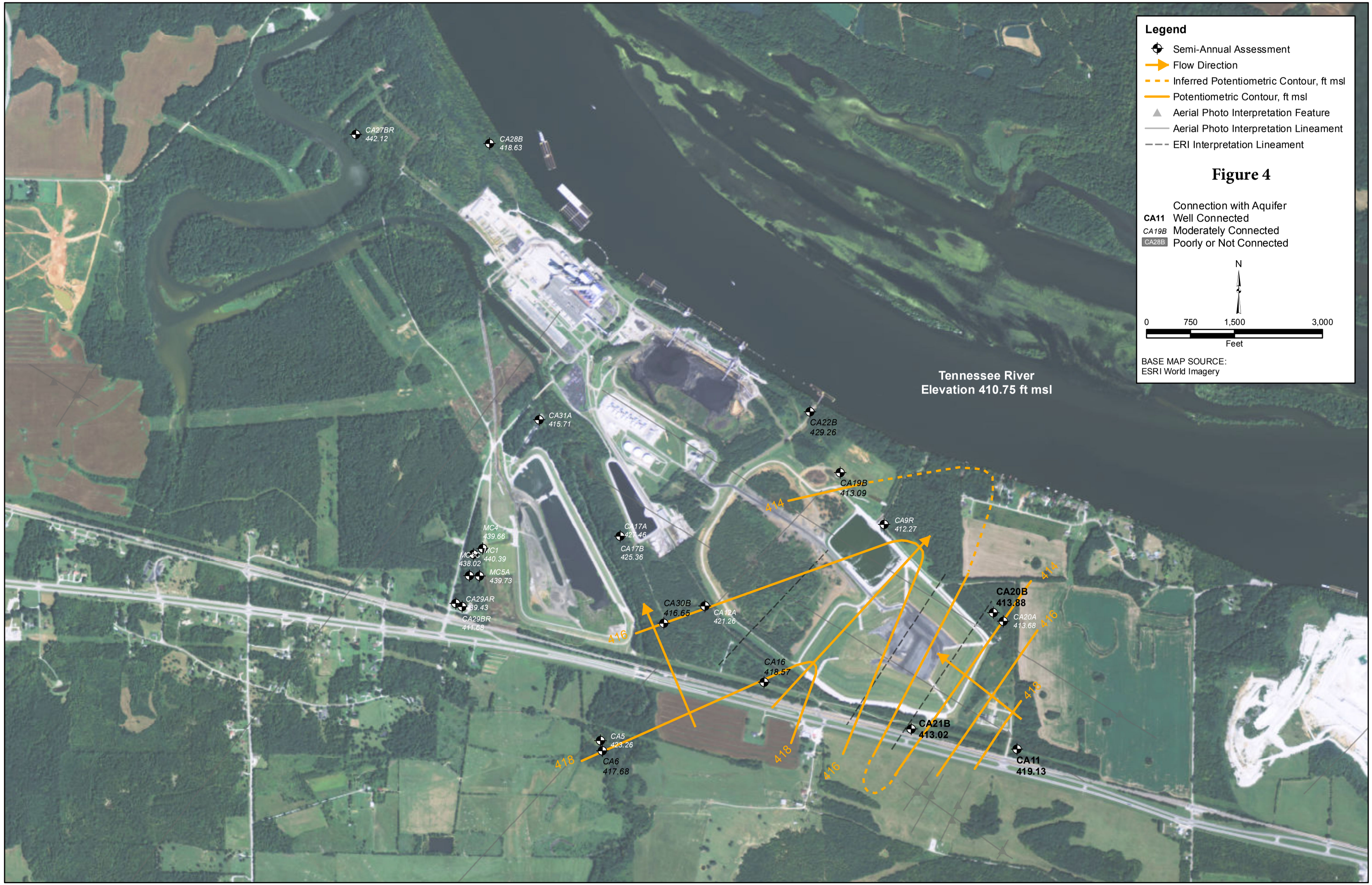
CA6 415.42

CA21B 413.96

CA20B 413.79

CA11 416.62

425 415 414 420 416 415 414 414 422 421 420 419 418 417 416 418 420 416 414 414 415 416


CA27BR
442.12
CA28B
418.63
CA31A
415.71
CA22B
429.26
CA19B
413.09
CA9R
412.27
MC4
439.66
MC1
440.39
MC5A
439.73
CA17A
427.46
CA17B
425.36
CA29AR
CA29BR
411.68
CA30B
416.65
CA12A
421.26
CA16
418.57
CA20B
413.88
CA20A
413.68
CA21B
413.02
CA11
419.13
CA5
423.26
CA6
417.68
414
416
418
411
Tennessee River
Elevation 410.75 ft msl
Legend
Semi-Annual Assessment
Flow Direction
Inferred Potentiometric Contour, ft msl
Potentiometric Contour, ft msl
Aerial Photo Interpretation Feature
Aerial Photo Interpretation Lineament
ERI Interpretation Lineament
Figure 4
Connection with Aquifer
CA11 Well Connected
CA19B Moderately Connected
CA28B Poorly or Not Connected
N
0
750
1,500
3,000
Feet
BASE MAP SOURCE:
ESRI World Imagery

TABLES

Table 1

Chemicals of Potential Concern and Analytical Methods

Chemicals of Potential Concern	Analytical Methods
Aluminum	EPA 6010 (ICP)
Ammonia	EPA 350.1
Antimony	EPA 6020 (ICP-MS)
Arsenic	EPA 6020 (ICP-MS)
Boron	EPA 6010 (ICP)
Chromium	EPA 6020 (ICP-MS)
Copper	EPA 6010 (ICP)
Iron	EPA 6010 (ICP)
Lead	EPA 6020 (ICP-MS)
Lithium	EPA 6020 (ICP-MS)
Manganese	EPA 6010 (ICP)
Molybdenum	EPA 6010 (ICP)
Strontium	EPA 6010 (ICP)
Vanadium	EPA 6020 (ICP-MS)
Zinc	EPA 6010 (ICP)
Nitrogen, NO2/NO3	EPA 353.2
Phosphorus	EPA 365.4
Sulfate	EPA 9056
General Chemistry	
Filterable Residue	SM 2540D
Nonfilterable Residue	SM 2540C
Oxidation-Reduction Potential	field
pH	field
Specific Conductance	field
Temperature	field
Turbidity	field

Table 2
Well Construction Details

Well	Facility Area	Top of Casing Elevation (ft msl)	Ground Surface Elevation (ft msl)	Top of Rock		Bottom of Well		Screened In	Screen or Open Hole Length (feet)	Well Diameter (inches)	Year Installed	Latitude	Longitude
				Depth (ft bgs)	Elevation (ft msl)	Depth (ft bgs)	Elevation (ft msl)						
CA5	Background	427.18	425.1	12.3	412.8	12.0	415.2	soil	5	4	1982	34° 43' 35.000" N	87° 50' 53.000" W
CA6	Background	427.08	424.5	11.2	413.3	98.8	328.3	rock	83	4	1982	34° 43' 35.000" N	87° 50' 53.000" W
CA9R	AP5	459.80	455.9	29.0	426.9	68.1	391.7	rock	18.5	2	1985	34° 44' 6.266" N	87° 50' 5.636" W
CA11	Upgradient	470.08	468.3	32.0	436.3	64.0	406.1	rock	79.5	4	1985	34° 43' 34.413" N	87° 49' 41.954" W
CA11A	Upgradient	471.73	468.3	32.0	436.3	32.0	439.7	soil	5	2	2003	34° 43' 35.245" N	87° 49' 43.300" W
CA12A	AP5	439.58	437.9	13.5	424.4	99.0	340.6	rock	86	4	1985	34° 43' 54.297" N	87° 50' 37.130" W
CA16	AP5	447.28	445.4	22.3	423.1	63.7	383.6	rock	36.7	4	1986	34° 43' 45.000" N	87° 50' 25.000" W
CA17A	AP4	437.08	435.5	19.3	416.2	18.7	418.4	soil	5	4	1986	34° 44' 5.000" N	87° 50' 50.000" W
CA17B	AP4	436.88	435.7	17.4	418.3	97.8	339.1	rock	76.3	4	2010	34° 44' 4.669" N	87° 50' 49.853" W
CA19B	AP5	459.48	456.5	51.6	404.9	75.3	384.2	rock	18.8	4	1989	34° 44' 12.859" N	87° 50' 10.623" W
CA20A	AP5	457.78	454.8	46.3	408.5	46.3	411.5	soil	10	2	1989	34° 43' 51.485" N	87° 49' 45.436" W
CA20B	AP5	457.78	454.6	48.5	406.1	74.7	383.1	rock	21.2	4	1989	34° 43' 52.789" N	87° 49' 43.559" W
CA21B	AP5	469.78	466.5	48.1	418.4	73.1	396.7	rock	25	2	1989	34° 43' 39.000" N	87° 50' 0.000" W
CA22B	AP5	463.28	460.3	23.1	437.2	65.3	398.0	rock	37.2	4	1989	34° 44' 22.143" N	87° 50' 18.325" W
CA27BR	AP1	487.24	484.5	32.0	452.5	75.0	412.2	rock	15	2	1989	34° 45' 0.143" N	87° 51' 34.519" W
CA28B	AP1	463.18	460.1	72.2	387.9	97.2	366.0	rock	20	2	1989	34° 44' 57.469" N	87° 51' 13.556" W
CA29AR	MCP/AP4	446.75	443.8	24.0	419.8	24.0	422.7	soil	10	2	2003	34° 43' 55.180" N	87° 51' 17.009" W
CA29BR	MCP/AP4	445.74	443.7	24.0	419.7	38.2	407.5	rock	5	2	1997	34° 43' 55.364" N	87° 51' 16.819" W
CA30B	AP4	441.45	438.4	20	418.4	53.0	388.5	rock	20	2	2010	34° 43' 52.582" N	87° 50' 42.732" W
CA31A	AP4	429.56	426.6	16	410.6	16.0	413.6	soil	10	2	2010	34° 44' 20.703" N	87° 51' 2.956" W
MC1	MCP	443.68	442.4	27.2	415.2	77.9	365.8	rock	45.7	4	1981	34° 44' 3.572" N	87° 51' 13.444" W
MC4	MCP	443.28	442.8	27.2	415.6	28.5	414.8	soil	10	4	1981	34° 44' 3.820" N	87° 51' 12.787" W
MC5A	MCP	443.29	440.6	25.0	415.6	25.0	418.3	soil	15	2	2003	34° 43' 59.127" N	87° 51' 13.632" W
MC5C	MCP	443.27	440.7	22.0	418.7	153.0	290.3	rock	15	4	2003	34° 43' 58.930" N	87° 51' 13.742" W
P2	Background	449.98	ND	ND	ND	190.3	259.7	rock	ND	ND	ND	34° 44' 12.677" N	87° 49' 49.879" W
P8	Upgradient	469.98	ND	ND	ND	200.1	269.8	rock	ND	ND	ND	34° 43' 21.676" N	87° 49' 15.882" W

ND: no data
NS: not sampled
AP1: Ash Pond 1
AP4: Ash Pond 4
AP5: Ash Pond 5
MCP: metal cleaning pond
ft msl: feet above mean sea level
ft bgs: feet below ground surface

TABLE 3. April 7, 2015 Groundwater Level Data

Location	Reference Point Elevation (ft-msl)	Depth to Water (ft)	Water Surface Elevation (ft-msl)
CA5	427.26	4.00	423.26
CA6	427.07	9.38	417.68
CA8A	463.02	41.31	421.71
CA9R	459.81	47.54	412.27
CA11	470.11	50.98	419.13
CA11A	471.72	(Dry)	(Dry)
CA12A	439.60	18.34	421.26
CA12B	439.70	18.44	421.26
CA13	456.59	36.09	420.50
CA16	447.31	28.74	418.57
CA17A	437.10	9.65	427.46
CA17B	439.89	14.53	425.36
CA19B	459.51	46.42	413.09
CA20A	457.81	44.13	413.68
CA20B	457.81	43.93	413.88
CA21B	469.81	56.79	413.02
CA22B	463.29	34.02	429.26
CA27BR	487.20	45.08	442.12
CA28B	463.19	44.55	418.63
CA29AR	446.75	7.32	439.43
CA29BR	445.73	34.06	411.68
CA30B	441.45	24.80	416.65
CA31A	429.56	13.85	415.71
MC1	443.86	3.48	440.39
MC4	444.88	5.22	439.66
MC5A	443.27	3.54	439.73
MC5C	443.24	5.22	438.02
Tennessee River	436.51	26.21	410.30
Ash Pond 4	463.38	10.63	452.75
Stilling Basin	478.25	NA	NA

Groundwater Purging and Sampling Summary

Table 4

Well	Purge			Sample		Field Data Collected at Time of Sampling						
	Date	Method	Rate (L/min)	Date	Method	Groundwater Elevation (ft-msl)	Temperature (degrees C)	pH (pH)	ORP (mV)	Specific Conductance (µmhos/cm)	Dissolved Oxygen (mg/L)	Turbidity, field (NTU)
CA5	4/8/2015	baller	ND	4/8/2015	baller	423.26	13.95	5.3	519	55.3	6.5	20.5
CA6	4/8/2015	centrifugal	0.4	4/8/2015	centrifugal	417.68	22.96	7.3	-101	576	0.7	1
CA9R	4/7/2015	baller	ND	4/8/2015	baller	412.27	20.85	7.5	241	565	7.85	29.2
CA11	4/8/2015	centrifugal	0.5	4/8/2015	centrifugal	419.13	21.46	6.73	486	568	4.8	3.7
CA11A	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
CA12A	4/13/2015	centrifugal	ND	4/14/2015	baller	421.26	16.61	7.5	307	368	9.61	3.5
CA16	4/14/2015	bladder	0.5	4/14/2015	bladder	418.57	16.9	6.8	320	507	6.05	0.3
CA17A	4/13/2015	baller	ND	4/14/2015	baller	427.46	13.86	5.7	341	90.5	8.47	2.7
CA17B	4/13/2015	centrifugal	0.6	4/13/2015	centrifugal	425.36	17.39	6.8	202	898	0.67	150
CA19B	4/15/2015	centrifugal	0.6	4/15/2015	centrifugal	413.09	22.4	6.7	254	964	1.74	6.5
CA20A	4/8/2015	baller	ND	4/9/2015	baller	413.68	17.28	6.6	286	402	6.65	10
CA20B	4/16/2015	centrifugal	0.5	4/16/2015	centrifugal	413.88	18.83	6.9	311	616	4.79	1.1
CA21B	4/15/2015	baller	ND	4/16/2015	baller	413.02	17.5	6.8	308	632	4.01	38.1
CA22B	4/14/2015	centrifugal	0.5	4/15/2015	centrifugal	429.26	21.07	7.2	255	708	5.32	2
CA27BR	4/13/2015	centrifugal	ND	4/14/2015	baller	442.12	17.28	7.7	249	291	8.58	1.1
CA28B	4/14/2015	centrifugal	ND	4/15/2015	baller	418.63	17.68	6.7	106	666	1.34	66.4
CA29AR	4/8/2015	centrifugal	0.4	4/8/2015	centrifugal	439.43	21.9	6.5	194	308	1.3	3.7
CA29BR	NS	NS	NS	NS	NS	411.68	NS	NS	NS	NS	NS	NS
CA30B	4/9/2015	centrifugal	0.5	4/9/2015	centrifugal	416.65	19.96	6.7	124	745	0.75	0.3
CA31A	4/7/2015	baller	ND	4/8/2015	baller	415.71	16.74	6.8	207	505	4.16	3.4
MC1	4/9/2015	centrifugal	0.6	4/9/2015	centrifugal	440.39	19.95	9.4	161	432	0.66	0.4
MC4	4/9/2015	centrifugal	0.5	4/9/2015	centrifugal	439.66	19.8	9.5	190	453	0.95	0.3
MCSA	4/9/2015	centrifugal	0.5	4/9/2015	centrifugal	439.73	20.38	8.4	221	339	0.44	5
MCSC	4/14/2015	centrifugal	ND	4/15/2015	baller	438.02	16.9	7.8	269	454	1.77	4.6
P8	4/9/2015	hydrant	2.0	4/9/2015	hydrant	ND	17.77	7.3	269	367	3.82	0.4

Table 5. April 2015 Groundwater Monitoring Data (page 1 of 5)

ADEM GROUND WATER DATABASE
Master ID Number: 0000012079
Site/Facility Name: TVA Colbert Fossil Plant
Sampling Schedule: Semiannual
Agency or Consultant Name Sample Collected By: TVA
Agency Name Sample Results To Be Reported To: TVA
Lab Name: ESC Lab Sciences
Lab Manager Name: Pam Langford
Lab Telephone Number: 615-758-5858

	Well ID Number	**COF-CA11**	**COF-CA11A**	**COF-CA12A**	**COF-CA16**	**COF-CA17A**	**COF-CA17B**
	Sampling Date (mm/dd/yyyy) and Time (hh:mm)	4/8/2015 10:03	NS	4/14/2015 11:34	4/14/2015 13:05	4/14/2015 11:00	4/13/2015 9:57
	Lab Sample ID Number	L758754-05	NS	L760001-11	L760001-02	L760001-03	L760001-04
	Total Well Depth measured before purging the well (feet)	64.37	33.27	100.39	19.95	100.92	65.52
	Depth to Ground Water measured before purging the well (feet)	50.98	DRY	18.34	28.74	9.65	14.53
	Free Product Thickness (feet)	0.00	0.00	0.00	0.00	0.00	0.00
	Sheen Observed? (yes / no)	No	No	No	No	No	No
	Field pH (standard units)	6.73	NS	7.5	6.8	5.7	6.8
	Field Specific Conductance (umhos / cm)	568	NS	368	507	90.5	898
	Field Dissolved Oxygen (mg/L)	4.8	NS	9.61	6.05	8.47	0.67
	Field EH (Mv)	486	NS	307	320	341	202
	Field Temperature (Degrees C)	21.46	NS	16.61	16.9	13.86	17.39

STORET Code No.	**Parameter Name**	**Units**	**Method Detection Limit (MDL)**	**Water Quality Goal[1]**	**Analytical Method**	**COF-CA11**	**COF-CA11A**	**COF-CA12A**	**COF-CA16**	**COF-CA17A**	**COF-CA17B**
01105	Aluminum, Total	mg/L	0.1	3.6	EPA 6010B/200.7	0.1	NS	0.12	<0.1	<0.1	<0.1
00610	Ammonia (as N)	mg/L	0.25	0.626	EPA 350.1	<0.25	NS	<0.25	<0.25	<0.25	<0.25
01097	Antimony, Total	mg/L	0.001	0.006	EPA 6020	0.00084	NS	0.0043	<0.002	<0.002	<0.002
01002	Arsenic, Total	mg/L	0.001	0.01	EPA 6020	<0.002	NS	0.00036	<0.002	<0.002	0.0063
01022	Boron, Total in Water	mg/L	0.2	NC	EPA 6010B/200.7	0.032	NS	<0.2	<0.2	<0.2	<0.2
01034	Chromium, Total	mg/L	0.002	0.1	EPA 6020	0.004	NS	<0.01	<0.01	<0.01	<0.01
01042	Copper, Total in Water	mg/L	0.002	1.3	EPA 6020	<0.02	NS	<0.02	<0.02	<0.02	<0.02
01045	Iron, Total in Water	mg/L	0.1	1.1	EPA 6010B/200.7	<0.1	NS	<0.1	<0.1	<0.1	**16**
01051	Lead, Total in Water	mg/L	0.001	0.015	EPA 6020	0.0009	NS	0.0085	<0.002	<0.002	0.0074
01132	Lithium, Total	mg/L	0.05	NC	EPA 6010B/200.7	<0.015	NS	<0.015	<0.015	<0.015	<0.015
01055	Manganese, Total	mg/L	0.01	0.088	EPA 6010B/200.7	0.0024	NS	<0.01	<0.01	<0.01	**0.89**
01062	Molybdenum, Total	mg/L	0.005	NC	EPA 6010B/200.7	<0.005	NS	<0.005	<0.005	<0.005	<0.005
00630	Nitrite + Nitrate	mg/L	0.1	10	EPA 353.2	0.52	NS	0.036	1.9	<0.1	<0.1
00665	Phosphorous, Total	mg/L	0.1	NC	EPA 365.4	<0.1	NS	<0.1	<0.1	<0.1	<0.1
01082	Strontium, Total	mg/L	0.01	2.2	EPA 6010B/200.7	0.14	NS	0.18	0.088	0.037	0.2
00945	Sulfate, in Water	mg/L	5	250	EPA 9056	1.9	NS	7.9	11	8.9	240
01087	Vanadium, Total	mg/L	0.002	0.0036	EPA 6020	0.00092	NS	0.00051	0.00078	0.0004	0.00021
01092	Zinc, Total in Water	mg/L	0.01	1.1	EPA 6020	0.008	NS	<0.05	<0.05	<0.05	0.069

[1]*ADEM PSV for tap water used where available*
*Data values in **bold** type exceed the Water Quality Goal*
NS - insufficient water for sample collection.
ND - no data
NC - no criteria

Table 5. April 2015 Groundwater Monitoring Data (page 2 of 5)

ADEM GROUND WATER DATABASE
Master ID Number: 0000012079
Site/Facility Name: TVA Colbert Fossil Plant
Sampling Schedule: Semiannual
Agency or Consultant Name Sample Collected By: TVA
Agency Name Sample Results To Be Reported To: TVA
Lab Name: ESC Lab Sciences
Lab Manager Name: Pam Langford
Lab Telephone Number: 615-758-5858

	Well ID Number	**COF-CA19B**	**COF-CA20A**	**COF-CA20B**	**COF-CA21B**	**COF-CA22B**	**COF-CA27BR**
	Sampling Date (mm/dd/yyyy) and Time (hh:mm)	4/15/2015 14:44	4/9/2015 14:41	4/16/2015 10:40	4/16/2015 7:38	4/13/2015 15:46	4/14/2015 13:45
	Lab Sample ID Number	L760001-05	L758754-08	L760001-06	L760001-07	L760001-08	L760001-09
	Total Well Depth measured before purging the well (feet)	74.21	49.15	77.43	73.75	67.85	77.89
	Depth to Ground Water measured before purging the well (feet)	46.42	44.13	43.93	56.79	34.02	45.08
	Free Product Thickness (feet)	0.00	0.00	0.00	0.00	0.00	0.00
	Sheen Observed? (yes / no)	No	No	No	No	No	No
	Field pH (standard units)	6.7	6.6	6.9	6.8	7.2	7.7
	Field Specific Conductance (umhos / cm)	964	402	616	632	708	291
	Field Dissolved Oxygen (mg/L)	1.74	6.65	4.79	4.01	5.32	8.58
	Field EH (Mv)	254	286	311	308	255	249
	Field Temperature (Degrees C)	22.4	17.28	18.83	17.5	21.07	17.28

STORET Code No.	**Parameter Name**	**Units**	**Method Detection Limit (MDL)**	**Water Quality Goal[1]**	**Analytical Method**	**COF-CA19B**	**COF-CA20A**	**COF-CA20B**	**COF-CA21B**	**COF-CA22B**	**COF-CA27BR**
01105	Aluminum, Total	mg/L	0.1	3.6	EPA 6010B/200.7	<0.1	0.37	<0.1	1.6	<0.1	<0.1
00610	Ammonia (as N)	mg/L	0.25	0.626	EPA 350.1	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
01097	Antimony, Total	mg/L	0.001	0.006	EPA 6020	<0.002	0.00049	<0.002	0.00026	<0.002	0.00038
01002	Arsenic, Total	mg/L	0.001	0.01	EPA 6020	0.00032	0.0013	<0.002	0.0012	<0.002	<0.002
01022	Boron, Total in Water	mg/L	0.2	NC	EPA 6010B/200.7	0.34	0.22	<0.2	1.5	<0.2	<0.2
01034	Chromium, Total	mg/L	0.002	0.1	EPA 6020	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
01042	Copper, Total in Water	mg/L	0.002	1.3	EPA 6020	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
01045	Iron, Total in Water	mg/L	0.1	1.1	EPA 6010B/200.7	<0.1	0.13	<0.1	1.1	<0.1	<0.1
01051	Lead, Total in Water	mg/L	0.001	0.015	EPA 6020	<0.002	0.0018	<0.002	0.004	<0.002	<0.002
01132	Lithium, Total	mg/L	0.05	NC	EPA 6010B/200.7	<0.015	<0.015	<0.015	0.033	<0.015	<0.015
01055	Manganese, Total	mg/L	0.01	0.088	EPA 6010B/200.7	0.065	0.033	<0.01	**0.24**	<0.01	<0.01
01062	Molybdenum, Total	mg/L	0.005	NC	EPA 6010B/200.7	<0.005	<0.005	<0.005	0.0096	<0.005	<0.005
00630	Nitrite + Nitrate	mg/L	0.1	10	EPA 353.2	1.5	3.7	2.8	1.8	<0.1	<0.1
00665	Phosphorous, Total	mg/L	0.1	NC	EPA 365.4	<0.1	0.104	<0.1	0.39	<0.1	<0.1
01082	Strontium, Total	mg/L	0.01	2.2	EPA 6010B/200.7	0.31	0.11	0.16	0.22	0.28	0.17
00945	Sulfate, in Water	mg/L	5	250	EPA 9056	180	10	14	39	93	4.7
01087	Vanadium, Total	mg/L	0.002	0.0036	EPA 6020	0.0011	**0.0058**	0.00091	**0.007**	0.00031	0.00092
01092	Zinc, Total in Water	mg/L	0.01	1.1	EPA 6020	<0.05	0.072	<0.05	0.15	<0.05	<0.05

[1]*ADEM PSV for tap water used where available*
Data values in ***bold*** *type exceed the Water Quality Goal*
NS - insufficient water for sample collection.
ND - no data
NC - no criteria

Table 5. April 2015 Groundwater Monitoring Data (page 3 of 5)

ADEM GROUND WATER DATABASE
Master ID Number: 0000012079
Site/Facility Name: TVA Colbert Fossil Plant
Sampling Schedule: Semiannual
Agency or Consultant Name Sample Collected By: TVA
Agency Name Sample Results To Be Reported To: TVA
Lab Name: ESC Lab Sciences
Lab Manager Name: Pam Langford
Lab Telephone Number: 615-758-5858

	Well ID Number	**COF-CA28B**	**COF-CA29AR**	**COF-CA29BR**	**COF-CA30B**	**COF-CA31A**	**COF-CA31A-DUP**
	Sampling Date (mm/dd/yyyy) and Time (hh:mm)	4/15/2015 12:44	4/8/2015 13:08	NS	4/9/2015 13:57	4/8/2015 15:20	4/8/2015 15:22
	Lab Sample ID Number	L760001-10	L758754-03	NS	L758754-15	L758754-06	L758754-07
	Total Well Depth measured before purging the well (feet)	99.80	26.67	40.19	55.31	18.14	18.14
	Depth to Ground Water measured before purging the well (feet)	44.55	7.32	34.06	24.80	13.85	13.85
	Free Product Thickness (feet)	0.00	0.00	0.00	0.00	0.00	0.00
	Sheen Observed? (yes / no)	No	No	No	No	No	No
	Field pH (standard units)	6.7	6.5	NS	6.7	6.8	6.8
	Field Specific Conductance (umhos / cm)	666	308	NS	745	505	505
	Field Dissolved Oxygen (mg/L)	1.34	1.3	NS	0.75	4.16	4.16
	Field EH (Mv)	106	194	NS	124	207	207
	Field Temperature (Degrees C)	17.68	21.9	NS	19.96	16.74	16.74

STORET Code No.	**Parameter Name**	**Units**	**Method Detection Limit (MDL)**	**Water Quality Goal[1]**	**Analytical Method**	**COF-CA28B**	**COF-CA29AR**	**COF-CA29BR**	**COF-CA30B**	**COF-CA31A**	**COF-CA31A-DUP**
01105	Aluminum, Total	mg/L	0.1	3.6	EPA 6010B/200.7	<0.1	0.1	NS	<0.1	0.12	0.06
00610	Ammonia (as N)	mg/L	0.25	0.626	EPA 350.1	**3.5**	<0.25	NS	<0.25	<0.25	<0.25
01097	Antimony, Total	mg/L	0.001	0.006	EPA 6020	0.00049	0.0013	NS	<0.002	0.0012	0.00081
01002	Arsenic, Total	mg/L	0.001	0.01	EPA 6020	0.00045	0.0017	NS	0.0012	0.0054	0.0029
01022	Boron, Total in Water	mg/L	0.2	NC	EPA 6010B/200.7	<0.2	1.1	NS	0.11	0.61	0.55
01034	Chromium, Total	mg/L	0.002	0.1	EPA 6020	<0.01	0.0026	NS	0.0023	<0.01	<0.01
01042	Copper, Total in Water	mg/L	0.002	1.3	EPA 6020	<0.02	<0.02	NS	<0.02	<0.02	<0.02
01045	Iron, Total in Water	mg/L	0.1	1.1	EPA 6010B/200.7	**19**	0.1	NS	0.52	**1.2**	0.44
01051	Lead, Total in Water	mg/L	0.001	0.015	EPA 6020	<0.002	0.00026	NS	0.00054	0.00058	0.00038
01132	Lithium, Total	mg/L	0.05	NC	EPA 6010B/200.7	<0.015	<0.015	NS	<0.015	<0.015	<0.015
01055	Manganese, Total	mg/L	0.01	0.088	EPA 6010B/200.7	**0.58**	**0.17**	NS	**2**	0.036	0.063
01062	Molybdenum, Total	mg/L	0.005	NC	EPA 6010B/200.7	<0.005	0.025	NS	<0.005	0.017	0.016
00630	Nitrite + Nitrate	mg/L	0.1	10	EPA 353.2	<0.1	0.12	NS	0.028	0.05	0.072
00665	Phosphorous, Total	mg/L	0.1	NC	EPA 365.4	0.48	<0.1	NS	<0.1	0.121	<0.1
01082	Strontium, Total	mg/L	0.01	2.2	EPA 6010B/200.7	0.2	0.089	NS	0.2	0.21	0.23
00945	Sulfate, in Water	mg/L	5	250	EPA 9056	<5	13	NS	73	38	37
01087	Vanadium, Total	mg/L	0.002	0.0036	EPA 6020	0.00033	**0.0042**	NS	<0.002	**0.004**	0.0022
01092	Zinc, Total in Water	mg/L	0.01	1.1	EPA 6020	<0.05	0.0076	NS	0.03	0.012	0.023

[1]*ADEM PSV for tap water used where available*
*Data values in **bold** type exceed the Water Quality Goal*
NS - insufficient water for sample collection.
ND - no data
NC - no criteria

Table 5. April 2015 Groundwater Monitoring Data (page 4 of 5)

ADEM GROUND WATER DATABASE
Master ID Number: 0000012079
Site/Facility Name: TVA Colbert Fossil Plant
Sampling Schedule: Semiannual
Agency or Consultant Name Sample Collected By: TVA
Agency Name Sample Results To Be Reported To: TVA
Lab Name: ESC Lab Sciences
Lab Manager Name: Pam Langford
Lab Telephone Number: 615-758-5858

	Well ID Number	**COF-CA5**	**COF-CA6**	**COF-CA9R**	**COF-MC1**	**COF-MC4**	**COF-MC5A**
	Sampling Date (mm/dd/yyyy) and Time (hh:mm)	4/8/2015 11:45	4/8/2015 13:08	4/8/2015 16:15	4/9/2015 10:37	4/9/2015 11:32	4/9/2015 10:32
	Lab Sample ID Number	L758754-02	L758754-04	L758754-01	L758754-10	L758754-11	L758754-12
	Total Well Depth measured before purging the well (feet)	14.01	100.36	71.49	77.36	30.48	27.30
	Depth to Ground Water measured before purging the well (feet)	4.00	9.38	47.54	3.48	5.22	3.54
	Free Product Thickness (feet)	0.00	0.00	0.00	0.00	0.00	0.00
	Sheen Observed? (yes / no)	No	No	No	No	No	No
	Field pH (standard units)	5.3	7.3	7.5	9.4	9.5	8.4
	Field Specific Conductance (umhos / cm)	55.3	576	565	432	453	339
	Field Dissolved Oxygen (mg/L)	6.5	0.7	7.85	0.66	0.95	0.44
	Field EH (Mv)	519	-101	241	181	190	221
	Field Temperature (Degrees C)	13.95	22.96	20.85	19.95	19.8	20.38

STORET Code No.	**Parameter Name**	**Units**	**Method Detection Limit (MDL)**	**Water Quality Goal[1]**	**Analytical Method**	**COF-CA5**	**COF-CA6**	**COF-CA9R**	**COF-MC1**	**COF-MC4**	**COF-MC5A**
01105	Aluminum, Total	mg/L	0.1	3.6	EPA 6010B/200.7	0.34	<0.1	<0.1	0.9	0.67	0.39
00610	Ammonia (as N)	mg/L	0.25	0.626	EPA 350.1	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
01097	Antimony, Total	mg/L	0.001	0.006	EPA 6020	0.00051	0.00037	**0.056**	**0.013**	**0.0065**	**0.008**
01002	Arsenic, Total	mg/L	0.001	0.01	EPA 6020	0.00033	<0.002	0.00095	**0.058**	**0.045**	**0.016**
01022	Boron, Total in Water	mg/L	0.2	NC	EPA 6010B/200.7	0.058	0.49	2.6	2.9	3.2	1.4
01034	Chromium, Total	mg/L	0.002	0.1	EPA 6020	<0.01	<0.01	0.0073	<0.01	<0.01	<0.01
01042	Copper, Total in Water	mg/L	0.002	1.3	EPA 6020	<0.02	<0.02	0.009	<0.02	<0.02	<0.02
01045	Iron, Total in Water	mg/L	0.1	1.1	EPA 6010B/200.7	0.92	<0.1	0.14	<0.1	<0.1	0.088
01051	Lead, Total in Water	mg/L	0.001	0.015	EPA 6020	0.0012	<0.002	<0.002	<0.002	<0.002	0.00035
01132	Lithium, Total	mg/L	0.05	NC	EPA 6010B/200.7	<0.015	0.061	0.039	0.023	0.0096	0.021
01055	Manganese, Total	mg/L	0.01	0.088	EPA 6010B/200.7	0.011	0.0038	0.011	0.017	0.0067	**0.089**
01062	Molybdenum, Total	mg/L	0.005	NC	EPA 6010B/200.7	<0.005	<0.005	0.033	0.11	0.14	0.038
00630	Nitrite + Nitrate	mg/L	0.1	10	EPA 353.2	<0.1	<0.1	<0.1	0.28	0.24	0.15
00665	Phosphorous, Total	mg/L	0.1	NC	EPA 365.4	<0.1	<0.1	0.225	<0.1	<0.1	<0.1
01082	Strontium, Total	mg/L	0.01	2.2	EPA 6010B/200.7	0.042	**3.3**	0.57	0.21	0.21	0.2
00945	Sulfate, in Water	mg/L	5	250	EPA 9056	1.8	32	85.2	99	97	35
01087	Vanadium, Total	mg/L	0.002	0.0036	EPA 6020	0.00073	0.00041	**0.0039**	**0.044**	**0.0045**	**0.03**
01092	Zinc, Total in Water	mg/L	0.01	1.1	EPA 6020	0.028	<0.05	0.044	<0.05	0.0042	0.005

[1]*ADEM PSV for tap water used where available*
*Data values in **bold** type exceed the Water Quality Goal*
NS - insufficient water for sample collection.
ND - no data
NC - no criteria

Table 5. April 2015 Groundwater Monitoring Data (page 5 of 5)

ADEM GROUND WATER DATABASE
Master ID Number: 0000012079
Site/Facility Name: TVA Colbert Fossil Plant
Sampling Schedule: Semiannual
Agency or Consultant Name Sample Collected By: TVA
Agency Name Sample Results To Be Reported To: TVA
Lab Name: ESC Lab Sciences
Lab Manager Name: Pam Langford
Lab Telephone Number: 615-758-5858

	Well ID Number	**COF-MC5C**	**COF-P8**
	Sampling Date (mm/dd/yyyy) and Time (hh:mm)	4/15/2015 8:44	4/9/2015 15:43
	Lab Sample ID Number	L760001-01	L758754-09
	Total Well Depth measured before purging the well (feet)	152.89	ND
	Depth to Ground Water measured before purging the well (feet)	5.22	ND
	Free Product Thickness (feet)	0.00	0.00
	Sheen Observed? (yes / no)	No	No
	Field pH (standard units)	7.8	7.3
	Field Specific Conductance (umhos / cm)	454	367
	Field Dissolved Oxygen (mg/L)	1.77	3.82
	Field EH (Mv)	269	269
	Field Temperature (Degrees C)	16.9	17.77

STORET Code No.	**Parameter Name**	**Units**	**Method Detection Limit (MDL)**	**Water Quality Goal[1]**	**Analytical Method**	**COF-MC5C**	**COF-P8**
01105	Aluminum, Total	mg/L	0.1	3.6	EPA 6010B/200.7	<0.1	<0.1
00610	Ammonia (as N)	mg/L	0.25	0.626	EPA 350.1	<0.25	<0.25
01097	Antimony, Total	mg/L	0.001	0.006	EPA 6020	0.0026	0.00052
01002	Arsenic, Total	mg/L	0.001	0.01	EPA 6020	0.00055	0.00026
01022	Boron, Total in Water	mg/L	0.2	NC	EPA 6010B/200.7	1.6	0.037
01034	Chromium, Total	mg/L	0.002	0.1	EPA 6020	<0.01	<0.01
01042	Copper, Total in Water	mg/L	0.002	1.3	EPA 6020	<0.020	<0.020
01045	Iron, Total in Water	mg/L	0.1	1.1	EPA 6010B/200.7	0.11	<0.1
01051	Lead, Total in Water	mg/L	0.001	0.015	EPA 6020	0.00044	0.0013
01132	Lithium, Total	mg/L	0.05	NC	EPA 6010B/200.7	0.027	<0.015
01055	Manganese, Total	mg/L	0.01	0.088	EPA 6010B/200.7	0.043	<0.01
01062	Molybdenum, Total	mg/L	0.005	NC	EPA 6010B/200.7	0.062	<0.005
00630	Nitrite + Nitrate	mg/L	0.1	10	EPA 353.2	<0.1	0.34
00665	Phosphorous, Total	mg/L	0.1	NC	EPA 365.4	<0.1	<0.1
01082	Strontium, Total	mg/L	0.01	2.2	EPA 6010B/200.7	1.1	0.16
00945	Sulfate, in Water	mg/L	5	250	EPA 9056	76	8.7
01087	Vanadium, Total	mg/L	0.002	0.0036	EPA 6020	0.00054	0.00084
01092	Zinc, Total in Water	mg/L	0.01	1.1	EPA 6020	<0.05	0.44

[1]*ADEM PSV for tap water used where available*
Data values in ***bold*** *type exceed the Water Quality Goal*
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Table 6. Historical Groundwater Analytical Data

location_id	sample_date	lab_id	Sample_depth	Aluminum, total (mg/L)	Ammonia (as N) (mg/L)	Antimony, total (ug/L)	Arsenic, total (ug/L)	Boron, total (ug/L)	Chromium, total (ug/L)	Copper, total (ug/L)	Iron, total (ug/L)	Lead, total (ug/L)	Lithium, total (ug/L)	Manganese, total (ug/L)	Molybdenum, total (ug/L)	Nitrite + Nitrate (mg/L)	Phosphorus, total (mg/L)	Strontium, total (ug/L)	Sulfate, total (mg/L)	Vanadium, total (ug/L)	Zinc, total (ug/L)
COF-CA11	3/20/1985		52.59			<1	<1	<500	5	100	450	4		35		0.36			4		52
COF-CA11	4/16/1985		52.79			<1	<1	<500	2	34	4100	5		160		0.35			2		37
COF-CA11	5/16/1985		53.22								150			17					1		
COF-CA11	1/23/1986	27778	53.61								190			14					1		
COF-CA11	2/24/1986	29102	53.61			<1	<1	<500	2	20	10	2		<5		0.44			7		20
COF-CA11	6/17/1986		53.61						2	20	50	1		8		0.43			1		
COF-CA11	9/10/1986	38602	53.71								50			20					9		
COF-CA11	12/9/1986	4523	24.02						6	10	800	2		20		1.1			12		
COF-CA11	3/18/1987	3558	53.61								20			<50					14		
COF-CA11	6/16/1987	7712	53.68						16	40	190	2		<5		0.59			<1		
COF-CA11	9/9/1987	11885	53.61								250			<5					<1		
COF-CA11	12/1/1987	16306	53.64	0.05					15	<10	160	<1		7		0.43			<1		<10
COF-CA11	3/23/1988	2994	53.64	<0.05						10	110			61					10		20
COF-CA11	6/2/1988	5798	53.71	<0.05					4	10	170	2		<5		0.46			4		<10
COF-CA11	9/22/1988	10551	53.71	0.1						<10	190			28					7		<10
COF-CA11	12/20/1988	13144	53.71	0.22					4	<10	140	2		<5		0.43			4		10
COF-CA11	3/22/1989	2813	53.51	0.28					2	30	440	5		52					2		10
COF-CA11	6/7/1989	5685	53.22	1					<1	<10	180	2		<5		0.38			1		30
COF-CA11	9/27/1989	11389	53.51	0.2			<1	<500	3	20	90	1	<10	<5	<20	0.36		70	7		10
COF-CA11	12/13/1989	14449	52.59	<0.05			<1	<500	1	<10	50	3	<10	28	<20	0.36		110	3		30
COF-CA11	3/7/1990	2809	51.51	<0.05			<1	<500	7	70	130	4	<10	40	<20	0.36		210	3		40
COF-CA11	6/11/1990	7363	53.81	0.05			<1	<500	3	10	30	1	<10	<5	50	0.37		190	1		<10
COF-CA11	9/25/1990	15135	53.71	<0.05			<1	<500	2	<10	30	2	<10	33	<20	0.36		90	3		20
COF-CA11	12/10/1990	18819	53.71	<0.05			<1	<500	3	<10	10	2	<10	<5	<20	0.33		100	120		<10
COF-CA11	3/13/1991	4726	51.41	<0.05			<1	<500	4	<10	160	9	<10	6	<20	0.34		40	4		10
COF-CA11	6/26/1991	12439	53.61	0.16		<1	<1	<500	14	50	460	13	<10	8	<20	0.33		140	2		30
COF-CA11	9/26/1991	18363	53.61	0.28			<1	<500	3	20	280	3	<10	36	<20	0.31		120	2		20
COF-CA11	12/18/1991	21354	49.9	0.24			<1	<500	<1	<10	220	4	<10	<5	<20	0.45		200	4		10
COF-CA11	3/23/1992	2930	51.51	0.14			<1	<500	5	<10	16000	<1	20	770	60	2.1		90	20		70
COF-CA11	6/17/1992	7461	53.81	1.8			11	<500	13	<10	2400	7	20	88	<20			<80	24		10
COF-CA11	8/31/1992	12421	53.71	0.49			<1	<500	2	<10	410	5	<10	55	<20	0.28		80	34		30
COF-CA11	12/8/1992	17182	53.74	0.5		<1	<1	<500	<1	<10	400	1	<10	210	<20			110	3		<10
COF-CA11	3/10/1993	1884	53.61	0.09		<1	<1	<500	7	<10	60	1	<10	<5	<20	0.3		100	5		<10
COF-CA11	6/16/1993	5536	53.71	0.11		<1	<1	<500	3	<10	90	<1	<10	14	<20			70	5		<10
COF-CA11	9/15/1993	12152	53.78	<0.05		<1	<1	<500	2	<10	20	<1	<10	<5	<20	0.72		100	4		<10
COF-CA11	11/16/1993	15674	51.97	<0.05		<1	1	<500	<1	<10	10	<1	<10	110	<20			160	<2		<10
COF-CA11	3/1/1994	1595	49.54	1.8		<1	<1	<500	1	<10	2000	16	<10	61	<20	0.44		90	6		30
COF-CA11	6/2/1994	6049	53.68	0.06		2	<1	<500	2	<10	50	2	<10	<5	<20			80	2		40
COF-CA11	9/1/1994	12020	53.64	<0.05		<1	<1	<500	5	<10	20	<1	<10	31	<20	0.33		200	4		<10
COF-CA11	11/2/1994	15764	53.19	<0.05		<1	<1	<500	<1	<10	800	<1	<10	<5	<20			120	2		60
COF-CA11	3/3/1995	1800	53.64	0.09		2	<1	<500	4	<10	150	<1		21		0.33		70	1	<10	<10
COF-CA11	6/7/1995	5752	53.68	0.13		<1	<1	<500	2	<10	140	1	<10	64	<20			70	4		<10
COF-CA11	9/20/1995	10862	53.71	<0.05		1	<1	<500	<1	<10	30	<1	<10	28	<20			60	2		<10
COF-CA11	11/7/1995	12657	39.5	1.2		1	2	<500	3	<10	1100	5	<10	22	<20			<50	11		<10
COF-CA11	3/6/1996	2544	38.55	15		<1	4	<500	25	<10	18000	15	<10	760	<20			70	200		70
COF-CA11	6/5/1996	6183	0	0.1		<1	2	<500	7	<10	100	5	<10	35	<20			100	3		<10
COF-CA11	6/5/1996	6188	0	0.13		<1	1	<500	7	<10	120	6	<10	30	<20			100	4		<10
COF-CA11	9/9/1996	13858	53.78	0.1		<1	<1	<500	2	<10	90	1	<10	60	<20			<50	3	<10	<10
COF-CA11	9/9/1996	13859	0	0.09		<1	<1	<500	3	<10	90	<1	<10	56	<20			<50	4	<10	<10
COF-CA11	11/19/1996	13859	0	0.1		<1	<1	<500	2	<10	90	1	<10	60	<20			<50	3		<10
COF-CA11	11/19/1996	2	0	0.09		<1	<1	<500	3	<10	90	<1	<10	56	<20			<50	4		<10
COF-CA11	2/25/1997	2343	53.58	<0.05		<1	<1	<500	4	<10	<10	<1	<10	<5	<20			90	11	<10	<10
COF-CA11	5/20/1997	6871	52.96	<0.05		<1	<1	<500	4	<10	10	4	<10	47	<20			70	<1	<10	<10
COF-CA11	11/18/1997	15657	53.71	0.24		<1	<1	<500	4	<10	240	2	<10	5	<20			90	11	<10	<10
COF-CA11	5/19/1998	4493	53.45	0.42		<1	<1	<200	11	<10	430	2	<10	53	<20			70	2	<10	10
COF-CA11	11/17/1998	10231	53.48	<0.05		<1	<1	<200	<1	<10	20	<1	<10	210	<20			80	3	<10	<10
COF-CA11	4/5/1999	3527	51.28	0.27		<1	<1	<200	4	<10	230	7	<10	110	<20			80	<1	<10	<10
COF-CA11	4/5/1999	3528	51.28	0.24		<1	<1	<200	4	<10	180	6	<10	110	<20			50	<1	<10	<10
COF-CA11	10/5/1999	10649	53.81	<0.05		<1	<1	<200	1	<10	60	1	<10	330	20			60	300	<10	<10
COF-CA11	4/12/2000	4868	51.18	0.2		<1	<1	<200	15	<10	260	5.6	<10	17	<20			100	8	<10	<10
COF-CA11	10/24/2000	12271	53.91	<0.05		<1	<1	<200	4	<10	37	<1	<10	39	<20			110	2	<10	<10
COF-CA11	4/10/2001	3434	52.66	0.13		<1	<1	<200	11	<10	150	<1	<10	13	<20			90	2	<10	<10
COF-CA11	10/23/2001	12980	53.64	<0.05		<1	<1	<200	3.8	<10	26	3.3	<10	34	<20			110	3	<10	<10
COF-CA11	4/15/2002	6691	53.25	0.16		<1	<1	<200	5	<10	160	6	<10	13	<20			110	1.2	<10	11
COF-CA11	10/22/2002	17818	53.78	0.52		<1	<1	<200	4	<10	880	4.7	<10	48	<20			140	4.5	<10	<10
COF-CA11	4/8/2003	5696	50.2	0.54		<1	2	<200	9	<10	510	4	<10	24	<20			120	3.9	<10	10
COF-CA11	10/28/2003	17879	53.68	1.99		<0.1	0.2	<200	6.4	<10	2340	4	<10	200	<20			140	9.8	<10	<10
COF-CA11	4/15/2004	6438	51.94	<0.05		<0.6	<0.1	<200	1.6	<10	30	0.5	20	13	<20			120	1.7	<10	<10

Table 6. Historical Groundwater Analytical Data

location_id	sample_date	lab_id	Sample_depth	Aluminum, total (mg/L)	Ammonia (as N) (mg/L)	Antimony, total (ug/L)	Arsenic, total (ug/L)	Boron, total (ug/L)	Chromium, total (ug/L)	Copper, total (ug/L)	Iron, total (ug/L)	Lead, total (ug/L)	Lithium, total (ug/L)	Manganese, total (ug/L)	Molybdenum, total (ug/L)	Nitrite + Nitrate (mg/L)	Phosphorus, total (mg/L)	Strontium, total (ug/L)	Sulfate, total (mg/L)	Vanadium, total (ug/L)	Zinc, total (ug/L)
COF-CA11	10/26/2004	17869	50.07	0.14		<3	<1	<200	2	<10	140	<1	<10	5	<20			120	2.8	<10	<10
COF-CA11	4/12/2005	16803	50.17	<0.05		<3	<1	<200	2	<10	70	<1	10	5	<20			100		<10	<10
COF-CA11	5/10/2005	20994	53.05																2		
COF-CA11	10/18/2005	38780	53.09	<0.05		<3	<1	<200	<1	<10	30	3	<10	31	<20			140	3	<10	<10
COF-CA11	4/11/2006	AG33601	49.08	0.3		<3	<1	<200	3	<10	40	<1	<10	<5	<20			140	2	<10	<10
COF-CA11	10/10/2006	AG54827	18	<0.2	<0.01	<3	<1	<200	2	<10	140	11	<10	81	<20	0.59		160	2.5	<10	<10
COF-CA11	4/9/2007	AH30342	18	<0.1	<0.1	<1	<1	<200	6.7	1.5	<100	2.3	<10	28	<5	0.52	<0.1	150	<5	<10	<10
COF-CA11	10/15/2007	L315801-08	18	<0.1	<0.1	<1	<1	<200	3.6	1.4	140	3.6	<15	90	<5	0.4	<0.1	180	<5	<10	<10
COF-CA11	4/14/2008	L341361-09	18	0.23	<0.1	<1	<1	<200	2.6	1.2	120	1.9	<15	<10	<5	0.58	<0.1	120	<5	<10	<10
COF-CA11	10/20/2008	L371417-10	18	0.14	<0.1	<1	<1	<200	3.2	<1	170	<1	<15	61	<5	0.67	<0.1	160	<5	<10	<10
COF-CA11	4/6/2009	L396908-07	18	0.96	<0.1	<1	<1	<200	6.5	<1	580	2.7	<15	17	<5	0.68	<0.1	120	<5	<2	<10
COF-CA11	10/26/2009	L429478-09	18	<0.1	<0.1	<1	<1	<200	3.1	<2	<100	1.2	<15	12	<5	0.56	<0.1	140	<5	<2	<10
COF-CA11	4/26/2010	L456474-10	18	<0.1	<0.1	<1	<1	<200	8.1	<2	<100	3.4	<15	23	<5	0.47	<0.1	170	<5	<2	<10
COF-CA11	10/19/2010	L485273-10	18	0.2	<0.1	<1	1.5	<200	2.3	<2	180	6.6	<15	62	<5	0.47	<0.1	180	<5	<2	<10
COF-CA11	4/11/2011	L511237-10	18	0.83	<0.1	<1	<1	<200	5	<2	530	3.3	<15	<10	<5	0.49	<0.1	140	<5	<2	31
COF-CA11	10/18/2011	L542857-10	18	<0.1	<0.1	<1	1.5	<200	19	<2	390	4.4	<15	110	11	0.36	<0.1	180	<5	<2	<10
COF-CA11	4/10/2012	L569652-10	18	<0.1	<0.1	<1	3.3	<200	7.6	<2	100	3.8	<15	13	13	0.6	<0.1	140	<5	<2	<10
COF-CA11	10/23/2012	L602894-10	18	<0.1	<0.1	1	<1	<200	3.3	<2	<100	<1	<15	36	11	0.56	<0.1	200	<5	<2	<10
COF-CA11	4/8/2013	L630049-10	18	<0.1	<0.1	<1	<1	<200	5.2	<2	<100	<1	<15	32	<2	0.55	<0.1	140	<5	<2	<10
COF-CA11	10/22/2013	4087278008	18	<0.5	<0.5	1.6	<1	<100	2.8	<10	<100	1.9	2.6	43.8	<20	0.49	<0.4	199	8.4	<1	<40
COF-CA11	4/15/2014	490-51172-4	18	<0.1	0.143	<2	<2	<50	3.51	<10	<100	<2	<20	<15	<50	0.594	<0.1	136	1.94	<2	<50
COF-CA11	10/22/2014	L729945-04	18	<0.1	<0.25	<1	<1	<200	5	<2	<100	1.1	<15	<10	<5	0.55	0.24	180	<5	<2	<10
COF-CA11	4/8/2015	L758754-05	18	0.1	<0.25	0.84	<2	32	4	<20	<100	0.9	<15	2.4	<5	0.52		140	1.9	0.92	8
COF-CA12A	11/18/1993	15762	30.35	0.35		<1	1	<500	2	<10	620	190	<10	33	20			250	20		20
COF-CA12A	3/1/1994	1587	15.78	0.53		1	2	<500	<1	<10	390	54	<10	16	<20	0.09		300	15		<10
COF-CA12A	6/1/1994	5925	20.01	0.29		2	1	<500	21	<10	400	32	<10	7	<20			360	17		60
COF-CA12A	8/31/1994	11805	17.36	0.05		1	4	<500	<1	<10	80	14	<10	38	<20	0.01		350	15		10
COF-CA12A	11/2/1994	15765	29.4	1.5		1	<1	<500	6	<10	1800	86	<10	<5	<20			250	12		140
COF-CA12A	3/2/1995	1801	19.42	0.19		3	<1	<500	2	<10	160	14		<5		0.05		230	12	<10	<10
COF-CA12A	6/8/1995	5753	0	0.47		2	<1	<500	2	<10	300	52	<10	17	<20			230	10		10
COF-CA12A	9/20/1995	10863	20.05	0.43		<1	<1	<500	<1	<10	360	38	<10	<5	<20			180	13		<10
COF-CA12A	11/7/1995	12658	20.51	0.1		<1	2	<500	2	<10	100	21	<10	40	<20			240	12		10
COF-CA12A	3/6/1996	2545	19.72	0.92		<1	<1	<500	10	<10	720	90	<10	31	<20			290	13		120
COF-CA12A	6/11/1996	6294	20.44	0.34		<1	1	<500	4	<10	310	27	<10	5	<20			210	11		<10
COF-CA12A	9/11/1996	10504	0	5.2		<1	2	<500	7	<10	3900	<1	<10	69	<20			260	11		120
COF-CA12A	9/11/1996	15077	20.6	0.37		<1	<1	<500	<1	<10	260	55	<10	<5	<20			190	12	<10	<10
COF-CA12A	2/26/1997	2344	18.96	0.58		<1	<1	<500	3	<10	320	46	<10	<5	<20			190	14	<10	<10
COF-CA12A	10/29/2003	18144	21.2	1.43		0.9	0.2	<200	8.38	<10	1060	70.2	<10	<5	<20			250	160	<10	<10
COF-CA12A	4/15/2004	6439	19.69	0.33		<0.6	<0.1	<200	0.5	10	290	18.4	20	5	<20			190	12	<10	10
COF-CA12A	10/27/2004	17870	17.55	1.4		<3	1	<200	4	<10	1000	130	<10	16	<20			220	11	<10	30
COF-CA12A	4/14/2005	16822	16.57	0.77		<3	<1	<200	2	<10	540	3	20	6	<20			210		<10	10
COF-CA12A	5/11/2005	20995	20.54																9		
COF-CA12A	10/19/2005	38781	20.47	<0.05		<3	3	<200	1	<10	40	6	10	<5	<20			180	7	<10	<10
COF-CA12A	4/11/2006	AG33602	18.73	0.3		<3	<1	<200	1	10	270	19	<10	8	<20			220	9	<10	20
COF-CA12A	10/11/2006	AG54828	0	<0.2	<0.01	<3	<1	<200	<1	<10	40	5	<10	<5	<20	0.05		180	9.2	<10	10
COF-CA12A	4/10/2007	AH30343	4.48	0.1	<0.1	1.2	1.1	<200	1.5	1.5	<100	5.3	<10	<10	<5	<0.1	<0.1	180	8.2	<10	<10
COF-CA12A	10/16/2007	L315801-09	7.29	<0.1	<0.1	<1	<1	<200	<1	2.6	<100	4.3	<15	<10	<5	<0.1	<0.1	170	8.6	<10	<10
COF-CA12A	4/15/2008	L341361-10	28.76	<0.1	<0.1	<1	<1	<200	<1	<1	<100	3.8	<15	<10	<5	<0.1	<0.1	180	7.8	<10	<10
COF-CA12A	10/21/2008	L371417-11	7.09	0.27	<0.1	<1	2.2	<200	2.5	1.6	180	6.8	<15	<10	<5	<0.1	<0.1	170	8.7	<10	13
COF-CA12A	4/7/2009	L396908-08	4.81	0.1	<0.1	<1	<1	<200	1.2	<1	<100	4.9	<15	<10	<5	<0.1	<0.1	180	8.5	<2	<10
COF-CA12A	10/27/2009	L429478-10	5.73	<0.1	<0.1	<1	<1	<200	<2	<2	<100	4.3	<15	<10	<5	<0.1	<0.1	190	9.6	<2	<10
COF-CA12A	4/27/2010	L456474-11	6.02	1.9	<0.1	<1	1.9	<200	6.6	3.9	2000	160	<15	32	<5	<0.1	<0.1	260	8.8	<2	66
COF-CA12A	10/19/2010	L485273-11	6.73	<0.1	<0.1	<1	<1	<200	<2	<2	<100	3	<15	<10	<5	<0.1	<0.1	160	8.6	<2	<10
COF-CA12A	4/12/2011	L511237-11	5.38	0.16	<0.1	<1	<1	<200	<2	<2	110	8	<15	<10	<5	<0.1	<0.1	180	7.8	<2	12
COF-CA12A	10/19/2011	L542857-11	6.29	<0.1	<0.1	3.5	1.4	<200	<2	<2	<100	17	<15	18	<5	<0.1	<0.1	230	7.4	<2	14
COF-CA12A	4/11/2012	L569652-11	6.16	<0.1	<0.1	2.9	<1	<200	<2	<2	<100	8.4	<15	22	15	0.39	<0.1	240	8.5	<2	13
COF-CA12A	10/24/2012	L602894-11	6.3	<0.1	<0.1	5.5	<1	<200	<2	3.4	<100	27	<15	<10	7	0.31	<0.1	170	8.9	<2	18
COF-CA12A	4/9/2013	L630049-11	5.87	<0.1	<0.1	3.5	<1	<200	<2	2.8	<100	12	<15	<10	<2	0.34	<0.1	170	7.6	<2	<10
COF-CA12A	10/23/2013	4087278009	6.76	<0.5	<0.5	4.5	<1	<100	1.3	<10	114	6.7	1.1	<5	<20	0.32	<0.4	167	9.2	<1	<40
COF-CA12A	4/16/2014	490-51172-5	5.85	<0.1	<0.1	13	<2	55.2	<2	<10	<100	3.47	<20	<15	<50	0.153	<0.1	178	8.78	<2	<50
COF-CA12A	10/24/2014	L729945-05	5.99	<0.1	<0.25	5.5	<1	<200	<2	<2	<100	5.4	<15	<10	<5	0.18	0.18	170	7.5	<2	13
COF-CA12A	4/14/2015	L760001-11	5.99	0.12	<0.25	4.3	0.36	<200	<10	<20	<100	8.5	<15	<10	<5	0.036	<0.1	180	7.9	0.51	<50

Table 6. Historical Groundwater Analytical Data

location_id	sample_date	lab_id	Sample_depth	Aluminum, total (mg/L)	Ammonia (as N) (mg/L)	Antimony, total (ug/L)	Arsenic, total (ug/L)	Boron, total (ug/L)	Chromium, total (ug/L)	Copper, total (ug/L)	Iron, total (ug/L)	Lead, total (ug/L)	Lithium, total (ug/L)	Manganese, total (ug/L)	Molybdenum, total (ug/L)	Nitrite + Nitrate (mg/L)	Phosphorus, total (mg/L)	Strontium, total (ug/L)	Sulfate, total (mg/L)	Vanadium, total (ug/L)	Zinc, total (ug/L)
COF-CA16	6/17/1986		29						<1	20	10	16		52		2.2			2		
COF-CA16	9/10/1986	38604	31.99								<10			<5					40		
COF-CA16	12/9/1986	4525	22.7						2	20	60	2		24		1.5			43		
COF-CA16	3/18/1987	3560	26.22								20			13					58		
COF-CA16	6/16/1987	7714	31.86						5	40	60	2		50		2.5			18		
COF-CA16	9/9/1987	11887	33.27								110			13					32		
COF-CA16	12/1/1987	16308	31.76	<0.05					49	<10	50	<1		5		2.3			49		<10
COF-CA16	3/23/1988	2996	29.92	<0.05						30	2200			76					11		10
COF-CA16	6/2/1988	5800	31.89	<0.05					3	<10	70	1		26		2.9			36		<10
COF-CA16	9/22/1988	10553	31.5	<0.05						<10	510			41					59		40
COF-CA16	12/20/1988	13147	31.89	0.22					3	20	160	4		<5		0.46			37		<10
COF-CA16	3/22/1989	2815	24.12	<0.05					<1	10	60	1		37					22		<10
COF-CA16	6/8/1989	5687	28.91	0.89					<1	<10	100	1		47		1.2			17		50
COF-CA16	9/26/1989	11399	30.71	0.08			<1	<500	1	20	40	<1	<10	18	<20	2.4		70	29		<10
COF-CA16	12/12/1989	14453	29.69	<0.05			<1	<500	1	<10	80	<1	<10	10	<20	0.66		70	21		<10
COF-CA16	3/7/1990	2813	23.49	<0.05			<1	<500	2	370	270	<1	<10	93	<20	3.3		670	22		110
COF-CA16	6/11/1990	7365	26.9	<0.05			<1	<500	2	<10	40	<1	<10	28	<20	1.4		100	21		<10
COF-CA16	9/25/1990	15137	32.71	0.16			<1	600	4	<10	300	20	<10	38	40	1.8		100	57		20
COF-CA16	12/10/1990	18821	29	<0.05			<1	<500	2	<10	130	10	<10	8	<20	1.3		90	28		<10
COF-CA16	3/13/1991	4728	23.49	<0.05			1	<500	2	<10	50	1	<10	<5	<20	2.7		140	25		10
COF-CA16	6/26/1991	12441	26.9	<0.05		<1	<1	<500	3	<10	230	1	<10	<5	<20	2.4		<50	18		<10
COF-CA16	9/25/1991	18508	32.51	0.09			<1	<500	<1	<10	70	1	<10	<5	<20	2.4		<50	50		10
COF-CA16	12/18/1991	21356	19.59	0.07			1	<500	<1	<10	80	1	<10	<5	<20	2.8		160	24		10
COF-CA16	3/25/1992	3067	27	<0.05			<1	<500	3	<10	80	<1	30	<5	<20	1.8		80	19		60
COF-CA16	6/15/1992	7456	31.6	0.08			3	<500	3	40	3800	<1	30	33000	<20			780	1200		220
COF-CA16	8/31/1992	12425	31.5	<0.05			<1	<500	1	<10	<10	3	<10	<5	<20	1.4		90	28		<10
COF-CA16	12/8/1992	17184	31.89	<0.05		<1	<1	<500	1	<10	30	2	<10	<5	<20			110	37		<10
COF-CA16	3/10/1993	1886	29.89	<0.05		<1	<1	<500	2	<10	<10	<1	<10	<5	<20	0.83		90	16		<10
COF-CA16	6/16/1993	5539	32.12	<0.05		<1	<1	<500	2	<10	40	<1	<10	<5	<20			90	21		<10
COF-CA16	9/15/1993	12153	32.48	<0.05		<1	<1	<500	2	<10	<10	8	<10	<5	<20	1.9		130	38		<10
COF-CA16	11/17/1993	15764	31.6	0.03		<1	<1	<500	1	<10	<50	<1	<10	<5	20			<50	43		<10
COF-CA16	3/3/1994	1596	24.21	<0.05		<1	<1	<500	<1	<10	50	15	<10	<5	<20	2.1		80	21		<10
COF-CA16	6/1/1994	5926	30.58	<0.05		2	<1	<500	2	<10	60	4	<10	<5	<20			110	17		60
COF-CA16	9/7/1994	12130	30.64	<0.05		<1	<1	<500	1	<10	10	<1	<10	<5	<20	1.7		110	29		10
COF-CA16	11/3/1994	15767	31.63	<0.05		<1	<1	<500	6	<10	1000	<1	<10	<5	<20			290	260		120
COF-CA16	3/2/1995	1802	26.31	<0.05		<1	<1	<500	2	<10	40	9		<5		1.1		90	12	<10	<10
COF-CA16	6/6/1995	5755	31.89	<0.05		<1	<1	<500	2	<10	10	<1	<10	<5	<20			100	20		<10
COF-CA16	9/20/1995	10865	31.33	<0.05		<1	<1	<500	<1	<10	20	<1	<10	<5	<20			80	38		<10
COF-CA16	11/7/1995	12660	28.51	<0.05		<1	2	<500	2	<10	<10	2	<10	<5	<20			<50	19		<10
COF-CA16	3/6/1996	2547	29.63	<0.05		<1	<1	<500	<1	<10	<10	<1	<10	<5	20			80	11		<10
COF-CA16	6/10/1996	6296	31.33	<0.05		<1	<1	<500	2	<10	10	<1	<10	<5	<20			90	19		<10
COF-CA16	9/10/1996	13860	32.65	<0.05		<1	<1	<500	<1	<10	40	<1	<10	<5	<20			90	26	<10	<10
COF-CA16	11/20/1996	13860	30.05	<0.05		<1	<1	<500	<1	<10	40	<1	<10	<5	<20			90	26		<10
COF-CA16	11/20/1996	13869	30.05	<0.05		<1	<1	<500	<1	<10	<10	<1	<10	<5	<20			70	18	<10	<10
COF-CA16	2/24/1997	2346	28.61	<0.05		<1	<1	<500	1	<10	<10	<1	<10	<5	<20			90	16	<10	<10
COF-CA16	5/20/1997	6872	30.45	<0.05		<1	<1	<500	2	<10	<10	<1	<10	<5	<20			70	12	<10	<10
COF-CA16	5/20/1997	6881	30.45	<0.05		<1	<1	<500	2	<10	<10	<1	<10	<5	<20			80	14	<10	<10
COF-CA16	11/18/1997	15658	31.79	<0.05		<1	<1	<500	2	<10	30	<1	<10	<5	<20			80	31	<10	10
COF-CA16	11/18/1997	15659	31.79	<0.05		<1	<1	<500	<1	<10	30	<1	<10	<5	<20			90	32	<10	10
COF-CA16	5/19/1998	4494	25.13	<0.05		<1	<1	<200	3	<10	20	<1	<10	<5	<20			50	14	<10	<10
COF-CA16	5/19/1998	4495	25.13	<0.05		<1	<1	<200	<1	<10	<10	<1	<10	<5	<20			<50	15	<10	<10
COF-CA16	11/17/1998	10232	33.63	<0.05		<1	<1	700	<1	<10	30	<1	<10	<5	<20			110	76	<10	<10
COF-CA16	11/17/1998	10233	33.63	<0.05		<1	<1	400	<1	<10	10	<1	<10	<5	<20			70	56	<10	<10
COF-CA16	4/5/1999	3529	28.44	<0.05		<1	<1	<200	2	<10	80	<1	<10	<5	<20			70	17	<10	<10
COF-CA16	4/5/1999	3530	28.44	<0.05		<1	<1	<200	1	<10	<10	<1	<10	<5	<20			<50	17	<10	<10
COF-CA16	10/5/1999	10650	33.66	<0.05		<1	<1	700	<1	<10	<10	<1	<10	<5	<20			70	70	<10	<10

Table 6. Historical Groundwater Analytical Data

location_id	sample_date	lab_id	Sample_depth	Aluminum, total (mg/L)	Ammonia (as N) (mg/L)	Antimony, total (ug/L)	Arsenic, total (ug/L)	Boron, total (ug/L)	Chromium, total (ug/L)	Copper, total (ug/L)	Iron, total (ug/L)	Lead, total (ug/L)	Lithium, total (ug/L)	Manganese, total (ug/L)	Molybdenum, total (ug/L)	Nitrite + Nitrate (mg/L)	Phosphorus, total (mg/L)	Strontium, total (ug/L)	Sulfate, total (mg/L)	Vanadium, total (ug/L)	Zinc, total (ug/L)
COF-CA16	10/5/1999	10651	33.66	<0.05		<1	<1	700	<1	<10	<10	<1	<10	<5	<20			70	74	<10	10
COF-CA16	4/12/2000	4869	25.62	<0.05		<1	<1	<200	<1	<10	14	<1	<10	<5	<20			82	8	<10	<10
COF-CA16	10/24/2000	12272	36.16	<0.05		<1	<1	700	<1	<10	<10	<1	<10	6.4	<20			130	53	<10	<10
COF-CA16	4/10/2001	3435	28.68	<0.05		<1	<1	<200	1.7	<10	95	5.3	<10	<5	<20			80	12	<10	<10
COF-CA16	10/23/2001	12981	29.66	<0.05		<1	<1	<200	<1	<10	<10	<1	<10	<5	<20			90	13	<10	<10
COF-CA16	4/15/2002	6692	28.38	<0.05		<1	<1	<200	<1	<10	<10	<1	<10	<5	<20			86	12	<10	11
COF-CA16	10/22/2002	17819	31.63	<0.05		2	<1	<200	<1	<10	10	<1	<10	<5	<20			120	24	<10	<10
COF-CA16	4/8/2003	5697	29.17	<0.05		<1	<1	<200	<1	<10	10	<1	<10	<5	<20			90	13	<10	10
COF-CA16	10/28/2003	18145	34.65	0.243		<0.6	<0.1	370	2.2	<10	197	2.2	<10	<5	<20			150	41	<10	<10
COF-CA16	4/14/2004	6440	30.78	<0.05		<0.6	<0.1	<200	0.8	<10	<10	<0.1	20	<5	<20			90	18	<10	<10
COF-CA16	10/26/2004	17871	27.3	<0.05		<3	<1	<200	2	<10	30	<1	<10	<5	<20			80	11	<10	<10
COF-CA16	4/12/2005	16804	27.1	<0.05		<3	<1	<200	<1	<10	10	<1	10	<5	<20			70		<10	<10
COF-CA16	5/11/2005	20996	31.56																16		
COF-CA16	10/19/2005	38782	33.89	<0.05		<3	<1	400	<1	<10	<10	<1	20	<5	<20			150	24	<10	<10
COF-CA16	4/10/2006	AG33603	29.2	<0.2		<3	<1	<200	1	<10	<30	<1	<10	<5	<20			110	9	<10	<10
COF-CA16	10/11/2006	AG54829	17.2	<0.2	<0.01	<3	<1	400	<1	<10	<30	<1	<10	<5	<20	1.8		160	75	<10	<10
COF-CA16	4/9/2007	AH30344	10.25	<0.1	<0.1	<1	<1	250	2.8	1	<100	<1	<10	<10	<5	1.5	<0.1	130	58	<10	<10
COF-CA16	4/9/2007	AH30345	10.25	<0.1	<0.1	<1	<1	250	2.8	<1	<100	<1	<10	<10	<5	1.7	<0.1	130	58	<10	<10
COF-CA16	10/15/2007	L315801-10	17.2	<0.1	<0.1	<1	<1	900	1.2	1.2	<100	<1	<15	<10	<5	1.5	<0.1	220	160	<10	<10
COF-CA16	4/15/2008	L341361-11	17.2	<0.1	<0.1	<1	<1	<200	1.8	<1	<100	<1	<15	<10	<5	9.9	<0.1	96	12	<10	<10
COF-CA16	10/21/2008	L371417-12	17.2	<0.1	<0.1	<1	2.2	1100	1.3	<1	<100	<1	<15	<10	7.4	2	<0.1	200	180	<10	12
COF-CA16	4/6/2009	L396908-09	17.2	<0.1	<0.1	<1	<1	<200	2.1	<1	<100	<1	<15	<10	<5	1.9	<0.1	86	13	<2	<10
COF-CA16	10/27/2009	L429478-11	17.2	<0.1	<0.1	<1	<1	<200	<2	<2	<100	<1	<15	<10	<5	1.6	<0.1	97	13	<2	<10
COF-CA16	4/26/2010	L456474-12	17.2	<0.1	<0.1	<1	<1	210	<2	<2	<100	<1	<15	<10	<5	2.7	<0.1	120	32	<2	<10
COF-CA16	10/19/2010	L485273-12	17.2	<0.1	<0.1	<1	<1	1100	<2	<2	<100	<1	<15	<10	<5	2.2	<0.1	180	120	<2	<10
COF-CA16	4/12/2011	L511237-12	17.2	<0.1	<0.1	<1	<1	<200	<2	<2	<100	<1	<15	<10	<5	1.7	<0.1	97	12	<2	10
COF-CA16	10/18/2011	L542857-12	17.2	<0.1	<0.1	<1	1.6	690	<2	<2	<100	<1	<15	<10	7.4	1.8	<0.1	160	53	<2	<10
COF-CA16	4/11/2012	L569652-12	17.2	<0.1	<0.1	<1	<1	310	<2	<2	<100	<1	<15	<10	13	1.9	<0.1	120	43	<2	<10
COF-CA16	10/24/2012	L602894-12	17.2	<0.1	<0.1	<1	<1	1200	<2	<2	<100	<1	<15	<10	16	2	<0.1	200	100	<2	<10
COF-CA16	4/8/2013	L630049-12	17.2	<0.1	<0.1	<1	<1	<200	<2	<2	<100	<1	19	<10	<2	2	<0.1	97	11	<2	<10
COF-CA16	10/22/2013	4087278010	17.2	<0.5	<0.5	<1	<1	1930	1.8	<10	<100	<1	26.8	<5	<20	2	<0.4	227	155	<1	<40
COF-CA16	4/15/2014	490-51172-6	17.2	<0.1	0.177	<2	<2	241	<2	<10	<100	<2	<20	<15	<50	1.45	<0.1	118	24.9	<2	<50
COF-CA16	10/23/2014	L729945-06	17.2	<0.1	<0.25	<1	<1	640	2.5	<2	<100	<1	<15	<10	<5	2.7	<0.1	140	50	<2	<10
COF-CA16	4/14/2015	L760001-02	17.2	<0.1	<0.25	<2	<2	<200	<10	<20	<100	<2	<15	<10	<5	1.9	<0.1	88	11	0.78	<50
COF-CA17A	6/18/1986		15.52						3	10	6690	19		534		11			32		
COF-CA17A	9/11/1986	38769	17.49								6110			608					24		
COF-CA17A	12/10/1986	4784	8.04						3	<10	1200	20		75		0.44			10		
COF-CA17A	3/19/1987	3765	10.96								1600			80					9		
COF-CA17A	6/17/1987	7755	16.34						9	80	15000	39				0.62			2		
COF-CA17A	12/2/1987	16421	15.55	0.55					6	20	1500	<1		770		0.46			64		60
COF-CA17A	3/24/1988	2998	14.17	1.5						10	2200			43					6		70
COF-CA17A	5/31/1988	5719	16.18	8.5					11	30	10000	18		120		0.23			5		100
COF-CA17A	12/20/1988	13148	18.21	1.6					5	20	2000	10		2200		0.11			300		120
COF-CA17A	3/23/1989	2818	11.19	0.42					3	20	540	3		16					2		30
COF-CA17A	6/9/1989	5690	13.09	1					2	<10	2100	5		53		0.54			8		20
COF-CA17A	12/12/1989	14454	16.41	0.36			<1	<500	3	<10	660	2	<10	7	<20	0.2		<50	7		<10
COF-CA17A	3/7/1990	2817	17.19	0.61			<1	<500	2	<10	440	<1	<10	23	<20	0.09		<50	<1		<10
COF-CA17A	6/12/1990	7369	15.81	0.42			<1	<500	2	20	770	6	<10	150	<20	0.1		70	5		<10
COF-CA17A	12/13/1990	18902	17.29	2.4			<1	<500	10	<10	3600	24	<10	55	<20	0.11		<50	<1		30
COF-CA17A	3/18/1991	4907	11.39	0.43			<1	<500	11	<10	330	<1	<10	<5	<20	0.07		<50	4		<10
COF-CA17A	7/1/1991	12572	13.48	<0.05			2	<500	1	<10	5400	1	<10	4500	<40	0.14		200	2		120
COF-CA17A	9/26/1991	18359	18.01	18			1	<500	28	50	23000	86	<10	520	<20	0.07		130	200		140
COF-CA17A	11/17/1993	15765	14.99	0.4		<1	<1	<500	2	<10	400	1	<10	22	30			<50	4		<10
COF-CA17A	3/3/1994	1597	7.38	1.8		<1	<1	<500	3	<10	1500	4	<10	50	<20	0.05		<50	6		20
COF-CA17A	6/1/1994	5927	12.53	0.41		<1	<1	<500	2	<10	450	2	<10	<5	<20			<50	3		130
COF-CA17A	9/1/1994	12021	16.57	0.34		<1	<1	<500	1	<10	350	1	<10	58	<20	0.17		<50	3		20
COF-CA17A	11/1/1994	15625	16.57	3.9		<1	<1	<500	7	<10	3700	6	<10	32	<20			<50	5		<10
COF-CA17A	3/9/1995	2099	7.28	2.8		<1	<1	<500	10	<10	2500	20	<10	24	30	0.19		<50	6		10
COF-CA17A	6/7/1995	5757	16.6	2		<1	1	<500	9	<10	2100	2	<10	440	<20			<50	54		30
COF-CA17A	9/20/1995	10866	15.68	0.72		<1	<1	<500	3	<10	870	<1	<10	7	<20			<50	5		<10
COF-CA17A	11/8/1995	12661	14.96	0.65		<1	1	<500	3	<10	540	2	<10	15	<20			<50	7		10
COF-CA17A	3/11/1996	2751	12.37	0.66		<1	<1	<500	2	<10	500	<1	<10	<5	30			<50	2		<10
COF-CA17A	6/7/1996	6191	14.96	3.7		<1	2	<500	22	<10	4200	11	<10	42	<20			<50	6		<10
COF-CA17A	9/10/1996	13861	17.36	2.6		3	<1	<500	4	<10	2600	3	<10	41	<20			<50	5	<10	10
COF-CA17A	11/19/1996	13861B	15.52	2.6		3	<1	<500	4	<10	2600	3	<10	41	<20			<50	5		10
COF-CA17A	2/25/1997	2347	10.66	0.33		<1	<1	<500	2	<10	130	<1	<10	<5	<20			<50	11	<10	<10
COF-CA17A	5/21/1997	6873	16.37	0.37		<1	<1	<500	2	<10	360	<1	<10	7	<20			<50	8	<10	<10

Table 6. Historical Groundwater Analytical Data

location_id	sample_date	lab_id	Sample_depth	Aluminum, total (mg/L)	Ammonia (as N) (mg/L)	Antimony, total (ug/L)	Arsenic, total (ug/L)	Boron, total (ug/L)	Chromium, total (ug/L)	Copper, total (ug/L)	Iron, total (ug/L)	Lead, total (ug/L)	Lithium, total (ug/L)	Manganese, total (ug/L)	Molybdenum, total (ug/L)	Nitrite + Nitrate (mg/L)	Phosphorus, total (mg/L)	Strontium, total (ug/L)	Sulfate, total (mg/L)	Vanadium, total (ug/L)	Zinc, total (ug/L)
COF-CA17A	11/18/1997	15660	16.63	13		<1	4	<500	23	<10	14000	10	<10	120	<20			<50	11	10	80
COF-CA17A	5/19/1998	4496	13.78	4		<1	<1	<200	9	<10	2900	3	<10	32	<20			<50	8	<10	10
COF-CA17A	11/17/1998	10234	17.65	2.8		<1	<1	<200	3	<10	2400	<1	<10	52	<20			<50	3	<10	10
COF-CA17A	4/5/1999	3531	8.92	1.3		<1	<1	<200	5	<10	760	1	<10	16	<20			<50	17	<10	<10
COF-CA17A	10/5/1999	10652	16.63	0.07		<1	6	<200	2	<10	100	<1	<10	60	<20			<50	15	<10	<10
COF-CA17A	4/12/2000	4870	10.6	1.1		<1	<1	<200	37	<10	1000	2	<10	25	<20			<50	6	<10	30
COF-CA17A	4/12/2000	4871	10.6	1.1		<1	<1	<200	39	<10	970	1.7	<10	23	<20			<50	6	<10	23
COF-CA17A	10/24/2000	12273	19.26	2.8		<1	<1	<200	<1	10	2000	5.3	<10	70	<20			<50	12	<10	34
COF-CA17A	4/10/2001	3436	11.12	0.42		<1	<1	<200	7	<10	280	<1	<10	32	<20			<50	7.6	<10	<10
COF-CA17A	10/23/2001	12982	14.9	1.6		<1	<1	<200	<1	<10	1400	<1	<10	45	<20			<50	7	<10	44
COF-CA17A	4/15/2002	6693	12.04	1.5		<1	<1	<200	2	<10	910	3	<10	24	<20			<50	7.6	<10	15
COF-CA17A	10/22/2002	17820	17.16	7.7		<1	<1	<200	10	<10	5900	2.9	<10	70	<20			<50	12	10	40
COF-CA17A	4/8/2003	5698	7.97	1.5		<1	<1	<200	<1	<10	930	<1	<10	18	<20			<50	8.5	<10	10
COF-CA17A	10/28/2003	18146	0	2.1		<0.6	1	<200	3	<10	1500	1.4	<10	75	<20			<50	8.2	<10	10
COF-CA17A	4/14/2004	6441	10.43	4.1		<0.6	0.6	<200	8.3	<10	3700	<0.1	<10	72	<20			<50	8.8	<10	20
COF-CA17A	10/26/2004	17872	14.11	2.1		<3	<1	<200	4	<10	1600	<1	<10	39	<20			<50	9.2	<10	10
COF-CA17A	4/12/2005	16805	11.71	1.2		<3	<1	<200	5	<10	950	<1	10	26	<20			<50		<10	10
COF-CA17A	5/10/2005	20997	14.96																5		
COF-CA17A	10/18/2005	38783	17.42	1.9		<3	1	<200	4	<10	1400	2	20	50	<20			<50	4	<10	20
COF-CA17A	4/10/2006	AG33604	10.17	1.7		<3	<1	<200	5	<10	1200	<1	<10	24	<20			<50	6	<10	10
COF-CA17A	10/11/2006	AG54830	0	1.6	<0.01	<3	<1	<200	1	<10	1200	<1	<10	72	<20	0.08		<50	10	<10	20
COF-CA17A	4/9/2007	AH30346	6.1	2.1	<0.1	<1	<1	<200	2.8	2.1	1200	<1	10	29	<5	0.16	<0.1	14	5	<10	24
COF-CA17A	4/14/2008	L341361-12	6.1	0.24	<0.1	<1	<1	<200	4	1.4	170	<1	<15	22	<5	<0.1	<0.1	18	6.2	<10	10
COF-CA17A	10/20/2008	L371417-13	5.55	9.7	<0.1	<1	<1	<200	3.2	4.7	5900	1.7	<15	100	<5	0.16	0.1	24	12	16	27
COF-CA17A	4/6/2009	L396908-10	6.1	1.6	<0.1	<1	<1	<200	9.1	<1	1000	<1	<15	34	<5	<0.1	<0.1	29	11	<2	69
COF-CA17A	10/27/2009	L429478-12	4.3	4.4	<0.1	<1	2.1	<200	12	3.6	5100	3.7	<15	81	<5	<0.1	0.36	44	17	11	30
COF-CA17A	4/26/2010	L456474-13	4.88	7	<0.1	<1	3.4	<200	21	5.3	8400	5.7	<15	140	<5	<0.1	<0.1	29	13	18	56
COF-CA17A	10/19/2010	L485273-13	5.81	1.8	<0.1	<1	<1	<200	<2	7.2	1200	1.8	<15	77	<5	0.14	<0.1	35	16	<2	28
COF-CA17A	4/12/2011	L511237-13	3.4	0.14	<0.1	<1	<1	<200	<2	<2	130	<1	<15	11	<5	0.84	<0.1	35	9.1	<2	<10
COF-CA17A	10/19/2011	L542857-13	5.3	6	<0.1	<1	2.8	<200	8.6	3.6	6100	3.9	<15	180	<5	0.41	0.19	97	14	8.9	29
COF-CA17A	4/11/2012	L569652-13	6.1	<0.1	<0.1	<1	<1	<200	<2	<2	<100	<1	<15	<10	6.1	0.14	<0.1	34	9.3	<2	<10
COF-CA17A	10/24/2012	L602894-13	5.35	<0.1	<0.1	<1	<1	<200	<2	<2	<100	<1	<15	21	<5	0.18	<0.1	44	12	<2	<10
COF-CA17A	4/9/2013	L630049-13	6.1	<0.1	<0.1	<1	<1	<200	<2	<2	<100	<1	<15	12	<2	<0.1	<0.1	37	11	<2	<10
COF-CA17A	10/22/2013	4087278011	5.57	2.45	<0.5	<1	1	<100	25.4	<10	1600	1.3	1.6	62.5	<20	0.29	<0.4	39.1	9.4	2.9	<40
COF-CA17A	4/15/2014	490-51172-7	4.28	1.78	0.115	<2	<2	<50	7.74	<10	2110	<2	<20	46.5	<50	<0.1	<0.1	<50	12.6	5.46	<50
COF-CA17A	10/24/2014	L729945-07	5.33	0.13	<0.25	<1	<1	<200	<2	<2	110	<1	<15	<10	<5	0.14	<0.1	130	19	<2	15
COF-CA17A	4/14/2015	L760001-03	5.33	<0.1	<0.25	<2	<2	<200	<10	<20	<100	<2	<15	<10	<5	<0.1	<0.1	37	8.9	0.4	<50
COF-CA17B	6/18/1986		15.39						1	30	46700	22		10800		0.01			1000		
COF-CA17B	9/11/1986	38770	17.39								65400			13800					1100		
COF-CA17B	12/10/1986	4785	10.5						2	<10	64000	10		14000		0.04			280		
COF-CA17B	3/19/1987	3766	12.43								48000			12000					1200		
COF-CA17B	6/17/1987	7756	16.86						10	60	48000	24				0.04			950		
COF-CA17B	9/10/1987	11980	18.64								5200			13000					1100		
COF-CA17B	12/2/1987	16422	16.96	<0.05					88	<10	49000	9		9500		0.03			1000		490
COF-CA17B	3/24/1988	2999	15.13	0.29						320	43000			10000					1100		640
COF-CA17B	5/31/1988	5720	16.34	<0.05					<1	10	53000	1		11000		0.09			880		550
COF-CA17B	9/21/1988	10555	18.6	<0.05						<10	49000			8900					1100		380
COF-CA17B	12/20/1988	13149	18.8	0.14					2	<10	13000	19		9700		0.07			930		260
COF-CA17B	3/22/1989	2816	13.91	<0.05					<1	30	36000	14		7600					600		360
COF-CA17B	6/9/1989	5691	16.31	2.8					1	<10	21000	33		7300		0.02			530		310
COF-CA17B	9/27/1989	11392	18.5	0.12			3	<500	<1	<10	15000	9	<10	6100	<20	0.15		440	670		190
COF-CA17B	12/12/1989	14455	18.31	<0.05			1	<500	<1	<10	22000	2	20	7100	<20	0.18		460	760		290
COF-CA17B	3/7/1990	2818	14.21	<0.05			2	<500	<1	<10	9700	4	<10	4500	<20	0.05		260	470		200
COF-CA17B	6/12/1990	7370	16.31	<0.05			2	<500	<1	40	8300	5	<10	5800	<20	0.01		390	580		80
COF-CA17B	9/27/1990	15140	18.5	<0.05			2	<500	<1	<10	9900	2	<10	6100	<20	0.05		310	540		170
COF-CA17B	12/13/1990	18903	18.31	<0.05			<1	<500	<1	<10	9600	4	<10	6900	<20	0.05		340	700		150
COF-CA17B	3/18/1991	4908	13.39	<0.05			3	<500	1	<10	14000	<1	<10	6500	<20	0.05		350	570		170
COF-CA17B	7/1/1991	12573	14.01	13			4	<500	23	20	16000	60	10	84	<20	0.01		<50	450		130
COF-CA17B	9/26/1991	18358	17.68	0.07			3	<500	<1	10	13000	8	<10	5500	<20	0.02		60	640		190
COF-CA17B	11/17/1993	15766	17.23	0.38		<1	15	<500	3	<10	38000	140	<10	4200	<20			420	560		430
COF-CA17B	3/2/1994	1598	10.6	0.07		<1	12	<500	1	30	25000	47	<10	4600	<20	<0.01		270	450		330
COF-CA17B	6/1/1994	6051	15.09	<0.05		6	5	<500	<1	<10	11000	16	10	3800	<20			240	440		120
COF-CA17B	8/31/1994	12022	17.06	0.06		1	9	<500	3	<10	17000	9	<10	3700	5	<0.01		130	330		210
COF-CA17B	11/1/1994	15626	16.86	<0.05		<1	3	<500	5	<10	16000	18	15	3500	<20			440	450		80
COF-CA17B	3/9/1995	2100	11.35	0.07		<1	1	<500	<1	<10	12000	<1	<10	3200	20	0.01		400	420		90
COF-CA17B	6/6/1995	5758	16.37	0.05		<1	4	<500	1	<10	14000	6	<10	3200	<20			450	360		120
COF-CA17B	9/19/1995	10867	17.29	<0.05		<1	2	<500	<1	<10	11000	17	<10	2800	<20			640	340		70
COF-CA17B	11/7/1995	12662	17.03	<0.05		1	7	<500	1	<10	7400	12	<10	3000	<20			340	360		70
COF-CA17B	3/11/1996	2752	4.04	0.07		<1	4	<500	3	<10	8800	17	<10	2500	<20			490	350		90
COF-CA17B	6/7/1996	6192	15.49	<0.05		<1	13	<500	3	<10	16000	10	<10	3000	<20			250	320		120
COF-CA17B	9/11/1996	15072	17.59	0.05		2	4	580	<1	<10	4700	2	<10	3200	<20			210	320	<10	60
COF-CA17B	2/25/1997	2348	13.12	<0.05		<1	<1	<500	1	<10	6800	4	<10	2100	<20			370	280	<10	40
COF-CA17B	4/12/2011	L511237-28	4.37	<0.1	<0.1	<1	1	<200	<2	<2	2500	2.1	<15	660	<5	<0.1	<0.1	210	210	<2	28
COF-CA17B	10/19/2011	L542857-28	28	<0.1	0.13	<1	2.6	<200	2.4	<2	7800	6.2	<15	1700	<5	<0.1	<0.1	500	610	<2	48
COF-CA17B	4/11/2012	L569652-27	28	<0.1	<0.1	<1	9.2	<200	<2	<2	2600	<1	<15	880	12	<0.1	<0.1	180	150	<2	12
COF-CA17B	10/24/2012	L602894-27	28	<0.1	0.16	<1	1.1	<200	4	2.7	13000	2.9	20	1200	7.2	<0.1	<0.1	840	1000	<10	30
COF-CA17B	4/9/2013	L630049-28	28	<0.1	<0.1	<1	3.2	<200	4.6	<2	8900	3.5	<15	1200	<2	<0.1	<0.1	220	300	<2	38
COF-CA17B	10/22/2013	4087278012	28	<0.5	<0.5	<1	1.3	<100	1.5	<10	5370	3.7	8.4	1110	<20	<0.25	<0.4	396	419	<1	<40
COF-CA17B	4/15/2014	490-51172-8	28	<0.1	<0.1	<2	6.6	<50	<2	<10	12000	4.34	<20	1430	<50	<0.1	<0.1	263	425	<2	77.5
COF-CA17B	10/23/2014	L729945-08	28	<0.1	<0.25	<1	3	<200	2.7	<2	9600	4.3	<15	1500	<5	<0.1	0.29	350	470	<2	58
COF-CA17B	4/13/2015	L760001-04	28	<0.1	<0.25	<2	6.3	<200	<10	<20	16000	7.4	<15	890	<5	<0.1	<0.1	200	240	0.21	69

Table 6. Historical Groundwater Analytical Data

location_id	sample_date	lab_id	Sample_depth	Aluminum, total (mg/L)	Ammonia (as N) (mg/L)	Antimony, total (ug/L)	Arsenic, total (ug/L)	Boron, total (ug/L)	Chromium, total (ug/L)	Copper, total (ug/L)	Iron, total (ug/L)	Lead, total (ug/L)	Lithium, total (ug/L)	Manganese, total (ug/L)	Molybdenum, total (ug/L)	Nitrite + Nitrate (mg/L)	Phosphorus, total (mg/L)	Strontium, total (ug/L)	Sulfate, total (mg/L)	Vanadium, total (ug/L)	Zinc, total (ug/L)
COF-CA19B	9/28/1989	11595	43.11	6.1			<1	<500	6	20	6900	4	<10	230	<20	0.72		290	520		110
COF-CA19B	12/13/1989	14457	40.19	2			<1	<500	5	<10	2000	2	<10	73	<20	0.53		240	300		30
COF-CA19B	3/7/1990	2815	37.01	0.21			<1	<500	3	<10	310	<1	<10	43	<20	0.5		130	140		10
COF-CA19B	6/12/1990	7377	37.8	4			<1	<500	5	<10	3900	2	<10	89	<20	0.2		160	90		50
COF-CA19B	9/25/1990	15138	42.19	0.35			<1	<500	4	20	570	4	<10	27	<20	0.24		150	120		130
COF-CA19B	12/10/1990	18822	43.6	0.38			<1	<500	3	<10	390	<1	<10	190	<20	0.19		140	65		<10
COF-CA19B	3/13/1991	4730	37.6	0.9			<1	<500	3	10	1000	1	<10	110	<20	0.63		450	280		50
COF-CA19B	6/26/1991	12444	40.29	0.26		2	<1	<500	4	10	430	1	<10	54	<20	0.84		300	250		20
COF-CA19B	9/25/1991	18510	43.51	1			<1	<500	5	20	1100	2	<10	85	<20	0.43		<50	150		20
COF-CA19B	12/17/1991	21221	35.11	1.1			1	<500	4	<10	1100	<1	<10	280	<20	0.65		390	270		50
COF-CA19B	3/23/1992	2932	31.76	0.07			<1	<500	5	<10	100	<1	10	6	<20	0.59		200	180		60
COF-CA19B	6/16/1992	7454	44.62	<0.05			<1	<500	5	40	220	<1	40	<5	<20			240	57		<10
COF-CA19B	8/31/1992	12427	44.65	4.3			1	<500	5	<10	3700	2	<10	330	<20	0.56		220	230		60
COF-CA19B	12/7/1992	17100	45.54	0.4		2	<1	<500	1	<50	330	2	<10	70	<20			210	150		20
COF-CA19B	3/9/1993	1830	45.21	0.31		1	<1	<500	5	<10	220	<1	<10	140	<20	0.37		180	100		20
COF-CA19B	6/16/1993	5541	44.79	<0.05		<1	<1	<500	2	<10	30	<1	<10	7	<20			220	180		<10
COF-CA19B	9/15/1993	12148	45.67	0.11		<1	<1	<500	3	<10	120	<1	<10	<5	<20	1.7		230	170		10
COF-CA19B	9/15/1993	12149	0	<0.05		<1	<1	<500	3	<10	<10	<1	<10	<5	<20	2		240	170		<10
COF-CA19B	11/17/1993	15769	43.01	0.08		<1	<1	<500	2	<10	80	<1	<10	<5	<20			190	240		10
COF-CA19B	3/3/1994	1599	39.63	1.9		<1	<1	<500	<1	<10	3100	3	<10	400	<20	0.66		180	120		50
COF-CA19B	6/2/1994	6053	44.1	<0.05		6	<1	<500	2	<10	20	4	<10	<5	<20			190	180		30
COF-CA19B	8/31/1994	11807	45.61	<0.05		<1	<1	<500	<1	<10	<10	<1	<10	<5	<20	0.76		360	260		10
COF-CA19B	11/3/1994	15770	46.03	<0.05		<1	<1	<500	3	<10	290	<1	<10	<5	<20			130	30		30
COF-CA19B	3/2/1995	1803	44.52	<0.05		1	1	<500	3	<10	30	<1		<5		0.34		<50	68	10	<10
COF-CA19B	6/7/1995	5761	44.52	<0.05		2	<1	<500	4	<10	20	<1	<10	5	<20			190	140		<10
COF-CA19B	9/20/1995	10870	45.38	<0.05		<1	<1	<500	<1	<10	<10	2	<10	<5	<20			190	150		<10
COF-CA19B	11/8/1995	12665	44.13	<0.05		1	3	<500	2	<10	<10	2	<10	<5	<20			120	82		<10
COF-CA19B	3/12/1996	2755	41.54	0.05		<1	<1	<500	<1	<10	<10	<1	<10	<5	<20			80	39		<10
COF-CA19B	6/5/1996	6184	42.69	<0.05		<1	1	<500	4	<10	<10	<1	<10	<5	<20			90	36		<10
COF-CA19B	9/9/1996	15074	43.77	<0.05		<1	3	<500	1	<10	10	<1	<10	<5	<20			90	47	<10	<10
COF-CA19B	2/24/1997	2351	42.69	<0.05		<1	<1	<500	3	<10	<10	<1	<10	<5	<20			240	230	<10	<10
COF-CA19B	10/29/2003	18147	48.92	<0.05		<0.6	<0.1	<200	1.7	<10	<10	<0.1	<10	8	<20			400	310	<10	<10
COF-CA19B	4/14/2004	6442	0	1.8		<0.6	0.8	<200	3.8	<10	2200	2.3	<10	500	<20			370	310	<10	20
COF-CA19B	10/26/2004	17873	0	0.57		<3	<1	210	3	<10	480	<1	<10	120	<20			350	290	<10	<10
COF-CA19B	4/12/2005	16806	43.05	<0.05		<3	1	<200	1	<10	30	<1	20	6	<20			250		<10	<10
COF-CA19B	5/10/2005	20998	44.62																208		
COF-CA19B	10/18/2005	38784	48.07	0.73		<3	<1	<200	<1	<10	560	<1	20	71	<20			320	270	<10	<10
COF-CA19B	10/18/2005	38800	48.07	0.64		<3	<1	<200	<1	<10	530	<1	20	68	<20			350	270	<10	<10
COF-CA19B	4/11/2006	AG33605	44.98	2.3		<3	<1	<200	10	<10	2000	2	<10	82	<20			350	245	<10	<10
COF-CA19B	10/10/2006	AG54831	-999	3.8	<0.01	<3	2	<200	12	<10	2700	1	<10	99	20	0.86		380	270	<10	20
COF-CA19B	4/9/2007	AH30347	20	<0.1	<0.1	<1	1.1	<200	4.4	1.5	<100	<1	<10	<10	<5	0.98	<0.1	300	250	<10	10
COF-CA19B	10/15/2007	L315801-11	20	0.54	<0.1	<1	<1	<200	9.2	3.7	460	<1	<15	22	<5	1.1	<0.1	360	310	<10	13
COF-CA19B	4/14/2008	L341361-13	20	1.2	<0.1	<1	1.6	<200	17	3.9	850	1.7	<15	67	<5	36	<0.1	370	300	<10	46
COF-CA19B	10/21/2008	L371417-14	20	<0.1	<0.1	<1	<1	<200	4.8	<1	<100	<1	<15	<10	<5	1.2	<0.1	340	260	<10	23
COF-CA19B	4/7/2009	L396908-11	20	0.94	<0.1	<1	<1	<200	5.6	1.7	570	<1	<15	64	6.5	1.1	<0.1	360	290	<2	21
COF-CA19B	10/27/2009	L429478-13	20	0.3	<0.1	<1	<1	<200	3.6	<2	290	<1	<15	24	<5	1.2	0.14	330	240	<2	10
COF-CA19B	4/26/2010	L456474-14	20	0.17	<0.1	<1	<1	<200	3.6	<2	150	<1	<15	12	<5	1.6	<0.1	310	200	<2	12
COF-CA19B	10/19/2010	L485273-14	20	0.11	<0.1	<1	<1	<200	2.8	<2	<100	<1	<15	12	<5	1.7	<0.1	300	240	<2	<10
COF-CA19B	4/12/2011	L511237-14	20	<0.1	<0.1	<1	<1	<200	2	<2	<100	<1	<15	<10	<5	1.4	<0.1	320	210	<2	19
COF-CA19B	10/19/2011	L542857-14	20	<0.1	<0.1	<1	3.3	210	3.8	<2	<100	<1	<15	<10	<5	1.6	<0.1	290	190	<2	<10
COF-CA19B	4/11/2012	L569652-14	20	<0.1	0.31	<1	<1	240	<2	<2	<100	<1	<15	61	18	1.2	<0.1	320	200	<2	11
COF-CA19B	10/24/2012	L602894-14	20	<0.1	<0.1	<1	<1	210	2.2	<2	<100	<1	<15	34	12	1.4	<0.1	360	210	<2	<10
COF-CA19B	4/9/2013	L630049-14	20	0.1	<0.1	<1	<1	<200	9.8	<2	190	<1	<15	37	2.4	1.3	<0.1	340	210	<2	11
COF-CA19B	10/23/2013	4087278013	20	<0.5	<0.5	<1	<1	256	2.8	<10	156	<1	1.4	208	<20	1	<0.4	326	195	<1	<40
COF-CA19B	4/15/2014	490-51172-9	20	0.133	0.264	<2	2.53	332	2.02	<10	189	<2	<20	128	<50	0.972	0.147	334	214	2.63	<50
COF-CA19B	10/22/2014	L729945-09	20	<0.1	<0.25	<1	<1	330	9	<2	110	<1	<15	130	<5	1.8	<0.1	330	200	<2	12
COF-CA19B	4/15/2015	L760001-05	20	<0.1	<0.25	<2	0.32	340	<10	<20	<100	<2	<15	65	<5	1.5	<0.1	310	180	1.1	<50

Table 6. Historical Groundwater Analytical Data

location_id	sample_date	lab_id	Sample_depth	Aluminum, total (mg/L)	Ammonia (as N) (mg/L)	Antimony, total (ug/L)	Arsenic, total (ug/L)	Boron, total (ug/L)	Chromium, total (ug/L)	Copper, total (ug/L)	Iron, total (ug/L)	Lead, total (ug/L)	Lithium, total (ug/L)	Manganese, total (ug/L)	Molybdenum, total (ug/L)	Nitrite + Nitrate (mg/L)	Phosphorus, total (mg/L)	Strontium, total (ug/L)	Sulfate, total (mg/L)	Vanadium, total (ug/L)	Zinc, total (ug/L)
COF-CA20A	9/27/1989	11393	41.21	1.8			<1	<500	7	10	2800	3	<10	32	<20	0.49		100	10		40
COF-CA20A	3/7/1990	2816	39.7	1.5			<1	<500	5	<10	1400	1	<10	82	<20	0.46		<50	8		50
COF-CA20A	6/12/1990	7378	42.59	20			1	<500	13	40	22000	11	<10	570	30	0.88		120	4		270
COF-CA20A	9/27/1990	15141	45.61	97			2	720	210	1200	230000	170	<10	7300	100	0.86		430	10		3600
COF-CA20A	12/12/1990	18914	42	0.07			<1	<500	<1	<10	170	<1	<10	10	<20	1.1		90	7		<10
COF-CA20A	11/17/1993	15770	42.36	1.6		<1	<1	<500	2	<10	1800	<1	<10	13	<20			<50	4		20
COF-CA20A	3/3/1994	1550	37.21	0.51		<1	<1	<500	<1	<10	470	<1	<10	7	<20	0.47		<50	6		10
COF-CA20A	6/1/1994	5929	0	1		<1	<1	<500	1	<10	990	2	<10	53	<20			<50	9		70
COF-CA20A	8/31/1994	11808	45.57	62		<1	8	<500	64	90	70000	37	<10	1200	<20	0.66		110	8		830
COF-CA20A	11/3/1994	15771	45.38	15		<1	3	<500	22	<10	15000	17	<10	340	<20			100	4		280
COF-CA20A	3/2/1995	1804	44.13	200			5	<500	100	220	270000	170		5900		0.53		500	5	400	3500
COF-CA20A	6/7/1995	5762	44.2	110		<1	25	<500	160	140	150000	68	<10	3100	<20			340	<2		2000
COF-CA20A	9/20/1995	10871	40.65	2		<1	1	<500	1	<10	2200	2	<10	<5	<20			<50	<2		20
COF-CA20A	11/8/1995	12666	43.24	15		<1	10	<500	30	20	26000	26	<10	630	<20			70	9		340
COF-CA20A	3/12/1996	2756	37.14	3		<1	2	<500	6	10	3600	12	<10	700	<20			50	6		50
COF-CA20A	6/5/1996	6185	44.1	2.7		<1	<1	<500	3	<10	3100	<1	<10	39	<20			50	6		20
COF-CA20A	9/9/1996	15075	45.44	1.2		<1	3	<500	3	<10	1400	20	<10	110	<20			<50	4	<10	20
COF-CA20A	2/25/1997	2352	44.16	0.19		<1	3	<500	2	<10	90	<1	<10	<5	<20			<50	11	<10	<10
COF-CA20A	10/29/2003	18148	46.29	6.7		<0.6	0.7	<200	7.5	<10	5000	2.4	<10	78	<20			100	26	<10	50
COF-CA20A	4/15/2004	6443	43.54	3.7		<0.6	0.3	<200	0.1	<10	3400	1.4	<10	40	<20			80	22	<10	30
COF-CA20A	11/23/2004	22033	43.21	7.5		<3	1	<200	7	<10	5200	2	<10	190	<20			90	29	10	60
COF-CA20A	4/12/2005	16807	0	1.2		<3	<1	<200	3	<10	990	<1	<10	21	<20			<50		<10	10
COF-CA20A	5/5/2005	19606	0																16		
COF-CA20A	10/18/2005	38785	0	1.3		<3	<1	<200	<1	<10	910	<1	<10	50	<20			70	15	<10	10
COF-CA20A	4/11/2006	AG33606	40.88	5.5		<3	<1	<200	11	<10	4500	4	<10	86	<20			120	15	10	50
COF-CA20A	10/11/2006	AG54832	0	0.6	<0.01	<3	<1	<200	1	<10	410	<1	<10	9	<20	1.5		110	19	<10	10
COF-CA20A	4/10/2007	AH30348	13.68	2.2	<0.1	<1	1.2	<200	5.5	2.5	1200	<1	<10	22	<5	2	<0.1	97	18	<10	25
COF-CA20A	10/15/2007	L315801-12	14	3.8	<0.1	<1	1.1	210	6	2	2300	1.2	<15	36	<5	2	<0.1	120	22	<10	33
COF-CA20A	4/15/2008	L341361-14	13.24	1.4	<0.1	<1	2.8	260	24	14	870	6.5	<15	64	<5	2.5	0.24	100	18	<10	160
COF-CA20A	10/21/2008	L371417-15	13.98	12	<0.1	<1	<1	360	4.6	5.1	17000	4.7	<15	500	<5	2.8	0.67	140	24	31	100
COF-CA20A	4/7/2009	L396908-12	11.96	0.83	<0.1	<1	<1	<200	2	2.3	510	<1	<15	11	<5	2.2	<0.1	52	9.2	<2	31
COF-CA20A	10/26/2009	L429478-14	13.53	2	<0.1	<1	1.2	220	3.6	2.3	2500	1.4	<15	99	<5	2.2	0.39	97	16	5.5	34
COF-CA20A	4/27/2010	L456474-15	13.32	3.1	<0.1	<1	2.6	<200	6.4	6.6	4000	2.7	<15	120	<5	3.2	0.28	110	13	9.3	76
COF-CA20A	10/19/2010	L485273-15	14	40	<0.1	<1	3.4	230	19	12	26000	8.9	32	420	<5	2.8	0.28	140	15	28	230
COF-CA20A	4/12/2011	L511237-15	12.19	3.8	<0.1	<1	<1	260	<2	<2	2600	1	<15	48	<5	2.5	0.46	89	16	<2	27
COF-CA20A	10/19/2011	L542857-15	14.04	4	<0.1	<1	13	280	7.1	4.7	4900	2.9	<15	100	<5	2.3	0.44	100	11	9.7	76
COF-CA20A	4/11/2012	L569652-15	13.8	4.3	<0.1	<1	<1	340	4.1	2.9	4600	1.9	<15	97	14	2.8	0.16	110	17	5.5	48
COF-CA20A	10/23/2012	L602894-15	14.03	<0.1	<0.1	<1	<1	440	<2	<2	<100	<1	<15	<10	7.8	2.4	0.17	120	20	<2	<10
COF-CA20A	4/9/2013	L630049-15	13.49	<0.1	<0.1	<1	<1	240	<2	<2	<100	<1	18	<10	<2	4.2	<0.1	110	12	<2	<10
COF-CA20A	10/23/2013	4087278014	14.1	0.689	<0.5	<1	<1	423	1.7	<10	358	<1	1.4	9.3	<20	3	<0.4	128	23	1.3	<40
COF-CA20A	4/15/2014	490-51172-10	12.9	0.119	0.108	<2	<2	385	<2	<10	174	<2	<20	<15	<50	2.74	0.181	105	18.4	<2	<50
COF-CA20A	10/22/2014	L729945-10	13.9	0.4	<0.25	<1	<1	360	2.5	<2	240	<1	<15	<10	<5	2.8	0.32	110	12	<2	11
COF-CA20A	4/9/2015	L758754-08	13.9	0.37	<0.25	0.49	1.3	220	<10	<20	130	1.8	<15	33	<5	3.7		110	10	5.8	72

Table 6. Historical Groundwater Analytical Data

location_id	sample_date	lab_id	Sample_depth	Aluminum, total (mg/L)	Ammonia (as N) (mg/L)	Antimony, total (ug/L)	Arsenic, total (ug/L)	Boron, total (ug/L)	Chromium, total (ug/L)	Copper, total (ug/L)	Iron, total (ug/L)	Lead, total (ug/L)	Lithium, total (ug/L)	Manganese, total (ug/L)	Molybdenum, total (ug/L)	Nitrite + Nitrate (mg/L)	Phosphorus, total (mg/L)	Strontium, total (ug/L)	Sulfate, total (mg/L)	Vanadium, total (ug/L)	Zinc, total (ug/L)
COF-CA20B	9/27/1989	11394	41.21	<0.05			<1	<500	3	20	50	1	<10	<5	<20	0.8		130	10		<10
COF-CA20B	3/7/1990	2819	39.6	<0.05			<1	<500	5	<10	<10	<1	<10	46	<20	0.96		100	10		<10
COF-CA20B	6/12/1990	7379	42.59	0.54			<1	<500	3	<10	440	2	<10	<5	<20	1.2		160	9		20
COF-CA20B	9/26/1990	15152	45.61	4.5			<1	<500	4	<10	4200	1	<10	98	<20	0.66		130	38		40
COF-CA20B	12/12/1990	18915	42	<0.05			<1	<500	2	<10	200	<1	<10	<5	<20	1.2		190	12		<10
COF-CA20B	11/17/1993	15771	42.1	0.28		1	<1	<500	1	<10	230	<1	<10	<5	<20			80	7		<10
COF-CA20B	3/2/1994	1551	37.01	0.1		<1	<1	<500	1	<10	90	2	<10	<5	<20	0.75		110	7		<10
COF-CA20B	6/2/1994	6054	43.05	0.11		3	<1	<500	3	<10	90	2	<10	<5	<20			100	10		60
COF-CA20B	8/31/1994	11809	45.57	14		<1	3	<500	9	10	13000	7	<10	400	<20	0.76		190	15		130
COF-CA20B	11/1/1994	15772	45.38	2.7		<1	<1	<500	4	<10	2800	7	<10	23	<20			160	8		70
COF-CA20B	3/2/1995	1805	44.13	<0.05		<1	<1	<500	5	<10	60	<1		<5		0.8		180	6	<10	<10
COF-CA20B	6/7/1995	5763	44.26	0.16		<1	<1	<500	5	<10	130	<1	<10	5	<20			130	<2		<10
COF-CA20B	9/20/1995	10872	40.36	<0.05		<1	<1	<500	<1	<10	<10	1	<10	<5	<20			100	22		<10
COF-CA20B	11/8/1995	12667	42.46	0.26		<1	2	<500	4	<10	180	1	<10	<5	<20			60	6		10
COF-CA20B	3/12/1996	2757	37.08	0.22		<1	1	<500	<1	<10	150	<1	<10	<5	<20			90	7		<10
COF-CA20B	6/5/1996	6186	44.1	0.05		<1	1	<500	4	<10	30	<1	<10	<5	<20			110	6		<10
COF-CA20B	9/9/1996	15076	45.44	<0.05		<1	3	<500	2	<10	10	2	<10	<5	<20			90	6	<10	<10
COF-CA20B	2/25/1997	2353	44.23	<0.05		<1	2	<500	4	<10	<10	<1	<10	32	<20			110	12	<10	<10
COF-CA20B	2/25/1997	2354	0	<0.05		<1	2	<500	4	<10	<10	<1	<10	31	<20			100	12	<10	<10
COF-CA20B	10/22/2002	17821	45.54		0.01											1.4					
COF-CA20B	4/8/2003	5699	41.67		<0.01											1.6					
COF-CA20B	10/29/2003	18149	46.23	4.7	0.03	<0.6	1	<200	12.7	<10	3500	4.1	<10	110	<20	1.3		190	11	<10	30
COF-CA20B	4/15/2004	6444	43.44	0.49	0.01	<0.6	<0.1	<200	5.7	<10	520	2	<10	21	<20	1.6		150	7.8	<10	<10
COF-CA20B	11/23/2004	22034	43.18	0.2	<0.01	<3	<1	<200	3	<10	180	<1	<10	8	<20	1.2		140	8.8	<10	<10
COF-CA20B	4/12/2005	16808	37.21	<0.05		<3	<1	<200	2	<10	20	<1	10	<5	<20			140		<10	<10
COF-CA20B	5/10/2005	20999	42.78		<1											1.3			12		
COF-CA20B	10/19/2005	38786	45.8	1.1	<0.01	<3	<1	<200	4	<10	810	2	10	32	<20	1.1		170	14	<10	<10
COF-CA20B	4/11/2006	AG33607	41.11	<0.2	<0.01	<3	<1	<200	4	<10	60	<1	<10	6	<20	1.5		170	16	<10	<10
COF-CA20B	4/11/2006	AG33608	41.11	<0.2	<0.01	<3	<1	<200	4	<10	70	<1	10	6	<20	1.5		180	16	<10	<10
COF-CA20B	10/11/2006	AG54833	17.3	<0.2	<0.01	<3	<1	<200	3	<10	80	<1	<10	<5	<20	1.4		180	15	<10	<10
COF-CA20B	4/10/2007	AH30349	17.3	<0.1	<0.1	<1	<1	<200	4.1	<1	100	<1	<10	<10	<5	1.6	<0.1	180	16	<10	<10
COF-CA20B	10/15/2007	L315801-13	17.3	<0.1	<0.1	<1	<1	<200	3.5	1.1	<100	<1	<15	<10	<5	1.5	<0.1	190	16	<10	<10
COF-CA20B	10/15/2007	L315801-14	17.3	0.13	<0.1	<1	1	<200	3.5	2.7	140	1.3	<15	<10	<5	1.6	<0.1	170	15	<10	16
COF-CA20B	4/15/2008	L341361-15	17.3	<0.1	<0.1	<1	<1	<200	5.3	4.1	<100	<1	<15	<10	<5	1.8	<0.1	180	18	<10	16
COF-CA20B	10/21/2008	L371417-16	17.3	<0.1	<0.1	<1	<1	<200	5.9	<1	<100	<1	<15	<10	<5	2.1	<0.1	200	20	<10	12
COF-CA20B	4/7/2009	L396908-13	17.3	<0.1	<0.1	<1	<1	<200	4.2	<1	<100	<1	<15	<10	<5	2.4	<0.1	160	16	<2	<10
COF-CA20B	10/26/2009	L429478-15	17.3	<0.1	0.14	<1	<1	<200	6.2	<2	<100	<1	<15	<10	<5	2.3	<0.1	170	19	<2	41
COF-CA20B	10/26/2009	L429478-27	17.3	<0.1	<0.1	<1	<1	<200	5.5	<2	<100	<1	<15	<10	<5	2.2	<0.1	170	18	<2	12
COF-CA20B	4/27/2010	L456474-16	13.27	<0.1	<0.1	<1	<1	<200	3.4	<2	<100	<1	<15	<10	<5	2.6	<0.1	190	17	<2	<10
COF-CA20B	10/19/2010	L485273-16	13.97	<0.1	<0.1	<1	<1	<200	3.7	<2	<100	<1	<15	<10	<5	2.8	<0.1	170	18	<2	10
COF-CA20B	4/12/2011	L511237-16	17.3	<0.1	<0.1	<1	<1	<200	3.1	<2	<100	<1	<15	<10	<5	2.5	<0.1	170	17	<2	11
COF-CA20B	10/19/2011	L542857-16	17.3	<0.1	<0.1	1.6	3.3	<200	3.5	<2	<100	<1	<15	<10	<5	2	<0.1	180	18	<2	12
COF-CA20B	4/11/2012	L569652-16	17.3	<0.1	<0.1	<1	<1	<200	5.2	<2	<100	<1	<15	<10	15	2.3	<0.1	170	17	<2	10
COF-CA20B	10/24/2012	L602894-16	17.3	<0.1	<0.1	1.2	<1	<200	4.3	<2	<100	<1	<15	<10	8.2	2.4	<0.1	190	17	<2	10
COF-CA20B	4/9/2013	L630049-16	17.3	<0.1	<0.1	<1	<1	<200	4.6	<2	<100	<1	<15	<10	<2	1	<0.1	180	16	<2	<10
COF-CA20B	7/22/2013	L648194-04	17.3																17		
COF-CA20B	10/23/2013	4087278015	17.3	<0.5	<0.5	<1	<1	177	4.6	<10	<100	<1	<1	<5	<20	2.9	<0.4	178	19.4	<1	<40
COF-CA20B	10/23/2013	4087278016	17.3	<0.5	<0.5	<1	<1	177	4.8	<10	<100	<1	<1	<5	<20	2.9	<0.4	180	19.3	<1	<40
COF-CA20B	2/5/2014	490-45972-12	17.3			<2	<2		<5	<10		<5								<2	<50
COF-CA20B	4/14/2014	490-51172-11	17.3	<0.1	<0.1	<2	<2	199	4.07	<10	<100	<2	<20	<15	<50	2.81	<0.1	188	18.9	2.08	<50
COF-CA20B	10/21/2014	L729543-05	17.3	<0.1	<0.25	9.5	63	250	<2	<2	<100	<1	<15	<10	<5	2.7	<0.1	170	16	12	<10
COF-CA20B	1/28/2015	L745963-04	17.3			<2	<2		6.4	<5		<2								<5	<25
COF-CA20B	1/28/2015	L745963-05	17.3			<2	<2		4.6	<5		<2								<5	<25
COF-CA20B	4/16/2015	L759988-04	17.3																	0.92	
COF-CA20B	4/16/2015	L760001-06	17.3	<0.1	<0.25	<2	<2	<200	<10	<20	<100	<2	<15	<10	<5	2.8	<0.1	160	14	0.91	<50

Table 6. Historical Groundwater Analytical Data

location_id	sample_date	lab_id	Sample_depth	Aluminum, total (mg/L)	Ammonia (as N) (mg/L)	Antimony, total (ug/L)	Arsenic, total (ug/L)	Boron, total (ug/L)	Chromium, total (ug/L)	Copper, total (ug/L)	Iron, total (ug/L)	Lead, total (ug/L)	Lithium, total (ug/L)	Manganese, total (ug/L)	Molybdenum, total (ug/L)	Nitrite + Nitrate (mg/L)	Phosphorus, total (mg/L)	Strontium, total (ug/L)	Sulfate, total (mg/L)	Vanadium, total (ug/L)	Zinc, total (ug/L)
COF-CA21B	9/26/1989	11402	54.4	220			2	990	56	200	330000	100	21	6900	<20	1		760	14		3700
COF-CA21B	12/13/1989	14458	56.99	220			970	9400	5900	2200	2600000	1700	2600	69000	<20	0.91		<50	<1		31000
COF-CA21B	3/7/1990	2820	56.3	21			3	<500	31	<10	18000	18	<10	420	20	0.96		140	8		240
COF-CA21B	6/12/1990	7380	56.01	31			1	<500	21	20	35000	17	<10	840	30	0.9		260	13		310
COF-CA21B	9/27/1990	15142	57.19	22			<1	<500	17	30	28000	13	50	820	<20	1.3		200	14		270
COF-CA21B	12/13/1990	18904	58.01	71			3	<500	47	30	73000	34	20	2100	<20	1.2		250	12		670
COF-CA21B	3/13/1991	4731	55.32	4.6			<1	<500	6	10	4900	2	<10	65	<20	0.95		270	6		90
COF-CA21B	6/27/1991	12455	55.71	20			8	<500	34	10	21000	12	30	470	<20	1.2		120	10		210
COF-CA21B	9/25/1991	18511	57.42	2.2			<1	<500	7	20	2100	2	<10	58	<20	1.9		<50	17		30
COF-CA21B	11/17/1993	15772	57.65	1.3		<1	1	<500	3	<10	1400	2	<10	56	30			<50	13		10
COF-CA21B	3/3/1994	1600	52.17	22		<1	6	<500	12	<10	20000	28	<10	1200	<20	0.69		140	9		240
COF-CA21B	6/2/1994	6055	56.07	1.4		2	<1	<500	3	<10	860	12	<10	430	<20			120	11		80
COF-CA21B	9/1/1994	12025	57.84	180		<1	4	<500	25	90	150000	45	<10	4300	<20	0.64		130	30		1600
COF-CA21B	11/2/1994	15773	57.91	26		<1	6	900	36	<10	30000	36	<10	660	<20			160	51		350
COF-CA21B	3/1/1995	1832	56.79	12		2	2	<500	14	<10	16000	18		460		0.82		100	16	30	200
COF-CA21B	6/6/1995	5764	57.09	28		1	2	<500	16	<10	31000	14	<10	730	<20			130	6		320
COF-CA21B	9/20/1995	10873	57.32	3.6		<1	3	1000	6	<10	3900	8	<10	130	<20			180	140		40
COF-CA21B	11/7/1995	12668	43.05	0.53		<1	2	<500	9	<10	520	2	<10	10	<20			50	12		<10
COF-CA21B	3/20/1996	3221	55.12	6.9		<1	<1	<500	40	<10	8500	7	<10	240	<20			60	17		90
COF-CA21B	6/5/1996	6187	56.14	0.46		<1	1	<500	11	<10	460	<1	<10	37	<20			120	16		<10
COF-CA21B	9/10/1996	13862	57.61	3.1		2	<1	<500	8	<10	2700	1	<10	85	<20			100	26	<10	20
COF-CA21B	11/19/1996	13862	56.96	3.1		2	<1	<500	8	<10	2700	1	<10	85	<20			100	26		20
COF-CA21B	2/24/1997	2355	57.16	0.51		<1	<1	500	9	<10	370	2	31	26	50			140	52	<10	70
COF-CA21B	5/20/1997	6874	55.78	0.11		<1	<1	<500	5	<10	100	<1	<10	41	<20			100	12	<10	<10
COF-CA21B	11/18/1997	15661	57.81	41		<1	7	<500	36	20	47000	29	<10	1100	<20			150	49	70	490
COF-CA21B	5/19/1998	4497	56.04	26		<1	5	<200	27	<10	29000	22	<10	790	<20			130	16	40	310
COF-CA21B	11/17/1998	10235	57.91	20		2	8	6200	22	<10	17000	11	360	480	<20			310	360	30	200
COF-CA21B	4/5/1999	3532	55.97	1.5		<1	<1	700	6	<10	1300	2	40	75	40			120	60	<10	10
COF-CA21B	10/5/1999	10653	57.68	7.4		<1	5	3900	22	<10	6300	6	47	160	50			270	510	10	90
COF-CA21B	4/12/2000	4872	54.69	1.7		<1	<1	230	10	<10	1400	1.6	13	49	<20			130	17	<10	18
COF-CA21B	10/24/2000	12274	57.98	50		<1	11	250	40	26	40000	26	<10	1500	<20			190	27	83	470
COF-CA21B	10/24/2000	12275	57.98	43		<1	7	250	40	22	37000	22	<10	1200	<20			180	24	75	400
COF-CA21B	4/10/2001	3437	56.5	6.4		<1	<1	230	17	<10	5500	5	<10	160	<20			120	18	10	80
COF-CA21B	10/23/2001	12983	57.19	4.8		<1	<1	400	13	<10	3600	<1	<10	110	<20			150	34	<10	43
COF-CA21B	4/15/2002	6694	56.89	4		<1	<1	<200	11	<10	2900	7	<10	85	<20			130	13	<10	37
COF-CA21B	10/22/2002	17822	57.75	22		<1	8	<200	40	20	18000	11	130	520	20			290	220	40	240
COF-CA21B	4/8/2003	5700	55.32	5.7		<1	3	500	10	<10	5400	<1	40	190	<20			140	40	10	80
COF-CA21B	10/28/2003	18150	57.65	10		<0.6	3.8	13700	32.7	<10	8400	7.1	810	260	70			600	460	25	100
COF-CA21B	4/14/2004	6445	55.94	0.87		<0.6	<0.1	2800	3.3	<10	870	0.9	160	46	51			220	130	<10	<10
COF-CA21B	10/26/2004	17874	56.07	1.8		<3	<1	2700	7	<10	1500	<1	70	67	20			230	130	<10	<10
COF-CA21B	4/14/2005	16823	55.35	2.3		<3	1	1100	6	<10	1800	<1	50	70	<20			160		<10	<10
COF-CA21B	4/14/2005	16826	55.35	2.4		<3	1	1100	5	<10	1900	<1	40	72	<20			150		<10	<10
COF-CA21B	5/11/2005	21000	55.71																102		
COF-CA21B	5/11/2005	21001	55.71																99		
COF-CA21B	10/19/2005	38787	57.75	4.9		<3	1	6000	9	<10	3800	2	200	46	20			270	65	<10	30
COF-CA21B	4/10/2006	AG33609	54.63	4		<3	<1	1800	17	<10	3200	4	70	93	40			220	70	<10	30
COF-CA21B	10/11/2006	AG54834	21.5	5.8	<0.01	<3	2	8000	29	<10	3900	2	230	250	100	0.94		340	290	<10	40
COF-CA21B	10/11/2006	AG54835	21.5	5.6	<0.01	<3	2	8100	29	<10	3800	2	220	250	100	0.94		350	300	<10	40
COF-CA21B	4/10/2007	AH30350	21.5	1	<0.1	<1	1.2	6400	7.3	1.6	590	<1	210	55	180	1.5	<0.1	380	210	<10	13
COF-CA21B	10/15/2007	L315801-15	23	4.9	0.14	<1	2.9	12000	23	4.4	2800	1.8	270	98	100	36	<0.1	430	390	<10	40
COF-CA21B	4/15/2008	L341361-16	21.5	0.52	<0.1	<1	1.5	4900	8.7	1.8	350	<1	100	16	29	11	<0.1	250	170	<10	22
COF-CA21B	10/21/2008	L371417-17	21.5	11	<0.1	<1	2.6	11000	9.8	2.2	11000	1.9	240	240	97	1.2	0.12	430	360	21	64
COF-CA21B	4/7/2009	L396908-14	21.5	0.38	<0.1	<1	<1	1900	3.3	<1	240	<1	48	26	44	0.96	<0.1	200	67	<2	<10
COF-CA21B	10/27/2009	L429478-16	21.5	<0.1	0.2	<1	<1	3100	3.1	<2	<100	<1	60	19	40	1.2	<0.1	230	110	<2	<10
COF-CA21B	4/26/2010	L456474-17	21.5	1.1	<0.1	<1	1.9	5500	9	2.6	1100	1.6	160	82	180	1.7	<0.1	450	170	2.2	24
COF-CA21B	4/26/2010	L456474-28	21.5	3.1	0.12	<1	9	5600	11	<2	2100	1.1	140	93	170	1.7	<0.1	410	160	3.6	24
COF-CA21B	10/19/2010	L485273-17	21.5	4.8	<0.1	<1	<1	9300	9.6	<2	2700	1.2	200	54	100	1.2	<0.1	400	360	3.9	32
COF-CA21B	4/12/2011	L511237-17	21.5	0.32	<0.1	<1	<1	1900	2.2	<2	180	<1	39	<10	20	0.89	<0.1	200	62	<2	<10
COF-CA21B	10/19/2011	L542857-17	17.59	0.29	<0.1	<1	19	<200	27	12	510	15	<15	10	7.1	1.1	1.7	270	260	26	240
COF-CA21B	4/10/2012	L569652-17	18	0.36	<0.1	<1	1.9	3300	14	<2	370	<1	65	22	55	0.94	<0.1	240	110	<2	<10
COF-CA21B	10/24/2012	L602894-17	17.62	0.92	<0.1	<1	1	4100	2.4	<2	600	1.2	90	38	51	1.1	0.73	290	140	2.6	25
COF-CA21B	4/8/2013	L629952-03	18																78		
COF-CA21B	4/8/2013	L630049-17	18	<0.1	<0.1	<1	<1	2300	3.4	<2	<100	<1	69	25	83	<0.1	<0.1	290	76	<2	<10
COF-CA21B	7/22/2013	L648194-03	18																76		
COF-CA21B	10/23/2013	4087278017	17.64	1.13	<0.5	<1	<1	4780	4.2	<10	712	<1	95.8	36	58.7	1.6	0.65	314	146	2.1	<40
COF-CA21B	10/23/2013	4087285001	17.64																161		
COF-CA21B	2/4/2014	490-45972-1	16.75			<2	<2		<5	<10		<5							184	5.71	<50
COF-CA21B	4/14/2014	490-51172-12	18	<0.1	<0.1	<2	<2	2580	3.28	<10	125	<2	55.5	<15	71.3	1.51	<0.1	289	80.5	<2	<50
COF-CA21B	10/23/2014	L729945-11	17.63	2	<0.25	<1	1.1	2800	9.4	2.3	1800	2.2	56	96	39	2.3	0.16	250	78	5	44
COF-CA21B	4/16/2015	L760001-07	17.63	1.6	<0.25	0.26	1.2	1500	<10	<20	1100	4	33	240	9.6	1.8	0.39	220	39	7	150

Table 6. Historical Groundwater Analytical Data

location_id	sample_date	lab_id	Sample_depth	Aluminum, total (mg/L)	Ammonia (as N) (mg/L)	Antimony, total (ug/L)	Arsenic, total (ug/L)	Boron, total (ug/L)	Chromium, total (ug/L)	Copper, total (ug/L)	Iron, total (ug/L)	Lead, total (ug/L)	Lithium, total (ug/L)	Manganese, total (ug/L)	Molybdenum, total (ug/L)	Nitrite + Nitrate (mg/L)	Phosphorus, total (mg/L)	Strontium, total (ug/L)	Sulfate, total (mg/L)	Vanadium, total (ug/L)	Zinc, total (ug/L)
COF-CA22B	9/29/1989	11653	38.81	0.2			3	<500	5	20	1500	3	<10	<5	<20	0.01		470	240		30
COF-CA22B	12/12/1989	14459	39.4	1.2			2	<500	5	<10	1800	3	<10	65	20	0.01		470	230		40
COF-CA22B	3/7/1990	2821	38.29	0.07			1	<500	2	<10	180	2	<10	<5	<20	<0.01		410	220		10
COF-CA22B	6/13/1990	7373	37.21	0.06			2	<500	2	40	160	1	<10	210	30	0.05		420	230		40
COF-CA22B	9/27/1990	15143	37.8	<0.05			<1	<500	3	<10	220	<1	<10	24	<20	<0.01		370	190		30
COF-CA22B	12/13/1990	18906	39.4	<0.05			1	<500	1	<10	190	2	<10	17	<20	<0.01		390	220		<10
COF-CA22B	3/18/1991	4909	35.01	<0.05			1	<500	<1	<10	170	<1	<10	14	<20	0.02		500	200		20
COF-CA22B	7/1/1991	12574	35.3	<0.05			7	<500	2	<10	500	3	<10	<5	<20	0.02		340	240		10
COF-CA22B	9/26/1991	18366	53.09	0.13			<1	<500	4	20	280	2	<10	44	<20	0.03		340	150		30
COF-CA22B	11/18/1993	15773	34.19	<0.05		<1	<1	<500	2	<10	120	<1	<10	<5	<20			250	170		<10
COF-CA22B	3/2/1994	1590	33.66	<0.05		<1	<1	<500	<1	<10	20	<1	20	59	<20	0.04		400	120		<10
COF-CA22B	6/1/1994	6056	33.93	<0.05		<1	<1	<500	2	<10	160	3	<10	<5	<20			330	160		20
COF-CA22B	8/30/1994	11810	34.12	<0.05		<1	1	<500	<1	<10	150	2	<10	<5	<20	0.03		340	150		30
COF-CA22B	11/3/1994	15774	34.02	<0.05		<1	<1	<500	7	<10	1400	4	<10	<5	<20			310	160		100
COF-CA22B	3/2/1995	1806	33.56	0.08		<1	<1	<500	3	<10	220	2		<5		0.01		270	150	<10	<10
COF-CA22B	6/7/1995	5765	33.86	<0.05		<1	1	<500	2	<10	150	<1	<10	<5	<20			330	130		<10
COF-CA22B	9/20/1995	10874	33.66	<0.05		<1	2	<500	2	<10	360	3	<10	<5	<20			290	130		<10
COF-CA22B	11/9/1995	12669	33.96	<0.05		<1	29	<500	1	<10	90	2	<10	<5	<20			280	140		<10
COF-CA22B	3/12/1996	2758	33.11	<0.05		<1	<1	<500	2	<10	90	<1	<10	<5	<20			310	120		<10
COF-CA22B	6/7/1996	6195	33.5	<0.05		<1	1	<500	18	<10	310	<1	<10	<5	<20			300	110		<10
COF-CA22B	9/11/1996	15080	33.33	<0.05		<1	2	<500	14	<10	220	<1	<10	<5	<20			270	94	<10	<10
COF-CA22B	2/25/1997	2356	32.74	<0.05		<1	<1	<500	2	<10	10	2	<10	<5	<20			270	160	<10	<10
COF-CA22B	10/29/2003	18151	33.99	0.06		<0.6	<0.1	<200	4	<10	110	0.9	<10	<5	<20			320	84	<10	<10
COF-CA22B	4/14/2004	6446	33.5	<0.05		0.9	<0.1	<200	1.7	<10	100	0.5	<10	5	<20			280	84	<10	<10
COF-CA22B	10/26/2004	17875	33.11	<0.05		<3	<1	<200	1	<10	150	<1	<10	7	<20			280	110	<10	<10
COF-CA22B	4/14/2005	16824	32.94	<0.05		<3	<1	<200	1	<10	90	<1	10	<5	<20			260		<10	<10
COF-CA22B	5/10/2005	21002	33.04																80		
COF-CA22B	10/19/2005	38788	33.6	0.12		<3	<1	<200	1	<10	180	<1	<10	<5	<20			270	84	<10	<10
COF-CA22B	4/11/2006	AG33610	33.14	<0.2		<3	<1	<200	2	<10	80	<1	<10	<5	<20			280	78	<10	<10
COF-CA22B	10/11/2006	AG54836	20	<0.2	<0.01	<3	<1	<200	3	<10	100	<1	<10	<5	<20	<0.01		250	76	<10	<10
COF-CA22B	4/10/2007	AH30351	20	<0.1	<0.1	<1	<1	<200	4.1	<1	<100	<1	<10	<10	<5	<0.1	<0.1	240	75	<10	<10
COF-CA22B	10/16/2007	L315801-16	20	<0.1	<0.1	<1	<1	<200	3	1.1	130	<1	<15	<10	<5	<0.1	<0.1	270	77	<10	<10
COF-CA22B	4/15/2008	L341361-17	20	<0.1	<0.1	<1	<1	<200	4.5	<1	<100	<1	<15	<10	<5	<0.1	<0.1	260	78	<10	<10
COF-CA22B	4/15/2008	L341361-18	20	<0.1	<0.1	<1	<1	<200	3.9	1.8	<100	<1	<15	<10	<5	<0.1	<0.1	250	78	<10	<10
COF-CA22B	10/21/2008	L371417-18	20.5	<0.1	<0.1	<1	<1	<200	4.5	<1	110	<1	<15	<10	<5	<0.1	<0.1	270	81	<10	29
COF-CA22B	4/7/2009	L396908-15	20	<0.1	<0.1	<1	<1	<200	1.7	<1	120	<1	<15	<10	5.3	<0.1	<0.1	260	81	<2	110
COF-CA22B	10/27/2009	L429478-17	18	<0.1	<0.1	<1	<1	<200	<2	<2	<100	<1	<15	<10	<5	<0.1	<0.1	260	85	<2	<10
COF-CA22B	4/27/2010	L456474-18	20.5	<0.1	<0.1	<1	<1	<200	2.3	<2	<100	<1	<15	<10	<5	<0.1	<0.1	280	89	<2	<10
COF-CA22B	10/19/2010	L485273-18	20.5	<0.1	<0.1	<1	<1	<200	2.6	<2	140	<1	<15	<10	<5	<0.1	<0.1	250	89	<2	<10
COF-CA22B	4/12/2011	L511237-18	20.5	0.11	<0.1	<1	<1	<200	<2	<2	<100	<1	<15	<10	<5	<0.1	<0.1	270	87	<2	16
COF-CA22B	10/19/2011	L542857-18	20	29	<0.1	<1	1.5	7300	9.3	<2	36000	1.8	160	1700	88	<0.1	<0.1	390	87	<2	11
COF-CA22B	4/11/2012	L569652-18	20	<0.1	<0.1	<1	<1	<200	<2	<2	<100	<1	<15	12	11	<0.1	<0.1	270	420	<2	<10
COF-CA22B	10/24/2012	L602894-18	20.5	<0.1	<0.1	<1	<1	<200	4.4	<2	<100	<1	<15	<10	7	<0.1	<0.1	280	88	<2	<10
COF-CA22B	4/9/2013	L630049-18	20.5	<0.1	0.14	<1	<1	<200	4.7	<2	100	<1	16	<10	<2	<0.1	<0.1	280	88	<2	<10
COF-CA22B	10/23/2013	4087278018	10.81	<0.5	<0.5	<1	<1	<100	3.8	<10	113	<1	3.2	<5	<20	<0.25	<0.4	278	83.9	<1	<40
COF-CA22B	4/15/2014	490-51172-13	20.5	<0.1	<0.1	<2	<2	<50	3.56	<10	<100	<2	<20	<15	<50	<0.1	<0.1	314	69.6	<2	<50
COF-CA22B	10/24/2014	L729945-12	18	<0.1	<0.25	<1	<1	<200	3.5	<2	<100	<1	<15	<10	<5	<0.1	<0.1	270	92	<2	<10
COF-CA22B	4/13/2015	L760001-08	18	<0.1	<0.25	<2	<2	<200	<10	<20	<100	<2	<15	<10	<5	<0.1	<0.1	280	93	0.31	<50
COF-CA27BR	4/14/2005	16825	44.85	0.35		3	<1	<200	4	<10	430	<1	10	13	<20			210		<10	10
COF-CA27BR	5/11/2005	21003	44.88																15		
COF-CA27BR	10/19/2005	38789	45.41	0.16		<3	<1	<200	<1	<10	100	<1	<10	<5	<20			180	4	<10	<10
COF-CA27BR	4/11/2006	AG33611	44.91	0.4		<3	<1	300	4	<10	330	<1	<10	9	<20			180	4	<10	10
COF-CA27BR	10/11/2006	AG54837	0	0.5	0.01	<3	1	<200	2	<10	350	1	<10	8	<20	<0.01		190	4.2	<10	20
COF-CA27BR	4/10/2007	AH30352	13.72	1.4	<0.1	1.7	<1	<200	9.1	6.2	610	1.4	<10	<10	<5	<0.1	<0.1	180	<5	<10	13
COF-CA27BR	10/16/2007	L315801-17	14.01	0.54	<0.1	1.1	1.8	<200	6	4.3	390	3	<15	<10	<5	<0.1	<0.1	190	7.4	<10	<10
COF-CA27BR	4/15/2008	L341361-19	19.62	0.13	<0.1	<1	<1	<200	4.4	7.2	150	1.4	<15	<10	<5	<0.1	<0.1	180	5.2	<10	16
COF-CA27BR	10/21/2008	L371417-19	14.02	<0.1	<0.1	1.1	<1	<200	3.2	1.6	200	<1	<15	<10	5.4	<0.1	<0.1	180	<5	<10	<10
COF-CA27BR	4/7/2009	L396908-16	13.75	0.38	<0.1	<1	<1	<200	<1	<1	250	<1	<15	<10	<5	<0.1	<0.1	160	<5	<2	18
COF-CA27BR	10/27/2009	L429478-18	13.79	0.16	<0.1	<1	<1	<200	<2	<2	140	<1	<15	<10	<5	<0.1	<0.1	160	6.9	<2	63
COF-CA27BR	4/27/2010	L456474-19	13.63	<0.1	<0.1	<1	<1	<200	<2	<2	<100	<1	<15	<10	<5	<0.1	<0.1	170	<5	<2	<10
COF-CA27BR	10/19/2010	L485273-19	13.85	0.32	<0.1	<1	<1	<200	<2	<2	380	<1	<15	<10	<5	<0.1	<0.1	170	6.1	<2	<10
COF-CA27BR	4/12/2011	L511237-19	13.68	0.83	<0.1	<1	<1	<200	<2	<2	340	<1	<15	<10	<5	<0.1	<0.1	180	<5	<2	<10
COF-CA27BR	10/19/2011	L542857-19	13.88	0.68	<0.1	24	3	<200	9.4	8.6	1100	5.6	<15	33	5.1	<0.1	0.15	170	<5	3.1	33
COF-CA27BR	4/11/2012	L569652-19	13.79	<0.1	<0.1	1.7	<1	<200	<2	<2	<100	<1	<15	<10	5.7	<0.1	<0.1	160	<5	<2	<10
COF-CA27BR	10/24/2012	L602894-19	13.83	<0.1	0.16	3.5	<1	<200	3.1	<2	100	<1	<15	<10	<5	<0.1	<0.1	190	5.5	<2	<10
COF-CA27BR	4/9/2013	L630049-19	13.66	<0.1	<0.1	<1	<1	<200	<2	<2	<100	<1	<15	<10	<2	<0.1	<0.1	160	<5	<2	<10
COF-CA27BR	10/23/2013	4087278019	13.84	<0.5	<0.5	1.9	<1	<100	<1	<10	<100	<1	3.4	<5	<20	<0.25	<0.4	165	5.5	1.1	<40
COF-CA27BR	4/16/2014	490-51172-14	13.76	<0.1	0.113	<2	<2	<50	<2	<10	<100	<2	<20	<15	<50	<0.1	<0.1	171	5.01	2.56	<50
COF-CA27BR	10/22/2014	L729945-13	13.87	<0.1	<0.25	<1	<1	<200	<2	<2	<100	<1	<15	<10	<5	<0.1	<0.1	160	<5	<2	11
COF-CA27BR	4/14/2015	L760001-09	13.87	<0.1	<0.25	0.38	<2	<200	<10	<20	<100	<2	<15	<10	<5	<0.1	<0.1	170	4.7	0.92	<50

Table 6. Historical Groundwater Analytical Data

location_id	sample_date	lab_id	Sample_depth	Aluminum, total (mg/L)	Ammonia (as N) (mg/L)	Antimony, total (ug/L)	Arsenic, total (ug/L)	Boron, total (ug/L)	Chromium, total (ug/L)	Copper, total (ug/L)	Iron, total (ug/L)	Lead, total (ug/L)	Lithium, total (ug/L)	Manganese, total (ug/L)	Molybdenum, total (ug/L)	Nitrite + Nitrate (mg/L)	Phosphorus, total (mg/L)	Strontium, total (ug/L)	Sulfate, total (mg/L)	Vanadium, total (ug/L)	Zinc, total (ug/L)
COF-CA28B	9/26/1989	11396	57.19	0.17			1	<500	2	<10	23000	<1	<10	700	<20	0.07		280	5		<10
COF-CA28B	12/14/1989	14462	43.9	<0.05			<1	<500	1	<10	18000	<1	<10	660	<20	0.09		220	1		<10
COF-CA28B	3/7/1990	2824	42.69	<0.05			2	<500	2	<10	17000	<1	<10	540	<20	0.05		180	3		<10
COF-CA28B	6/13/1990	7376	41.7	0.08			<1	<500	<1	10	23000	<1	<10	840	<20	0.03		230	<1		100
COF-CA28B	9/27/1990	15145	43.7	<0.05			<1	<500	2	<10	20000	1	<10	810	<20	0.06		230	6		20
COF-CA28B	12/13/1990	18908	44.39	<0.05			<1	<500	<1	<10	26000	1	<10	800	<20	0.08		230	<1		<10
COF-CA28B	3/18/1991	4912	42.49	<0.05			<1	<500	<1	<10	22000	<1	<10	750	<20	0.07		400	<1		40
COF-CA28B	7/1/1991	12577	38.91	<0.05			3	<500	2	<10	24000	<1	<10	660	<20	0.02		220	3		<10
COF-CA28B	9/26/1991	18357	40.59	0.05			<1	<500	<1	20	26000	4	<10	790	<20	0.03		70	1		20
COF-CA28B	12/19/1991	21363	41.21	0.11			<1	<500	<1	<10	27000	9	<10	870	<20	0.04		<50	<1		10
COF-CA28B	3/26/1992	3071	41.41	0.08			<1	<500	2	<10	28000	4	80	680	<20	<0.01		200	22		80
COF-CA28B	6/17/1992	7463	41.14	<0.05			6	<500	4	10	23000	<1	40	750	<20			210	43		10
COF-CA28B	9/1/1992	12429	46.79	0.093			<1	<500	<1	<10	1700	10	<10	650	<20	<0.01		200	<1		120
COF-CA28B	12/8/1992	17188	43.74	0.07		<1	<1	<500	3	<10	31000	2	<10	830	<20			270	<1		<10
COF-CA28B	3/11/1993	1890	43.8	<0.05		1	<1	<500	<1	<10	24000	3	<10	710	<20	0.09		210	6		10
COF-CA28B	6/14/1993	5542	42.65	<0.05		<1	<1	<500	<1	<10	23	3	<10	920	<20			190	11		<10
COF-CA28B	9/15/1993	12155	43.97	<0.05		<1	<1	<500	1	10	25000	2	<10	560	<20	0.86		240	2		20
COF-CA28B	11/17/1993	15775	42.75	<0.05		1	<1	<500	1	<10	15000	<1	<10	570	<20			70	2		<10
COF-CA28B	3/1/1994	1592	43.31	0.23		<1	<1	<500	2	<10	20000	24	<10	650	<20	<0.01		230	<2		110
COF-CA28B	6/2/1994	6057	41.14	<0.05		<1	<1	<500	<1	<10	20000	3	<10	570	<20			200	1		20
COF-CA28B	8/31/1994	12027	45.21	0.07		<1	1	<500	<1	<10	21000	2	<10	1400	<20	<0.01		100	24		20
COF-CA28B	11/1/1994	15628	44.62	0.28		<1	2	<500	5	<10	27000	5	<10	590	<20			300	5		<10
COF-CA28B	3/3/1995	1808	43.57	0.07		1	1	<500	5	<10	24000	4		660		0.03		180	<1	<10	<10
COF-CA28B	6/7/1995	5767	41.9	<0.05		1	<1	<500	6	<10	23000	1	<10	560	<20			210	<2		<10
COF-CA28B	9/19/1995	10876	43.21	0.09		<1	2	<500	<1	<10	24000	7	<10	610	<20			220	2		<10
COF-CA28B	11/7/1995	12671	43.54	<0.05		<1	3	<500	1	<10	23000	4	<10	560	<20			190	10		<10
COF-CA28B	3/13/1996	2837	43.41	<0.05		<1	<1	<500	10	<10	22000	<1	<10	560	<20			190	4		<10
COF-CA28B	6/6/1996	6194	40.95	<0.05		<1	1	<500	4	<10	27000	<1	<10	680	<20			200	4		<10
COF-CA28B	9/5/1996	15082	41.73	0.08		<1	<1	<500	40	<10	30000	4	<10	650	<20			200	3	<10	<10
COF-CA28B	2/26/1997	2358	42.26	<0.05		<1	<1	<500	2	<10	23000	<1	<10	560	<20			200	4	<10	<10
COF-CA28B	10/23/2003	17881	42.55	0.202		<0.1	<0.1	<200	<0.5	<10	26800	1.4	<10	780	<20			220	<1	<10	<10
COF-CA28B	4/15/2004	6448	41.7	<0.05		<0.6	<0.1	<200	<0.1	<10	20000	0.5	<10	570	<20			190	1.6	<10	<10
COF-CA28B	10/27/2004	17877	40.88	<0.05		<3	<1	<200	<1	<10	24000	<1	<10	650	<20			230	3	<10	<10
COF-CA28B	4/14/2005	16827	39.34	<0.05		<3	1	<200	1	<10	19000	<1	10	580	<20			180		<10	<10
COF-CA28B	5/10/2005	21004	40.32																<1		
COF-CA28B	10/19/2005	38790	42.46	<0.05		<3	<1	<200	<1	<10	20000	<1	<10	560	<20			210	<1	<10	<10
COF-CA28B	4/11/2006	AG33612	42.85	<0.2		<3	<1	<200	2	<10	20000	<1	<10	570	<20			230	<1	<10	<10
COF-CA28B	10/11/2006	AG54838	20	<0.2	3.7	<3	1	<200	1	<10	19000	<1	<10	560	<20	<0.01		190	<1	<10	<10
COF-CA28B	4/10/2007	AH30353	25	<0.1	3.3	<1	<1	<200	4.1	<1	18000	<1	<10	540	<5	<0.1	0.52	190	<5	<10	<10
COF-CA28B	10/16/2007	L315801-18	26	<0.1	3.4	<1	<1	<200	3.5	<1	19000	<1	<15	570	<5	<0.1	0.47	210	<5	<10	<10
COF-CA28B	4/15/2008	L341361-20	30.2	<0.1	2.8	<1	<1	<200	1.7	1.9	21000	<1	<15	580	<5	<0.1	0.51	200	<5	<10	22
COF-CA28B	10/21/2008	L371417-20	16.89	<0.1	4.6	<1	<1	<200	4.2	<1	19000	<1	<15	600	<5	<0.1	0.31	200	<5	<10	<10
COF-CA28B	4/7/2009	L396908-17	13.5	0.14	3.4	<1	<1	<200	<1	<1	17000	<1	<15	570	<5	<0.1	0.45	200	<5	<2	29
COF-CA28B	10/27/2009	L429478-19	13.28	<0.1	3.4	<1	<1	<200	<2	<2	17000	<1	<15	570	<5	<0.1	0.55	200	<5	<2	<10
COF-CA28B	4/27/2010	L456474-20	12.92	<0.1	3.3	<1	4.8	<200	<2	<2	19000	<1	<15	580	<5	<0.1	0.49	200	<5	<2	<10
COF-CA28B	10/19/2010	L485273-20	13.25	0.22	3.6	<1	<1	<200	<2	3.4	23000	3	<15	600	<5	<0.1	1.6	260	<5	<2	20
COF-CA28B	4/12/2011	L511237-20	13.24	<0.1	3.1	<1	1.6	<200	<2	<2	19000	<1	<15	580	<5	<0.1	0.52	200	<5	<2	<10
COF-CA28B	10/19/2011	L542857-20	13.16	<0.1	3.3	1.2	2.1	<200	<2	<2	20000	<1	<15	580	<5	<0.1	0.6	190	<5	<2	<10
COF-CA28B	4/11/2012	L569652-20	13.18	<0.1	3.3	<1	<1	<200	<2	<2	18000	<1	<15	540	13	<0.1	0.53	180	<5	<2	<10
COF-CA28B	10/24/2012	L602894-20	13.26	<0.1	3.6	1.3	1.3	<200	<2	<2	25000	<1	<15	680	<5	<0.1	0.56	210	<5	<2	<10
COF-CA28B	4/9/2013	L630049-20	13.18	<0.1	3.6	<1	<1	<200	<2	<2	20000	<1	18	600	<2	0.11	0.42	190	<5	<2	<10
COF-CA28B	10/23/2013	4087278020	13.04	<0.5	3.6	<1	<1	<100	<1	<10	17800	<1	1.4	553	<20	<0.25	0.43	196	<4	<1	<40
COF-CA28B	4/16/2014	490-51172-15	13.19	<0.1	3.59	<2	<2	<50	<2	<10	19700	<2	<20	560	<50	<0.1	0.348	200	<1	<2	<50
COF-CA28B	4/16/2014	490-51172-16	13.19	<0.1	3.4	<2	<2	<50	<2	<10	20000	<2	<20	551	<50	<0.1	0.44	200	<1	<2	<50
COF-CA28B	10/22/2014	L729945-14	13.58	<0.1	3.2	<1	<1	<200	<2	<2	19000	<1	<15	570	<5	<0.1	0.47	200	<5	<2	<10
COF-CA28B	4/15/2015	L760001-10	13.58	<0.1	3.5	0.49	0.45	<200	<10	<20	19000	<2	<15	580	<5	<0.1	0.48	200	<5	0.33	<50
COF-CA29AR	4/14/2004	6449	7.22	0.66		<0.6	0.8	1200	0.9	<10	880	0.5	<10	940	50			100	63	<10	<10
COF-CA29AR	10/19/2004	17274	7.35	3.5		<3	2	1700	8	<10	4100	<1	<10	1100	60			120	88	<10	20
COF-CA29AR	4/12/2005	16809	7.35	1.3		<3	1	800	3	<10	1200	<1	<10	260	40			90		<10	<10
COF-CA29AR	5/10/2005	21005	9.65																76		
COF-CA29AR	10/18/2005	38791	9.91	1.2		<3	3	2300	<1	<10	1200	<1	<10	350	110			130	94	<10	<10
COF-CA29AR	4/10/2006	AG33613	7.28	0.2		<3	<1	1400	<1	<10	330	<1	<10	430	60			120	48	<10	<10
COF-CA29AR	10/10/2006	AG54839	8	0.7	0.08	<3	5	2300	1	<10	1000	<1	<10	710	120	<0.01		110	88	<10	20
COF-CA29AR	4/9/2007	AH30354	8	2	<0.1	<1	3	1800	12	1.5	1600	1.1	<10	580	65	<0.1	<0.1	100	71	<10	14
COF-CA29AR	10/15/2007	L315801-19	8	2.2	0.2	<1	7.4	2800	6.4	<1	1800	1.1	<15	400	140	<0.1	<0.1	130	99	<10	<10
COF-CA29AR	4/14/2008	L341361-21	8	1.8	<0.1	<1	2.4	1700	4.3	6	2000	1.4	<15	460	42	34	<0.1	97	51	<10	19
COF-CA29AR	10/20/2008	L371417-21	8	0.25	<0.1	<1	5.1	2600	1.6	<1	730	<1	<15	510	120	<0.1	<0.1	120	97	<10	<10
COF-CA29AR	10/20/2008	L371417-22	8	0.29	<0.1	<1	5.3	2600	1.2	<1	900	<1	<15	570	110	<0.1	<0.1	120	92	<10	27
COF-CA29AR	4/6/2009	L396908-18	8	1.8	<0.1	<1	1.3	1300	2.1	1.2	1200	<1	<15	260	33	<0.1	<0.1	88	40	<2	210
COF-CA29AR	10/26/2009	L429478-20	8	<0.1	<0.1	<1	3.2	1400	<2	<2	590	<1	<15	620	46	<0.1	<0.1	94	44	<2	<10
COF-CA29AR	4/26/2010	L456474-21	8	2.2	<0.1	<1	4.6	1300	8.2	<2	2100	1.5	<15	340	45	<0.1	0.14	110	46	5.8	15
COF-CA29AR	10/19/2010	L485273-21	8	0.5	<0.1	<1	2.7	1800	<2	<2	870	1.1	<15	670	66	<0.1	<0.1	97	80	<2	<10
COF-CA29AR	4/11/2011	L511237-21	8	0.14	<0.1	<1	1.2	1300	<2	<2	210	<1	<15	220	32	<0.1	<0.1	88	37	<2	<10
COF-CA29AR	10/19/2011	L542857-21	8	<0.1	<0.1	<1	4.6	1800	<2	<2	200	<1	<15	620	66	<0.1	<0.1	99	68	<2	<10
COF-CA29AR	4/10/2012	L569652-21	8	<0.1	<0.1	<1	<1	1400	<2	<2	170	<1	<15	230	46	<0.1	<0.1	88	52	<2	<10
COF-CA29AR	10/23/2012	L602894-21	8	<0.1	<0.1	<1	2.9	2000	<2	<2	680	<1	<15	700	67	<0.1	<0.1	110	72	<2	<10
COF-CA29AR	4/8/2013	L630049-21	8	<0.1	<0.1	<1	<1	1200	<2	<2	<100	<1	<15	200	33	0.3	<0.1	94	36	<2	<10
COF-CA29AR	10/22/2013	4087278021	8	<0.5	<0.5	<1	3.1	1970	1.1	<10	319	<1	<1	606	68.1	<0.25	<0.4	105	70.1	<1	<40
COF-CA29AR	4/15/2014	490-51172-17	8	<0.1	<0.1	<2	<2	1670	<2	<10	262	<2	<20	267	<50	0.126	0.17	102	50.6	<2	<50
COF-CA29AR	10/22/2014	L729945-15	8	<0.1	<0.25	<1	1.9	1900	<2	<2	220	<1	<15	680	56	<0.1	<0.1	100	73	<2	<10
COF-CA29AR	4/8/2015	L758754-03	8	0.1	<0.25	1.3	1.7	1100	2.6	<20	100	0.26	<15	170	25	0.12		89	13	4.2	7.6

Table 6. Historical Groundwater Analytical Data

location_id	sample_date	lab_id	Sample_depth	Aluminum, total (mg/L)	Ammonia (as N) (mg/L)	Antimony, total (ug/L)	Arsenic, total (ug/L)	Boron, total (ug/L)	Chromium, total (ug/L)	Copper, total (ug/L)	Iron, total (ug/L)	Lead, total (ug/L)	Lithium, total (ug/L)	Manganese, total (ug/L)	Molybdenum, total (ug/L)	Nitrite + Nitrate (mg/L)	Phosphorus, total (mg/L)	Strontium, total (ug/L)	Sulfate, total (mg/L)	Vanadium, total (ug/L)	Zinc, total (ug/L)
COF-CA30B	4/12/2011	L511237-29	16	<0.1	<0.1	<1	<1	<200	<2	<2	<100	<1	<15	1200	5	0.14	<0.1	440	94	<2	21
COF-CA30B	10/18/2011	L542857-29	16	0.2	0.11	<1	2.9	<200	280	7.8	1400	<1	<15	1100	47	<0.1	<0.1	480	83	<2	12
COF-CA30B	4/11/2012	L569652-28	16	0.12	<0.1	<1	1.5	<200	6.2	<2	120	<1	<15	1700	10	<0.1	<0.1	220	81	<2	<10
COF-CA30B	10/24/2012	L602894-28	16	<0.1	<0.1	<1	<1	<200	3.8	<2	110	<1	<15	810	6.2	<0.1	<0.1	290	72	<2	<10
COF-CA30B	4/9/2013	L630049-25	16	<0.1	<0.1	<1	<1	<200	<2	<2	<100	<1	<15	1400	<2	<0.1	<0.1	240	69	<2	<10
COF-CA30B	10/22/2013	4087278022	16	<0.5	<0.5	<1	<1	107	45.1	<10	532	<1	1.8	392	<20	<0.25	<0.4	344	65.8	<1	<40
COF-CA30B	4/15/2014	490-51172-19	16	<0.1	<0.1	<2	<2	131	<2	<10	131	<2	<20	833	<50	<0.1	<0.1	199	67	<2	<50
COF-CA30B	10/23/2014	L729945-17	16	<0.1	<0.25	<1	<1	<200	2.9	<2	510	<1	<15	2100	<5	<0.1	<0.1	210	58	<2	13
COF-CA30B	4/9/2015	L758754-15	16	<0.1	<0.25	<2	1.2	110	2.3	<20	520	0.54	<15	2000	<5	0.028		200	73	<5	30
COF-CA31A	4/12/2011	L511237-30	4.19	0.1	0.28	<1	<1	620	<2	<2	110	<1	<15	110	21	0.2	<0.1	140	44	<2	<10
COF-CA31A	10/19/2011	L542857-30	4.49	0.18	0.56	<1	6.9	910	<2	12	900	<1	<15	650	38	<0.1	<0.1	220	92	2.9	28
COF-CA31A	4/11/2012	L569652-29	4.39	0.1	0.32	<1	<1	760	<2	<2	380	<1	<15	370	40	<0.1	<0.1	170	81	<2	<10
COF-CA31A	10/24/2012	L602894-29	4.3	<0.1	0.25	<1	2	890	<2	<2	390	<1	<15	180	51	<0.1	<0.1	180	76	<2	<10
COF-CA31A	4/9/2013	L630049-26	4.29	<0.1	<0.1	<1	<1	590	<2	<2	100	<1	<15	160	21	0.12	<0.1	160	49	<2	<10
COF-CA31A	10/21/2013	4087278023	4.36	1.99	<0.5	<1	3.8	295	3.7	<10	1510	1.1	3.4	145	<20	<0.25	<0.4	164	26.9	6.2	<40
COF-CA31A	4/15/2014	490-51172-20	4.19	0.12	0.194	<2	<2	263	<2	<10	1120	<2	<20	50.4	<50	0.318	<0.1	340	38.9	<2	<50
COF-CA31A	10/22/2014	L729945-18	4.33	<0.1	<0.25	<1	2.2	840	<2	<2	190	<1	<15	71	19	<0.1	<0.1	190	56	<2	12
COF-CA31A	4/8/2015	L758754-06	4.33	0.12	<0.25	1.2	5.4	610	<10	<20	1200	0.58	<15	36	17	0.05		210	38	4	12
COF-CA31A	4/8/2015	L758754-07	4.33	0.06	<0.25	0.81	2.9	550	<10	<20	440	0.38	<15	63	16	0.072		230	37	2.2	23
COF-CA5	1/12/1983		4.86	<0.1		<1	1		<1	<10	<50	<1		130		0.16			62		30
COF-CA5	2/2/1983		4.99				<1		<1	10	<50	6		120		0.19			62		130
COF-CA5	4/26/1983		4.3				<1			<10	120	<1		120		0.12			13		
COF-CA5	6/8/1983		10.5				<1			<10	220	1		210		0.53			11		
COF-CA5	6/8/1989	5681	7.71	4.3					13	90	4800	8		79		0.09			14		150
COF-CA5	12/14/1989	14443	7.61	2.1			1	<500	5	10	2100	4	<10	180	<20	0.11		<50	10		30
COF-CA5	3/6/1990	2800	6.2	24			2	<500	34	130	24000	41	<10	420	<20	0.09		120	15		450
COF-CA5	6/12/1990	7366	8.69	0.62			<1	<500	2	30	2000	2	<10	50	<20	0.06		170	9		70
COF-CA5	12/12/1990	18910	9.19	1.9			2	<500	3	<10	2100	40	<10	20	<20	0.18		60	13		<10
COF-CA5	3/14/1991	4732	4.59	6.4			<1	<500	8	10	4600	3	<10	76	<20	0.9		190	11		40
COF-CA5	6/27/1991	12453	8.01	6.8			<1	<500	13	20	6400	10	10	150	<20	0.11		<50	13		110
COF-CA5	9/23/1991	18151	12.3	120			1	<500	66	380	110000	97	120	2500	60	0.06		80	<1		730
COF-CA5	11/16/1993	15671	11.39	6.8		<1	2	<500	9	<10	7600	11	<10	300	<20			260	10		50
COF-CA5	2/28/1994	1548	4.63	6.5		<1	3	<500	6	<10	5100	14	<10	130	<20	0.08		<50	12		50
COF-CA5	5/30/1994	5852	9.19	2		<1	1	<500	8	<10	2100	10	<10	100	<20			<50	15		80
COF-CA5	8/30/1994	11690	10.27	15		<1	4	<500	40	60	15000	55	<10	700	<20	0.06		130	16		160
COF-CA5	11/1/1994	15623	10.5	1.4		<1	2	<500	4	<10	1600	2	10	680	<20			100	9		<10
COF-CA5	3/3/1995	1796	6.66	2.9		<1	<1	<500	2	<10	1800	<1		28		0.1		100	16	10	20
COF-CA5	6/8/1995	5748	10.7	0.83		<1	<1	<500	1	<10	750	1	<10	32	<20			70	9		10
COF-CA5	9/20/1995	10857	11.58	9.1		<1	3	<500	30	10	8900	21	<10	100	<20			70	8		60
COF-CA5	11/8/1995	12652	9.84	0.85		<1	1	<500	5	<10	710	3	<10	27	<20			100	12		<10
COF-CA5	3/20/1996	3218	4.59	2.5		<1	<1	<500	4	<10	2000	<1	<10	12	<20			<50	11		10
COF-CA5	6/6/1996	6189	9.22	1.7		<1	2	<500	7	<10	1400	4	<10	51	<20			<50	9		<10
COF-CA5	9/5/1996	13854	11.78	0.28		<1	<1	<500	10	<10	200	<1	<10	<5	<20			<50	11	<10	<10
COF-CA5	11/20/1996	13854	10.17	0.28		<1	<1	<500	10	<10	200	23	<10	<5	<20			<50	11		<10
COF-CA5	2/26/1997	2339	5.51	1.2		<1	2	<500	11	<10	670	2	11	8	<20			<50	15	<10	<10
COF-CA5	5/21/1997	6867	8.79	0.47		<1	<1	<500	2	<10	400	2	<10	5	<20			<50	6	<10	<10
COF-CA5	11/19/1997	15651	11.45	2.4		<1	<1	<500	5	<10	1900	3	<10	<5	20			130		<10	10
COF-CA5	5/20/1998	4487	7.15	1.1		<1	<1	<200	2	<10	830	<1	<10	13	<20			<50	11	<10	<10
COF-CA5	11/17/1998	10225	12.47	2.7		<1	1	<200	<1	<10	1800	3	<10	110	<20			80	18	<10	<10
COF-CA5	4/6/1999	3522	4.95	2.3		<1	<1	<200	5	<10	1200	2	<10	13	<20			<50	14	<10	<10
COF-CA5	10/6/1999	10645	12.83	12		<1	4	<200	16	<10	7000	9	<10	180	<20			90	50	10	40
COF-CA5	4/12/2000	4864	4.76	1.5		<1	<1	<200	3	<10	990	2	<10	16	48			51	11	<10	<10
COF-CA5	10/25/2000	12267	13.09	49		<1	9.7	<200	40	37	31000	28	<10	480	<20			140	16	82	200
COF-CA5	4/10/2001	3430	4.46	2.4		1.5	<1	<200	4.7	<10	1200	<1	<10	14	<20			<50	13	<10	<10
COF-CA5	10/24/2001	12976	10.5	0.67		<1	<1	<200	<1	<10	500	<1	<10	120	<20			80	13	<10	<10
COF-CA5	4/15/2002	6686	5.94	1.5		<1	<1	<200	5	<10	1000	3	<10	19	<20			<50	16	<10	17
COF-CA5	11/21/2002	19294	10.43	2		<1	<1	<200	3.6	<10	1200	<1	<10	12	<20			110	15	<10	<10
COF-CA5	4/8/2003	5691	5.61	1.5		<1	3	<200	3	<10	870	<1	<10	12	<20			<50	11	<10	20
COF-CA5	10/22/2003	17876	12.17	5.24		<0.1	5.4	<200	8.2	23	11000	7.9	<10	920	<20			230	10	<10	50
COF-CA5	4/14/2004	6434	6.2	2.6		<0.6	0.8	<200	3.2	<10	2300	3	<10	66	<20			50	18	<10	20
COF-CA5	10/27/2004	17865	10.37	0.36		<3	1	<200	1	<10	1800	<1	<10	670	<20			220	8.5	<10	<10
COF-CA5	4/11/2005	16802	5.12	0.37		<3	<1	<200	1	<10	280	<1	10	13	<20			<50		<10	20
COF-CA5	5/5/2005	19604	8.04																8		
COF-CA5	10/19/2005	38777	12.47	5.9		<3	6	<200	8	12	4000	7	<10	290	<20			160	5	<10	20
COF-CA5	4/11/2006	AG33598	6.56	0.3		<3	<1	200	3	<10	180	<1	10	6	<20			100	9	<10	20
COF-CA5	10/11/2006	AG54824	0	2	0.07	<3	2	<200	2	<10	1500	2	<10	140	<20	0.04		220	6.3	<10	20
COF-CA5	4/10/2007	AH30339	2.82	0.49	<0.1	<1	<1	<200	1.7	1.3	210	<1	<10	12	<5	<0.1	<0.1	70	9	<10	<10
COF-CA5	4/14/2008	L341361-07	1.78	4.1	<0.1	<1	<1	<200	6.4	2.3	1900	2.3	<15	25	<5	<0.1	<0.1	91	9.7	<10	33
COF-CA5	10/21/2008	L371417-07	3.86	5.2	<0.1	<1	1.5	<200	4	7	2800	4.7	<15	100	<5	<0.1	<0.1	330	12	<10	28
COF-CA5	10/26/2009	L429478-07	2.67	0.14	<0.1	<1	1.2	<200	<2	4.8	1100	1.3	<15	240	<5	<0.1	<0.1	180	9.5	<2	14
COF-CA5	4/27/2010	L456474-07	2.26	0.98	<0.1	<1	1.2	<200	<2	<2	3200	1.9	<15	27	<5	<0.1	<0.1	97	8	<2	13
COF-CA5	10/20/2010	L485273-07	3.86	8	0.14	<1	3.8	<200	18	160	100000	100	<15	340	<5	<0.1	0.62	260	6.4	<10	170
COF-CA5	4/11/2011	L511237-07	1.49	4.9	<0.1	<1	<1	<200	4.6	2.6	3300	2.6	<15	38	<5	<0.1	<0.1	62	7.2	4.8	22
COF-CA5	10/19/2011	L542857-07	3.7	0.48	0.12	<1	8.1	<200	<2	15	2600	11	<15	230	5.5	<0.1	<0.1	200	6.4	<2	15
COF-CA5	4/10/2012	L569652-07	2.33	0.26	<0.1	<1	<1	<200	<2	<2	200	<1	<15	<10	<5	<0.1	<0.1	77	8.5	<2	13
COF-CA5	10/23/2012	L602894-07	3.88	0.18	<0.1	<1	<1	<200	<2	2.1	360	1.2	<15	56	<5	<0.1	0.16	200	<5	<2	28
COF-CA5	4/8/2013	L630049-07	1.43	0.35	<0.1	<1	<1	<200	<2	<2	330	<1	<15	12	<2	<0.1	<0.1	44	7.3	<2	18
COF-CA5	10/22/2013	4087278005	3.8	3.02	<0.5	<1	1.7	<100	4.1	14.8	2420	3	1.9	113	<20	<0.25	<0.4	201	6.3	3.8	<40
COF-CA5	4/15/2014	490-51172-1	2.13	0.706	0.163	<2	<2	<50	<2	<10	528	<2	<20	<15	<50	<0.1	<0.1	59.7	11.4	2.7	<50
COF-CA5	10/23/2014	L729945-01	3.76	0.16	<0.25	<1	<1	<200	<2	8.6	1400	<1	<15	100	<5	0.13	0.51	200	5.5	<2	62
COF-CA5	4/8/2015	L758754-02	3.76	0.34	<0.25	0.51	0.33	58	<10	<20	920	1.2	<15	11	<5	<0.1		42	1.8	0.73	28

Table 6. Historical Groundwater Analytical Data

location_id	sample_date	lab_id	Sample_depth	Aluminum, total (mg/L)	Ammonia (as N) (mg/L)	Antimony, total (ug/L)	Arsenic, total (ug/L)	Boron, total (ug/L)	Chromium, total (ug/L)	Copper, total (ug/L)	Iron, total (ug/L)	Lead, total (ug/L)	Lithium, total (ug/L)	Manganese, total (ug/L)	Molybdenum, total (ug/L)	Nitrite + Nitrate (mg/L)	Phosphorus, total (mg/L)	Strontium, total (ug/L)	Sulfate, total (mg/L)	Vanadium, total (ug/L)	Zinc, total (ug/L)
COF-CA6	1/12/1983		9.32	<0.1		<1	<1		2	<10	210	3		20		<0.01			56		110
COF-CA6	2/2/1983		7.19				<1		<1	<10	140	9		20		0.03			56		30
COF-CA6	4/26/1983		8.4				<1			<10	0	<1		0		0.01			24		
COF-CA6	6/8/1983		8.4				<1			<10	120	<1		23		<0.01			22		
COF-CA6	3/12/1985	11064	10.56						<1	46	170	1				<0.01			25		
COF-CA6	9/17/1985	21389	11.91	0.14					1	<10	270	2		16		0.02			37		20
COF-CA6	3/6/1986	29705	10.96	0.68					1	<10	140	2		13		<0.01			48		<10
COF-CA6	6/16/1986		10.01																50		
COF-CA6	9/9/1986	38571	12.3						2	<10	180	2				0.01			60		
COF-CA6	12/8/1986	4520	7.09																24		
COF-CA6	3/17/1987	3460	10.04						2	<10	140	5				0.02			81		
COF-CA6	6/15/1987	7709	11.71																52		
COF-CA6	9/8/1987	11860	12.4						16	<10	190	<1				<0.01			46		
COF-CA6	11/30/1987	16243	11.61																61		
COF-CA6	3/22/1988	2909	10.7	<0.05					4	<10	90	<1		16		0.03			290		30
COF-CA6	6/1/1988	5758	11.81																77		
COF-CA6	9/21/1988	10561	12.21	0.07					<1	<10	50	<1		25		<0.01			100		<10
COF-CA6	12/20/1988	13155	11.39																70		
COF-CA6	3/24/1989	2810	10.5	<0.05					<1	20	80	<1		11		<0.01			31		<10
COF-CA6	6/8/1989	5682	10.11	0.52					<1	<10	60	<1		36		<0.01			51		<10
COF-CA6	9/25/1989	11334	11.81	<0.05			<1	<500	<1	<10	50	2	51	20	<20	<0.01		3900	90		<10
COF-CA6	12/14/1989	14444	9.81	<0.05			<1	580	<1	<10	100	<1	60	30	<20	<0.01		4000	45		<10
COF-CA6	12/14/1989	14446	9.81	<0.05			<1	700	1	10	130	<1	60	30	<20	<0.01		4200	54		<10
COF-CA6	3/6/1990	2801	9.81	<0.05			<1	630	1	20	160	<1	60	76	<20	<0.01		4400	40		20
COF-CA6	6/12/1990	7367	10.99	<0.05			<1	<500	<1	30	110	50	60	<5	<20	0.01		4000	35		<10
COF-CA6	9/26/1990	15149	12.6	<0.05			<1	580	<1	<10	720	<1	60	7	<20	<0.01		4300	71		20
COF-CA6	12/12/1990	18911	11.09	<0.05			<1	600	<1	<10	70	20	60	<5	<20	<0.01		4400	77		<10
COF-CA6	3/14/1991	4733	23.49	0.09			<1	570	4	10	350	<1	50	13	<20	<0.01		5200	50		20
COF-CA6	6/27/1991	12454	10.79	0.11			<1	<500	6	10	170	<1	60	25	<20	<0.01		4800	59		10
COF-CA6	9/23/1991	18152	12.7	0.09			<1	530	<1	<10	2400	4	50	17	<20	0.01		4300	94		<10
COF-CA6	9/23/1991	18153	0	0.06			<1	<500	<1	<10	2600	4	50	29	<20	0.01		4600	98		<10
COF-CA6	3/24/1992	2926	9.25	0.09			<1	<500	<1	<10	140	<1	80	12	<20	0.05		3700	56		60
COF-CA6	6/17/1992	7460	11.55	0.11			34	740	2	20	210	<1	80	<5	<20			4500	43		<10
COF-CA6	12/7/1992	17095	11.32	0.1		<1	<1	670	<1	<50	70	1	60	<5	<20			4700	78		<10
COF-CA6	12/7/1992	17096	0	0.06		<1	<1	610	<1	<50	100	1	60	<5	<20			4500	74		<10
COF-CA6	3/9/1993	1827	10.43	0.16		<1	3	500	<1	<10	660	2	60	18	<20	0.12		4400	69		<10
COF-CA6	6/14/1993	5375	11.81	<0.05		<1	<1	<500	4	<10	140	<1	50	13	<20			3800	39		<10
COF-CA6	9/13/1993	12033	12.14	<0.05		<1	<1	<500	1	<10	20	<1	50	<5	<20	<0.01		3800	40		<10
COF-CA6	11/16/1993	15672	10.79	<0.05		<1	<1	<500	1	<10	290	<1	50	9	<20			3900	59		<10
COF-CA6	2/28/1994	1549	9.29	0.07		<1	<1	<500	<1	<10	340	2	50	12	<20	<0.01		3900	27		<10
COF-CA6	5/31/1994	5853	11.29	<0.05		1	<1	<500	<1	<10	70	4	50	<5	<20			3800	39		10
COF-CA6	5/31/1994	5854	0	0.06		2	<1	<500	<1	<10	70	4	50	7	<20			5000	37		40
COF-CA6	8/30/1994	11691	11.81	<0.05		<1	<1	<500	<1	<10	60	<1	50	6	<20	<0.01		4300	46		10
COF-CA6	11/1/1994	15624	11.29	<0.01		<1	2	600	1	<10	1400	<1	64	11	<20			4500	57		100
COF-CA6	3/3/1995	1797	10.24	0.08		<1	<1	500	3	<10	130	<1		8		<0.01		3800	30	<10	<10
COF-CA6	6/8/1995	5749	11.65	<0.05		<1	<1	<500	<1	<10	30	<1	46	11	<20			4100	37		<10
COF-CA6	9/20/1995	10858	11.75	<0.05		<1	1	500	<1	<10	20	<1	52	<5	<20			4500	63		<10
COF-CA6	9/20/1995	10859	0	<0.05		<1	<1	500	<1	<10	<10	<1	54	<5	<20			4200	73		<10
COF-CA6	11/8/1995	12653	9.51	<0.05		2	<1	500	<1	<10	<10	1	50	7	<20			4000	34		<10
COF-CA6	3/20/1996	3219	8.76	<0.05		<1	<1	<500	3	<10	10	<1	50	<5	<20			3600	33		<10
COF-CA6	6/6/1996	6190	11.61	<0.05		<1	<1	<500	5	<10	30	<1	54	7	<20			4000	50		<10
COF-CA6	9/5/1996	13855	12.01	<0.05		2	<1	500	<1	<10	10	2	<10	8	<20			4000	43	<10	<10
COF-CA6	11/20/1996	13855	11.09	<0.05		2	<1	500	<1	<10	10	2	<10	8	<20			4000	43		<10
COF-CA6	11/20/1996	13868	10.66	<0.05		2	<1	600	2	<10	60	<1	<10	15	<20			4700	67	<10	<10
COF-CA6	2/26/1997	2340	9.88	<0.05		<1	<1	<500	<1	<10	<10	<1	61	<5	<20			3700	35	<10	<10
COF-CA6	5/21/1997	6868	11.45	<0.05		<1	<1	<500	<1	<10	30	<1	53	6	<20			4000	28	<10	<10
COF-CA6	5/21/1997	6880	11.45	<0.05		<1	2	600	1	<10	100	<1	60	<5	<20			4600	28	<10	<10
COF-CA6	11/19/1997	15652	11.58	<0.05		<1	<1	<500	<1	<10	30	<1	51	<5	<20			3900	57	<10	<10
COF-CA6	11/19/1997	15653	0	<0.05		<1	<1	<500	<1	<10	160	<1	51	<5	<20			3900	59	<10	<10
COF-CA6	11/19/1997	15654	11.58	<0.05		<1	4	<500	<1	<10	150	<1	53	58	<20			4300	39	<10	<10
COF-CA6	5/20/1998	4488	10.73	<0.05		<1	4	600	4	<10	140	2	58	110	<20			3700	44	<10	<10
COF-CA6	5/20/1998	4489	10.73	<0.05		<1	<1	400	6	<10	170	<1	61	10	<20			3400	44	<10	100
COF-CA6	11/17/1998	10226	12.11	<0.05		<1	<1	500	<1	<10	40	2	50	10	<20			4000	48	<10	<10
COF-CA6	11/17/1998	10227	12.11	<0.05		<1	1	600	<1	<10	130	<1	60	42	<20			4400	52	<10	<10
COF-CA6	4/6/1999	3523	9.06	<0.05		<1	<1	400	<1	<10	<10	3	55	10	<20			3600	86	<10	<10
COF-CA6	4/6/1999	3524	9.06	<0.05		<1	<1	600	2	<10	110	2	61	<5	<20			4100	50	<10	<10
COF-CA6	10/6/1999	10646	12.63	<0.05		<1	1	600	<1	<10	190	<1	50	9	<20			4200	75	<10	10
COF-CA6	4/12/2000	4865	9.65	<0.05		<1	2.4	670	9	<10	240	<1	57	25	<20			4200	54	<10	<10
COF-CA6	10/25/2000	12268	12.7	<0.05		<1	<1	880	<1	<10	51	3.3	60	9.1	<20			4300	73	<10	<10
COF-CA6	4/10/2001	3431	9.51	<0.05		1.7	<1	<200	1.7	<10	70	<1	32	<5	<20			550	62	<10	<10
COF-CA6	10/24/2001	12977	11.39	0.52		<1	<1	800	<1	10	300	<1	45	25	<20			4100	72	<10	<10
COF-CA6	4/15/2002	6687	10.56	0.27		<1	<1	680	2	<10	230	<1	25	6.6	<20			4300	65	<10	10
COF-CA6	4/15/2002	6688	10.56	0.29		<1	<1	690	2	<10	240	<1	24	5.8	<20			4300	68	<10	17
COF-CA6	11/21/2002	19295	10.7	0.15		<1	2	420	3.3	10	180	<1	<10	14	<20			3900	48	<10	<10
COF-CA6	4/8/2003	5692	9.09	<0.05		<1	<1	500	<1	<10	60	<1	60	6	<20			3500	33	<10	10
COF-CA6	10/22/2003	17877	11.98	0.27		<0.1	<0.1	460	<0.1	<10	1150	0.4	60	17	<20			<10	25	<10	<10
COF-CA6	4/15/2004	6435	9.91	0.79		<0.6	<0.1	700	2.5	<10	650	0.8	60	9	<20			3600	50	<10	<10
COF-CA6	10/27/2004	17866	9.81	0.19		<3	<1	830	<1	<10	160	<1	70	6	<20			4000	79	<10	<10
COF-CA6	4/14/2005	16820	9.61	0.79		<3	<1	700	4	<10	510	<1	70	7	<20			4100		<10	<10

Table 6. Historical Groundwater Analytical Data

location_id	sample_date	lab_id	Sample_depth	Aluminum, total (mg/L)	Ammonia (as N) (mg/L)	Antimony, total (ug/L)	Arsenic, total (ug/L)	Boron, total (ug/L)	Chromium, total (ug/L)	Copper, total (ug/L)	Iron, total (ug/L)	Lead, total (ug/L)	Lithium, total (ug/L)	Manganese, total (ug/L)	Molybdenum, total (ug/L)	Nitrite + Nitrate (mg/L)	Phosphorus, total (mg/L)	Strontium, total (ug/L)	Sulfate, total (mg/L)	Vanadium, total (ug/L)	Zinc, total (ug/L)
COF-CA6	5/11/2005	20993	11.12																53		
COF-CA6	10/19/2005	38778	11.94	0.15		<3	<1	600	<1	<10	160	1	70	5	<20			3700	46	<10	<10
COF-CA6	4/11/2006	AG33599	15	<0.2		<3	<1	800	2	<10	130	2	70	6	<20			3800	40	<10	<10
COF-CA6	10/11/2006	AG54825	15	<0.2	0.38	<3	<1	900	1	<10	100	<1	70	34	<20	0.02		4100	63	<10	10
COF-CA6	4/10/2007	AH30340	15	<0.1	0.26	<1	1.5	660	3.6	<1	<100	<1	61	<10	<5	<0.1	<0.1	3700	29	<10	17
COF-CA6	10/16/2007	L315801-07	15	<0.1	0.41	<1	1	620	3.2	<1	180	<1	58	<10	<5	<0.1	0.1	3800	22	<10	19
COF-CA6	4/15/2008	L341361-08	15	0.13	0.35	<1	<1	580	1.7	1.4	100	<1	58	<10	<5	<0.1	<0.1	3400	13	<10	19
COF-CA6	10/21/2008	L371417-08	15	0.11	0.31	<1	1.3	690	1.2	<1	210	<1	55	<10	<5	<0.1	<0.1	3900	21	<10	20
COF-CA6	10/26/2009	L429478-08	15	<0.1	0.33	<1	1.9	590	<2	<2	150	<1	55	<10	<5	<0.1	0.14	3700	17	<2	25
COF-CA6	4/27/2010	L456474-08	15	<0.1	0.37	<1	3	530	<2	<2	230	<1	60	18	<5	<0.1	0.18	3600	9.2	<2	19
COF-CA6	10/19/2010	L485273-08	15	<0.1	0.3	<1	<1	600	2.8	<2	<100	<1	70	<10	<5	<0.1	<0.1	3800	15	<2	16
COF-CA6	4/11/2011	L511237-08	15	<0.1	0.4	<1	<1	480	<2	<2	330	<1	60	13	<5	<0.1	0.13	3400	5.2	<2	14
COF-CA6	10/19/2011	L542857-08	15	0.8	0.43	<1	2.1	650	3.8	<2	700	<1	63	15	<5	<0.1	0.19	3800	31	<2	<10
COF-CA6	4/11/2012	L569652-08	15	0.11	0.36	<1	<1	550	<2	<2	260	<1	69	<10	6.2	<0.1	0.18	3500	17	<2	<10
COF-CA6	10/24/2012	L602894-08	15	<0.1	0.48	<1	1.2	570	<2	<2	170	<1	57	19	<5	<0.1	0.22	3800	12	<2	<10
COF-CA6	4/9/2013	L630049-08	15	<0.1	0.45	<1	<1	540	4.7	<2	140	<1	71	<10	<2	<0.1	<0.1	3600	12	<2	<10
COF-CA6	10/23/2013	4087278006	15	<0.5	<0.5	<1	<1	544	2	<10	119	<1	60.5	8.1	<20	<0.25	<0.4	3730	13.2	<1	<40
COF-CA6	2/5/2014	490-45972-11	15			<2	<2		<5	<10		<5								<2	<50
COF-CA6	4/15/2014	490-51172-2	15	<0.1	0.501	<2	<2	475	<2	<10	267	<2	65.1	<15	<50	<0.1	0.1	3590	17.8	<2	<50
COF-CA6	10/23/2014	L729945-02	15	<0.1	0.37	<1	<1	530	2	<2	130	<1	64	<10	<5	<0.1	0.8	3400	7.8	<2	14
COF-CA6	4/8/2015	L758754-04	15	<0.1	<0.25	0.37	<2	490	<10	<20	<100	<2	61	3.8	<5	<0.1		3300	32	0.41	<50
COF-CA9R	4/14/2005	16821	54.4	3.1		<3	2	<200	15	10	1100	1	30	15	50			360		10	10
COF-CA9R	5/5/2005	19605	59.22		0.34											0.07			47		
COF-CA9R	10/19/2005	38779	53.32	0.55	0.1	<3	4	<200	2	30	850	7	<10	17	20	0.01		460	20	<10	70
COF-CA9R	4/11/2006	AG33600	48.2	0.3	0.04	<3	3	1000	3	20	990	3	30	13	<20	0.02		650	70	<10	20
COF-CA9R	10/11/2006	AG54826	0	<0.2	0.04	<3	2	600	<1	<10	1100	1	20	12	20	0.07		660	40	<10	<10
COF-CA9R	4/10/2007	AH30341	14.96	0.21	<0.1	5.9	4.3	960	2.2	4.2	770	1.7	42	<10	56	<0.1	0.17	620	38	<10	15
COF-CA9R	10/20/2008	L371417-09	14.55	0.28	<0.1	<1	1.7	1800	1.2	2.2	1300	1.4	34	15	7.1	<0.1	<0.1	680	90	<10	22
COF-CA9R	4/27/2010	L456474-09	14.07	<0.1	0.14	1.9	4.6	2200	<2	2.7	1300	<1	43	11	21	<0.1	0.62	670	130	3.4	10
COF-CA9R	10/19/2010	L485273-09	14.52	<0.1		3.4	1.7	2400	<2	<2	850	<1	49	<10	37			600		4.8	24
COF-CA9R	4/12/2011	L511237-09	13.84	<0.1		2.3	2.3	2000	<2	<2	760	<1	40	<10	18			630		3.7	<10
COF-CA9R	10/19/2011	L542857-09	15.45	0.2		10	4.1	2600	<2	46	380	1.2	53	48	21			590		5.9	20
COF-CA9R	4/11/2012	L569652-09	14.81	<0.1		36	<1	2600	<2	<2	160	<1	18	12	30			550		3.7	<10
COF-CA9R	10/23/2012	L602894-09	14.7	<0.1		39	3.4	2600	<2	3.4	480	<1	28	13	51			610		6.2	19
COF-CA9R	4/9/2013	L630049-09	14.49	<0.1	0.1	59	2.3	2800	<2	<2	190	<1	29	<10	57	<0.1	<0.1	600	110	6.3	<10
COF-CA9R	10/23/2013	4087278007	14.61	<0.5		44	4.2	3160	<1	<10	1340	<1	17.9	10.5	65.6			609		4.9	<40
COF-CA9R	4/15/2014	490-51172-3	14.59	<0.1	0.227	48.5	3.68	3700	<2	11.8	1010	<2	26.7	<15	<50	0.103	0.146	605	118	4.23	<50
COF-CA9R	10/23/2014	L729945-03	14.88	<0.1	<0.25	60	<1	2800	<2	<2	<100	<1	52	<10	28	0.18	<0.1	550	99	9.3	17
COF-CA9R	4/8/2015	L758754-01	14.88	<0.1		56	0.95	2600	7.3	9	140	<2	39	11	33			570		3.9	44
COF-MC1	4/6/1982		4.92			<2	7		<1	20	90	<1		230		0.13			330		<10
COF-MC1	4/27/1982		5.41	0.2		<2	7		<1	30	<50	2		420		<0.01			480		<10
COF-MC1	7/6/1982		6.37	0.2		<1	6		<1	20	<50	<1		660		<0.01			400		<10
COF-MC1	9/8/1982		6.14	<0.1		<1	7		<1	<10	<50	<1		850		0.01			410		<10
COF-MC1	1/11/1983		4.69							<10	<50					<0.01					<10
COF-MC1	7/26/1983		5.18							<10	10					<0.01					<10
COF-MC1	1/25/1984		3.81							22	40										22
COF-MC1	3/12/1985	11060	5.81						<1	72	80	<1				<0.01			18		
COF-MC1	9/17/1985	21385	7.05	0.24					1	<10	40	<1		863		<0.01			350		<5
COF-MC1	3/6/1986	29701	5.71	1.68					<1	<10	<10	<1		872		<0.01			420		<10
COF-MC1	6/16/1986	34095	4.99																320		
COF-MC1	9/9/1986	38567	5.81						<1	<10	20	<1				<0.01			360		
COF-MC1	12/8/1986	4516	4.4																420		
COF-MC1	3/17/1987	3456	5.25						<1	<10	<10	4				0.12			490		
COF-MC1	6/15/1987	7705	5.38																320		
COF-MC1	9/8/1987	11856	5.91						2	<10	140	<1				<0.01			350		
COF-MC1	11/30/1987	16239	4.99																330		
COF-MC1	3/22/1988	2905	5.61	0.36					<1	<10	40	<1		600		<0.01			320		<10
COF-MC1	6/1/1988	5754	6.1																360		
COF-MC1	9/21/1988	10557	5.81	0.32					2	<10	40	<1		600		<0.01			350		<10
COF-MC1	12/20/1988	13151	5.32																330		
COF-MC1	3/22/1989	2806	4.99	0.38					<1	<10	<10	<1		350		<0.01			280		<10
COF-MC1	6/7/1989	5677	5.09	1.7					<1	<10	50	<1		470		<0.01			400		<10
COF-MC1	9/25/1989	11329	5.09	0.37			20	6900	<1	<10	30	<1	<10	370	1200	0.03		490	350		<10
COF-MC1	9/25/1989	11330	5.09	0.31			19	6900	<1	<10	30	<1	<10	430	1200	<0.01		440	370		<10
COF-MC1	12/14/1989	14439	5.09	0.42			19	6500	<1	10	<10	<1	10	350	1100	<0.01		540	330		<10
COF-MC1	3/6/1990	2795	4.69	0.79			19	6800	2	<10	30	<1	20	210	1300	<0.01		580	370		<10
COF-MC1	6/11/1990	7356	5.51	0.41			20	7400	5	<10	40	<1	10	430	1300	<0.01		750	370		<10
COF-MC1	9/25/1990	15128	5.61	0.3			18	6500	<1	<10	30	1	<10	400	1100	0.19		540	330		<10
COF-MC1	12/10/1990	18813	4.79	0.4			20	7000	<1	<10	70	<1	<10	290	1000	<0.01		460	460		<10
COF-MC1	3/13/1991	4720	4	0.49			23	7200	<1	<10	210	<1	<10	130	960	0.02		470	290		10
COF-MC1	6/25/1991	12303	4.3	0.52			24	7500	<1	<10	340	1	<10	110	820	<0.01		460	280	<10	<10
COF-MC1	9/23/1991	18147	4.79	0.52			21	6900	<1	10	2100	1	10	260	300	<0.01		170	250		<10
COF-MC1	6/14/1993	5373	5.74	0.56		4	28	2400	<1	<10	<10	17	<10	120	380			270	150		<10
COF-MC1	6/14/1993	5374	0	0.58		4	28	2400	<1	<10	<10	<1	<10	120	380			270	150		<10
COF-MC1	9/13/1993	12031	0	0.64		4	28	5000	<1	<10	<10	<1	<10	<5	390	0.17		290	170		<10
COF-MC1	11/16/1993	15667	4.4	0.66		6	28	3600	<1	<10	20	<1	<10	86	450			270	170		<10
COF-MC1	2/28/1994	1488	4	0.71		7	37	2100	<1	<10	20	2	<10	31	480	<0.01		330	140		<10
COF-MC1	6/1/1994	6045	5.74	0.66		6	36	4400	<1	<10	<10	<1	10	73	400			280	180		40
COF-MC1	9/7/1994	12126	5.77	0.58		6	31	4400	<1	<10	<10	1	<10	62	380	0.62		290	200		<10
COF-MC1	9/7/1994	12127	0	0.18		7	30	4400	<1	<10	<10	<1	<10	62	350	0.2		300	200		<10

Table 6. Historical Groundwater Analytical Data

location_id	sample_date	lab_id	Sample_depth	Aluminum, total (mg/L)	Ammonia (as N) (mg/L)	Antimony, total (ug/L)	Arsenic, total (ug/L)	Boron, total (ug/L)	Chromium, total (ug/L)	Copper, total (ug/L)	Iron, total (ug/L)	Lead, total (ug/L)	Lithium, total (ug/L)	Manganese, total (ug/L)	Molybdenum, total (ug/L)	Nitrite + Nitrate (mg/L)	Phosphorus, total (mg/L)	Strontium, total (ug/L)	Sulfate, total (mg/L)	Vanadium, total (ug/L)	Zinc, total (ug/L)
COF-MC1	11/1/1994	15618	5.12	0.74		7	28	5300	<1	<10	70	2	12	76	420			380	180		<10
COF-MC1	3/1/1995	1826	4.56	0.88		7	43	5100	2	<10	<10	<1		55		0.01		240	180	50	<10
COF-MC1	6/6/1995	5743	3.51	0.76		7	33	4900	<1	<10	<10	<1	<10	85	340			280	170		<10
COF-MC1	9/19/1995	10853	4.72	0.8			37	4600	<1	<10	<10	<1	12	38	320			310	160		<10
COF-MC1	11/7/1995	12648	3.22	0.86		7	42	4300	2	<10	<10	1	11	45	300			320	170		<10
COF-MC1	3/5/1996	2540	4.59	0.83		5	56	4500	<1	<10	110	<1	<10	36	290			340	210		<10
COF-MC1	6/4/1996	6179	5.35	0.75		6	53	4500	1	<10	<10	<1	15	66	280			340	220		<10
COF-MC1	9/5/1996	15070	4.95	0.98		15	42	6400	<1	<10	<10	<1	15	24	270			400	250	40	<10
COF-MC1	2/24/1997	2335	3.87	0.87		10	54	4400	<1	<10	<10	<1	24	16	250			470	310	30	<10
COF-MC1	10/28/2003	18140	3.94	1.49		11.2	58	4410	0.9	<10	53	<0.1	30	280	200			350	160	63	<10
COF-MC1	10/28/2003	18141	3.94	1.45		11.2	57.8	4370	1.1	<10	<10	<0.1	20	27	200			340	160	62	<10
COF-MC1	4/14/2004	6429	3.18	1.2		11.1	60.4	3600	<0.1	<10	10	<0.1	40	27	180			290	180	50	<10
COF-MC1	10/19/2004	17272	2.46	1.2		9	64	3800	<1	<10	10	<1	20	23	180			310	140	50	<10
COF-MC1	4/12/2005	16800	3.18	1.3		14	72	3600	1	<10	40	<1	30	38	180			320		50	<10
COF-MC1	5/10/2005	20990	4.13																138		
COF-MC1	10/18/2005	38773	4.1	1.1		12	59	3700	<1	<10	20	<1	30	17	170			300	120	40	<10
COF-MC1	4/10/2006	AG33594	3.18	1.3		12	58	3900	<1	<10	<30	<1	30	12	180			300	129	60	<10
COF-MC1	10/10/2006	AG54820	12	1.3	0.4	12	73	3600	<1	<10	<30	<1	20	13	190	0.02		290	110	60	<10
COF-MC1	4/9/2007	AH30335	12	1.2	0.27	14	68	3500	1.4	1.1	<100	<1	29	11	160	<0.1	<0.1	250	120	47	<10
COF-MC1	10/15/2007	L315801-03	12	1.2	0.47	13	64	3500	<1	<1	<100	<1	20	12	180	<0.1	<0.1	260	110	50	<10
COF-MC1	4/14/2008	L341361-03	12	1.3	0.28	14	52	3400	<1	3.5	<100	<1	26	11	160	<0.1	<0.1	250	110	52	<10
COF-MC1	10/20/2008	L371417-03	12	1.3	0.32	11	64	3600	<1	<1	<100	<1	<15	14	170	<0.1	<0.1	260	110	58	<10
COF-MC1	4/6/2009	L396908-03	12	1.1	0.31	12	61	3200	<1	<1	<100	<1	18	12	150	<0.1	<0.1	220	100	41	<10
COF-MC1	4/6/2009	L396908-25	12	1.2	0.28	11	60	3100	<1	<1	<100	<1	24	17	140	0.74	<0.1	210	100	41	750
COF-MC1	10/26/2009	L429478-03	12	1.3	0.34	13	70	3800	<2	<2	<100	<1	24	<10	170	<0.1	<0.1	250	110	61	<10
COF-MC1	4/26/2010	L456474-03	12	1.4	0.35	12	62	3700	<2	<2	<100	<1	21	<10	180	<0.1	<0.1	260	120	50	<10
COF-MC1	10/19/2010	L485273-03	12	1.3	0.34	13	70	3500	<2	<2	<100	<1	24	16	160	<0.1	<0.1	260	110	57	<10
COF-MC1	4/11/2011	L511237-03	12	1.4	0.33	14	<1	3200	<2	<2	<100	<1	18	<10	150	<0.1	<0.1	230	110	59	<10
COF-MC1	4/11/2011	L511237-27	12	1.5	0.33	14	68	3200	<2	<2	<100	<1	17	<10	150	<0.1	<0.1	230	110	57	<10
COF-MC1	4/11/2011	L516862-01	12				67														
COF-MC1	4/11/2011	L516862-02	12				71														
COF-MC1	10/18/2011	L542857-03	12	1.6	0.38	15	76	3500	<2	<2	<100	<1	22	<10	170	<0.1	<0.1	250	110	69	<10
COF-MC1	4/10/2012	L569652-03	12	1.6	0.31	14	<1	3100	<2	<2	<100	<1	20	<10	150	<0.1	<0.1	250	120	60	<10
COF-MC1	10/23/2012	L602894-03	12	1.5	0.77	14	68	3200	<2	<2	<100	<1	<15	<10	150	<0.1	<0.1	250	110	64	<10
COF-MC1	10/23/2012	L602894-30	12	1.6	0.38	13	65	3200	<2	<2	<100	<1	20	<10	150	<0.1	<0.1	260	120	56	<10
COF-MC1	4/8/2013	L630049-03	12	1.6	0.29	15	70	3100	<2	<2	<100	<1	35	<10	160	<0.1	<0.1	250	160	68	<10
COF-MC1	10/22/2013	4087278001	12	1.67	<0.5	16.3	85.2	3410	<1	<10	<100	<1	19.6	6.1	151	<0.25	<0.4	264	107	66.5	<40
COF-MC1	4/14/2014	490-51172-21	12	1.7	0.43	16.3	72.5	3620	<2	<10	153	<2	24.2	<15	161	<0.1	<0.1	292	141	67	<50
COF-MC1	10/21/2014	L729543-04	12	1.6	0.35	<1	<1	3600	6.6	<2	<100	<1	<15	<10	140	<0.1	0.47	270	120	<2	<10
COF-MC1	4/9/2015	L758754-10	12	0.9	<0.25	13	58	2900	<10	<20	<100	<2	23	17	110	0.28		210	99	44	<50

Table 6. Historical Groundwater Analytical Data

location_id	sample_date	lab_id	Sample_depth	Aluminum, total (mg/L)	Ammonia (as N) (mg/L)	Antimony, total (ug/L)	Arsenic, total (ug/L)	Boron, total (ug/L)	Chromium, total (ug/L)	Copper, total (ug/L)	Iron, total (ug/L)	Lead, total (ug/L)	Lithium, total (ug/L)	Manganese, total (ug/L)	Molybdenum, total (ug/L)	Nitrite + Nitrate (mg/L)	Phosphorus, total (mg/L)	Strontium, total (ug/L)	Sulfate, total (mg/L)	Vanadium, total (ug/L)	Zinc, total (ug/L)
COF-MC4	4/6/1982		4.66			<2	<1		1	20	50	4		320		0.24			230		30
COF-MC4	4/27/1982		5.09	<0.1		<2	<1		<1	30	80	2		340		0.03			220		30
COF-MC4	7/6/1982		6	<0.1		<1	2		<1	30	<50	<1		590		0.37			300		30
COF-MC4	9/8/1982		5.74	0.17		<1	3		<1	<10	90	<1		670		<0.01			350		<10
COF-MC4	1/11/1983		5.97							<10	70					0.08					10
COF-MC4	7/26/1983		7.81							<10	140					<0.01					140
COF-MC4	1/25/1984		6.3							<10	70										36
COF-MC4	3/12/1985	11063	6.79						<1	41	70	<1				<0.01			300		
COF-MC4	9/17/1985	21388	6	0.11					1	<10	60	<1		826		<0.01			300		6
COF-MC4	3/6/1986	29704	6.76	1.39					<1	<10	<10	<1		489		<0.01			360		<10
COF-MC4	6/16/1986	34098	6.07																350		
COF-MC4	9/9/1986	38570	6.86						1	<10	<10	1				0.01			350		
COF-MC4	12/8/1986	4519	5.51																380		
COF-MC4	3/17/1987	3459	6.33						<1	<10	10	4				0.13			320		
COF-MC4	6/15/1987	7708	6.92																310		
COF-MC4	9/8/1987	11859	7.12						2	<10	60	2				<0.01			330		
COF-MC4	11/30/1987	16242	6.1																310		
COF-MC4	3/22/1988	2908	6.59	0.09					1	<10	40	<1		360		<0.01			310		30
COF-MC4	6/1/1988	5757	7.09																300		
COF-MC4	9/21/1988	10560	7.09	0.09					<1	<10	40	<1		330		<0.01			320		<10
COF-MC4	12/20/1988	13154	6.4																300		
COF-MC4	3/23/1989	2809	6.2	<0.05					<1	20	40	<1		510		<0.01			280		<10
COF-MC4	6/7/1989	5680	6.79	1.3					<1	<10	200	<1		380		0.04			350		40
COF-MC4	9/25/1989	11333	6.2	0.11			12	6500	<1	<10	40	<1	<10	330	860	<0.01		280	360		<10
COF-MC4	12/14/1989	14442	5.91	0.14			12	5700	<1	<10	70	3	<10	230	840	<0.01		480	330		<10
COF-MC4	3/6/1990	2799	5.18	0.18			5	4600	1	70	150	<1	<10	500	740	0.02		500	230		10
COF-MC4	6/11/1990	7360	5.32	0.27			14	6300	1	<10	280	1	<10	220	1400	<0.01		530	340		<10
COF-MC4	9/25/1990	15131	6.69	0.1			12	6000	<1	<10	180	<1	<10	270	830	<0.01		450	250		10
COF-MC4	9/25/1990	15132	6.69	0.28			12	6100	<1	<10	100	31	<10	290	860	<0.01		450	250		<10
COF-MC4	12/10/1990	18816	5.81	0.17			14	6700	<1	20	<10	<1	<10	160	930	<0.01		460	920		<10
COF-MC4	3/13/1991	4723	5.81	0.07			9	4900	<1	<10	170	3	<10	280	700	0.01		480	260		<10
COF-MC4	6/25/1991	12304	5.41	0.12			12	6100	1	<10	840	<1	<10	290	620	<0.01		380	230	<10	80
COF-MC4	9/23/1991	18150	6.69	0.29			18	6900	<1	10	2400	2	<10	220	530	0.01		130	240		<10
COF-MC4	6/14/1993	5378	9.51	0.24		3	20	2300	<1	<10	30	<1	<10	93	330			260	150		<10
COF-MC4	9/13/1993	12032	0	0.23		2	19	5100	<1	<10	20	<1	<10	<5	310	0.02		270	170		<10
COF-MC4	11/16/1993	15670	5.48	0.12		1	14	3600	<1	<10	<10	<1	<10	130	180			260	170		<10
COF-MC4	3/1/1994	1489	5.09	0.14		1	18	1800	<1	<10	40	1	<10	140	310	<0.01		260	140		<10
COF-MC4	3/1/1994	1490	0	0.15		2	18	1800	<1	<10	40	<1	<10	140	320	<0.01		260	160		<10
COF-MC4	6/2/1994	6048	6.86	0.25		5	24	4300	<1	<10	<10	16	10	83	350			270	190		20
COF-MC4	9/7/1994	12131	6.66	0.2		2	22	4600	<1	<10	20	<1	<10	86	290	0.06		260	180		10
COF-MC4	11/1/1994	15622	6.23	0.36		3	20	5200	<1	10	920	2	12	76	340			310	180		<10
COF-MC4	3/1/1995	1830	5.68	0.18		<1	21	4400	2	<10	20	2		160		0.02		220	160	10	<10
COF-MC4	6/6/1995	5746	6.66	0.44		5	33	4900	<1	<10	<10	<1	<10	26	320			330	160		<10
COF-MC4	6/6/1995	5747	0	0.43		4	33	5000	<1	<10	<10	<1	<10	27	300			330	170		<10
COF-MC4	9/19/1995	10856	5.84	0.34		5	21	4600	<1	<10	<10	<1	<10	43	280			280	150		<10
COF-MC4	11/7/1995	12651	4.27	0.38		4	26	4100	<1	<10	10	<1	<10	58	270			250	160		<10
COF-MC4	3/5/1996	2543	5.68	0.41		4	47	4500	<1	<10	50	<1	<10	39	290			320	<2		<10
COF-MC4	6/4/1996	6182	6.43	0.33		4	38	4500	1	<10	<10	<1	10	88	250			310	200		<10
COF-MC4	9/5/1996	15071	6.1	0.39		12	35	5600	<1	<10	10	<1	<10	36	260			350	240	<10	<10
COF-MC4	2/24/1997	2338	4.99	0.32		7	43	4400	<1	<10	<10	<1	24	37	240			410	250	10	<10
COF-MC4	10/28/2003	18142	5.28	0.67		5.8	38.6	4330	1.2	<10	59	<0.1	10	117	148			300	150	<10	<10
COF-MC4	4/14/2004	6430	4.43	0.64		8.6	52.5	3600	<0.1	<10	70	<0.1	20	37	190			270	150	<10	<10
COF-MC4	10/19/2004	17273	3.77	0.71		6	60	3700	<1	<10	<10	<1	<10	18	170			290	150	10	<10
COF-MC4	4/12/2005	16801	4.43	0.71		11	62	3600	1	<10	40	<1	20	25	180			290		10	<10
COF-MC4	5/10/2005	20991	5.35																139		
COF-MC4	10/18/2005	38774	5.38	1		11	58	3900	<1	<10	40	<1	30	21	170			300	130	20	<10
COF-MC4	4/10/2006	AG33595	4.49	0.8		9	55	4200	1	<10	<30	<1	20	15	180			260	131	20	<10
COF-MC4	10/10/2006	AG54821	5	0.8	0.42	8	67	3600	1	<10	<30	<1	10	18	180	0.02		260	120	20	10
COF-MC4	4/9/2007	AH30336	5	0.66	<0.1	9.8	55	3600	1.1	1.2	<100	<1	18	14	150	0.3	<0.1	230	120	12	<10
COF-MC4	10/15/2007	L315801-04	5	0.85	0.44	10	58	3600	<1	<1	<100	<1	<15	16	170	<0.1	<0.1	240	110	<10	<10
COF-MC4	4/14/2008	L341361-04	5	0.77	0.12	8.6	38	3400	<1	1.1	<100	<1	<15	12	160	<0.1	<0.1	220	110	13	<10
COF-MC4	10/20/2008	L371417-04	5	0.7	0.4	6.3	49	3700	<1	1	<100	<1	<15	25	160	<0.1	<0.1	240	120	<10	<10
COF-MC4	4/6/2009	L396908-04	5	0.7	<0.1	6	41	3000	1.3	<1	<100	<1	<15	<10	150	0.2	<0.1	190	93	7.8	26
COF-MC4	10/26/2009	L429478-04	5	0.73	0.31	6.4	53	3600	<2	<2	<100	<1	<15	36	180	0.12	<0.1	230	110	12	<10
COF-MC4	4/26/2010	L456474-04	5	0.5	0.4	5.1	38	3500	<2	<2	<100	<1	<15	15	180	0.32	<0.1	230	110	4.9	<10
COF-MC4	10/19/2010	L485273-04	5	0.68	0.26	7.9	53	3600	<2	<2	<100	<1	<15	11	160	0.11	<0.1	230	110	11	<10
COF-MC4	4/11/2011	L511237-04	5	0.63	<0.1	5.5	46	3200	<2	<2	<100	<1	<15	<10	170	0.33	<0.1	210	100	9.2	<10
COF-MC4	10/18/2011	L542857-04	5	0.97	0.49	11	66	3600	<2	<2	<100	<1	<15	<10	170	<0.1	<0.1	230	100	20	<10
COF-MC4	10/18/2011	L542857-27	5	0.94	0.42	11	64	3400	<2	<2	<100	<1	<15	<10	160	<0.1	<0.1	220	110	19	<10
COF-MC4	4/10/2012	L569652-04	5	0.69	<0.1	7.1	<1	3100	<2	<2	<100	<1	26	<10	150	0.3	<0.1	220	120	8.6	<10
COF-MC4	10/23/2012	L602894-04	5	0.71	0.39	8	47	3200	<2	<2	<100	<1	<15	13	140	0.13	<0.1	240	120	11	<10
COF-MC4	4/8/2013	L630049-04	5	0.69	<0.1	6.7	42	3200	<2	<2	<100	<1	19	<10	140	0.35	<0.1	220	17000	8.4	<10
COF-MC4	4/8/2013	L630049-27	5	0.66	<0.1	5.8	44	3200	<2	<2	<100	<1	16	<10	170	0.35	<0.1	220	120	8.1	<10
COF-MC4	10/22/2013	4087278002	5	0.869	0.51	9.9	65.5	3460	<1	<10	<100	<1	8	18	150	<0.25	<0.4	235	108	12.7	<40
COF-MC4	4/14/2014	490-51172-22	5	0.734	0.134	8.85	55.4	3510	<2	<10	<100	<2	<20	<15	165	0.327	0.104	257	132	12.5	<50
COF-MC4	10/21/2014	L729543-03	5	0.8	0.36	16	81	3600	<2	<2	<100	<1	<15	20	140	<0.1	<0.1	240	120	67	<10
COF-MC4	4/9/2015	L758754-11	5	0.67	<0.25	6.5	45	3200	<10	<20	<100	<2	9.6	6.7	140	0.24		210	97	4.5	4.2

Table 6. Historical Groundwater Analytical Data

location_id	sample_date	lab_id	Sample_depth	Aluminum, total (mg/L)	Ammonia (as N) (mg/L)	Antimony, total (ug/L)	Arsenic, total (ug/L)	Boron, total (ug/L)	Chromium, total (ug/L)	Copper, total (ug/L)	Iron, total (ug/L)	Lead, total (ug/L)	Lithium, total (ug/L)	Manganese, total (ug/L)	Molybdenum, total (ug/L)	Nitrite + Nitrate (mg/L)	Phosphorus, total (mg/L)	Strontium, total (ug/L)	Sulfate, total (mg/L)	Vanadium, total (ug/L)	Zinc, total (ug/L)
COF-MC5A	4/14/2004	6431	3.22	2.6		8	56.2	3400	6.1	<10	1700	0.8	10	160	180			270	150	60	<10
COF-MC5A	4/14/2004	6432	3.22	2		8.6	54.6	3300	7.3	<10	1200	0.6	10	140	180			260	140	50	<10
COF-MC5A	10/26/2004	17862	3.54	6.2		10	58	3800	14	<10	4100	<1	20	210	190			290	150	120	20
COF-MC5A	4/14/2005	16819	3.64	2.4		9	46	2900	17	<10	1800	<1	20	130	170			260		30	<10
COF-MC5A	5/10/2005	20992	4.46																139		
COF-MC5A	10/18/2005	38775	4.53	1.4		10	59	3600	1	<10	380	<1	10	31	170			270	130	40	<10
COF-MC5A	4/10/2006	AG33596	3.35	1.1		7	25	2800	10	<10	560	<1	20	40	120			230	81	20	<10
COF-MC5A	10/10/2006	AG54822	8	2.4	0.48	10	76	3500	10	<10	950	<1	20	51	180	0.02		250	120	70	10
COF-MC5A	4/9/2007	AH30337	8	9.5	0.33	13	69	3600	88	5.5	5000	2.9	34	230	160	<0.1	<0.1	230	120	160	36
COF-MC5A	10/15/2007	L315801-05	8	4.9	0.49	12	62	3500	32	2.7	2400	1.4	18	130	170	<0.1	<0.1	260	110	100	16
COF-MC5A	4/14/2008	L341361-05	8	1.7	<0.1	5.3	8.5	1400	7.7	1.7	950	<1	22	190	55	0.16	<0.1	200	34	26	<10
COF-MC5A	10/20/2008	L371417-05	8	11	0.36	10	64	3600	110	6.4	7000	1.9	17	340	200	<0.1	<0.1	260	110	190	34
COF-MC5A	4/6/2009	L396908-05	8	1.9	<0.1	4.4	8.3	1000	3.6	<1	990	<1	17	200	38	0.29	<0.1	190	25	18	<10
COF-MC5A	10/26/2009	L429478-05	8	3.9	0.35	8.8	52	3400	11	<2	2500	1.4	23	200	170	<0.1	0.17	220	110	100	<10
COF-MC5A	4/26/2010	L456474-05	8	5.5	0.47	6.5	43	3300	11	2.4	4100	2.3	24	310	170	<0.1	0.35	240	110	120	19
COF-MC5A	10/18/2010	L485273-05	8	2	0.37	9.9	66	3300	<2	<2	700	<1	20	66	160	<0.1	<0.1	240	110	83	<10
COF-MC5A	4/11/2011	L511237-05	8	2	0.16	9	28	2400	6.5	<2	1100	<1	20	110	130	<0.1	<0.1	190	88	44	<10
COF-MC5A	10/18/2011	L542857-05	8	1.7	0.49	11	72	3500	2.4	<2	310	<1	16	36	170	<0.1	<0.1	250	110	81	<10
COF-MC5A	4/10/2012	L569652-05	8	1.2	0.37	7.6	<1	3000	<2	<2	320	<1	16	32	150	<0.1	<0.1	230	120	70	<10
COF-MC5A	4/10/2012	L569652-30	8	1.1	0.42	6.8	<1	2900	<2	<2	230	<1	<15	27	150	<0.1	<0.1	230	120	61	<10
COF-MC5A	10/23/2012	L602894-05	6.5	1.5	0.44	10	63	3200	<2	<2	<100	<1	<15	34	150	<0.1	<0.1	260	120	74	<10
COF-MC5A	4/8/2013	L630049-05	6.5	0.45	0.24	7.8	15	1800	2.1	<2	200	<1	30	54	70	0.11	<0.1	190	60	14	<10
COF-MC5A	10/22/2013	4087278003	6.5	1.49	0.56	11.8	76.4	3270	1.2	<10	114	<1	14.8	9.8	149	<0.25	<0.4	245	108	68.9	<40
COF-MC5A	4/14/2014	490-51172-23	6.5	0.893	0.617	8.06	45.1	3220	<2	<10	320	<2	<20	<15	147	<0.1	<0.1	249	123	29.3	<50
COF-MC5A	10/21/2014	L729543-01	6.5	1.6	0.47	12	72	3600	5.8	<2	370	<1	<15	41	140	<0.1	0.16	260	110	70	<10
COF-MC5A	10/21/2014	L729543-02	6.5	1.6	0.42	13	72	3600	6.7	<2	380	<1	<15	38	140	<0.1	<0.1	260	130	70	<10
COF-MC5A	4/9/2015	L758754-12	6.5	0.39	<0.25	8	16	1400	<10	<20	88	0.35	21	89	38	0.15		200	35	30	5
COF-MC5C	4/19/2005	17226	4.27	42		<3	10	1400	17	10	19000	32	40	760	40			1800	73	10	130
COF-MC5C	5/5/2005	19603	5.77																89		
COF-MC5C	10/19/2005	38776	6.23	0.22		<3	1	1200	<1	10	280	1	30	16	50			1100	88	<10	10
COF-MC5C	4/10/2006	AG33597	4.63	0.3		<3	3	1200	40	<10	390	1	80	17	60			1200	73	<10	<10
COF-MC5C	10/11/2006	AG54823	0	<0.2	0.12	<3	2	1000	3	<10	70	<1	60	11	60	0.03		1100	67	<10	20
COF-MC5C	4/10/2007	AH30338	1.93	<0.1	<0.1	1.4	3.8	960	3.2	4.7	<100	<1	91	<10	44	<0.1	<0.1	850	64	<10	13
COF-MC5C	10/16/2007	L315801-06	2.07	<0.1	0.22	<1	3	1000	<1	2.3	<100	<1	130	<10	49	<0.1	<0.1	930	61	<10	<10
COF-MC5C	4/14/2008	L341361-06	10.29	<0.1	<0.1	<1	3.6	960	6	2.5	<100	<1	140	<10	43	<0.1	<0.1	870	59	<10	32
COF-MC5C	10/21/2008	L371417-06	2.04	0.24	<0.1	<1	2.6	1000	12	4.5	180	<1	100	<10	47	<0.1	<0.1	920	61	<10	12
COF-MC5C	4/7/2009	L396908-06	1.49	0.18	<0.1	<1	<1	1100	4.3	2.5	<100	<1	44	14	49	0.87	<0.1	1100	64	<2	16
COF-MC5C	10/27/2009	L429478-06	1.72	<0.1	<0.1	<1	2.3	1100	4.5	4.2	120	<1	65	<10	44	<0.1	<0.1	980	60	<2	14
COF-MC5C	4/27/2010	L456474-06	2.05	<0.1	0.37	<1	1.4	1200	<2	<2	<100	<1	46	20	43	<0.1	<0.1	1200	57	<2	12
COF-MC5C	10/19/2010	L485273-06	2.29	0.16	0.12	<1	1	1200	<2	<2	160	<1	84	19	38	<0.1	<0.1	1200	56	<2	19
COF-MC5C	4/12/2011	L511237-06	1.81	0.13	<0.1	<1	<1	1200	<2	<2	<100	<1	35	69	51	<0.1	<0.1	1400	61	<2	12
COF-MC5C	10/19/2011	L542857-06	2.27	0.11	0.17	<1	1.7	1300	<2	2.1	170	<1	39	110	54	<0.1	<0.1	1500	62	<2	<10
COF-MC5C	4/11/2012	L569652-06	2.26	<0.1	<0.1	<1	<1	1200	<2	<2	<100	<1	75	11	45	<0.1	<0.1	1200	61	<2	<10
COF-MC5C	10/24/2012	L602894-06	2.19	<0.1	0.17	<1	1.3	1100	10	<2	180	<1	75	32	43	<0.1	<0.1	1400	51	<2	<10
COF-MC5C	4/9/2013	L630049-06	1.87	<0.1	0.24	<1	<1	1200	<2	<2	<100	<1	46	72	43	<0.1	<0.1	1400	60	<2	<10
COF-MC5C	10/23/2013	4087278004	2.29	<0.5	<0.5	5.5	<1	1270	1.9	<10	435	<1	35.7	82	55.1	<0.25	<0.4	1370	58.6	<1	<40
COF-MC5C	4/15/2014	490-51172-24	1.95	<0.1	0.144	<2	<2	1510	<2	11.7	262	<2	80.2	26.7	50.2	<0.1	<0.1	1220	64.8	<2	<50
COF-MC5C	10/24/2014	L729945-19	2.11	0.14	<0.25	3.1	<1	1600	<2	<2	240	11	20	60	50	<0.1	<0.1	1000	75	<2	17
COF-MC5C	4/15/2015	L760001-01	2.11	<0.1	<0.25	2.6	0.55	1600	<10	<20	110	0.44	27	43	62	<0.1	<0.1	1100	76	0.54	<50

Table 6. Historical Groundwater Analytical Data

location_id	sample_date	lab_id	Sample_depth	Aluminum, total (mg/L)	Ammonia (as N) (mg/L)	Antimony, total (ug/L)	Arsenic, total (ug/L)	Boron, total (ug/L)	Chromium, total (ug/L)	Copper, total (ug/L)	Iron, total (ug/L)	Lead, total (ug/L)	Lithium, total (ug/L)	Manganese, total (ug/L)	Molybdenum, total (ug/L)	Nitrite + Nitrate (mg/L)	Phosphorus, total (mg/L)	Strontium, total (ug/L)	Sulfate, total (mg/L)	Vanadium, total (ug/L)	Zinc, total (ug/L)
COF-P8	9/28/1989	11592	0	<0.05			<1	<500	<1	10	170	6	<10	<5	<20	2.4		<50	12		1200
COF-P8	12/14/1989	14463	0	0.24			<1	<500	<1	<10	170	5	<10	18	<20	1.8		140	12		1000
COF-P8	3/8/1990	2805	0	<0.05			<1	<500	1	60	1900	61	<10	42	<20	1.5		250	11		1000
COF-P8	6/13/1990	7384	0	0.11			<1	<500	<1	10	1500	6	<10	11	30	1.5		210	13		720
COF-P8	9/27/1990	15147	0	<0.05			<1	<500	<1	<10	220	7	<10	<5	<20	1.2		180	11		840
COF-P8	12/13/1990	18900	0	<0.05			<1	<500	<1	<10	390	12	<10	<5	<20	1.4		150	14		1100
COF-P8	3/18/1991	4903	0	<0.05			<1	<500	<1	60	370	12	<10	68	40	1.1		200	15		950
COF-P8	7/1/1991	12579	0	<0.05			4	<500	<1	10	600	18	<10	<5	<20	0.96		120	14		990
COF-P8	9/26/1991	18360	0	0.05			<1	<500	<1	20	470	21	<10	18	<20	0.93		170	13		1100
COF-P8	12/23/1992	17521	0	<0.05	<0.01	<1	<1	<500	<1	<10	80	8	<10	<5	<20	0.97	0.03	80	4	<10	800
COF-P8	2/10/1993	1096	0	<0.05	<0.01	<1	1	<500	<1	<10	60	7	<10	<5	<20	0.8	0.06	150	11	<10	950
COF-P8	2/10/1993	1097	0	<0.05	<0.01	<1	<1	<500	<1	<10	80	7	<10	<5	<20	0.79	<0.01	170	11	<10	920
COF-P8	11/16/1993	15665	0	<0.05		<1	<1	<500	<1	<10	<10	4	<10	<5	<20			150	11		840
COF-P8	3/1/1994	1486	0	<0.05		1	<1	<500	<1	<10	260	10	<10	<5	<20	0.66		150	11		810
COF-P8	5/31/1994	5850	0	0.05		<1	<1	<500	<1	<10	90	6	<10	19	<20			230	11		1300
COF-P8	8/30/1994	11693	0	<0.05		<1	<1	<500	<1	<10	130	7	<10	<5	<20	0.7		170	10		900
COF-P8	11/2/1994	15777	0	<0.05		<1	<1	<500	<1	<10	770	9	<10	<5	<20			160	9		630
COF-P8	3/9/1995	2104	0	<0.05		<1	<1	<500	<1	<10	300	6	<10	<5	<20	0.72		80	10		1100
COF-P8	6/5/1995	5771	0	<0.05		<1	<1	<500	<1	<10	20	3	<10	<5	<20			130	<2		580
COF-P8	9/19/1995	10879	0	<0.05		<1	<1	<500	<1	<10	40	6	<10	<5	<20			100	16		840
COF-P8	11/6/1995	12674	0	<0.05		<1	1	<500	<1	<10	50	9	<10	<5	<20			90	9		920
COF-P8	3/13/1996	2834	0	<0.05		<1	<1	<500	<1	<10	340	18	<10	<5	<20			90	10		1900
COF-P8	6/11/1996	6291	0	<0.05		<1	<1	<500	<1	<10	80	3	<10	<5	<20			200	10		440
COF-P8	9/12/1996	13865	0	<0.05		<1	<1	<500	2	<10	60	6	<10	<5	<20			170	11	<10	990
COF-P8	11/19/1996	13865	0	<0.05		<1	<1	<500	2	<10	60	6	<10	<5	<20			170	11		990
COF-P8	2/24/1997	2360	0	<0.05		<1	3	<500	<1	<10	<10	4	<10	<5	<20			130	12	<10	1700
COF-P8	5/21/1997	6878	0	<0.05		<1	<1	<500	<1	<10	810	5	<10	11	<20			140	3	<10	880
COF-P8	11/19/1997	15665	0	<0.05		<1	<1	<500	<1	<10	130	8	<10	<5	<20			130	14	<10	1200
COF-P8	5/18/1998	4501	0	<0.05		<1	<1	<200	6	<10	80	4	<10	<5	<20			130	10	<10	910
COF-P8	11/16/1998	10238	0	<0.05		<1	<1	<200	<1	<10	160	4	<10	<5	<20			170	11	<10	640
COF-P8	4/6/1999	3535	0	<0.05		<1	<1	<200	<1	<10	130	5	<10	<5	<20			150	8	<10	500
COF-P8	10/6/1999	10656	52.2	<0.05		<1	<1	<200	<1	<10	640	4	<10	14	<20			90	8	<10	1400
COF-P8	4/12/2000	4876	0	<0.05		<1	<1	<200	<1	<10	170	4.6	<10	<5	<20			150	9	<10	600
COF-P8	10/24/2000	12279	0	<0.05		<1	<1	<200	<1	<10	110	<1	<10	<5	<20			150	11	<10	1200
COF-P8	4/10/2001	3440	0	<0.05		<1	<1	<200	<1	<10	170	19	<10	<5	<20			160	11	<10	530
COF-P8	10/23/2001	12986	0	<0.05		<1	<1	<200	<1	<10	58	4.5	<10	9.2	<20			130	10	<10	930
COF-P8	4/15/2002	6697	0	<0.05		<1	<1	<200	<1	<10	91	8	<10	<5	<20			150	9.4	<10	810
COF-P8	10/22/2002	17825	0	<0.05	<0.01	<1	<1	<200	<1	<10	60	2.5	<10	<5	<20	0.81		160	9.6	<10	1000
COF-P8	4/8/2003	5703	0	<0.05	0.01	<1	<1	<200	<1	<10	190	<1	<10	<5	<20	<0.01		150	5.4	<10	670
COF-P8	10/28/2003	18154	0	<0.05	<0.01	<0.6	<0.1	<200	<0.5	<10	80	5.3	<10	<5	<20	1.1		150	8.4	<10	1100
COF-P8	4/14/2004	6452	0	<0.05	<0.01	<0.6	<0.1	<200	<0.1	<10	270	37.7	<10	<5	<20	1.1		120	7.8	<10	980
COF-P8	10/18/2004	17277	0	<0.05	<0.01	<3	<1	<200	<1	<10	140	2	<10	5	<20	1		150	7.5	<10	920
COF-P8	4/11/2005	16812	0	<0.05		<3	<1	<200	<1	<10	80	2	<10	5	<20			160		<10	810
COF-P8	5/5/2005	19608	0		<0.01											0.76			7		
COF-P8	10/17/2005	38794	0	<0.05	<0.01	<3	1	<200	<1	<10	100	3	<10	<5	<20	0.88		150	8	<10	860
COF-P8	4/10/2006	AG33616	0	<0.2	<0.01	<3	<1	<200	1	<10	670	24	<10	<5	<20	0.83		200	8	<10	910
COF-P8	10/11/2006	AG54842	0	<0.2	<0.01	<3	<1	<200	<1	<10	190	4	<10	6	<20	0.49		160	9.6	<10	1100
COF-P8	4/9/2007	AH30356	0	<0.1	<0.1	<1	<1	<200	<1	1.5	100	2.8	<10	<10	<5	0.85	<0.1	130	6.5	<10	1000
COF-P8	10/15/2007	L315801-21	0	<0.1	<0.1	<1	<1	<200	<1	2.3	980	39	<15	250	<5	<0.1	<0.1	160	8.8	<10	3200
COF-P8	4/14/2008	L341361-24	0	<0.1	<0.1	<1	1.4	<200	1.1	2.7	<100	1.6	<15	<10	<5	0.53	<0.1	150	7.6	<10	470
COF-P8	10/20/2008	L371417-24	0	<0.1	<0.1	<1	<1	<200	1.9	1.7	<100	2.6	<15	<10	<5	0.38	<0.1	160	8.7	<10	1200
COF-P8	4/6/2009	L396908-20	0	<0.1	<0.1	<1	<1	<200	<1	3	<100	1.2	<15	<10	<5	0.4	<0.1	160	8.2	<2	430
COF-P8	10/26/2009	L429478-23	0	<0.1	<0.1	<1	<1	<200	<2	<2	<100	1.5	<15	<10	<5	0.31	0.48	170	8.3	<2	540
COF-P8	4/26/2010	L456474-24	0	<0.1	0.13	<1	3.7	<200	<2	<2	<100	1	<15	<10	<5	0.53	<0.1	140	7.3	<2	420
COF-P8	10/19/2010	L485273-23	0	<0.1	<0.1	<1	<1	<200	<2	<2	<100	1.6	<15	<10	<5	0.22	<0.1	230	9.3	<2	140
COF-P8	4/11/2011	L511237-24	0	<0.1	<0.1	<1	1.2	<200	<2	7.7	970	18	<15	<10	<5	0.41	<0.1	140	7.8	<2	1300
COF-P8	10/18/2011	L542857-24	0	<0.1	<0.1	<1	1	<200	<2	3.3	380	12	<15	14	<5	<0.1	<0.1	110	6.7	<2	2700
COF-P8	4/10/2012	L569652-24	0	<0.1	<0.1	<1	<1	<200	<2	<2	<100	<1	23	<10	8.4	0.38	<0.1	160	9	<2	320
COF-P8	10/23/2012	L602894-24	0	<0.1	<0.1	<1	<1	<200	<2	<2	<100	1.9	<15	<10	<5	0.39	<0.1	170	8	<2	520
COF-P8	4/8/2013	L630049-24	0	<0.1	<0.1	<1	<1	<200	<2	2.9	<100	1.2	<15	<10	<2	<0.1	<0.1	160	7.5	<2	380
COF-P8	10/21/2013	4087278025	0	<0.5	<0.5	<1	<1	<100	<1	<10	<100	<1	<1	<5	<20	0.62	<0.4	184	10.2	<1	479
COF-P8	4/16/2014	490-51172-25	0	<0.1	<0.1	<2	<2	<50	<2	<10	127	<2	<20	<15	<50	0.344	0.204	140	10.2	<2	908
COF-P8	10/24/2014	L729945-20	0	<0.1	<0.25	<1	<1	<200	7.4	40	900	23	<15	<10	<5	0.47	<0.1	170	8.3	<2	850
COF-P8	4/9/2015	L758754-09	0	<0.1	<0.25	0.52	0.26	37	<10	<20	<100	1.3	<15	<10	<5	0.34		160	8.7	0.84	440



TENNESSEE VALLEY AUTHORITY
COLBERT FOSSIL PLANT

Spatial Distribution of Ammonia

DATE: 7/22/2015	FIGURE NO. 5
DRAWN BY: NMP	CHECKED BY: MGG
	JOB NO.

Ammonia

- <0.626 mg/L (WQG)
- <6.26 mg/L
- <62.6 mg/L

N

0 750 1,500 3,000

Feet

BASE MAP SOURCE:
ESRI World Imagery

TENNESSEE VALLEY AUTHORITY
COLBERT FOSSIL PLANT

Spatial Distribution of Antimony

DATE: 7/22/2015	FIGURE NO. 6
DRAWN BY: NMP	CHECKED BY: MGG
	JOB NO.

Antimony

- <0.006 mg/L (WQG)
- <0.06 mg/L
- <0.6 mg/L

N

0 750 1,500 3,000

Feet

BASE MAP SOURCE:
ESRI World Imagery

CA27BR
CA28B
CA31A
CA22B
CA19B
CA9R
CA17A
CA17B
MC1
MC4
MC5C
MC5A
MC5B
CA29AR
CA29BR
CA30B
CA12A
CA12B
CA20A
CA20B
CA5
CA6
CA11
P-8

TENNESSEE VALLEY AUTHORITY
COLBERT FOSSIL PLANT

Spatial Distribution of Arsenic

DATE: 7/22/2015	FIGURE NO. 7
DRAWN BY: NMP	CHECKED BY: MGG
	JOB NO.

Arsenic

- <0.01 mg/L (WQG)
- <0.1 mg/L
- <1 mg/L

N

0 750 1,500 3,000

Feet

BASE MAP SOURCE:
ESRI World Imagery

CA27BR
CA28B
CA31A
CA22B
CA19B
CA9R
CA17A
CA17B
MC1
MC4
MC5C
MC5A
MC5B
CA29AR
CA29BR
CA30B
CA12A
CA12B
CA20A
CA20B
CA5
CA6
CA11
P-8

TENNESSEE VALLEY AUTHORITY
COLBERT FOSSIL PLANT

Spatial Distribution of Iron

DATE: 7/22/2015	FIGURE NO. 8
DRAWN BY: NMP	CHECKED BY: MGG
	JOB NO.

Iron

- <1.1 mg/L (WQG)
- <11 mg/L
- <110 mg/L

N

0 750 1,500 3,000

Feet

BASE MAP SOURCE:
ESRI World Imagery

CA27BR
CA28B
CA31A
CA22B
CA19B
CA9R
CA17A
CA17B
MC1
MC4
MC5C
MC5A
MC5B
CA29AR
CA29BR
CA30B
CA12A
CA12B
CA20A
CA20B
CA5
CA6
CA11
P-8



TENNESSEE VALLEY AUTHORITY
COLBERT FOSSIL PLANT

Spatial Distribution of Manganese

DATE: 7/22/2015	FIGURE NO. 9
DRAWN BY: NMP	CHECKED BY: MGG
	JOB NO.

Manganese

- <0.088 mg/L (WQG)
- <0.88 mg/L
- <8.8 mg/L

N

0 750 1,500 3,000

Feet

BASE MAP SOURCE:
ESRI World Imagery


CA27BR
CA28B
CA31A
CA22B
CA19B
CA9R
CA17A
CA17B
MC1
MC4
MC5C
MC5A
MC5B
CA29AR
CA29BR
CA30B
CA12A
CA12B
CA20A
CA20B
CA5
CA6
CA11
P-8
TENNESSEE VALLEY AUTHORITY
COLBERT FOSSIL PLANT
Spatial Distribution of Strontium
DATE: 7/22/2015
FIGURE NO. 10
DRAWN BY: NMP
CHECKED BY: MGG
JOB NO.
Strontium
<2.2 mg/L (WQG)
<22 mg/L
<220 mg/L
N
0
750
1,500
3,000
Feet
BASE MAP SOURCE:
ESRI World Imagery



TENNESSEE VALLEY AUTHORITY
COLBERT FOSSIL PLANT

Spatial Distribution of Vanadium

DATE: 7/22/2015	FIGURE NO. 11
DRAWN BY: NMP	CHECKED BY: MGG
	JOB NO.

Vanadium

- <0.0036 mg/L (WQG)
- <0.036 mg/L
- <0.36 mg/L

N

0 750 1,500 3,000

Feet

BASE MAP SOURCE:
ESRI World Imagery

APPENDIX A

FIELD DATA SHEETS

Preliminary Groundwater Data Field Worksheet

Sheet ____ of ____

Project/Site	Well Number	Purge Date	Year	Month	Day
Colbert	MC 1 84068		2015	04	9

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
1.13 4195	23.59 4194	RD 51 102 4188	R. Duncan	R. Duncan R. Minor A. Nesbitt

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter Type and Size:
4191		4190	COF-mc1-0415	☐ Unfiltered ☐ Filtered ☐ Both

[Bottom of Well - Depth to Water] x Volume Factor =	Well Volume (L)	Target Purge Volume (L)	Actual Purge Volume (L)
[(23.59)m - (1.13)m] x (8.107)L/m=	182.08	Micro Purge	4186

Purge Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Notes and WQ Observations	Time ET CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1005		1.13	12.0						
2 L	1010	0.4	1.14	12.0	19.56	9.3	2.18	428	193	0.91
2 L	1015	0.4	1.14	12.0	19.78	9.4	1.30	431	187	0.66
3 L	1020	0.6	1.14	12.0	19.89	9.4	1.13	431	179	0.77
3 L	1025	0.6	1.14	12.0	19.76	9.4	0.87	431	173	0.65
3 L	1030	0.6	1.14	12.0	19.89	9.4	0.82	431	176	0.41
3 L	1035	0.6	1.14	12.0	19.95	9.4	0.66	432	181	0.43
1 L										
Sampled at	1032									

Remarks: Tubing Volume ≈ 3.84 L

Reviewed By: _____ Survey Leader _____ Date _____ Project Leader 5/5/15 Date

Sample Collector: R. Minor

Sample Date			Time
Year	Month	Day	
2015	4	9	1037 ET (CT)

Pump Duration 30 min 72004

"999" = 2 days

Sample Readings

1037	0.6	1.14	12.0	19.95	9.4	0.66	432	181	0.43
Analysis Time ET CT	4193 Pump Rate (L/min)	Depth to Water (m)	4192 Pump Depth (m)	10 Temp °C EPA 170.1	400 pH (s.u.) EPA 150.1	300 DO (mg/L) EPA 360.1	94 COND (umhos/cm) EPA 120.1	90 (+/-) ORP (mV) SM 2580B	Turbidity (NTU) EPA 180.1

Additional Sample Data

Analyst: R. Duncan

Date Analyzed: Year 2015 Month 4 Day 9

Turbidity 1350: ☑ Clear ☐ Turbid ☐ Slightly Turbid ☐ Highly Turbid

Color: None

Odor: None

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Bottles Required: ☐ Ferrous ☐ Mineral ☐ Phenol ☐ BOD ☐ TOC ☐ Metals ☐ Dis. Mineral ☐ Filt TIC ☐ COD ☐ TIC ☐ Dis. Metals ☐ Nutrient ☐ TSS/TDS Others (list): _____

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Distribution: (1) Original - Data Mgmt. (2) Pink - Survey Leader (3) Blue - Project Manager (4) Green - Customer (5) Yellow - ERS Files

TVA 300664 (9-1999)

Preliminary Groundwater Data Field Worksheet

Sheet ____ of ____

Project/Site	Well Number	Purge Date	Year	Month	Day
COF Groundwater	MC1 84068		2015	06	15

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
4195	4194	4188	R. Duncan	R. Duncan, R Minor, S. Whitehead

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter
4191		4190	COF-MC1-0615	☐ Unfiltered ☐ Filtered ☐ Both; Filter Type and Size:

[Bottom of Well − Depth to Water] x Volume Factor =	Well Volume	Target Purge Volume	Actual Purge Volume
[(23.59)m − (1.44)m] x (8.107)L/m=	179.57 (L)	micro purge (L)	(L) 4186

Purge Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Notes and WQ Observations	Time ET CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1536			12.0	23.73	10.45	2.52	565.0	60	2.06
2L	1535	0.4	1.44	12.0	22.93	10.59	1.11	572.0	32	2.02
2L	1540	0.4	1.44	12.0	22.52	10.62	1.11	574.3	25	2.16
2L	1545	0.4	1.44	12.0	23.15	10.66	1.04	576.2	22	2.13
2L	1550	0.4	1.44	12.0	23.43	10.66	0.91	577.3	18	1.80
2.5L	~~1600~~ 1555	0.5	1.44	12.0	23.32	10.66	0.69	577.2	11	1.81
2L	1600	0.4	1.45	12.0	23.11	10.67	0.57	579.1	8	1.69
2L	1605	0.4	1.45	12.0	22.86	10.67	0.50	576.5	5	1.80

Remarks: _____

Reviewed By: _____ Survey Leader _____ Date _____ Project Leader _____ Date

Sample Collector: R minor

Sample Date			Time
Year	Month	Day	
2015	06	15	1607 ET CT

Pump Duration: min 72004

"999" = 2 days

Sample Readings

Analysis Time ET CT	Pump Rate (L/min) 4193	Depth to Water (m)	Pump Depth (m) 4192	Temp °C 10	pH (s.u.) 400	DO (mg/L) 300	COND (umhos/cm) 94	(+/-) ORP (mV) 90	Turbidity (NTU)
	0.4	1.45	12	22.86	10.67	0.50	576.5	5	1.80
	EPA 170.1			EPA 150.1		EPA 360.1	EPA 120.1	SM 2580B	EPA 180.1

Additional Sample Data

Analyst: R. Duncan

Date Analyzed: Year 2015 Month 06 Day 15

Turbidity 1350: ☑ Clear ☐ Turbid ☐ Slightly Turbid ☐ Highly Turbid

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Bottles Required ☐ Ferrous ☐ Mineral ☐ Phenol Others (list):

Preliminary Groundwater Data Field Worksheet

Sheet ____ of ____

Project/Site	Well Number	Purge Date: Year	Month	Day
Colbert	MC4 84068	2015	04	9

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
1.66 4195	9.34 4194	102 4188	R. Duncan	R. Duncan, R. Minor, A. Nesbitt

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter Type and Size:
4191		4190	COF-MC4-0415	☐ Unfiltered ☐ Filtered ☐ Both

[Bottom of Well - Depth to Water] x Volume Factor =	Well Volume (L)	Target Purge Volume (L)	Actual Purge Volume (L)
[(9.34)m - (1.66)m] x (8.107)L/m=	62.26	16.5 micro Purge	16.5 4186

Purge Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Notes and WQ Observations	Time ET (CT)	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	~~1056~~ 1400		1.66	5.0						
3.5 L	1105	0.7	1.88		18.68	9.5	1.24	451	190	0.5
3.0 L	1110	0.6	1.87		19.07	9.5	0.92	452	191	0.4
2.0 L	1115	0.4	1.86		19.48	9.5	1.01	453	191	0.3
3.0 L	1120	0.6	1.88		19.70	9.5	0.88	453	190	0.3
2.5 L	1125	0.5	1.88		19.77	9.5	0.95	453	190	0.2
2.5 L	1130	0.5	1.88		19.80	9.5	0.95	453	190	0.3
Sampled @ 1132										

Remarks: Tubing Volume = 3.84 L

Reviewed By: _____ (Survey Leader) _____ (Date) Mitch Dan (Project Leader) 5/5/15 (Date)

Sample Collector: R. Minor

Sample Date			Time
Year	Month	Day	
2015	04	9	1132 ET (CT)

Pump Duration 32 min 72004

"999" = 2 days

Sample Readings

1132	0.5	1.88	5.0	19.80	9.5	0.95	453	190	0.
Analysis Time ET CT	4193 Pump Rate (L/min)	Depth to Water (m)	4192 Pump Depth (m)	10 Temp °C EPA 170.1	400 pH (s.u.) EPA 150.1	300 DO (mg/L) EPA 360.1	94 COND (umhos/cm) EPA 120.1	90 (+/-) ORP (mV) SM 2580B	Turbidity (NTU) EPA 180.1

Additional Sample Data

Analyst: R. Duncan

Date Analyzed: Year 2015 Month 4 Day 9

Turbidity 1350: ☑ Clear ☐ Turbid ☐ Slightly Turbid ☐ Highly Turbid

Color: None

Odor: None

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Bottles Required ☐ Ferrous ☐ Mineral ☐ Phenol ☐ BOD ☐ TOC ☐ Metals ☐ Dis. Mineral ☐ Filt TIC ☐ COD ☐ TIC ☐ Dis. Metals ☐ Nutrient ☐ TSS/TDS

Others (list): _____

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

TVA 30066A (9-1999)

Distribution: (1) Original - Data Mgmt. (2) Pink - Survey Leader (3) Blue - Project Manager (4) Green - Customer (5) Yellow - ERS Files

Preliminary Groundwater Data Field Worksheet

Sheet ____ of ____

Project/Site	Well Number	Purge Date: Year	Month	Day
COF Groundwater	MC4 84068	2015	06	15

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
4195	4194	4188	R. Duncan	R. Duncan, R. Minor, S. Whitehead

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter
4191		4190	COF-MC4-0615	☐ Unfiltered ☐ Filtered ☐ Both; Filter Type and Size:

[Bottom of Well − Depth to Water] × Volume Factor =	Well Volume	Target Purge Volume	Actual Purge Volume
[(9.34)m − (1.92)m] × (8.107)L/m=	60.15 (L)	180.46 (L)	14 (L) 4186

Purge Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Notes and WQ Observations	Time ET (CT)	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1445		2.19	5.0	28.43	9.57	2.21	492.2	139	2.35
3L	1450	0.6	2.11	5.0	25.14	9.67	1.83	495.5	141	2.40
3L	1455	0.6	2.10	5.0	24.13	9.71	1.58	492.3	~~492.44~~ 144	2.48
2L	1500	0.4	2.05	5.0	24.14	9.75	1.69	493.1	143	2.18
2L	1505	0.4	2.05	5.0	24.35	9.72	1.43	490.7	142	2.01
2L	1510	0.4	2.06	5.0	24.11	9.71	1.27	492.8	143	1.97
2L	1515	0.4	2.08	5.0	24.08	9.72	0.98	492.4	140	1.59
Sampled	1517									

Remarks: _____

Reviewed By: _____ Survey Leader _____ Date _____ Project Leader _____ Date

Sample Collector: RMinor

Sample Date			Time
Year	Month	Day	
2015	06	15	1517 ET CT

Pump Duration ____ min 72004

"999" = 2 days

Sample Readings

1517	0.4	2.08	5.0	24.08	9.72	0.98	492.4	140	1.59
Analysis Time ET CT	4193 Pump Rate (L/min)	Depth to Water (m)	4192 Pump Depth (m)	10 Temp °C EPA 170.1	400 pH (s.u.) EPA 150.1	300 DO (mg/L) EPA 360.1	94 COND (umhos/cm) EPA 120.1	90 (+/-) ORP (mV) SM 2580B	Turbidity (NTU) EPA 180.1

Additional Sample Data

Analyst: R. Duncan

Date Analyzed: Year 2015 Month 6 Day 15

Turbidity 1350 ☑ Clear ☐ Turbid ☐ Slightly Turbid ☐ Highly Turbid

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Well Diameter (mm)	Vol. Factor (L/m)
12.7 (0.5 in)	0.127
51 (2 in)	2.027
76 (3 in)	4.560
102 (4 in)	8.107
127 (5 in)	12.668
153 (6 in)	18.228

Bottles Required ☐ Ferrous ☐ Mineral ☐ Phenol Others (list):

Preliminary Groundwater Data Field Worksheet

Sheet ____ of ____

Project/Site	Well Number	Purge Date	Year	Month	Day
Colbert	MC 5A 84068		2015	04	09

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
1.22 4195	8.36 4194	51 4188	R. Duncan	R. Duncan R. Minor A Nesbitt

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter Type and Size:
4191		4190	COF MC5A-0415	☐ Unfiltered ☐ Filtered ☐ Both

[Bottom of Well - Depth to Water] x Volume Factor =	Well Volume (L)	Target Purge Volume (L)	Actual Purge Volume (L)
[(8.36)m - (1.22)m] x (2.027)L/m=	14.47	43.41	28.5 4186

Purge Pump: ☐ Bladder ☑ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Sample Pump: ☐ Bladder ☑ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Notes and WQ Observations	Time ET (CT)	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	0830			6.5						
2 L	0835	0.4	1.22	6.5	20.13	8.4 [illegible]	1.46	334	223	17.9
2 L	0840	0.4	1.23	6.5	20.13	8.4	1.25	335	227	32.5
2 L	0845	0.4	1.24	6.5	20.14	8.4	1.26	335	228	30.9
2 L	0850	0.4	1.24	6.5	20.22	8.4	1.05	336	230	15.7
2.5L	0855	0.5	1.25	6.5	20.33	8.4	0.81	336	230	17.6
2.5L	0900	0.5	1.26	6.5	20.38	8.4	0.71	336	228	16.4
3.0L	0905	0.6	1.25	6.5	20.39	8.4	0.62	336	227	14.3
2.5L 0910	0910	0.5	1.25	6.5	20.37	8.4	0.55	337	225	12.0
2.5L	0915	0.5	1.25	6.5	20.36	8.4	0.51	337	224	9.08
2.5L	0920	0.5	1.25	6.5	20.37	8.4	0.49	337	222	7.02
2.5L	0925	0.5	1.25	6.5	20.37	8.4	0.47	337	221	6.10
2.5L	0930	0.5	1.25	6.5	20.38	8.4	0.44	339	221	4.95
	0932	Sampled								

Remarks: Tubing volume = 3.84 L

Reviewed By: _____ Survey Leader _____ Date _____ Project Leader 5/5/15 Date

Sample Collector: R. Duncan

Sample Date			Time
Year	Month	Day	0932 ET (CT)
2015	04	9	

Pump Duration 60 min 72004

"999" = 2 days

Sample Readings

Analysis Time ET (CT)	Pump Rate (L/min) 4193	Depth to Water (m)	Pump Depth (m) 4192	Temp °C 10	pH (s.u.) 400	DO (mg/L) 300	COND (umhos/cm) 94	(+/-) ORP (mV) 90	Turbidity (NTU)
0932	0.5	1.25	6.5	20.38	8.4	0.44	339	221	4.95
	EPA 170.1	EPA 150.1	EPA 360.1	EPA 120.1	SM 2580B	EPA 180.1			

Additional Sample Data

Analyst: R. Duncan

Date Analyzed

Year	Month	Day
2015	4	9

Turbidity 1350 ☑ Clear ☐ Turbid ☐ Slightly Turbid ☐ Highly Turbid

Color: Clear

Odor: none

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Bottles Required ☐ Ferrous ☐ Mineral ☐ Phenol ☐ BOD ☐ TOC ☐ Metals ☐ Dis. Mineral ☐ Filt TIC ☐ COD ☐ TIC ☐ Dis. Metals ☐ Nutrient ☐ TSS/TDS

Others (list): _____ _____

Distribution: (1) Original - Data Mgmt. (2) Pink - Survey Leader (3) Blue - Project Manager (4) Green - Customer (5) Yellow - ERS Files

Preliminary Groundwater Data Field Worksheet

Sheet ____ of ____

Project/Site	Well Number	Purge Date	Year	Month	Day
COF Gr	MC5A 84068		2015	6	16

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
1.68 4195	8.36 4194	4188	R. Duncan	RMinor, R Duncan, SWhitehead

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label
4191		4190	COF-MC5A-0615

☐ Unfiltered ☐ Filtered ☐ Both
Filter Type and Size:

[Bottom of Well - Depth to Water] x Volume Factor =	Well Volume	Target Purge Volume	Actual Purge Volume
[(8.36)m - (1.68)m] x (2.027)L/m=	13.54 (L)	40.62 (L)	20.5 (L) 4186

Purge Pump: ☐ Bladder ☑ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Sample Pump: ☐ Bladder ☑ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Notes and WQ Observations	Time ET (CT)	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1048		1.68	6.5	~~24.78~~ ~~24.38~~	9.31	1.58	489.5	180	22.8
2 L	1053	0.4	1.70	6.5	22.97	9.4	1.10	495.3	134	25.6
1.5 L	1058	0.3	1.70	6.5	22.74	9.4	1.29	492.3	122	39.7
2 L	1103	0.4	1.71	6.5	23.21	9.4	1.18	489.7	122	34.7
2 L	1108	0.4	1.72	6.5	23.76	9.3	0.92	492.6	112	21.7
3 L	1113	0.6	1.72	6.5	23.68	9.3	0.71	492.0	103	10.5
2.5 L	1118	0.5	1.72	6.5	23.52	9.3	0.63	492.2	97	7.7
3 L	1123	0.6	1.73	6.5	23.40	9.3	0.56	491.6	94	5.58
2.5 L	1128	0.5	1.73	6.5	23.35	9.3	0.52	491.7	93	3.15
Sampled	1130									

Remarks: tubing volume = 3.84 L

Reviewed By: _____ Survey Leader _____ Date _____ Project Leader _____ Date

Sample Collector: RMinor

Sample Date			Time
Year	Month	Day	1130 ET (CT)
2015	6	16	

Pump Duration _____ min 72004

"999" = 2 days

Sample Readings

1130	0.5	1.73	6.5	23.95	9.3	0.52	491.7	93	3.15
Analysis Time ET CT	4193 Pump Rate (L/min)	Depth to Water (m)	4192 Pump Depth (m)	10 Temp °C EPA 170.1	400 pH (s.u.) EPA 150.1	300 DO (mg/L) EPA 360.1	94 COND (umhos/cm) EPA 120.1	90 (+/-) ORP (mV) SM 2580B	Turbidity (NTU) EPA 180.1

Additional Sample Data

Analyst: Ray Duncan

Date Analyzed: Year 2015 Month 6 Day 16

Turbidity 1350 ☑ Clear ☐ Turbid ☐ Slightly Turbid ☐ Highly Turbid

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Bottles Required ☐ Ferrous ☐ Mineral ☐ Phenol Others (list):

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

120 FT

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date Year	Month	Day
Colbert	MC5C 84068	2015	04	14

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
1.57 4195	46.6 4194	51 4188	R. Duncan	R. Duncan R. Minor

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter Type and Size:
4191		4190	CoF-MC5C-0415	☐ Unfiltered ☐ Filtered ☐ Both

[Bottom of Well - Depth to Water] x Volume Factor =	Well Volume	Target Purge Volume	Actual Purge Volume
[(46.6)m - (1.57)m] x (2.027)L/m=	91.27 (L)	273.81 (L)	94 (L) 4186

Purge Pump: ☐ Bladder ☑ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): Bailer

Notes and WQ Observations	Time ET (CT)	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	0859		1.57	45.0						
12 L	0904		10.01	45.0	18.81	7.9	0.34	452	16	2.82
8.0 L	0909		12.97	45.0	19.02	8.1	0.34	447	9	5.10
12.0 L	0914		17.78	45.0	19.51	8.2	0.25	441	32	6.46
14.0 L	0919		25.25	45.0	19.94	8.1	0.24	440	68	7.65
16.0 L	0924		33.59	45.0	20.47	8.1	0.32	442	65	6.93
9.0 L	0929		36.57	45.0	20.76	8.1	0.40	443	86	7.06
10.0 L	0934		40.43	45.0	21.27	8.1	0.39	445	75	7.81
9.0 L	0939		43.45	45.0	21.87	8.1	0.54	446	72	7.63
4.0 L	0941	Pumped DRY and Let Recover								

Remarks: _____

Reviewed By: _____ (Survey Leader) _____ (Date) Mark Dunn (Project Leader) 5/5/15 (Date)

Sample Collector: R. Minor

Sample Date			Time
Year	Month	Day	
2015	4	15	0844 ET (CT)

Pump Duration 43 min 72004

"999" = 2 days

Sample Readings

0844	NA	1.41	NA	16.90	7.8	1.77	454	269	4.65
Analysis Time ET CT	4193 Pump Rate (L/min)	Depth to Water (m)	4192 Pump Depth (m)	10 Temp °C EPA 170.1	400 pH (s.u.) EPA 150.1	300 DO (mg/L) EPA 360.1	94 COND (umhos/cm) EPA 120.1	90 (+/-) ORP (mV) SM 2580B	Turbidity (NTU) EPA 180.1

Additional Sample Data

Analyst: R. Duncan

Date Analyzed: Year 2015 Month 4 Day 15

Turbidity 1350: ☑ Clear ☐ Turbid ☐ Slightly Turbid ☐ Highly Turbid

Color: None

Odor: None

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Bottles Required: ☐ Ferrous ☐ Mineral ☐ Phenol ☐ BOD ☐ TOC ☐ Metals ☐ Dis. Mineral ☐ Filt TIC ☐ COD ☐ TIC ☐ Dis. Metals ☐ Nutrient ☐ TSS/TDS

Others (list): _____

Distribution: (1) Original - Data Mgmt. (2) Pink - Survey Leader

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Preliminary Groundwater Data Field Worksheet

Sheet ____ of ____

Project/Site	Well Number	Purge Date	Year	Month	Day
Colbert	CA 5 84068		2015	04	8

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
1.29 4195	4.27 4184	102 4188	R. Duncan	R. Duncan R. Minor, A Nesbitt

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter Type and Size:
4191		4190	COF-CA5-0415	☐ Unfiltered ☐ Filtered ☐ Both

[Bottom of Well - Depth to Water] x Volume Factor =	Well Volume (L)	Target Purge Volume (L)	Actual Purge Volume (L)
[(4.27)m - (1.29)m] x (8.107)L/m=	24.15	72.47	75.0 4186

Purge Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): Bailed

Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): Bailer

Notes and WQ Observations	Time ET CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1049									
End	1134	Bailed three well volumes 75 L and collected sample								

Remarks: Collected dissolved metals

Reviewed By: _____ Survey Leader _____ Date Mat D Project Leader 5/5/15 Date

Sample Collector: R. Duncan

Sample Date			Time
Year	Month	Day	
2015	04	8	1145 ET (CT)

Pump Duration: min 72004

"999" = 2 days

Sample Readings

Analysis Time ET CT	4193 Pump Rate (L/min)	1.35 Depth to Water (m)	4192 Pump Depth (m)	13.95 10 Temp °C EPA 170.1	5.30 400 pH (s.u.) EPA 150.1	6.50 300 DO (mg/L) EPA 360.1	55.3 94 COND (umhos/cm) EPA 120.1	519 90 (+/-) ORP (mV) SM 2580B	20.5 Turbidity (NTU) EPA 180.1

Additional Sample Data

Analyst: R. Duncan

Date Analyzed: Year 2015 Month 04 Day 8

Turbidity 1350: ☑ Clear ☐ Turbid ☐ Slightly Turbid ☐ Highly Turbid

Color: None

Odor: None

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Bottles Required ☐ Ferrous ☐ Mineral ☐ Phenol Others (list):

☐ BOD ☐ TOC ☐ Metals ☐ Dis. Mineral ☐ Filt TIC

☐ COD ☐ TIC ☐ Dis. Metals ☐ Nutrient ☐ TSS/TDS

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Distribution: (1) Original - Data Mgmt. (2) Pink - Survey Leader (3) Blue - Project Manager (4) Green - Customer (5) Yellow - ERS Files

Preliminary Groundwater Data Field Worksheet

Sheet ____ of ____

Project/Site	Well Number	Purge Date: Year	Month	Day
COF Groundwater	CA5 84068	2015	6	15

Depth to Water (m) 4195	Bottom of Well (m) 4194	Well Diameter (mm) 4188	Survey Leader	Field Crew
		102	Ray Duncan	R Minor, R Duncan S Whitehead.

☐ Depth of Screen ☐ Open Bore Hole

(m) 4191	To	(m) 4190	Sample Label	Filter Type and Size:
			COF-CA5-0615	☐ Unfiltered ☐ Filtered ☐ Both

[Bottom of Well − Depth to Water]	x Volume Factor =	Well Volume (L)	Target Purge Volume (L)	Actual Purge Volume (L) 4186
[(4.34)m − (2.22)m]	x (8.107)L/m =	17.19	51.56	36.5

Purge Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Notes and WQ Observations	Time ET CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1354									
8.5L										
10.0L										
9.0L										
8.0L										
Dry	1404									
6-16-15	836		2.28		19.12	5.94	4.88	83.2	317	16.6

Remarks: Baled dry, water turbid, left to recover overnight

Reviewed By: _____ Survey Leader _____ Date _____ Project Leader _____ Date

Sample Collector: R. Minor

Sample Date			Time
Year	Month	Day	
2015	6	16	0836 ET (CT)

Pump Duration _____ min 72004

"999" = 2 days

Sample Readings

0836		2.28		9.12	5.94	4.88	83.2	317	16.6
Analysis Time ET CT	4193 Pump Rate (L/min)	Depth to Water (m)	4192 Pump Depth (m)	10 Temp °C EPA 170.1	400 pH (s.u.) EPA 150.1	300 DO (mg/L) EPA 360.1	94 COND (umhos/cm) EPA 120.1	90 (+/-) ORP (mV) SM 2580B	Turbidity (NTU) EPA 180.1

Additional Sample Data

Analyst: Ray Duncan

Date Analyzed: Year 2015 Month 06 Day 16

Turbidity 1350 ☐ Clear ☐ Turbid ☑ Slightly Turbid ☐ Highly Turbid

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Bottles Required ☐ Ferrous ☐ Mineral ☐ Phenol Others (list):

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Preliminary Groundwater Data Field Worksheet

Sheet ____ of ____

Project/Site	Well Number	Purge Date: Year	Month	Day
Colbert	CA6 84068	2015	04	8

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
2.92 4195	30.59 4194	102 4188	R. Duncan	R. Duncan, R. Minor, A Nesbitt

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter
4191		4190	COF-CA6-0415	☐ Unfiltered ☐ Filtered ☐ Both; Filter Type and Size:

[Bottom of Well − Depth to Water] x Volume Factor =	Well Volume (L)	Target Purge Volume (L)	Actual Purge Volume (L)
[(30.59)m − (2.92)m] x (8.107)L/m=	224.3	MicroPurge	23 4186

Purge Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Notes and WQ Observations	Time ET (CT)	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1212		2.92	15.0						
5 L	1217	1.0	3.44		Had Computer Issues					3.44
5 L	1222									
	1240									
3 L	1245	0.6	3.30	15.0	22.07	7.3	1.30	574	-86	1.38
2 L	1250	0.4	3.27		22.89	7.3	1.21	576	-89	1.20
3 L	1255	0.6	3.28		22.44	7.3	1.12	573	-93	0.90
2 L	1300	0.4	3.18		22.94	7.3	0.87	576	-97	1.89
2 L	1305	0.4	3.17		22.96	7.3	0.70	576	-101	0.95
1 L										
	1308 Sampled									

Remarks: Tubing Volume = 3.84 L

Reviewed By: _____ (Survey Leader) _____ (Date) Mitch Dr (Project Leader) 5/5/15 (Date)

Sample Collector: R Duncan

Sample Date			Time
Year	Month	Day	1308 ET CT
2015	04	8	

Pump Duration 35 min 72004 "999" = 2 days

Sample Readings

1308	0.4	3.17		22.96	7.3	0.70	576	-101	0.95
Analysis Time ET (CT)	4193 Pump Rate (L/min)	Depth to Water (m)	4192 Pump Depth (m)	10 Temp °C EPA 170.1	400 pH (s.u.) EPA 150.1	300 DO (mg/L) EPA 360.1	94 COND (umhos/cm) EPA 120.1	90 (+/-) ORP (mV) SM 2580B	Turbidity (NTU) EPA 180.1

Additional Sample Data

Analyst: R. Duncan

Date Analyzed: Year 2015 Month 4 Day 8

Turbidity 1350: ☑ Clear ☐ Turbid ☐ Slightly Turbid ☐ Highly Turbid

Color: None

Odor: Sulfur sulfur RD

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Bottles Required ☐ Ferrous ☐ Mineral ☐ Phenol Others (list): _____

☐ BOD ☐ TOC ☐ Metals ☐ Dis. Mineral ☐ Filt TIC

☐ COD ☐ TIC ☐ Dis. Metals ☐ Nutrient ☐ TSS/TDS

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Distribution: (1) **Original** - Data Mgmt. (2) **Pink** - Survey Leader (3) **Blue** - Project Manager (4) **Green** - Customer (5) **Yellow** - ERS Files

TVA 30066A (9-1999)

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date	Year	Month	Day
COF Groundwater	CA6 84068		2015	06	15

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
4195	4194	4188	R. Duncan	

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	
4191		4190	COF-CA6-0615	☐ Unfiltered ☐ Filtered ☐ Both Filter Type and Size:

[Bottom of Well - Depth to Water] x Volume Factor =	Well Volume (L)	Target Purge Volume (L)	Actual Purge Volume (L)
[(30.59)m - (3.38)m] x (8.107)L/m=	220.59	micropurge	4186

Purge Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list):

Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list):

Notes and WQ Observations	Time ET CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1214		3.74	15.0	21.65	7.37	0.78	580.4	-55	1.87
5L	1219	1.0	3.71	15.0	22.73	7.37	0.81	579.5	-64	1.43
2L	1224	0.4	3.70	15.0	23.39	7.37	0.71	579.0	-73	1.30
2L	1229	0.4	3.69	15.0	23.41	7.32	0.63	579.3	-82	0.98
2L	1234	0.4	3.68	15.0	23.33	7.33	0.56	576.4	-87	0.81
2L	1239	0.4	3.63	15.0	24.20	7.36	0.59	577.9	-90	0.77
3L	1244	0.6	3.69	15.0	23.80	7.36	0.46	579.3	-95	0.82
3L	1249	0.6	3.69	15.0	23.41	7.37	0.40	579.4	-99	1.25
2L	1254	0.4	3.59	15.0	24.31	7.37	0.44	576.2	-101	0.81
1.5L	1259	0.3	3.60	15.0	24.56	7.38	0.47	578.5	-101	1.50
2.5L	1304	0.5	3.64	15.0	24.65	7.37	0.42	572.8	-103	0.94
Sampled	1305									

Remarks: tubing volume = 3.84L

Reviewed By: Survey Leader Date Project Leader Date

Sample Collector: R. Minor

Sample Date			Time
Year	Month	Day	
2015	6	15	1305 ET CT

Pump Duration 50 min 72004

"999" = 2 days

Sample Readings

Analysis Time ET CT	4193 Pump Rate (L/min)	Depth to Water (m)	4192 Pump Depth (m)	10 Temp °C EPA 170.1	400 pH (s.u.) EPA 150.1	300 DO (mg/L) EPA 360.1	94 COND (umhos/cm) EPA 120.1	90 (+/-) ORP (mV) SM 2580B	Turbidity (NTU) EPA 180.1
		3.64	15	24.65	7.37	0.42	572.8 ~~572~~ SW	-103	0.94

Additional Sample Data

Analyst: R. Minor

Date Analyzed: Year 2015 Month 06 Day 15

Turbidity 1350: ☑ Clear ☐ Turbid ☐ Slightly Turbid ☐ Highly Turbid

Color: N/[illegible]

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Bottles Required ☐ Ferrous ☐ Mineral ☐ Phenol ☐ BOD ☐ TOC ☐ Metals ☐ Dis. Mineral ☐ Filt TIC

Others (list):

Preliminary Groundwater Data Field Worksheet

Sheet ____ of ____

Project/Site	Well Number	Purge Date	Year	Month	Day
COF	CA9R 84068		2015	04	07

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
14.62 4195	21.79 4194	51 4188	R. Duncan	R. Minor R. Duncan, A. Nesbitt

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	
4191		4190	COF-CA9R-0415	☐ Unfiltered ☐ Filtered ☐ Both Filter Type and Size:

[Bottom of Well - Depth to Water] x Volume Factor =	Well Volume (L)	Target Purge Volume (L)	Actual Purge Volume (L)
[(21.79)m - (14.62)m] x (2.027)L/m=	14.53	43.60	19.5 4186

Purge Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): Bailer

Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): Bailer

Notes and WQ Observations	Time ET CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1657									
End Purge	1727									
		Bailed dry 19.5L and Let Recover overnight								

Remarks: Collected dissolved metals

Reviewed By: _____ Survey Leader _____ Date _____ Project Leader 5/5/15 Date

Sample Collector: R. Duncan

Sample Date			Time
Year	Month	Day	
2015	04	08	1615 ET CT

Pump Duration min 72004

"999" = 2 days

Sample Readings

Analysis Time ET CT	4193 Pump Rate (L/min)	21.16 Depth to Water (m)	4192 Pump Depth (m)	20.85 10 Temp °C EPA 170.1	7.5 400 pH (s.u.) EPA 150.1	7.85 300 DO (mg/L) EPA 360.1	565 94 COND (umhos/cm) EPA 120.1	241 90 (+/-) ORP (mV) SM 2580B	29.2 Turbidity (NTU) EPA 180.1

Additional Sample Data

Analyst: R. Duncan

Date Analyzed

Year	Month	Day
2015	4	8

Turbidity 1350 ☑ Clear ☐ Turbid ☐ Slightly Turbid ☐ Highly Turbid

Color: None

Odor: None

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Bottles Required ☐ BOD ☐ COD ☐ TOC ☐ TIC ☐ Ferrous ☐ Metals ☐ Dis. Metals ☐ Mineral ☐ Dis. Mineral ☐ Nutrient ☐ Phenol ☐ Filt TIC ☐ TSS/TDS

Others (list):

Distribution: (1) **Original** - Data Mgmt. (2) **Pink** - Survey Leader (3) **Blue** - Project Manager (4) **Green** - Customer (5) **Yellow** - ERS Files

TVA 30066A (9-1999)

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date: Year	Month	Day
COF Groundwater	CA9R 84068	2015	6	16

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
13.85 4195	21.79 4194	4188	Ray Duncan	R Duncan, R Minor, S Whitehead

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	☐ Unfiltered ☐ Filtered ☐ Both
4191		4190	COF-CA9R-0615	Filter Type and Size:

[Bottom of Well − Depth to Water] x Volume Factor =	Well Volume	Target Purge Volume	Actual Purge Volume
[(21.79)m − (13.85)m] x (2.027)L/m=	16.09 (L)	48.28 (L)	(L) 4186

Purge Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): Bail

Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): Bailed

Notes and WQ Observations	Time ET (CT)	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1502									
9L										
9L										
3L	1531									
dry										
The well only Recovered about 1.3 Liters We filled the Four Small Bottles for ALKalinity Sulfate, Nitrate Nitrite Phosphorus Ammonia Nitrogen, Acidity and the TSS bottle was almost ½ Full.										
No Field reading were Taken										

Remarks: Bailed dry, left to recover overnight

Reviewed By: _____ Survey Leader _____ Date _____ Project Leader _____ Date

Sample Collector: R. Duncan

Sample Date			Time
Year	Month	Day	
2015	06	17	1314 ET (CT)

Pump Duration: min 72004

"999" = 2 days

Sample Readings

Analysis Time ET CT	4193 Pump Rate (L/min)	21.32 Depth to Water (m)	4192 Pump Depth (m)	10 Temp °C EPA 170.1	400 pH (s.u.) EPA 150.1	300 DO (mg/L) EPA 360.1	94 COND (umhos/cm) EPA 120.1	90 (+/-) ORP (mV) SM 2580B	Turbidity (NTU) EPA 180.1

Additional Sample Data

Analyst: R. Duncan

Date Analyzed: Year | Month | Day

Turbidity 1350: ☑ Clear ☐ Turbid ☐ Slightly Turbid ☐ Highly Turbid

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Bottles Required ☐ Ferrous ☐ Mineral ☐ Phenol Others (list):

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Preliminary Groundwater Data Field Worksheet

Sheet ____ of ____

Project/Site	Well Number	Purge Date	Year	Month	Day
Colbert	CA11 84068		2015	04	8

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
4195	4194	4188	R. Duncan	R. Duncan, R. Minor, A. Nesbitt

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter Type and Size:
4191		4190	COF-CA11-0415	☐ Unfiltered ☐ Filtered ☐ Both

[Bottom of Well - Depth to Water] x Volume Factor =	Well Volume (L)	Target Purge Volume (L)	Actual Purge Volume (L)
[(19.78)m - (15.90)m] x (8.107)L/m=	31.45	94.36	23 (4186)

Purge Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Notes and WQ Observations	Time ET (CT)	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	0852		15.90	18.0						
2 Liters	0857	.4	16.07	18.0	18.86	6.90	4.84	465	464	13.9
3 Liters	0902	.6	16.05	18.0	19.36	6.89	4.36	467	471	14.1
3 Liters	0907	.6	16.05							13.4
2 Liters	0912	.4	16.05				Computer			12.2
3 Liters	0917	.6	16.05				Issues			
	0936									
1 Liter	0941	0.1	16.10	18.0	21.29	6.84	5.41	511	464	7.90
2 Liters	0946	0.4	16.09	18.0	20.50	6.81	4.71	511	486	8.17
2 Liter	0951	0.4	16.08	18.0	20.77	6.72	4.75	536	498	4.58
2 Liters	0956	0.4	16.08	18.0	21.21	6.72	4.81	559	476	4.20
2.5 Liters	1001	0.5	16.08	18.0	21.46	6.73	4.77	568	486	3.71
1 Liter	1003									

Remarks: Tubing Volume = 3.84

Reviewed By: _____ Survey Leader _____ Date Mitch Dorn Project Leader 5/5/15 Date

Sample Collector: R. Duncan

Sample Date			Time
Year	Month	Day	1003 ET (CT)
2015	04	8	

Pump Duration 50 min 72004

"999" = 2 days

Sample Readings

Analysis Time ET (CT)	Pump Rate (L/min) 4193	Depth to Water (m)	Pump Depth (m) 4192	Temp °C 10 EPA 170.1	pH (s.u.) 400 EPA 150.1	DO (mg/L) 300 EPA 360.1	COND (umhos/cm) 94 EPA 120.1	(+/-) ORP (mV) 90 SM 2580B	Turbidity (NTU) EPA 180.1
1003	0.5	16.08	18.0	21.46	6.73	4.77	568	486	3.71

Additional Sample Data

Analyst: R. Duncan

Date Analyzed: Year 2015 Month 4 Day 8

Turbidity 1350: ☑ Clear ☐ Turbid ☐ Slightly Turbid ☐ Highly Turbid

Color: None

Odor: None

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Bottles Required ☐ Ferrous ☐ Mineral ☐ Phenol Others (list): _____

☐ BOD ☐ TOC ☐ Metals ☐ Dis. Mineral ☐ Filt TIC _____

☐ COD ☐ TIC ☐ Dis. Metals ☐ Nutrient ☐ TSS/TDS _____

Distribution: (1) Original - Data Mgmt. (2) Pink - Survey Leader (3) Blue - Project Manager (4) Green - Customer (5) Yellow - ERS Files

TVA 30066A (9-1999)

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date: Year	Month	Day
COF	CA11 84068	2015	06	15

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
16.35 4195	19.78 4194	4188	R. Duncan	R. Duncan R. Minor S. Whitehead

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label
4191		4190	COF-CA11-0615

☐ Unfiltered ☐ Filtered ☐ Both
Filter Type and Size:

[Bottom of Well − Depth to Water]	x Volume Factor =	Well Volume	Target Purge Volume	Actual Purge Volume
[(19.78)m − (16.35)m]	x (8.107)L/m =	27.80 (L)	Micro Purge 83.42	19.5 (L) 4186

Purge Pump: ☐ Bladder ☑ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Sample Pump: ☐ Bladder ☑ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Notes and WQ Observations	Time ET (CT)	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1043		16.32	18.0	26.75	7.00	3.68	367.	274	9.36
3.5 L	1048	0.6	16.39	18.0	22.33	6.97	2.20	410.6	280	10.1
3.0 L	1053	0.6	16.39	18.0	22.63	6.99	2.13	410.9	281	9.20
2.0 L	1058	0.4	16.37	18.0	23.10	7.01	2.28	414.7	282	8.65
2.0 L	1103	0.4	16.38	18.0	23.54	6.99	2.32	417.5	283	8.32
2.0 L	1108	0.4	16.38	18.0	23.74	6.85	2.71	474.2	288	7.04
2.0 L	1113	0.4	16.38	18.0	23.86	6.79	2.91	507.4	290	5.83
2.0 L	1118	0.4	16.39	18.0	23.95	6.76	3.05	532.5	292	4.98
2.0 L	1123	0.4	16.38	18.0	24.16	6.74	3.11	545.3	292	4.29
Sampled 1.0 L	1125									

Remarks: tubing volume = 3.84L

Reviewed By: _____ Survey Leader _____ Date _____ Project Leader _____ Date

Sample Collector: B. Minor

Sample Date: Year	Month	Day	Time
2015	6	15	1125 ET CT

Pump Duration 40 min 72004

"999" = 2 days

Sample Readings

Analysis Time ET CT	Pump Rate (L/min) 4193	Depth to Water (m)	Pump Depth (m) 4192	Temp °C 10 EPA 170.1	pH (s.u.) 400 EPA 150.1	DO (mg/L) 300 EPA 360.1	COND (umhos/cm) 94 EPA 120.1	(+/-) ORP (mV) 90 SM 2580B	Turbidity (NTU) EPA 180.1
1125	0.4	16.38	18	24.16	6.74	3.11	545.3	292	4.29

Additional Sample Data

Analyst: R. Duncan

Date Analyzed Year | Month | Day

Turbidity 1350 ☑ Clear ☐ Turbid ☐ Slightly Turbid ☐ Highly Turbid

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Bottles Required ☐ Ferrous ☐ Mineral ☐ Phenol Others (list):

☐ BOD ☐ TOC ☐ Metals ☐ Dis. Mineral ☐ Filt TIC

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date: Year	Month	Day
Colbert	CA 11 A 84068	2015	04	8

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
NA 4195	10.14 4194	4188	R. Duncan	R. Duncan R. Minor, A. Nesbitt

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter Type and Size:
4191		4190	NA	☐ Unfiltered ☐ Filtered ☐ Both

[Bottom of Well - Depth to Water] x Volume Factor =	Well Volume (L)	Target Purge Volume (L)	Actual Purge Volume (L)
[( )m - ( )m] x ( )L/m=			4186

Purge Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Notes and WQ Observations	Time ET CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →										
		Well	Was	DRY		NO	Sample			

Remarks: Well Was DRY No Sample

Reviewed By: _____ Survey Leader _____ Date _____ Project Leader 5/5/15 Date

Sample Collector:			
Sample Date			**Time**
Year	Month	Day	ET CT
Pump Duration			min 72004

"999" = 2 days

Sample Readings

Analysis Time ET CT	4193 Pump Rate (L/min)	Depth to Water (m)	4192 Pump Depth (m)	10 Temp °C EPA 170.1	400 pH (s.u.) EPA 150.1	300 DO (mg/L) EPA 360.1	94 COND (umhos/cm) EPA 120.1	90 (+/-) ORP (mV) SM 2580B	Turbidity (NTU) EPA 180.1

Additional Sample Data

Analyst:				
	415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:				
Initial:				

Date Analyzed: Year	Month	Day

Turbidity 1350 ☐ Clear ☐ Turbid ☐ Slightly Turbid ☐ Highly Turbid

Color:

Odor:

Bottles Required ☐ Ferrous ☐ Mineral ☐ Phenol Others (list): _____

☐ BOD ☐ TOC ☐ Metals ☐ Dis. Mineral ☐ Filt TIC

☐ COD ☐ TIC ☐ Dis. Metals ☐ Nutrient ☐ TSS/TDS

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Distribution: (1) **Original** - Data Mgmt. (2) **Pink** - Survey Leader
(3) **Blue** - Project Manager (4) **Green** - Customer (5) **Yellow** - L

Preliminary Groundwater Data Field Worksheet

Sheet ____ of ____

Project/Site	Well Number	Purge Date	Year	Month	Day
Colbert	CA 12A 84068		2015	04	13

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
5.69 4195	30.60 4194	102 4188	R. Duncan	R. Duncan R. Minor

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter Type and Size:
4191		4190	COF-CA 12A-0415	☐ Unfiltered ☐ Filtered ☐ Both

[Bottom of Well − Depth to Water]	x Volume Factor =	Well Volume (L)	Target Purge Volume (L)	Actual Purge Volume (L)
[(30.60)m − (5.69 / 5.84 RD)m]	x (8.107)L/m =	201.9	605.7	181 4186

Purge Pump: ☐ Bladder ☑ Centrifugal ☒ Peristaltic RD ☐ Dedicated Other (list): ____

Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): Bailed

Notes and WQ Observations	Time ET CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1152			30.0						
8.0L	1155	4.0	7.38	30.0	16.73	7.0	0.41	552	313	3.39
13.0L	1200	2.6	8.63	30.0	16.86	7.0	0.28	548	305	2.60
13.0L	1205	2.6	11.09	30.0	17.06	7.0	0.19	551	297	2.27
14.0L	1210	2.8	12.42	30.0	17.03	7.0	0.0	549	291	2.36
18.0L	1215	3.6	15.57	30.0	17.3	7.0	0.27	548	287	1.93
23.0L	1220	4.6	18.13	30.0	17.43	7.1	1.53	538	284	2.31
23.0L	1225	4.6	20.80	30.0	17.56	7.1	2.0	535	284	1.65
22.0L	1230	4.4	24.12	30.0	17.74	7.1	2.5	533	283	1.74
22.0L	1235	4.4	26.61	30.0	17.87	7.1	2.77	533	281	1.84
20.0L	1240	4.0	29.23	30.0	17.89	7.1	2.34	537	278	3.02
5.0L	1241	1.0 pumped	DRY	Let	Recover	overnight				

4

Remarks: ____

Reviewed By: ____ (Survey Leader) ____ (Date) Matthew Dean (Project Leader) 5/5/15 (Date)

Sample Collector: R. Minor

Sample Date			Time
Year	Month	Day	
2015	04	14	1134 ET CT

Pump Duration 50 min 72004

"999" = 2 days

Sample Readings

Analysis Time ET CT	Pump Rate (L/min) 4193	Depth to Water (m)	Pump Depth (m) 4192	Temp °C 10	pH (s.u.) 400	DO (mg/L) 300	COND (umhos/cm) 94	(+/-) ORP (mV) 90	Turbidity (NTU)
1134	NA	27.53	NA	16.61	7.5	9.61	368	307	3.55
	EPA 170.1	EPA 150.1	EPA 360.1	EPA 120.1	SM 2580B	EPA 180.1			

Additional Sample Data

Analyst: R. Duncan

Date Analyzed: Year 2015 Month 4 Day 14

Turbidity 1350: ☑ Clear ☐ Turbid ☐ Slightly Turbid ☐ Highly Turbid

Color: None

Odor: None

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Bottles Required ☐ Ferrous ☐ Mineral ☐ Phenol Others (list): ____

☐ BOD ☐ TOC ☐ Metals ☐ Dis. Mineral ☐ Filt TIC

☐ COD ☐ TIC ☐ Dis. Metals ☐ Nutrient ☐ TSS/TDS

Preliminary Groundwater Data Field Worksheet

Sheet ____ of ____

Project/Site	Well Number	Purge Date	Year	Month	Day
Colbert	CA 16 84068		2015	4	14

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
8.70 4195	19.47 4194	51 4188	Ray Duncan	R. Duncan R. Minor

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	
4191		4190	COF-CA16-0415	☐ Unfiltered ☐ Filtered ☐ Both Filter Type and Size:

[Bottom of Well - Depth to Water] x Volume Factor =	Well Volume (L)	Target Purge Volume (L)	Actual Purge Volume (L)
[(19.47)m - (8.70)m] x (8.107)L/m=	87.31	~~261.93~~ 4.0 Micropurge	14 4186

Purge Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☑ Dedicated Other (list): ____

Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☑ Dedicated Other (list): ____

Notes and WQ Observations	Time ET CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1238		8.70	17.2						
3.0 L	1243	0.6	8.69	17.2	17.01	6.8	6.02	511	306	0.67
3.0 L	1248	0.6	8.69	17.2	17.06	7.1	9.09	509	312	0.65
2.5 L	1253	0.5	8.69	~~16.90~~ 17.2	16.90	6.8	6.18	508	315	0.71
3.0 L	1258	0.6	8.70	17.2	16.90	6.8	6.09	508	317	0.20
2.5	1303	0.5	8.70	17.2	16.90	6.8	6.05	507	320	0.25
Sampled at 1305										

Remarks: Tubing Volume = 3.84L

Reviewed By: ____ Survey Leader ____ Date ____ Project Leader 5/5/15 Date

Sample Collector: R. Minor

Sample Date			Time
Year	Month	Day	1305 ET CT
2015	4	14	

Pump Duration 25 min 72004

"999" = 2 days

Sample Readings

1305	0.5	8.70	17.2	16.90	6.8	6.05	507	320	0.25
	4193		4192	10	400	300	94	90	
Analysis Time ET CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C EPA 170.1	pH (s.u.) EPA 150.1	DO (mg/L) EPA 360.1	COND (umhos/cm) EPA 120.1	(+/-) ORP (mV) SM 2580B	Turbidity (NTU) EPA 180.1

Additional Sample Data

Analyst: R. Duncan

Date Analyzed: Year 2015 Month 4 Day 14

Turbidity 1350: ☑ Clear ☐ Turbid ☐ Slightly Turbid ☐ Highly Turbid

Color: None Clear

Odor: None

415	431	436	437
Phenol Alkalinity mg/L (EPA 310.1)	Total Alk. mg/L (EPA 310.1)	Mineral Acidity mg/L (EPA 305.1)	CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Bottles Required ☐ BOD ☐ COD ☐ TOC ☐ TIC ☐ Ferrous ☐ Metals ☐ Dis. Metals ☐ Mineral ☐ Dis. Mineral ☐ Nutrient ☐ Phenol ☐ Filt TIC ☐ TSS/TDS

Others (list): ____

Distribution: (1) **Original** - Data Mgmt. (2) **Pink** - Survey Leader (3) **Blue** - Project Manager (4) **Green** - Customer (5) **Yellow** - ERS Files

TVA 30066A (9-1999)

Preliminary Groundwater Data Field Worksheet

Sheet ____ of ____

Project/Site	Well Number	Purge Date	Year	Month	Day
Colbert	CA17A 84068		2015	04	13

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
3.18 4195	6.21 4194	4188	R. Duncan	R. Duncan R. Minor

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter Type and Size:
4191		4190	COF-CA17A-0415	☐ Unfiltered ☐ Filtered ☐ Both

[Bottom of Well - Depth to Water] x Volume Factor =	Well Volume	Target Purge Volume	Actual Purge Volume
[(6.21)m - (3.18)m] x (8.107)L/m=	24.56 (L)	73.68 (L)	63 (L) 4186

Purge Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): Bailer

Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): Bailer

Notes and WQ Observations	Time ET CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1040									
End Purge	1114	Bailed DRY with Bailer								
		Let recover overnight								

Remarks: _____

Reviewed By: _____ Survey Leader _____ Date _____ Project Leader 5/5/15 Date

Sample Collector: R. Minor

Sample Date			Time
Year	Month	Day	
2015	04	14	1100 ET (CT)

Pump Duration ____ min 72004

"999" = 2 days

Sample Readings

Analysis Time ET (CT)	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
1100	NA 4193	2.31	4192	13.86 10	5.7 400	8.47 300	90.5 94	341 90	2.69
(6)				EPA 170.1	EPA 150.1	EPA 360.1	EPA 120.1	SM 2580B	EPA 180.1

Additional Sample Data

Analyst: R. Duncan

Date Analyzed Year 2015 Month 4 Day 14

Turbidity 1350 ☑ Clear ☐ Turbid ☐ Slightly Turbid ☐ Highly Turbid

Color: None

Odor: None

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Bottles Required ☐ Ferrous ☐ Mineral ☐ Phenol Others (list): _____

☐ BOD ☐ TOC ☐ Metals ☐ Dis. Mineral ☐ Filt TIC _____

☐ COD ☐ TIC ☐ Dis. Metals ☐ Nutrient ☐ TSS/TDS _____

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Distribution: (1) **Original** - Data Mgmt. (2) **Pink** - Survey Leader
(3) **Blue** - Project Manager (4) **Green** - Customer (5) **Yellow** - ERS Files

Turbidity 178 @ 0950 Turbidity 0955 150

Preliminary Groundwater Data Field Worksheet

Sheet ____ of ____

Project/Site	Well Number	Purge Date: Year	Month	Day
CoF Wells Colbert	CA17B 84068	2015	04	13

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
4.39 4195	30.30 4194	102 4188	R. Duncan	R. Minor, R. Duncan

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter Type and Size:
4191		4190	COF-CA17B-0415	☐ Unfiltered ☐ Filtered ☐ Both

[Bottom of Well − Depth to Water] × Volume Factor =	Well Volume (L)	Target Purge Volume (L)	Actual Purge Volume (L)
[(30.30)m − (4.39)m] × (8.107)L/m=	210.0	Micro Purged	2.5 4186

Purge Pump: ☐ Bladder ☑ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Notes and WQ Observations	Time ET CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	0906			28.0						
3 L	0910	0.6	4.76	28.0	17.05	6.8	2.00	908	193	21.9
3 L	0915	0.6	5.24	28.0	16.96	6.8	1.91	908	196	22.1
2.5 L	0920	0.5	5.40	28.0	17.07	6.8	1.73	908	191	23.5
2.0 L	0925	0.4	5.51	28.0	17.21	6.8	1.67	909	188	23.6
2.0 L	0930	0.4	5.84	28.0	17.18	6.8	1.13	909	198	27.6
2.5 L	0935	0.5	6.17	28.0	17.05	6.8	0.87	908	206	65.3
3.0 L	0940	0.6	6.36	28.0	17.26	6.8	0.84	907	195	149
2.0 L	0945	0.4	6.53	28.0	17.57	6.8	0.73	904	197	106
2.0 L	0950	0.4	6.71	28.0	17.31	6.8	0.77	903	205	126
3.0 L	0955	0.6	6.90	28.0	17.39	6.8	0.67	898	202	150
Sampled	0957									

Remarks: Reviewing Heavy Rain Collecte Dissolved Metals
Tubing Volume = 3.84 L

Reviewed By: _____ Survey Leader _____ Date _____ Project Leader 5/5/15 Date

Sample Collector: R. Minor

Sample Date			Time
Year	Month	Day	0957 ET CT
2015	04	13	

Pump Duration 50 min 72004

"999" = 2 days

Sample Readings

Analysis Time ET CT	4193 Pump Rate (L/min)	Depth to Water (m)	4192 Pump Depth (m)	10 Temp °C EPA 170.1	400 pH (s.u.) EPA 150.1	300 DO (mg/L) EPA 360.1	94 COND (umhos/cm) EPA 120.1	90 (+/-) ORP (mV) SM 2580B	Turbidity (NTU) EPA 180.1
0957	0.6	6.90	28.0	17.39	6.8	0.67	898	202	150

Additional Sample Data

Analyst: R. Duncan

Date Analyzed: Year 2015 Month 4 Day 13

Turbidity 1350 ☐ Clear ☐ Turbid ☐ Slightly Turbid ☑ Highly Turbid

Color: Tan

Odor: None

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Bottles Required ☐ Ferrous ☐ Mineral ☐ Phenol Others (list):
☐ BOD ☐ TOC ☐ Metals ☐ Dis. Mineral ☐ Filt TIC
☐ COD ☐ TIC ☐ Dis. Metals ☐ Nutrient ☐ TSS/TDS

Distribution: (1) Original - Data Mgmt. (2) Pink - Survey Leader
(3) Blue - Project Manager (4) Green - Customer (5) Yellow

Preliminary Groundwater Data Field Worksheet

Sheet ____ of ____

Project/Site	Well Number	Purge Date: Year	Month	Day
Colbert	CA 19B 84068	2015	4	15

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
13.96 4195	22.82 4194	102 4188	R. Duncan	R. Minor, R. Duncan

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter Type and Size:
4191		4190	COE-CA 19B-0415	☐ Unfiltered ☐ Filtered ☐ Both

[Bottom of Well − Depth to Water] × Volume Factor =	Well Volume (L)	Target Purge Volume (L)	Actual Purge Volume (L)
[(22.82)m − (13.96)m] × (8.107)L/m =	71.82	micro purge	34 4186

Purge Pump: ☐ Bladder ☑ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Sample Pump: ☐ Bladder ☑ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Notes and WQ Observations	Time ET CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1342		~~13.96~~ 13.96	20.0	~~20.40~~	~~6.8~~	~~1.04~~	~~1008~~	~~198~~	
4.5L	1347		13.96	20.0	20.40	6.8	1.04	1008	198	35.8
2.5L	1352	0.5	13.96	20.0	21.43	6.8	1.13	1011	205	31.4
2.5L	1357	0.5	13.96	20.0	21.96	6.8	1.07	1012	213	28.3
3.0 L	1402	0.6	13.96	20.0	22.01	6.8	1.02	1006	224	26.3
3.0 L	1407	0.6	13.96	20.0	22.05	6.8	1.01	1002	232	23.7
2.0L	1412	0.4	13.96	20.0	22.28	6.8	1.06	1000	236	20.5
3.0L	1417	0.6	13.96	20.0	22.65	6.8	1.09	994	240	16.6
2.5L	1422	0.5	13.96	20.0	22.77	6.8	1.16	991	243	14.3
3.0L	1427	0.6	13.96	20.0	22.74	6.7	1.31	982	245	11.0
2.5L	1432	0.5	13.96	20.0	22.77	6.7	1.43	978	247	9.19
2.5L	1437	0.5	13.96	20.0	22.58	6.7	1.59	971	251	7.39
3.0L	1442	0.6	13.96	20.0	22.43	6.7	1.74	964	254	6.54
	1444									

Remarks: There was a slight Sulfur order when we first started pumping well. Tubing Volume is 3.84 L Collected Dissolved metals

Reviewed By: _____ Survey Leader _____ Date _____ Project Leader 5/5/15 Date

Sample Collector: R. Minor

Sample Date			Time
Year	Month	Day	1444 ET CT
2015	4	15	

Pump Duration 60 min 72004

"999" = 2 days

Sample Readings

Analysis Time ET CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C EPA 170.1	pH (s.u.) EPA 150.1	DO (mg/L) EPA 360.1	COND (umhos/cm) EPA 120.1	(+/-) ORP (mV) SM 2580B	Turbidity (NTU) EPA 180.1
1444	4193		4192	10	400	300	94	90	

Additional Sample Data

Analyst: R. Duncan

Date Analyzed: Year 2015 Month 4 Day 15

Turbidity 1350: ☐ Clear ☐ Turbid ☐ Slightly Turbid ☐ Highly Turbid

Color:

Odor:

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Bottles Required ☐ Ferrous ☐ Mineral ☐ Phenol Others (list): _____

☐ BOD ☐ TOC ☐ Metals ☐ Dis. Mineral ☐ Filt TIC

☐ COD ☐ TIC ☐ Dis. Metals ☐ Nutrient ☐ TSS/TDS

Distribution: (1) **Original** - Data Mgmt. (2) **Pink** - Survey Leader (3) **Blue** - Project Manager (4) **Green** - Customer (5) **Yellow** - ERS Files

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date: Year	Month	Day
Colbert	CA 20 A 84068	2015	04	08

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
13.61 4195	14.98 4194	51 4188	R. Duncan	R. Duncan, R. Minor, A. Nesbitt

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter
4191		4190	COF-CA20A-0415	☐ Unfiltered ☐ Filtered ☐ Both; Filter Type and Size:

[Bottom of Well - Depth to Water] x Volume Factor =	Well Volume (L)	Target Purge Volume (L)	Actual Purge Volume (L)
[(14.98)m - (13.61)m] x (2,027)L/m=	2.77	8.31	20 4186

Purge Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): Bailed

Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): Bailed

Notes and WQ Observations	Time ET (CT)	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1642									
End Purge	1655		Bailed three well volumes and Let recover overnight Highly Turbid							

Remarks:

Reviewed By: _____ Survey Leader _____ Date Mitchell Dan Project Leader 5/5/15 Date

Sample Collector: R. Minor	Sample Date			Time
	Year	Month	Day	
	2015	4	9	1441 ET (CT)
Pump Duration				min 72004

"999" = 2 days

Sample Readings

Analysis Time ET CT	Pump Rate (L/min) 4193	Depth to Water (m)	Pump Depth (m) 4192	Temp °C 10 EPA 170.1	pH (s.u.) 400 EPA 150.1	DO (mg/L) 300 EPA 360.1	COND (umhos/cm) 94 EPA 120.1	(+/-) ORP (mV) 90 SM 2580B	Turbidity (NTU) EPA 180.1
1441	NA	13.70	NA	17.28	6.6	6.65	402	286	10.0

Additional Sample Data

Analyst: R. Duncan

Date Analyzed: Year 2015 Month 4 Day 9

Turbidity 1350: ☐ Clear ☐ Turbid ☑ Slightly Turbid ☐ Highly Turbid

Color: Light Tan

Odor: None

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Bottles Required: ☐ Ferrous ☐ Mineral ☐ Phenol ☐ BOD ☐ TOC ☐ Metals ☐ Dis. Mineral ☐ Filt TIC ☐ COD ☐ TIC ☐ Dis. Metals ☐ Nutrient ☐ TSS/TDS

Others (list): _____ _____

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Distribution: (1) Original - Data Mgmt. (2) Pink - Survey Leader (3) Blue - Project Manager (4) Green - Customer (5) Yellow - ERS Files

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date	Year	Month	Day
COF Groundwater	CA-20A 84068		2015	6	16

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
13.30 4195	14.98 4194	4188	R. Duncan	R Duncan, R Minor, S. Whitehead

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label
4191		4190	COF-20A-0615

☐ Unfiltered ☐ Filtered ☐ Both
Filter Type and Size:

[Bottom of Well − Depth to Water] x Volume Factor =	Well Volume	Target Purge Volume	Actual Purge Volume
[(14.98)m − (13.30)m] x (2.027)L/m=	3.40 (L)	10.21 (L)	— (L) 4186

Purge Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): Bailed
Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): Bailer

Notes and WQ Observations	Time ET (CT)	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1440									
9 L	1445									
5h	1447		13.34							
water highly turbid, left to recover overnight										

Remarks:

Reviewed By: Survey Leader ____ Date ____ Project Leader ____ Date ____

Sample Collector: R. Minor

Sample Date			Time
Year	Month	Day	
2015	06	17	1210 ET (CT)

Pump Duration ____ min 72004
"999" = 2 days

Sample Readings

Analysis Time ET CT	4193 Pump Rate (L/min)	Depth to Water (m)	4192 Pump Depth (m)	Temp °C EPA 170.1	pH (s.u.) EPA 150.1	DO (mg/L) EPA 360.1	COND (umhos/cm) EPA 120.1	(+/-) ORP (mV) SM 2580B	Turbidity (NTU) EPA 180.1
1210		13.31		19.97	6.5	6.28	357	326	2.92
	4193		4192	10	400	300	94	90	

Additional Sample Data

Analyst: R. Duncan

Date Analyzed: Year 2015 Month 6 Day 17

Turbidity 1350: ☑ Clear ☐ Turbid ☐ Slightly Turbid ☐ Highly Turbid

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Bottles Required ☐ Ferrous ☐ Mineral ☐ Phenol Others (list):

Preliminary Groundwater Data Field Worksheet

Sheet ____ of ____

Project/Site	Well Number	Purge Date	Year	Month	Day
Colbert	CA 20 B 84068		2015	4	16

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
13.36 4195	23.63 4194	102 4188	R. Duncan	L. Minor R. Duncan

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	
4191		4190	COF-CA20B-0415	☐ Unfiltered ☐ Filtered ☐ Both Filter Type and Size:

[Bottom of Well - Depth to Water] x Volume Factor =	Well Volume	Target Purge Volume	Actual Purge Volume
[(23.63)m - (13.36)m] x (8.107)L/m=	83.25 (L)	Micro Purge (L)	17 (L) 4186

Purge Pump: ☐ Bladder ☑ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Sample Pump: ☐ Bladder ☑ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Notes and WQ Observations	Time ET (CT)	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1003		13.36	17.3						
2.0L	1008	0.4	13.38	17.3	17.72	6.9	5.05	638	302	3.27
2.5L	1013	0.5	13.38	17.3	18.03	6.9	5.06	636	306	2.12
2.5L	1018	0.5	13.38	17.3	18.36	6.9	4.97	635	309	1.84
2.5L	1023	0.5	13.38	17.3	18.50	7.0	4.94	631	311	1.39
2.5L	1028	0.5	13.38	17.3	18.62	6.9	4.89	626	311	1.17
2.5L	1033	0.5	13.38	17.3	18.74	6.9	4.83	620	311	1.52
2.5L	1038	0.5	13.38	17.3	18.83	6.9	4.79	616	311	1.07
Sampled at 1040										
Collected Field and Equipment Blanks										

Remarks: Tubing Volume = 3.84 L

Reviewed By: _____ (Survey Leader) _____ (Date) Mitchell Dan (Project Leader) 6/5/15 (Date)

Sample Collector: R. Minor

Sample Date			Time
Year	Month	Day	1040 ET (CT)
2015	4	16	

Pump Duration 35 min 72004

"999" = 2 days

Sample Readings

Analysis Time ET (CT)	Pump Rate (L/min) 4193	Depth to Water (m)	Pump Depth (m) 4192	Temp °C 10	pH (s.u.) 400	DO (mg/L) 300	COND (umhos/cm) 94	(+/-) ORP (mV) 90	Turbidity (NTU)
1040	0.5	13.38	17.3	18.83	6.9	4.79	616	311	1.07
Analysis Time ET (CT)	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
				EPA 170.1	EPA 150.1	EPA 360.1	EPA 120.1	SM 2580B	EPA 180.1

Additional Sample Data

Analyst: R. Duncan

Date Analyzed: Year 2015 Month 4 Day 16

Turbidity 1350: ☑ Clear ☐ Turbid ☐ Slightly Turbid ☐ Highly Turbid

Color: None

Odor: None

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Bottles Required ☐ Ferrous ☐ Mineral ☐ Phenol Others (list):

☐ BOD ☐ TOC ☐ Metals ☐ Dis. Mineral ☐ Filt TIC

☐ COD ☐ TIC ☐ Dis. Metals ☐ Nutrient ☐ TSS/TDS

Distribution: (1) **Original** - Data Mgmt. (2) **Pink** - Survey Leader (3) **Blue** - Project Manager (4) **Green** - Customer (5) **Yellow** - ERS Files

Preliminary Groundwater Data Field Worksheet

Sheet ____ of ____

Project/Site	Well Number	Purge Date: Year	Month	Day
Colbert	CA2 1B 84068	2015	4	15

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
4195	4194	4188	R. Duncan	R. Minor, R. Duncan

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter Type and Size:
4191		4190	COF-CA2B-0415	☐ Unfiltered ☐ Filtered ☐ Both

[Bottom of Well - Depth to Water] x Volume Factor =	Well Volume (L)	Target Purge Volume (L)	Actual Purge Volume (L)
[(23.25)m - (17.17)m] x (2.027)L/m=	12.3	36.9	38.0 4186

Purge Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): Bailed

Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): Bailed

Notes and WQ Observations	Time ET CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m) RD	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1135		17.17	~~18.5~~						
Purge Ended	1215		purged three well volumes. Water was highly Turbid Let recover overnight							
			water surface		17.18					

Remarks: Collected Dissolved metals because of high Turbidity

Reviewed By: _____ Survey Leader _____ Date Mike Dan Project Leader 5/5/15 Date

Sample Collector: R. Duncan

Sample Date: Year	Month	Day	Time
2015	4	16	0738 ET (CT)

Pump Duration: min 72004

"999" = 2 days

Sample Readings

Analysis Time ET CT	Pump Rate (L/min) 4193	Depth to Water (m)	Pump Depth (m) 4192	Temp °C 10 EPA 170.1	pH (s.u.) 400 EPA 150.1	DO (mg/L) 300 EPA 360.1	COND (umhos/cm) 94 EPA 120.1	(+/-) ORP (mV) 90 SM 2580B	Turbidity (NTU) EPA 180.1
0738	NA	17.09	~~17.RD~~	17.50	6.8	4.01	632	308	38.1

Additional Sample Data

Analyst: R. Duncan

Date Analyzed: Year 2015 Month 4 Day 16

Turbidity 1350 ☐ Clear ☑ Turbid ☐ Slightly Turbid ☐ Highly Turbid

Color: Tan

Odor: None

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Bottles Required ☐ Ferrous ☐ Mineral ☐ Phenol ☐ BOD ☐ TOC ☐ Metals ☐ Dis. Mineral ☐ Filt TIC ☐ COD ☐ TIC ☐ Dis. Metals ☐ Nutrient ☐ TSS/TDS Others (list): _____ _____

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Distribution: (1) **Original** - Data Mgmt. (2) **Pink** - Survey Leader (3) **Blue** - Project Manager (4) **Green** - Customer (5) **Yellow** - ERS Files

Preliminary Groundwater Data Field Worksheet

Sheet ____ of ____

Project/Site	Well Number	Purge Date	Year	Month	Day
Colbert	CA 22B 84068		2015	4	14

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
10.31 4195	20.7 4194	102 4188	R. Duncan	R. Duncan, R. Minor

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter Type and Size
4191		4190	COF-CA22B-0415	☐ Unfiltered ☐ Filtered ☐ Both

[Bottom of Well - Depth to Water] x Volume Factor =	Well Volume (L)	Target Purge Volume (L)	Actual Purge Volume (L)
[(20.7)m - (10.31)m] x (8.107)L/m =	84.2	252.6	91.5 4186

Purge Pump: ☐ Bladder ☑ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Sample Pump: ☐ Bladder ☑ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Notes and WQ Observations	Time ET CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1552		10.31	20.5						
1 4 L	1557		12.21	20.5	18.02	7.0	0.51	691	196	1.66
18.0L	1602		14.41	20.5	18.26	7.0	0.19	681	207	1.44
17.0L	1607		16.45	20.5	18.45	7.1	0.28	639	180	1.24
15.0L	1612		18.01	20.5	18.63	7.2	1.86	594	172	1.80
17.0L	1617		18.43	20.5	18.88	7.3	4.20	658	174	1.80
2.0L	1619	Pumped DRY and Let Recover overnight								
4/15/15	1530		11.65	18.0						
3.0L	1535	0.6	12.44	18.0	20.37	7.2	5.42	708	259	2.68
3.0L	1540	0.6	12.73	18.0	20.86	7.2	5.41	708	257	3.29
2.5L	1545	0.5	12.94	18.0	21.07	7.2	5.32	708	255	1.95
Sampled at 1546										

Remarks: _____

Reviewed By: _____ (Survey Leader) _____ (Date) Mitch D (Project Leader) 5/5/15 (Date)

Sample Collector: R. Duncan

Sample Date			Time
Year	Month	Day	
2015	4	15	1546 ET (CT)

Pump Duration 45 min 72004

"999" = 2 days

Sample Readings

Analysis Time ET CT	Pump Rate (L/min) 4193	Depth to Water (m)	Pump Depth (m) 4192	Temp °C 10 EPA 170.1	pH (s.u.) 400 EPA 150.1	DO (mg/L) 300 EPA 360.1	COND (umhos/cm) 94 EPA 120.1	(+/-) ORP (mV) 90 SM 2580B	Turbidity (NTU) EPA 180.1
1546	0.5	12.94	18.0	21.07	7.2	5.32	708	255	1.95

Additional Sample Data

Analyst: R. Duncan

Date Analyzed: Year 2015 Month 4 Day 15

Turbidity 1350 ☑ Clear ☐ Turbid ☐ Slightly Turbid ☐ Highly Turbid

Color: None

Odor: None

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Bottles Required ☐ Ferrous ☐ Mineral ☐ Phenol Others (list): _____

☐ BOD ☐ TOC ☐ Metals ☐ Dis. Mineral ☐ Filt TIC _____

☐ COD ☐ TIC ☐ Dis. Metals ☐ Nutrient ☐ TSS/TDS _____

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Distribution: **(1) Original** - Data Mgmt. **(2) Pink** - Survey Leader **(3) Blue** - Project Manager **(4) Green** - Customer **(5) Yellow** - ERS Files

Preliminary Groundwater Data Field Worksheet

Sheet ____ of ____

Project/Site	Well Number	Purge Date: Year	Month	Day
Colbert	CA27BR 84068	2015	04	13

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
13.74 4195	23.74 4194	51 4188	Ray Duncan	R. Minor, R. Duncan

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter Type and Size:
4191		4190	CoF-CA27BR-0415	☐ Unfiltered ☐ Filtered ☐ Both

[Bottom of Well - Depth to Water] x Volume Factor =	Well Volume (L)	Target Purge Volume (L)	Actual Purge Volume (L) 4186
[(23.74)m - (13.74)m] x (2.027)L/m =	20.27		

Purge Pump: ☐ Bladder ☑ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): Bailer

Notes and WQ Observations	Time ET CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1355		13.74	23.5						
6.0L	1400		19.16	23.5	18.95	7.7	6.1	306	249	5.48
7.0L	1405		20.47	23.5	18.64	7.7	3.83	298	235	1.49
9.0L	1410				18.80	7.5	2.16	306	144	2.70
1.0L	1411	pumped Dry Let Recover overnight								

Remarks: PH 7.7 } upon
DO 8.58 } sampling

Reviewed By: _____ (Survey Leader) _____ (Date) Mitchell D (Project Leader) 5/5/15 (Date)

Sample Collector: R. Minor

Sample Date			Time
Year	Month	Day	1345 ET CT
2015	04	14	

Pump Duration: min 72004

"999" = 2 days

Sample Readings

1345	NA	19.60		17.28	7.7	8.58	291	249	1.13
Analysis Time ET (CT)	4193 Pump Rate (L/min)	Depth to Water (m)	4192 Pump Depth (m)	10 Temp °C EPA 170.1	400 pH (s.u.) EPA 150.1	300 DO (mg/L) EPA 360.1	94 COND (umhos/cm) EPA 120.1	90 (+/-) ORP (mV) SM 2580B	Turbidity (NTU) EPA 180.1

Additional Sample Data

Analyst: R. Duncan

Date Analyzed: Year 2015 Month 4 Day 14

Turbidity 1350: ☑ Clear ☐ Turbid ☐ Slightly Turbid ☑ Highly Turbid

Color: None

Odor: None

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Bottles Required: ☐ Ferrous ☐ Mineral ☐ Phenol ☐ BOD ☐ TOC ☐ Metals ☐ Dis. Mineral ☐ Filt TIC ☐ COD ☐ TIC ☐ Dis. Metals ☐ Nutrient ☐ TSS/TDS

Others (list): _____

Preliminary Groundwater Data Field Worksheet

Sheet ____ of ____

Project/Site	Well Number	Purge Date: Year	Month	Day
Colbert	CA28B 84068	2015	4	14

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
13.45 4195	30.42 4194	102 4188	Ray Duncan	R. Minor, R. Duncan

☐ Depth of Screen ☐ Open Bore Hole

(m) 4191	To	(m) 4190	Sample Label	Filter
			COF-CA28B-0415	☐ Unfiltered ☐ Filtered ☐ Both; Filter Type and Size:

[Bottom of Well - Depth to Water] x Volume Factor =	Well Volume (L)	Target Purge Volume (L)	Actual Purge Volume (L) 4186
[(30.42)m - (13.45)m] x (8.107)L/m=	137.5		135

Purge Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Notes and WQ Observations	Time ET CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1426		13.45	30.1						
24 L	1431		16.81	30.1	18.58	6.7	0.05	702	58	1.77
27 L	1436		19.77	30.1	18.69	6.7	0.0	686	65	1.22
24 L	1441		22.55	30.1	18.82	6.7	0.0	685	67	1.00
22 L	1446		24.92	30.1	18.90	6.7	0.0	684	70	2.31
21 L	1451		27.26	30.1	19.03	6.7	0.07	686	73	2.03
18 L	1456		28.85	30.1	19.19	6.8	1.44	687	85	2.10
7 L	1458		pumped	DRY	Let	Recover	overnight			

Remarks: % Sat and LDO Reading went to Zero after first reading

Reviewed By: _____ Survey Leader _____ Date _____ Project Leader 5/5/15 Date

Sample Collector: R. Minor

Sample Date			Time
Year	Month	Day	1244 ET (CT)
2015	4	15	

Pump Duration ____ min 72004

"999" = 2 days

Sample Readings

1244	NA	13.37	NA	17.68	6.7	1.34	666	106	66.4
Analysis Time ET (CT)	4193 Pump Rate (L/min)	Depth to Water (m)	4192 Pump Depth (m)	10 Temp °C EPA 170.1	400 pH (s.u.) EPA 150.1	300 DO (mg/L) EPA 360.1	94 COND (umhos/cm) EPA 120.1	90 (+/-) ORP (mV) SM 2580B	Turbidity (NTU) EPA 180.1

Additional Sample Data

Analyst: R. Duncan

Date Analyzed: Year 2015 Month 4 Day 15

Turbidity 1350 ☐ Clear ☐ Turbid ☐ Slightly Turbid ☑ Highly Turbid

Color: Light Gray

Odor: None

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Bottles Required ☐ Ferrous ☐ Mineral ☐ Phenol Others (list): _____

☐ BOD ☐ TOC ☐ Metals ☐ Dis. Mineral ☐ Filt TIC _____

☐ COD ☐ TIC ☐ Dis. Metals ☐ Nutrient ☐ TSS/TDS _____

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Distribution: **(1) Original** - Data Mgmt. **(2) Pink** - Survey Leader
(3) Blue - Project Manager **(4) Green** - Customer **(5) Yellow** - ERS Files

Preliminary Groundwater Data Field Worksheet

Sheet ____ of ____

Project/Site	Well Number	Purge Date	Year	Month	Day
Colbert	CA 29AR 4068		2015	04	8

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
2.31 4195	8.17 4194	51 4188	R. Duncan	R Duncan, R. Minor, A Nesbitt

☐ Depth of Screen ☐ Open Bore Hole

(m) 4191	To	(m) 4190	Sample Label	☐ Unfiltered ☐ Filtered ☐ Both
			CoF-CA29AR-0415	Filter Type and Size:

[Bottom of Well - Depth to Water] x Volume Factor =	Well Volume (L)	Target Purge Volume (L)	Actual Purge Volume (L) 4186
[(8.17)m - (2.31)m] x (2.027)L/m =	11.87	35.63	

Purge Pump: ☐ Bladder ☑ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Sample Pump: ☐ Bladder ☑ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Notes and WQ Observations	Time ET CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1400		2.31	8.0						
2 L	1405	0.4	3.46	8.0	21.63	6.2	2.74	266	192	38.3
3 L	1410	0.6	3.46	8.0	21.08	6.3	2.30	291	200	10.1
3 L	1415	0.6	3.15	8.0	21.57	6.4	1.85	303	198	8.97
2 L	1420	0.4	3.17	8.0	21.57	6.4	1.59	305	196	6.74
2.5 L	1425	0.5	3.15	8.0	23.06	6.4	1.36	315	192	4.11
2.0 L	1430	0.4	3.15	8.0	21.89	6.5	1.27	308	194	3.69
	1432	Sampled								

Remarks: _____

Reviewed By: _____ Survey Leader _____ Date Mike Duncan Project Leader 5/5/15 Date

Sample Collector: R. Minor

Sample Date			Time
Year	Month	Day	
2015	04	8	1432 ET (CT)

Pump Duration 30 min 72004

"999" = 2 days

Sample Readings

1432	0.5	3.15	8.0	21.89	6.5	1.27	308	194	3.69
Analysis Time ET CT	4193 Pump Rate (L/min)	Depth to Water (m)	4192 Pump Depth (m)	10 Temp °C EPA 170.1	400 pH (s.u.) EPA 150.1	300 DO (mg/L) EPA 360.1	94 COND (umhos/cm) EPA 120.1	90 (+/-) ORP (mV) SM 2580B	Turbidity (NTU) EPA 180.1

Additional Sample Data

Analyst: R. Duncan

Date Analyzed: Year 2015 Month 04 Day 8

Turbidity 1350: ☑ Clear ☐ Turbid ☐ Slightly Turbid ☐ Highly Turbid

Color: None

Odor: None

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Bottles Required: ☐ Ferrous ☐ Mineral ☐ Phenol ☐ BOD ☐ TOC ☐ Metals ☐ Dis. Mineral ☐ Filt TIC ☐ COD ☐ TIC ☐ Dis. Metals ☐ Nutrient ☐ TSS/TDS Others (list): _____

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Distribution: (1) **Original** - Data Mgmt. (2) **Pink** - Survey Leader (3) **Blue** - Project Manager (4) **Green** - Customer (5) **Yellow** - ERS Files

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date: Year	Month	Day
CoF we Ground water	CA 29 AR 84068	2015	06	16

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
3.16 4195	8.17 4194	51 4188	R. Duncan	R Duncan, R minor S Whitehead

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter Type and Size:
4191		4190	CA COF-29AR-0615	☐ Unfiltered ☐ Filtered ☐ Both

[Bottom of Well − Depth to Water] x Volume Factor =	Well Volume (L)	Target Purge Volume (L)	Actual Purge Volume (L)
[(8.17)m − (3.16)m] x (2.027)L/m=	10.15	30.46	19.5 4186

Purge Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Notes and WQ Observations	Time ET CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	0935		3.16	8.0	25.78	7.15	3.22	370.6	304	19.2
2L	0940	0.4	4.26	8.0	22.78	6.48	1.24	350.0	312	31.7
2.5L	0945	0.5	3.92	8.0	21.72	6.47	1.36	329.6	315	17.8
2L	0950	0.4	3.96	8.0	22.00	6.59	1.17	348.6	285	7.88
2.5L	0955	0.5	3.99	8.0	22.41	6.44	0.95	356.3	223	4.63
3L	1000	0.6	4.00	8.0	22.23	6.65	0.83	357.2	207	3.52
2.5L	1005	0.5	4.00	8.0	22.17	6.63	0.75	360.0	204	2.30
2.5L	1010	0.5	3.99	8.0	22.38	6.64	0.70	358.9	201	1.78
2.5	1015	0.5	3.97	8.0	22.44	6.63	0.68	361.6	200	1.67
Sampled	1017									

Remarks: Tubing volume = 3.84 ~~LRD~~ L

Reviewed By: _____ Survey Leader _____ Date _____ Project Leader _____ Date

Sample Collector: R. Minor

Sample Date			Time
Year	Month	Day	
2015	6	16	1017 ET CT

Pump Duration 40 min 72004

"999" = 2 days

Sample Readings

1017	0.5	3.97	8.0	22.44	6.63	0.68	361.6	200	1.67
Analysis Time ET CT	4193 Pump Rate (L/min)	Depth to Water (m)	4192 Pump Depth (m)	10 Temp °C EPA 170.1	400 pH (s.u.) EPA 150.1	300 DO (mg/L) EPA 360.1	94 COND (umhos/cm) EPA 120.1	90 (+/-) ORP (mV) SM 2580B	Turbidity (NTU) EPA 180.1

Additional Sample Data

Analyst:

Date Analyzed Year 2015 Month 6 Day

Turbidity 1350 ☑ Clear ☐ Turbid ☐ Slightly Turbid ☐ Highly Turbid

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Bottles Required ☐ Ferrous ☐ Mineral ☐ Phenol Others (list):

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Preliminary Groundwater Data Field Worksheet

Sheet ____ of ____

Project/Site	Well Number	Purge Date: Year	Month	Day
COF Groundwater	CA29BR 84068	2015	04	7

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
10.38 4195	12.25 4194	51 4188	R. Duncan	R. Duncan A Nesbitt

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter Type and Size:
4191		4190		☐ Unfiltered ☐ Filtered ☐ Both

[Bottom of Well - Depth to Water] x Volume Factor =	Well Volume (L)	Target Purge Volume (L)	Actual Purge Volume (L)
[(12.25)m - (10.38)m] x (2.027)L/m=	3.79	11.37	4.0 4186

Purge Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): Bailed

Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): ____

Notes and WQ Observations	Time ET (CT)	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1609									
		Bailed dry at 1615 Let Recover overnight.								
		Well Did not Recover within 24 hrs								
		Could Not Sample								

Remarks: ____

Reviewed By: ____ Survey Leader ____ Date ____ Project Leader 5/5/15 Date

Sample Collector:			
Sample Date			**Time**
Year	Month	Day	ET CT
Pump Duration			min 72004

"999" = 2 days

Sample Readings

Analysis Time ET CT	Pump Rate (L/min) 4193	Depth to Water (m)	Pump Depth (m) 4192	Temp °C (EPA 170.1) 10	pH (s.u.) (EPA 150.1) 400	DO (mg/L) (EPA 360.1) 300	COND (umhos/cm) (EPA 120.1) 94	(+/-) ORP (mV) (SM 2580B) 90	Turbidity (NTU) (EPA 180.1)

Additional Sample Data

Analyst:				
Date Analyzed Year / Month / Day				
	415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
	Time:	Time:	Time:	Time:
	Initial:	Initial:	Initial:	Initial:

Turbidity 1350 ☐ Clear ☐ Turbid ☐ Slightly Turbid ☐ Highly Turbid

Color: ____

Odor: ____

Bottles Required ☐ Ferrous ☐ Mineral ☐ Phenol Others (list): ____

☐ BOD ☐ TOC ☐ Metals ☐ Dis. Mineral ☐ Filt TIC ____

☐ COD ☐ TIC ☐ Dis. Metals ☐ Nutrient ☐ TSS/TDS ____

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Distribution: **(1) Original** - Data Mgmt. **(2) Pink** - Survey Leader
(3) Blue - Project Manager **(4) Green** - Customer **(5) Yellow** - ERS Files

TVA 30066A (9-1999)

Preliminary Groundwater Data Field Worksheet

Sheet ____ of ____

Project/Site	Well Number	Purge Date	Year	Month	Day
Colbert	CA30B 84068		2015	04	9

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
7.56 4195	16.84 4194	5 4188	R. Duncan	R. Duncan, R. Minor, A. Nesbitt

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter Type and Size:
4191		4190	COF-CA30B-0415	☐ Unfiltered ☐ Filtered ☐ Both

[Bottom of Well − Depth to Water] x Volume Factor =	Well Volume (L)	Target Purge Volume (L)	Actual Purge Volume (L)
[(16.84)m − (7.56)m] x (2.027)L/m=	18.81	Micro Purge	23.5 4186

Purge Pump: ☐ Bladder ☑ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Sample Pump: ☐ Bladder ☑ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Notes and WQ Observations	Time ET (CT)	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1250		7.56	16.0						
3 L	1255	0.6	9.09	16.0	19.92	6.7	1.79	805	352	8.1
3 L	1300	0.6	9.08	16.0	19.68	6.7	1.44	803	350	4.2
2.5 L	1305	0.5	9.08	16.0	19.95	6.7	1.25	802	306	4.0
2.0 L	1310	0.4	9.07	16.0	20.01	6.7	1.05	801	213	2.5
2.5 L	1315	0.5	9.13	16.0	19.95	6.7	0.95	797	149	1.9
2.0 L	1320	0.4	9.13	16.0	19.93	6.7	0.86	787	126	1.1
3.0 L	1325	0.6	9.12	16.0	19.95	6.7	0.85	770	118	1.0
3.0 L	1330	0.6	9.11	16.0	19.91	6.7	0.77	757	120	1.0
2.5 L	1335	0.5	9.08	16.0	19.96	6.7	0.75	745	124	0.3
Sampled at 1337										
Collected Field & Equipment Blanks										

Remarks: Tubing Volume = 3.84

Reviewed By: _____ Survey Leader _____ Date _____ Project Leader 5/5/15 Date

Sample Collector: R. Minor

Sample Date			Time
Year	Month	Day	1337 ET (CT)
2015	4	9	

Pump Duration 45 min 72004

"999" = 2 days

Sample Readings

1337	0.5	9.08	16.0	19.96	6.7	0.75	745	124	0.3
Analysis Time ET CT	4193 Pump Rate (L/min)	Depth to Water (m)	4192 Pump Depth (m)	10 Temp °C EPA 170.1	400 pH (s.u.) EPA 150.1	300 DO (mg/L) EPA 360.1	94 COND (umhos/cm) EPA 120.1	90 (+/-) ORP (mV) SM 2580B	Turbidity (NTU) EPA 180.1

Additional Sample Data

Analyst: R. Duncan

Date Analyzed: Year 2015 Month 4 Day 9

Turbidity 1350: ☑ Clear ☐ Turbid ☐ Slightly Turbid ☐ Highly Turbid

Color: None

Odor: None

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Bottles Required ☐ Ferrous ☐ Mineral ☐ Phenol Others (list): _____

☐ BOD ☐ TOC ☐ Metals ☐ Dis. Mineral ☐ Filt TIC _____

☐ COD ☐ TIC ☐ Dis. Metals ☐ Nutrient ☐ TSS/TDS _____

Distribution: **(1) Original** - Data Mgmt. **(2) Pink** - Survey Leader
(3) Blue - Project Manager **(4) Green** - Customer **(5) Yellow** - ERS Files

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date	Year	Month	Day
COF Groundwater	CA30B 84068		2015	6	16

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
7.69 4195	16.84 4194	4188	R. Duncan	R Minor, R Duncan, S Whitehead

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter
4191		4190	COF-CA30B-0615	☐ Unfiltered ☐ Filtered ☐ Both Filter Type and Size:

[Bottom of Well - Depth to Water] x Volume Factor =	Well Volume	Target Purge Volume	Actual Purge Volume
[(16.84)m - (7.69)m] x (2.027)L/m=	18.54 (L)	55.64 (L)	(L) 4186

Purge Pump: ☐ Bladder ☐ Centrifugal ☐ Peristatic ☐ Dedicated Other (list): _____

Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristatic ☐ Dedicated Other (list): _____

Notes and WQ Observations	Time ET (CT)	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	~~1355~~ 1354 (CT)		7.69	16.0	26.33	6.8	3.39	761.5	310	9.01
3.5 L	1317	0.6	9.50	16.0	21.75	6.8	1.84	765.9	304	9.33
2 L	1322	0.4	9.38	16.0	22.07	6.7	1.68	763.1	309	8.61
3L	1327	0.6	9.48	16.0	21.74	6.7	1.73	767.6	314	5.57
3L	1332	0.6	9.45	16.0	21.45	6.7	1.42	761.2	313	3.60
3L	1337	0.6	9.36	16.0	21.52	6.8	1.20	761.2	177	1.95
3L	1342	0.6	9.32	16.0	21.57	6.7	1.07	759.9	102	1.42
3L	1347	0.6	9.25	16.0	21.68	6.7	1.32	759.1	97	1.32
3L SW	13~~52~~ 1352	0.6	9.22	16.0	21.79	6.6	1.08	752.8	96	1.44
sampled SW	~~1454~~ 1354									

Remarks: tubing volume = 3.84L

Reviewed By: _____ Survey Leader _____ Date _____ Project Leader _____ Date

Sample Collector: R. Minor

Sample Date			Time
Year	Month	Day	~~1454~~ 1354 ET (CT)
2015	6	16	

Pump Duration _____ min 72004

"999" = 2 days

Sample Readings

~~1454~~ 1354 SW	0.6	9.22	16.0	21.79	6.6	1.08	752.8	96	1.44
Analysis Time ET CT	4193 Pump Rate (L/min)	Depth to Water (m)	4192 Pump Depth (m)	10 Temp °C EPA 170.1	400 pH (s.u.) EPA 150.1	300 DO (mg/L) EPA 360.1	94 COND (umhos/cm) EPA 120.1	90 (+/-) ORP (mV) SM 2580B	Turbidity (NTU) EPA 180.1

Additional Sample Data

Analyst: R. Duncan

Date Analyzed: Year 2015 Month 6 Day 16

Turbidity 1350 ☐ Clear ☐ Turbid ☐ Slightly Turbid ☐ Highly Turbid

Color: Clear

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Bottles Required ☐ Ferrous ☐ Mineral ☐ Phenol Others (list):

☐ BOD ☐ TOC ☐ Metals ☐ Dis. Mineral ☐ Filt TIC

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Preliminary Groundwater Data Field Worksheet

Sheet ____ of ____

Project/Site	Well Number	Purge Date	Year	Month	Day
COF	CA 31A 84068		2015	04	7

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
4.22 4195	5.53 4194	51 4188	R. Duncan	R. Duncan / A. Nesbitt

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter
4191		4190	COF-CA31A-0415	☐ Unfiltered ☐ Filtered ☐ Both Filter Type and Size:

[Bottom of Well - Depth to Water] x Volume Factor =	Well Volume	Target Purge Volume	Actual Purge Volume
[(5.53)m - (4.22)m] x (2.027)L/m=	2.65 (L)	7.96 (L)	9.0 (L) 4186

Purge Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): Bailer

Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): Bailer

Notes and WQ Observations	Time ET	Time CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1743										
End Purge	1754										
Bailed three well volume's water was highly turbid let recover overnight											

Remarks: _____

Reviewed By: _____ Survey Leader _____ Date Mike Duncan Project Leader 5/5/15 Date

Sample Collector: R. Minor			
Sample Date			**Time**
Year	Month	Day	
2015	04	8	1520 ET (CT)
Pump Duration			min 72004

"999" = 2 days

Sample Readings

Analysis Time ET (CT)	4193 Pump Rate (L/min)	Depth to Water (m)	4192 Pump Depth (m)	10 Temp °C EPA 170.1	400 pH (s.u.) EPA 150.1	300 DO (mg/L) EPA 360.1	94 COND (umhos/cm) EPA 120.1	90 (+/-) ORP (mV) SM 2580B	Turbidity (NTU) EPA 180.1
1520		4.12		16.74	6.8	4.16	505	207	3.37

Additional Sample Data

Analyst: R. Duncan

Date Analyzed: Year 2015 Month 4 Day 8

Turbidity 1350 ☑ Clear ☐ Turbid ☐ Slightly Turbid ☐ Highly Turbid

Color: None

Odor: None

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Bottles Required ☐ Ferrous ☐ Mineral ☐ Phenol Others (list):

☐ BOD ☐ TOC ☐ Metals ☐ Dis. Mineral ☐ Filt TIC

☐ COD ☐ TIC ☐ Dis. Metals ☐ Nutrient ☐ TSS/TDS

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Distribution: (1) **Original** - Data Mgmt. (2) **Pink** - Survey Leader (3) **Blue** - Project Manager (4) **Green** - Customer (5) **Yellow** - ERS Files

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date	Year	Month	Day
COF Groundwater	CA31A 84068		2015	06	16

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
4195	4194	4188	R. Duncan	R Duncan, R minor, S Whitehead

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter
4191		4190	COF-CA31A-0615	☐ Unfiltered ☐ Filtered ☐ Both; Filter Type and Size:

[Bottom of Well − Depth to Water] x Volume Factor =	Well Volume	Target Purge Volume	Actual Purge Volume
[(5.53)m − (4.33)m] x (2.027)L/m=	24.32 (L)	7.30 (L)	10 (L) 4186

Purge Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): Bailed

Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): Bailed

Notes and WQ Observations	Time ET (CT)	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1547									
10L	1552									
Water Surface at Sampling 4.34										

Remarks: Water highly turbid, left to recover overnight

Reviewed By: _____ Survey Leader _____ Date _____ Project Leader _____ Date

Sample Collector: R. Duncan

Sample Date			Time
Year	Month	Day	
2015	06	17	1120 ET (CT)

Pump Duration _____ min 72004

"999" = 2 days

Sample Readings

1120	NA	4.34	NA	18.78	6.9	2.25	510	322	33.0 (RD) 57.0
Analysis Time ET CT	4193 Pump Rate (L/min)	Depth to Water (m)	4192 Pump Depth (m)	10 Temp °C EPA 170.1	400 pH (s.u.) EPA 150.1	300 DO (mg/L) EPA 360.1	94 COND (umhos/cm) EPA 120.1	90 (+/-) ORP (mV) SM 2580B	Turbidity (NTU) EPA 180.1

Additional Sample Data

Analyst: R. Duncan

Date Analyzed: Year 2015 Month 06 Day 17

Turbidity 1350 ☐ Clear ☐ Turbid ☑ Slightly Turbid ☐ Highly Turbid

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Bottles Required ☐ Ferrous ☐ Mineral ☐ Phenol Others (list):

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date Year	Month	Day
Colbert	P8 84068	2015	04	9

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
NA 4195	NA 4194	NA 4188	R. Duncan	R. Duncan R. Minor, A. Nesbitt

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label	Filter
4191		4190	COF-P8-0415	☐ Unfiltered ☐ Filtered ☐ Both Filter Type and Size:

[Bottom of Well - Depth to Water] x Volume Factor =	Well Volume (L)	Target Purge Volume (L)	Actual Purge Volume (L)
[(NA)m - (NA)m] x ( )L/m=			4186

Purge Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list): _____

Notes and WQ Observations	Time ET (CT)	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1520									
	1526	2	NA	NA	17.79	7.3	3.88	379	263	0.81
	1531	2	NA	NA	17.71	7.3	3.48	375	272	0.44
	1536		NA	NA	17.63	7.3	3.78	377	273	0.46
	1541		NA	NA	17.77	7.3	3.82	367	269	0.36
			NA	NA						
	1543	Sampled								

Remarks: 10 Liter in 15 sec for 5 min then slowed to ½ Liter per minute for Readings ~~321~~ 1521-1526

Reviewed By: _____ Survey Leader _____ Date Matt Duncan Project Leader 5/5/15 Date

Sample Collector: R. Minor

Sample Date			Time
Year	Month	Day	
2015	4	9	1543 ET (CT)

Pump Duration 2.5 min 72004

"999" = 2 days

Sample Readings

Analysis Time ET CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
1543	2	NA	NA	17.77	7.3	3.82	367	269	0.36
	4193		4192	10	400	300	94	90	
	Pump Rate		Pump Depth	Temp	pH	DO	COND	(+/-) ORP	Turbidity
	(L/min)		(m)	°C	(s.u.)	(mg/L)	(umhos/cm)	(mV)	(NTU)
				EPA 170.1	EPA 150.1	EPA 360.1	EPA 120.1	SM 2580B	EPA 180.1

Additional Sample Data

Analyst: R. Duncan

Date Analyzed: Year 2015 Month 04 Day 09

Turbidity 1350: ☑ Clear ☐ Turbid ☐ Slightly Turbid ☐ Highly Turbid

Color: None

Odor: None

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

Bottles Required: ☐ Ferrous ☐ Mineral ☐ Phenol ☐ BOD ☐ TOC ☐ Metals ☐ Dis. Mineral ☐ Filt TIC ☐ COD ☐ TIC ☐ Dis. Metals ☐ Nutrient ☐ TSS/TDS

Others (list): _____ _____

Distribution: (1) Original - Data Mgmt. (2) Pink - Survey Leader (3) Blue - Project Manager (4) Green - Customer (5) Yellow - ERS Files

TVA 30066A (9-1999)

10 L in ~~30~~ 30 sec

Preliminary Groundwater Data Field Worksheet

Sheet 1 of 1

Project/Site	Well Number	Purge Date: Year	Month	Day
CoF Groundwater	P8 84068	2015	06	17

Depth to Water (m)	Bottom of Well (m)	Well Diameter (mm)	Survey Leader	Field Crew
NA 4195	NA 4194	4188	R. Duncan	R. Minor, R. Duncan

☐ Depth of Screen ☐ Open Bore Hole

(m)	To	(m)	Sample Label
4191		4190	COF-P8-0615

☐ Unfiltered ☐ Filtered ☐ Both
Filter Type and Size:

[Bottom of Well – Depth to Water] x Volume Factor =	Well Volume (L)	Target Purge Volume (L)	Actual Purge Volume (L)
[(NA)m – (NA)m] x (NA)L/m=			4186

Purge Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list):
Sample Pump: ☐ Bladder ☐ Centrifugal ☐ Peristaltic ☐ Dedicated Other (list):

Notes and WQ Observations	Time ET CT	Pump Rate (L/min)	Depth to Water (m)	Pump Depth (m)	Temp °C	pH (s.u.)	DO (mg/L)	COND (umhos/cm)	(+/-) ORP (mV)	Turbidity (NTU)
Begin Purge →	1046	5 gpm			20.36	7.5	7.57	385	308	0.88
	1051				20.73	7.5	7.95	384	295	0.44
	1056				19.38	7.5	8.14	383	291	0.23
Sampled	1058									

Remarks: Sampled at 3L for 30 seconds

Reviewed By: _____ Survey Leader _____ Date _____ Project Leader _____ Date

Sample Collector: R. Minor

Sample Date: Year	Month	Day	Time
2015	06	17	1058 ET (CT)

Pump Duration: 10 min (min 72004)
"999" = 2 days

Sample Readings

1058				19.38	7.5	8.14	383	291	0.23
Analysis Time ET CT	4193 Pump Rate (L/min)	Depth to Water (m)	4192 Pump Depth (m)	10 Temp °C EPA 170.1	400 pH (s.u.) EPA 150.1	300 DO (mg/L) EPA 360.1	94 COND (umhos/cm) EPA 120.1	90 (+/-) ORP (mV) SM 2580B	Turbidity (NTU) EPA 180.1

Additional Sample Data

Analyst: R. Duncan

Date Analyzed: Year 2015 Month 6 Day 17

Turbidity 1350: ☑ Clear ☐ Turbid ☐ Slightly Turbid ☐ Highly Turbid

Color: Clear

415 Phenol Alkalinity mg/L (EPA 310.1)	431 Total Alk. mg/L (EPA 310.1)	436 Mineral Acidity mg/L (EPA 305.1)	437 CO_2 Acidity mg/L (EPA 305.1)
Time:	Time:	Time:	Time:
Initial:	Initial:	Initial:	Initial:

Bottles Required: ☐ Ferrous ☐ Mineral ☐ Phenol ☐ BOD ☐ TOC ☐ Metals ☐ Dis. Mineral ☐ Filt TIC
Others (list):

Well Diameter (mm)		Vol. Factor (L/m)
12.7	(0.5 in)	0.127
51	(2 in)	2.027
76	(3 in)	4.560
102	(4 in)	8.107
127	(5 in)	12.668
153	(6 in)	18.228

APPENDIX B

LABORATORY ANALYTICAL RESULTS

AND CHAIN OF CUSTODY RECORDS

ANALYTICAL REPORT

June 09, 2015

TVA-Environmental Affairs

Sample Delivery Group:	L758754
Samples Received:	04/11/2015
Project Number:	COF-CA5
Description:	COF Groundwater

Report To: Matthew Williams
400 W. Summit Hill Mailstop TVA WT 9A
Knoxville, TN 37902

Entire Report Reviewed By:

Pamela A. Langford

Pam Langford
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



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COF-CA9R-0415 L758754-01 GW

Collected by: RD/AN/RM | Collected date/time: 04/08/15 16:15 | Received date/time: 04/11/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Metals (ICP) by Method 6010B	WG781672	1	04/13/15 12:56	04/14/15 03:28	RDS
Metals (ICP) by Method 6010B	WG782007	1	04/14/15 14:30	04/14/15 22:19	RDS
Metals (ICPMS) by Method 6020	WG781675	1	04/13/15 18:39	04/16/15 15:03	JD
Metals (ICPMS) by Method 6020	WG782259	1	04/15/15 13:48	04/22/15 12:24	JD

COF-CA5-0415 L758754-02 GW

Collected by: RD/AN/RM | Collected date/time: 04/08/15 11:45 | Received date/time: 04/11/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 D-2011	WG781869	1	04/15/15 10:18	04/16/15 03:28	MF
Metals (ICP) by Method 6010B	WG781672	1	04/13/15 12:56	04/14/15 03:32	RDS
Metals (ICP) by Method 6010B	WG782007	1	04/14/15 14:30	04/14/15 22:24	RDS
Metals (ICPMS) by Method 6020	WG781675	1	04/13/15 18:39	04/16/15 15:06	JD
Metals (ICPMS) by Method 6020	WG782259	1	04/15/15 13:48	04/17/15 10:32	JD
Wet Chemistry by Method 2310 B-2011	WG783124	1	04/20/15 01:46	04/20/15 01:46	ASK
Wet Chemistry by Method 2320 B-2011	WG782420	1	04/16/15 18:57	04/16/15 18:57	MCG
Wet Chemistry by Method 350.1	WG783422	1	04/21/15 11:06	04/21/15 11:06	JAL
Wet Chemistry by Method 353.2	WG783472	1	04/21/15 11:02	04/21/15 11:02	JAL
Wet Chemistry by Method 9056MOD	WG782226	1	04/16/15 18:52	04/16/15 18:52	DJD
Wet Chemistry by Method 9066	WG783453	1	04/21/15 10:28	04/21/15 14:23	JAL

COF-CA29AR-0415 L758754-03 GW

Collected by: RD/AN/RM | Collected date/time: 04/08/15 14:32 | Received date/time: 04/11/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 D-2011	WG781869	1	04/15/15 10:18	04/16/15 03:28	MF
Metals (ICP) by Method 6010B	WG781672	1	04/13/15 12:56	04/14/15 03:37	RDS
Metals (ICPMS) by Method 6020	WG781675	1	04/13/15 18:39	04/16/15 15:08	JD
Wet Chemistry by Method 2310 B-2011	WG783124	1	04/20/15 01:46	04/20/15 01:46	ASK
Wet Chemistry by Method 2320 B-2011	WG782420	1	04/16/15 18:57	04/16/15 18:57	MCG
Wet Chemistry by Method 350.1	WG783422	1	04/21/15 11:14	04/21/15 11:14	JAL
Wet Chemistry by Method 353.2	WG783472	1	04/21/15 11:04	04/21/15 11:04	JAL
Wet Chemistry by Method 9056MOD	WG782226	1	04/16/15 19:22	04/16/15 19:22	DJD
Wet Chemistry by Method 9066	WG783453	1	04/21/15 10:28	04/21/15 14:30	JAL

COF-CA6-0415 L758754-04 GW

Collected by: RD/AN/RM | Collected date/time: 04/08/15 13:08 | Received date/time: 04/11/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 D-2011	WG781869	1	04/15/15 10:18	04/16/15 03:27	MF
Metals (ICP) by Method 6010B	WG781672	1	04/13/15 12:56	04/14/15 03:41	RDS
Metals (ICPMS) by Method 6020	WG781675	1	04/13/15 18:39	04/16/15 15:11	JD
Wet Chemistry by Method 2310 B-2011	WG783124	1	04/20/15 01:46	04/20/15 01:46	ASK
Wet Chemistry by Method 2320 B-2011	WG782420	1	04/16/15 18:57	04/16/15 18:57	MCG
Wet Chemistry by Method 350.1	WG783422	1	04/21/15 11:16	04/21/15 11:16	JAL
Wet Chemistry by Method 353.2	WG783472	1	04/21/15 11:08	04/21/15 11:08	JAL
Wet Chemistry by Method 9056MOD	WG782226	1	04/16/15 19:07	04/16/15 19:07	DJD
Wet Chemistry by Method 9066	WG783453	1	04/21/15 10:28	04/21/15 14:30	JAL

COF-CA11-0415 L758754-05 GW

Collected by: RD/AN/RM | Collected date/time: 04/08/15 10:03 | Received date/time: 04/11/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

COF-CA11-0415 L758754-05 GW

Collected by: RD/AN/RM | Collected date/time: 04/08/15 10:03 | Received date/time: 04/11/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 D-2011	WG781869	1	04/15/15 10:18	04/16/15 03:27	MF
Metals (ICP) by Method 6010B	WG781672	1	04/13/15 12:56	04/14/15 03:46	RDS
Metals (ICPMS) by Method 6020	WG781675	1	04/13/15 18:39	04/16/15 15:13	JD
Wet Chemistry by Method 2310 B-2011	WG783124	1	04/20/15 01:46	04/20/15 01:46	ASK
Wet Chemistry by Method 2320 B-2011	WG782420	1	04/16/15 18:57	04/16/15 18:57	MCG
Wet Chemistry by Method 350.1	WG783422	1	04/21/15 11:19	04/21/15 11:19	JAL
Wet Chemistry by Method 353.2	WG783472	1	04/21/15 11:09	04/21/15 11:09	JAL
Wet Chemistry by Method 9056MOD	WG782226	1	04/16/15 19:38	04/16/15 19:38	DJD
Wet Chemistry by Method 9066	WG783453	1	04/21/15 10:28	04/21/15 14:33	JAL

COF-CA31A-0415 L758754-06 GW

Collected by: RD/AN/RM | Collected date/time: 04/08/15 15:20 | Received date/time: 04/11/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 D-2011	WG781869	1	04/15/15 10:18	04/16/15 03:29	MF
Metals (ICP) by Method 6010B	WG781672	1	04/13/15 12:56	04/14/15 03:51	RDS
Metals (ICPMS) by Method 6020	WG781675	1	04/13/15 18:39	04/16/15 15:16	JD
Wet Chemistry by Method 2310 B-2011	WG783124	1	04/20/15 01:46	04/20/15 01:46	ASK
Wet Chemistry by Method 2320 B-2011	WG782420	1	04/16/15 18:57	04/16/15 18:57	MCG
Wet Chemistry by Method 350.1	WG783422	1	04/21/15 11:21	04/21/15 11:21	JAL
Wet Chemistry by Method 353.2	WG783472	1	04/21/15 11:10	04/21/15 11:10	JAL
Wet Chemistry by Method 9056MOD	WG782226	1	04/16/15 19:53	04/16/15 19:53	DJD
Wet Chemistry by Method 9066	WG783453	1	04/21/15 10:28	04/21/15 14:34	JAL

COF-CA31A DUP-0415 L758754-07 GW

Collected by: RD/AN/RM | Collected date/time: 04/08/15 15:22 | Received date/time: 04/11/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 D-2011	WG781869	1	04/15/15 10:18	04/16/15 03:29	MF
Metals (ICP) by Method 6010B	WG781672	1	04/13/15 12:56	04/14/15 03:55	RDS
Metals (ICPMS) by Method 6020	WG781675	1	04/13/15 18:39	04/16/15 15:19	JD
Wet Chemistry by Method 2310 B-2011	WG783124	1	04/20/15 01:46	04/20/15 01:46	ASK
Wet Chemistry by Method 2320 B-2011	WG782420	1	04/16/15 18:57	04/16/15 18:57	MCG
Wet Chemistry by Method 350.1	WG783422	1	04/21/15 11:24	04/21/15 11:24	JAL
Wet Chemistry by Method 353.2	WG783472	1	04/21/15 11:12	04/21/15 11:12	JAL
Wet Chemistry by Method 9056MOD	WG782389	1	04/16/15 16:14	04/16/15 16:14	DJD
Wet Chemistry by Method 9066	WG783453	1	04/21/15 10:28	04/21/15 14:35	JAL

COF-CA20A-0415 L758754-08 GW

Collected by: RD/AN/RM | Collected date/time: 04/09/15 14:41 | Received date/time: 04/11/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 D-2011	WG782099	1	04/15/15 15:51	04/16/15 07:35	MF
Metals (ICP) by Method 6010B	WG781672	1	04/13/15 12:56	04/14/15 04:00	RDS
Metals (ICP) by Method 6010B	WG782007	1	04/14/15 14:30	04/14/15 22:28	RDS
Metals (ICPMS) by Method 6020	WG781675	1	04/13/15 18:39	04/16/15 15:21	JD
Metals (ICPMS) by Method 6020	WG782259	1	04/15/15 13:48	04/17/15 10:35	JD
Wet Chemistry by Method 2310 B-2011	WG783124	1	04/20/15 01:46	04/20/15 01:46	ASK
Wet Chemistry by Method 2320 B-2011	WG783458	1	04/21/15 08:46	04/21/15 08:46	RBS
Wet Chemistry by Method 350.1	WG783422	1	04/21/15 11:26	04/21/15 11:26	JAL
Wet Chemistry by Method 353.2	WG783472	1	04/21/15 11:13	04/21/15 11:13	JAL
Wet Chemistry by Method 9056MOD	WG782389	1	04/16/15 16:27	04/16/15 16:27	DJD
Wet Chemistry by Method 9066	WG783453	1	04/21/15 10:28	04/21/15 14:36	JAL

COF-P8-0415 L758754-09 GW

Collected by: RD/AN/RM | Collected date/time: 04/09/15 15:43 | Received date/time: 04/11/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 D-2011	WG782099	1	04/15/15 15:51	04/16/15 07:35	MF
Metals (ICP) by Method 6010B	WG781672	1	04/13/15 12:56	04/14/15 04:14	RDS
Metals (ICPMS) by Method 6020	WG781675	1	04/13/15 18:39	04/16/15 15:24	JD
Wet Chemistry by Method 2310 B-2011	WG783124	1	04/20/15 01:46	04/20/15 01:46	ASK
Wet Chemistry by Method 2320 B-2011	WG783458	1	04/21/15 08:46	04/21/15 08:46	RBS
Wet Chemistry by Method 350.1	WG783422	1	04/21/15 11:29	04/21/15 11:29	JAL
Wet Chemistry by Method 353.2	WG783472	1	04/21/15 11:18	04/21/15 11:18	JAL
Wet Chemistry by Method 9056MOD	WG782389	1	04/16/15 16:41	04/16/15 16:41	DJD
Wet Chemistry by Method 9066	WG782619	1	04/19/15 00:29	04/21/15 15:35	MCG

COF-MC1-0415 L758754-10 GW

Collected by: RD/AN/RM | Collected date/time: 04/09/15 10:37 | Received date/time: 04/11/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 D-2011	WG782099	1	04/15/15 15:51	04/16/15 07:33	MF
Metals (ICP) by Method 6010B	WG781672	1	04/13/15 12:56	04/14/15 04:18	RDS
Metals (ICPMS) by Method 6020	WG781675	1	04/13/15 18:39	04/16/15 15:34	JD
Wet Chemistry by Method 2310 B-2011	WG783124	1	04/20/15 01:46	04/20/15 01:46	ASK
Wet Chemistry by Method 2320 B-2011	WG783458	1	04/21/15 08:46	04/21/15 08:46	RBS
Wet Chemistry by Method 350.1	WG783422	1	04/21/15 11:39	04/21/15 11:39	JAL
Wet Chemistry by Method 353.2	WG783472	1	04/21/15 11:19	04/21/15 11:19	JAL
Wet Chemistry by Method 9056MOD	WG782389	1	04/16/15 16:55	04/16/15 16:55	DJD
Wet Chemistry by Method 9066	WG782619	1	04/19/15 00:29	04/21/15 15:36	MCG

COF-MC4-0415 L758754-11 GW

Collected by: RD/AN/RM | Collected date/time: 04/09/15 11:32 | Received date/time: 04/11/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 D-2011	WG782099	1	04/15/15 15:51	04/16/15 07:34	MF
Metals (ICP) by Method 6010B	WG781672	1	04/13/15 12:56	04/14/15 04:23	RDS
Metals (ICPMS) by Method 6020	WG781675	1	04/13/15 18:39	04/16/15 15:36	JD
Wet Chemistry by Method 2310 B-2011	WG783124	1	04/20/15 01:46	04/20/15 01:46	ASK
Wet Chemistry by Method 2320 B-2011	WG783458	1	04/21/15 08:46	04/21/15 08:46	RBS
Wet Chemistry by Method 350.1	WG783422	1	04/21/15 11:41	04/21/15 11:41	JAL
Wet Chemistry by Method 353.2	WG783472	1	04/21/15 11:20	04/21/15 11:20	JAL
Wet Chemistry by Method 9056MOD	WG782848	2	04/17/15 22:14	04/17/15 22:14	DJD
Wet Chemistry by Method 9066	WG782619	1	04/19/15 00:29	04/21/15 15:36	MCG

COF-MC5A-0415 L758754-12 GW

Collected by: RD/AN/RM | Collected date/time: 04/09/15 10:32 | Received date/time: 04/11/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 D-2011	WG782099	1	04/15/15 15:51	04/16/15 07:36	MF
Metals (ICP) by Method 6010B	WG781672	1	04/13/15 12:56	04/14/15 04:27	RDS
Metals (ICPMS) by Method 6020	WG781675	1	04/13/15 18:39	04/16/15 15:39	JD
Wet Chemistry by Method 2310 B-2011	WG783124	1	04/20/15 01:46	04/20/15 01:46	ASK
Wet Chemistry by Method 2320 B-2011	WG783458	1	04/21/15 08:46	04/21/15 08:46	RBS
Wet Chemistry by Method 350.1	WG783422	1	04/21/15 11:44	04/21/15 11:44	JAL
Wet Chemistry by Method 353.2	WG783472	1	04/21/15 11:21	04/21/15 11:21	JAL
Wet Chemistry by Method 9056MOD	WG782389	1	04/16/15 17:23	04/16/15 17:23	DJD
Wet Chemistry by Method 9066	WG782619	1	04/19/15 00:29	04/21/15 15:37	MCG

COF-FIELD BLANK-0415 L758754-13 GW

Collected by: RD/AN/RM
Collected date/time: 04/09/15 14:10
Received date/time: 04/11/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 D-2011	WG782099	1	04/15/15 15:51	04/16/15 07:32	MF
Metals (ICP) by Method 6010B	WG781672	1	04/13/15 12:56	04/14/15 04:32	RDS
Metals (ICPMS) by Method 6020	WG781675	1	04/13/15 18:39	04/16/15 15:41	JD
Wet Chemistry by Method 2310 B-2011	WG783124	1	04/20/15 01:46	04/20/15 01:46	ASK
Wet Chemistry by Method 2320 B-2011	WG783458	1	04/21/15 08:46	04/21/15 08:46	RBS
Wet Chemistry by Method 350.1	WG783422	1	04/21/15 11:46	04/21/15 11:46	JAL
Wet Chemistry by Method 353.2	WG783472	1	04/21/15 11:22	04/21/15 11:22	JAL
Wet Chemistry by Method 9056MOD	WG782389	1	04/16/15 20:38	04/16/15 20:38	DJD
Wet Chemistry by Method 9066	WG782619	1	04/19/15 00:29	04/21/15 15:38	MCG

COF-EQ BLANK-0415 L758754-14 GW

Collected by: RD/AN/RM
Collected date/time: 04/09/15 14:00
Received date/time: 04/11/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 D-2011	WG782099	1	04/15/15 15:51	04/16/15 07:32	MF
Metals (ICP) by Method 6010B	WG781672	1	04/13/15 12:56	04/14/15 04:37	RDS
Metals (ICPMS) by Method 6020	WG781675	1	04/13/15 18:39	04/16/15 15:44	JD
Wet Chemistry by Method 2310 B-2011	WG783124	1	04/20/15 01:46	04/20/15 01:46	ASK
Wet Chemistry by Method 2320 B-2011	WG783458	1	04/21/15 08:46	04/21/15 08:46	RBS
Wet Chemistry by Method 350.1	WG783422	1	04/21/15 11:49	04/21/15 11:49	JAL
Wet Chemistry by Method 353.2	WG783472	1	04/21/15 11:24	04/21/15 11:24	JAL
Wet Chemistry by Method 9056MOD	WG782389	1	04/16/15 21:34	04/16/15 21:34	DJD
Wet Chemistry by Method 9066	WG782619	1	04/19/15 00:29	04/21/15 15:39	MCG

COF-CA30B-0415 L758754-15 GW

Collected by: RD/AN/RM
Collected date/time: 04/09/15 13:57
Received date/time: 04/11/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 D-2011	WG782099	1	04/15/15 15:51	04/16/15 07:46	MF
Metals (ICP) by Method 6010B	WG782244	1	04/15/15 15:46	04/16/15 09:11	RDS
Metals (ICPMS) by Method 6020	WG782256	1	04/15/15 14:51	04/20/15 11:53	JD
Metals (ICPMS) by Method 6020	WG782256	1	04/15/15 14:51	04/20/15 17:57	JD
Wet Chemistry by Method 2310 B-2011	WG783124	1	04/20/15 01:46	04/20/15 01:46	ASK
Wet Chemistry by Method 2320 B-2011	WG783458	1	04/21/15 08:46	04/21/15 08:46	RBS
Wet Chemistry by Method 350.1	WG783422	1	04/21/15 11:51	04/21/15 11:51	JAL
Wet Chemistry by Method 353.2	WG783472	1	04/21/15 11:25	04/21/15 11:25	JAL
Wet Chemistry by Method 9056MOD	WG782389	1	04/16/15 21:47	04/16/15 21:47	DJD
Wet Chemistry by Method 9066	WG782619	1	04/19/15 00:29	04/21/15 15:40	MCG

All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Pamela A. Langford

Pam Langford

Pam Langford
Technical Service Representative

Sample Handling and Receiving

Sample quantity was not sufficient to complete analysis per recommended method guidelines for the following samples.

ESC Sample ID	Project Sample ID	Method
L758754-13	COF-FIELD BLANK-0415	2540 D-2011

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Aluminum	ND		0.100	1	04/14/2015 03:28	WG781672
Aluminum,Dissolved	ND		0.100	1	04/14/2015 22:19	WG782007
Boron	2.56		0.200	1	04/14/2015 03:28	WG781672
Boron,Dissolved	2.67		0.200	1	04/14/2015 22:19	WG782007
Chromium	ND		0.0100	1	04/14/2015 03:28	WG781672
Chromium,Dissolved	ND		0.0100	1	04/14/2015 22:19	WG782007
Copper	ND		0.0200	1	04/14/2015 03:28	WG781672
Copper,Dissolved	ND		0.0200	1	04/14/2015 22:19	WG782007
Iron	0.143		0.100	1	04/14/2015 03:28	WG781672
Iron,Dissolved	ND		0.100	1	04/14/2015 22:19	WG782007
Lithium	0.0387		0.0150	1	04/14/2015 03:28	WG781672
Lithium,Dissolved	0.0294		0.0150	1	04/14/2015 22:19	WG782007
Manganese	0.0113		0.0100	1	04/14/2015 03:28	WG781672
Manganese,Dissolved	ND		0.0100	1	04/14/2015 22:19	WG782007
Molybdenum	0.0333		0.00500	1	04/14/2015 03:28	WG781672
Molybdenum,Dissolved	0.0277		0.00500	1	04/14/2015 22:19	WG782007
Strontium	0.567		0.0100	1	04/14/2015 03:28	WG781672
Strontium,Dissolved	0.530		0.0100	1	04/14/2015 22:19	WG782007
Zinc	ND		0.0500	1	04/14/2015 03:28	WG781672
Zinc,Dissolved	ND		0.0500	1	04/14/2015 22:19	WG782007

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Antimony	0.0555		0.00200	1	04/16/2015 15:03	WG781675
Antimony,Dissolved	0.0520		0.00200	1	04/22/2015 12:24	WG782259
Arsenic	ND		0.00200	1	04/16/2015 15:03	WG781675
Arsenic,Dissolved	ND		0.00200	1	04/22/2015 12:24	WG782259
Lead	ND		0.00200	1	04/16/2015 15:03	WG781675
Lead,Dissolved	ND		0.00200	1	04/22/2015 12:24	WG782259
Vanadium	0.00387		0.00200	1	04/16/2015 15:03	WG781675
Vanadium,Dissolved	0.00359		0.00200	1	04/22/2015 12:24	WG782259

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	13.7		2.50	1	04/16/2015 03:28	WG781869

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	170		10.0	1	04/20/2015 01:46	WG783124

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	ND		20.0	1	04/16/2015 18:57	WG782420

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	ND		0.250	1	04/21/2015 11:06	WG783422

Wet Chemistry by Method 353.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Nitrate-Nitrite	ND		0.100	1	04/21/2015 11:02	WG783472

Wet Chemistry by Method 9056MOD

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Sulfate	ND		5.00	1	04/16/2015 18:52	WG782226

Wet Chemistry by Method 9066

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Total Phenol by 4AAP	ND		0.0400	1	04/21/2015 14:23	WG783453

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	0.344		0.100	1	04/14/2015 03:32	WG781672
Aluminum,Dissolved	ND		0.100	1	04/14/2015 22:24	WG782007
Boron	ND		0.200	1	04/14/2015 03:32	WG781672
Boron,Dissolved	ND		0.200	1	04/14/2015 22:24	WG782007
Chromium	ND		0.0100	1	04/14/2015 03:32	WG781672
Chromium,Dissolved	ND		0.0100	1	04/14/2015 22:24	WG782007
Copper	ND		0.0200	1	04/14/2015 03:32	WG781672
Copper,Dissolved	ND		0.0200	1	04/14/2015 22:24	WG782007
Iron	0.921		0.100	1	04/14/2015 03:32	WG781672
Iron,Dissolved	ND		0.100	1	04/14/2015 22:24	WG782007
Lithium	ND		0.0150	1	04/14/2015 03:32	WG781672
Lithium,Dissolved	ND		0.0150	1	04/14/2015 22:24	WG782007
Manganese	0.0108		0.0100	1	04/14/2015 03:32	WG781672
Manganese,Dissolved	ND		0.0100	1	04/14/2015 22:24	WG782007
Molybdenum	ND		0.00500	1	04/14/2015 03:32	WG781672
Molybdenum,Dissolved	ND		0.00500	1	04/14/2015 22:24	WG782007
Strontium	0.0415		0.0100	1	04/14/2015 03:32	WG781672
Strontium,Dissolved	0.0388		0.0100	1	04/14/2015 22:24	WG782007

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Zinc	ND		0.0500	1	04/14/2015 03:32	WG781672
Zinc,Dissolved	ND		0.0500	1	04/14/2015 22:24	WG782007

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	04/16/2015 15:06	WG781675
Antimony,Dissolved	ND		0.00200	1	04/17/2015 10:32	WG782259
Arsenic	ND		0.00200	1	04/16/2015 15:06	WG781675
Arsenic,Dissolved	ND		0.00200	1	04/17/2015 10:32	WG782259
Lead	ND		0.00200	1	04/16/2015 15:06	WG781675
Lead,Dissolved	ND		0.00200	1	04/17/2015 10:32	WG782259
Vanadium	ND		0.00200	1	04/16/2015 15:06	WG781675
Vanadium,Dissolved	ND		0.00200	1	04/17/2015 10:32	WG782259

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	3.60		2.50	1	04/16/2015 03:28	WG781869

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	ND		10.0	1	04/20/2015 01:46	WG783124

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	74.0		20.0	1	04/16/2015 18:57	WG782420

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	ND		0.250	1	04/21/2015 11:14	WG783422

Wet Chemistry by Method 353.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Nitrate-Nitrite	0.120	J5	0.100	1	04/21/2015 11:04	WG783472

Wet Chemistry by Method 9056MOD

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Sulfate	13.4		5.00	1	04/16/2015 19:22	WG782226

Wet Chemistry by Method 9066

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Total Phenol by 4AAP	ND		0.0400	1	04/21/2015 14:30	WG783453

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	0.105		0.100	1	04/14/2015 03:37	WG781672
Boron	1.12		0.200	1	04/14/2015 03:37	WG781672
Chromium	ND		0.0100	1	04/14/2015 03:37	WG781672
Copper	ND		0.0200	1	04/14/2015 03:37	WG781672
Iron	0.103		0.100	1	04/14/2015 03:37	WG781672
Lithium	ND		0.0150	1	04/14/2015 03:37	WG781672
Manganese	0.166		0.0100	1	04/14/2015 03:37	WG781672
Molybdenum	0.0254		0.00500	1	04/14/2015 03:37	WG781672
Strontium	0.0887		0.0100	1	04/14/2015 03:37	WG781672
Zinc	ND		0.0500	1	04/14/2015 03:37	WG781672

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	04/16/2015 15:08	WG781675
Arsenic	ND		0.00200	1	04/16/2015 15:08	WG781675
Lead	ND		0.00200	1	04/16/2015 15:08	WG781675

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Vanadium	0.00426		0.00200	1	04/16/2015 15:08	WG781675

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	ND		2.50	1	04/16/2015 03:27	WG781869

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	ND		10.0	1	04/20/2015 01:46	WG783124

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	280		20.0	1	04/16/2015 18:57	WG782420

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	ND		0.250	1	04/21/2015 11:16	WG783422

Wet Chemistry by Method 353.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Nitrate-Nitrite	ND		0.100	1	04/21/2015 11:08	WG783472

Wet Chemistry by Method 9056MOD

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Sulfate	32.4		5.00	1	04/16/2015 19:07	WG782226

Wet Chemistry by Method 9066

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Total Phenol by 4AAP	ND		0.0400	1	04/21/2015 14:30	WG783453

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	ND		0.100	1	04/14/2015 03:41	WG781672
Boron	0.491		0.200	1	04/14/2015 03:41	WG781672
Chromium	ND		0.0100	1	04/14/2015 03:41	WG781672
Copper	ND		0.0200	1	04/14/2015 03:41	WG781672
Iron	ND		0.100	1	04/14/2015 03:41	WG781672
Lithium	0.0610		0.0150	1	04/14/2015 03:41	WG781672
Manganese	ND		0.0100	1	04/14/2015 03:41	WG781672
Molybdenum	ND		0.00500	1	04/14/2015 03:41	WG781672
Strontium	3.33		0.0100	1	04/14/2015 03:41	WG781672
Zinc	ND		0.0500	1	04/14/2015 03:41	WG781672

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	04/16/2015 15:11	WG781675
Arsenic	ND		0.00200	1	04/16/2015 15:11	WG781675
Lead	ND		0.00200	1	04/16/2015 15:11	WG781675

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Vanadium	ND		0.00200	1	04/16/2015 15:11	WG781675

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	3.14		2.50	1	04/16/2015 03:27	WG781869

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	ND		10.0	1	04/20/2015 01:46	WG783124

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	310		20.0	1	04/16/2015 18:57	WG782420

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	ND		0.250	1	04/21/2015 11:19	WG783422

Wet Chemistry by Method 353.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Nitrate-Nitrite	0.524		0.100	1	04/21/2015 11:09	WG783472

Wet Chemistry by Method 9056MOD

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Sulfate	ND		5.00	1	04/16/2015 19:38	WG782226

Wet Chemistry by Method 9066

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Total Phenol by 4AAP	ND		0.0400	1	04/21/2015 14:33	WG783453

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	0.105		0.100	1	04/14/2015 03:46	WG781672
Boron	ND		0.200	1	04/14/2015 03:46	WG781672
Chromium	ND		0.0100	1	04/14/2015 03:46	WG781672
Copper	ND		0.0200	1	04/14/2015 03:46	WG781672
Iron	ND		0.100	1	04/14/2015 03:46	WG781672
Lithium	ND		0.0150	1	04/14/2015 03:46	WG781672
Manganese	ND		0.0100	1	04/14/2015 03:46	WG781672
Molybdenum	ND		0.00500	1	04/14/2015 03:46	WG781672
Strontium	0.143		0.0100	1	04/14/2015 03:46	WG781672
Zinc	ND		0.0500	1	04/14/2015 03:46	WG781672

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	04/16/2015 15:13	WG781675
Arsenic	ND		0.00200	1	04/16/2015 15:13	WG781675
Lead	ND		0.00200	1	04/16/2015 15:13	WG781675

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Vanadium	ND		0.00200	1	04/16/2015 15:13	WG781675

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	17.1		2.50	1	04/16/2015 03:29	WG781869

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	ND		10.0	1	04/20/2015 01:46	WG783124

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	180		20.0	1	04/16/2015 18:57	WG782420

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	ND		0.250	1	04/21/2015 11:21	WG783422

Wet Chemistry by Method 353.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Nitrate-Nitrite	ND		0.100	1	04/21/2015 11:10	WG783472

Wet Chemistry by Method 9056MOD

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Sulfate	38.3		5.00	1	04/16/2015 19:53	WG782226

Wet Chemistry by Method 9066

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Total Phenol by 4AAP	ND		0.0400	1	04/21/2015 14:34	WG783453

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	0.115		0.100	1	04/14/2015 03:51	WG781672
Boron	0.612		0.200	1	04/14/2015 03:51	WG781672
Chromium	ND		0.0100	1	04/14/2015 03:51	WG781672
Copper	ND		0.0200	1	04/14/2015 03:51	WG781672
Iron	1.26		0.100	1	04/14/2015 03:51	WG781672
Lithium	ND		0.0150	1	04/14/2015 03:51	WG781672
Manganese	0.0364		0.0100	1	04/14/2015 03:51	WG781672
Molybdenum	0.0171		0.00500	1	04/14/2015 03:51	WG781672
Strontium	0.208		0.0100	1	04/14/2015 03:51	WG781672
Zinc	ND		0.0500	1	04/14/2015 03:51	WG781672

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	04/16/2015 15:16	WG781675
Arsenic	0.00545		0.00200	1	04/16/2015 15:16	WG781675
Lead	ND		0.00200	1	04/16/2015 15:16	WG781675

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Vanadium	0.00395		0.00200	1	04/16/2015 15:16	WG781675

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	13.5		2.50	1	04/16/2015 03:29	WG781869

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	ND		10.0	1	04/20/2015 01:46	WG783124

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	200		20.0	1	04/16/2015 18:57	WG782420

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	ND		0.250	1	04/21/2015 11:24	WG783422

Wet Chemistry by Method 353.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Nitrate-Nitrite	ND		0.100	1	04/21/2015 11:12	WG783472

Wet Chemistry by Method 9056MOD

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Sulfate	37.3		5.00	1	04/16/2015 16:14	WG782389

Wet Chemistry by Method 9066

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Total Phenol by 4AAP	ND		0.0400	1	04/21/2015 14:35	WG783453

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	ND		0.100	1	04/14/2015 03:55	WG781672
Boron	0.552		0.200	1	04/14/2015 03:55	WG781672
Chromium	ND		0.0100	1	04/14/2015 03:55	WG781672
Copper	ND		0.0200	1	04/14/2015 03:55	WG781672
Iron	0.445		0.100	1	04/14/2015 03:55	WG781672
Lithium	ND		0.0150	1	04/14/2015 03:55	WG781672
Manganese	0.0630		0.0100	1	04/14/2015 03:55	WG781672
Molybdenum	0.0159		0.00500	1	04/14/2015 03:55	WG781672
Strontium	0.227		0.0100	1	04/14/2015 03:55	WG781672
Zinc	ND		0.0500	1	04/14/2015 03:55	WG781672

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	04/16/2015 15:19	WG781675
Arsenic	0.00292		0.00200	1	04/16/2015 15:19	WG781675
Lead	ND		0.00200	1	04/16/2015 15:19	WG781675

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Vanadium	0.00222		0.00200	1	04/16/2015 15:19	WG781675

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	109		2.50	1	04/16/2015 07:35	WG782099

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	ND		10.0	1	04/20/2015 01:46	WG783124

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	190		20.0	1	04/21/2015 08:46	WG783458

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	ND		0.250	1	04/21/2015 11:26	WG783422

Wet Chemistry by Method 353.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Nitrate-Nitrite	3.69		0.100	1	04/21/2015 11:13	WG783472

Wet Chemistry by Method 9056MOD

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Sulfate	10.3		5.00	1	04/16/2015 16:27	WG782389

Wet Chemistry by Method 9066

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Total Phenol by 4AAP	ND		0.0400	1	04/21/2015 14:36	WG783453

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	0.375		0.100	1	04/14/2015 04:00	WG781672
Aluminum,Dissolved	ND		0.100	1	04/14/2015 22:28	WG782007
Boron	0.224		0.200	1	04/14/2015 04:00	WG781672
Boron,Dissolved	0.231		0.200	1	04/14/2015 22:28	WG782007
Chromium	ND		0.0100	1	04/14/2015 04:00	WG781672
Chromium,Dissolved	ND		0.0100	1	04/14/2015 22:28	WG782007
Copper	ND		0.0200	1	04/14/2015 04:00	WG781672
Copper,Dissolved	ND		0.0200	1	04/14/2015 22:28	WG782007
Iron	0.129		0.100	1	04/14/2015 04:00	WG781672
Iron,Dissolved	ND		0.100	1	04/14/2015 22:28	WG782007
Lithium	ND		0.0150	1	04/14/2015 04:00	WG781672
Lithium,Dissolved	ND		0.0150	1	04/14/2015 22:28	WG782007
Manganese	0.0330		0.0100	1	04/14/2015 04:00	WG781672
Manganese,Dissolved	ND		0.0100	1	04/14/2015 22:28	WG782007
Molybdenum	ND		0.00500	1	04/14/2015 04:00	WG781672
Molybdenum,Dissolved	ND		0.00500	1	04/14/2015 22:28	WG782007
Strontium	0.106		0.0100	1	04/14/2015 04:00	WG781672
Strontium,Dissolved	0.102		0.0100	1	04/14/2015 22:28	WG782007

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Zinc	0.0722		0.0500	1	04/14/2015 04:00	WG781672
Zinc,Dissolved	ND		0.0500	1	04/14/2015 22:28	WG782007

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	04/16/2015 15:21	WG781675
Antimony,Dissolved	ND		0.00200	1	04/17/2015 10:35	WG782259
Arsenic	ND		0.00200	1	04/16/2015 15:21	WG781675
Arsenic,Dissolved	ND		0.00200	1	04/17/2015 10:35	WG782259
Lead	ND		0.00200	1	04/16/2015 15:21	WG781675
Lead,Dissolved	ND		0.00200	1	04/17/2015 10:35	WG782259
Vanadium	0.00585		0.00200	1	04/16/2015 15:21	WG781675
Vanadium,Dissolved	ND		0.00200	1	04/17/2015 10:35	WG782259

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	ND		2.50	1	04/16/2015 07:35	WG782099

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	ND		10.0	1	04/20/2015 01:46	WG783124

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	190		20.0	1	04/21/2015 08:46	WG783458

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	ND		0.250	1	04/21/2015 11:29	WG783422

Wet Chemistry by Method 353.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Nitrate-Nitrite	0.337		0.100	1	04/21/2015 11:18	WG783472

Wet Chemistry by Method 9056MOD

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Sulfate	8.69		5.00	1	04/16/2015 16:41	WG782389

Wet Chemistry by Method 9066

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Total Phenol by 4AAP	ND		0.0400	1	04/21/2015 15:35	WG782619

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	ND		0.100	1	04/14/2015 04:14	WG781672
Boron	ND		0.200	1	04/14/2015 04:14	WG781672
Chromium	ND		0.0100	1	04/14/2015 04:14	WG781672
Copper	ND		0.0200	1	04/14/2015 04:14	WG781672
Iron	ND		0.100	1	04/14/2015 04:14	WG781672
Lithium	ND		0.0150	1	04/14/2015 04:14	WG781672
Manganese	ND		0.0100	1	04/14/2015 04:14	WG781672
Molybdenum	ND		0.00500	1	04/14/2015 04:14	WG781672
Strontium	0.157		0.0100	1	04/14/2015 04:14	WG781672
Zinc	0.439		0.0500	1	04/14/2015 04:14	WG781672

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	04/16/2015 15:24	WG781675
Arsenic	ND		0.00200	1	04/16/2015 15:24	WG781675
Lead	ND		0.00200	1	04/16/2015 15:24	WG781675

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Vanadium	ND		0.00200	1	04/16/2015 15:24	WG781675

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	ND		2.50	1	04/16/2015 07:33	WG782099

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	ND		10.0	1	04/20/2015 01:46	WG783124

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	32.0		20.0	1	04/21/2015 08:46	WG783458

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	ND		0.250	1	04/21/2015 11:39	WG783422

Wet Chemistry by Method 353.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Nitrate-Nitrite	0.277		0.100	1	04/21/2015 11:19	WG783472

Wet Chemistry by Method 9056MOD

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Sulfate	99.4		5.00	1	04/16/2015 16:55	WG782389

Wet Chemistry by Method 9066

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Total Phenol by 4AAP	ND		0.0400	1	04/21/2015 15:36	WG782619

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	0.905		0.100	1	04/14/2015 04:18	WG781672
Boron	2.91		0.200	1	04/14/2015 04:18	WG781672
Chromium	ND		0.0100	1	04/14/2015 04:18	WG781672
Copper	ND		0.0200	1	04/14/2015 04:18	WG781672
Iron	ND		0.100	1	04/14/2015 04:18	WG781672
Lithium	0.0226		0.0150	1	04/14/2015 04:18	WG781672
Manganese	0.0170		0.0100	1	04/14/2015 04:18	WG781672
Molybdenum	0.114		0.00500	1	04/14/2015 04:18	WG781672
Strontium	0.214		0.0100	1	04/14/2015 04:18	WG781672
Zinc	ND		0.0500	1	04/14/2015 04:18	WG781672

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	0.0134		0.00200	1	04/16/2015 15:34	WG781675
Arsenic	0.0579		0.00200	1	04/16/2015 15:34	WG781675
Lead	ND		0.00200	1	04/16/2015 15:34	WG781675

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Vanadium	0.0438		0.00200	1	04/16/2015 15:34	WG781675

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	ND		2.50	1	04/16/2015 07:34	WG782099

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	ND		10.0	1	04/20/2015 01:46	WG783124

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	32.0		20.0	1	04/21/2015 08:46	WG783458

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	ND		0.250	1	04/21/2015 11:41	WG783422

Wet Chemistry by Method 353.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Nitrate-Nitrite	0.243		0.100	1	04/21/2015 11:20	WG783472

Wet Chemistry by Method 9056MOD

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Sulfate	97.4		10.0	2	04/17/2015 22:14	WG782848

Wet Chemistry by Method 9066

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Total Phenol by 4AAP	ND		0.0400	1	04/21/2015 15:36	WG782619

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	0.668		0.100	1	04/14/2015 04:23	WG781672
Boron	3.22		0.200	1	04/14/2015 04:23	WG781672
Chromium	ND		0.0100	1	04/14/2015 04:23	WG781672
Copper	ND		0.0200	1	04/14/2015 04:23	WG781672
Iron	ND		0.100	1	04/14/2015 04:23	WG781672
Lithium	ND		0.0150	1	04/14/2015 04:23	WG781672
Manganese	ND		0.0100	1	04/14/2015 04:23	WG781672
Molybdenum	0.139		0.00500	1	04/14/2015 04:23	WG781672
Strontium	0.209		0.0100	1	04/14/2015 04:23	WG781672
Zinc	ND		0.0500	1	04/14/2015 04:23	WG781672

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	0.00651		0.00200	1	04/16/2015 15:36	WG781675
Arsenic	0.0449		0.00200	1	04/16/2015 15:36	WG781675
Lead	ND		0.00200	1	04/16/2015 15:36	WG781675

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Vanadium	0.00450		0.00200	1	04/16/2015 15:36	WG781675

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	13.4		2.50	1	04/16/2015 07:36	WG782099

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	ND		10.0	1	04/20/2015 01:46	WG783124

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	110		20.0	1	04/21/2015 08:46	WG783458

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	ND		0.250	1	04/21/2015 11:44	WG783422

Wet Chemistry by Method 353.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Nitrate-Nitrite	0.148		0.100	1	04/21/2015 11:21	WG783472

Wet Chemistry by Method 9056MOD

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Sulfate	35.3		5.00	1	04/16/2015 17:23	WG782389

Wet Chemistry by Method 9066

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Total Phenol by 4AAP	ND		0.0400	1	04/21/2015 15:37	WG782619

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	0.387		0.100	1	04/14/2015 04:27	WG781672
Boron	1.36		0.200	1	04/14/2015 04:27	WG781672
Chromium	ND		0.0100	1	04/14/2015 04:27	WG781672
Copper	ND		0.0200	1	04/14/2015 04:27	WG781672
Iron	ND		0.100	1	04/14/2015 04:27	WG781672
Lithium	0.0209		0.0150	1	04/14/2015 04:27	WG781672
Manganese	0.0890		0.0100	1	04/14/2015 04:27	WG781672
Molybdenum	0.0380		0.00500	1	04/14/2015 04:27	WG781672
Strontium	0.205		0.0100	1	04/14/2015 04:27	WG781672
Zinc	ND		0.0500	1	04/14/2015 04:27	WG781672

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	0.00795		0.00200	1	04/16/2015 15:39	WG781675
Arsenic	0.0155		0.00200	1	04/16/2015 15:39	WG781675
Lead	ND		0.00200	1	04/16/2015 15:39	WG781675

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Vanadium	0.0299		0.00200	1	04/16/2015 15:39	WG781675

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	ND		2.50	1	04/16/2015 07:32	WG782099

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	30.0		10.0	1	04/20/2015 01:46	WG783124

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	ND		20.0	1	04/21/2015 08:46	WG783458

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	ND		0.250	1	04/21/2015 11:46	WG783422

Wet Chemistry by Method 353.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Nitrate-Nitrite	ND		0.100	1	04/21/2015 11:22	WG783472

Wet Chemistry by Method 9056MOD

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Sulfate	ND	P1	5.00	1	04/16/2015 20:38	WG782389

Wet Chemistry by Method 9066

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Total Phenol by 4AAP	ND		0.0400	1	04/21/2015 15:38	WG782619

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	ND		0.100	1	04/14/2015 04:32	WG781672
Boron	ND		0.200	1	04/14/2015 04:32	WG781672
Chromium	ND		0.0100	1	04/14/2015 04:32	WG781672
Copper	ND		0.0200	1	04/14/2015 04:32	WG781672
Iron	ND		0.100	1	04/14/2015 04:32	WG781672
Lithium	ND		0.0150	1	04/14/2015 04:32	WG781672
Manganese	ND		0.0100	1	04/14/2015 04:32	WG781672
Molybdenum	ND		0.00500	1	04/14/2015 04:32	WG781672
Strontium	ND		0.0100	1	04/14/2015 04:32	WG781672
Zinc	ND		0.0500	1	04/14/2015 04:32	WG781672

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	04/16/2015 15:41	WG781675
Arsenic	ND		0.00200	1	04/16/2015 15:41	WG781675
Lead	ND		0.00200	1	04/16/2015 15:41	WG781675

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Vanadium	ND		0.00200	1	04/16/2015 15:41	WG781675

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	ND		2.50	1	04/16/2015 07:32	WG782099

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	ND		10.0	1	04/20/2015 01:46	WG783124

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	ND		20.0	1	04/21/2015 08:46	WG783458

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	ND		0.250	1	04/21/2015 11:49	WG783422

Wet Chemistry by Method 353.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Nitrate-Nitrite	ND		0.100	1	04/21/2015 11:24	WG783472

Wet Chemistry by Method 9056MOD

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Sulfate	ND		5.00	1	04/16/2015 21:34	WG782389

Wet Chemistry by Method 9066

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Total Phenol by 4AAP	ND		0.0400	1	04/21/2015 15:39	WG782619

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	ND		0.100	1	04/14/2015 04:37	WG781672
Boron	ND		0.200	1	04/14/2015 04:37	WG781672
Chromium	ND		0.0100	1	04/14/2015 04:37	WG781672
Copper	ND		0.0200	1	04/14/2015 04:37	WG781672
Iron	ND		0.100	1	04/14/2015 04:37	WG781672
Lithium	ND		0.0150	1	04/14/2015 04:37	WG781672
Manganese	ND		0.0100	1	04/14/2015 04:37	WG781672
Molybdenum	ND		0.00500	1	04/14/2015 04:37	WG781672
Strontium	ND		0.0100	1	04/14/2015 04:37	WG781672
Zinc	ND		0.0500	1	04/14/2015 04:37	WG781672

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	04/16/2015 15:44	WG781675
Arsenic	ND		0.00200	1	04/16/2015 15:44	WG781675
Lead	ND		0.00200	1	04/16/2015 15:44	WG781675

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Vanadium	ND		0.00200	1	04/16/2015 15:44	WG781675

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	ND		2.50	1	04/16/2015 07:46	WG782099

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	ND		10.0	1	04/20/2015 01:46	WG783124

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	340		20.0	1	04/21/2015 08:46	WG783458

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	ND		0.250	1	04/21/2015 11:51	WG783422

Wet Chemistry by Method 353.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Nitrate-Nitrite	ND		0.100	1	04/21/2015 11:25	WG783472

Wet Chemistry by Method 9056MOD

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Sulfate	73.2		5.00	1	04/16/2015 21:47	WG782389

Wet Chemistry by Method 9066

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Total Phenol by 4AAP	ND		0.0400	1	04/21/2015 15:40	WG782619

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	ND		0.100	1	04/16/2015 09:11	WG782244
Boron	ND		0.200	1	04/16/2015 09:11	WG782244
Chromium	ND		0.0100	1	04/16/2015 09:11	WG782244
Copper	ND		0.0200	1	04/16/2015 09:11	WG782244
Iron	0.516		0.100	1	04/16/2015 09:11	WG782244
Lithium	ND		0.0150	1	04/16/2015 09:11	WG782244
Manganese	1.98		0.0100	1	04/16/2015 09:11	WG782244
Molybdenum	ND		0.00500	1	04/16/2015 09:11	WG782244
Strontium	0.199		0.0100	1	04/16/2015 09:11	WG782244
Zinc	ND		0.0500	1	04/16/2015 09:11	WG782244

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	04/20/2015 11:53	WG782256
Arsenic	ND		0.00200	1	04/20/2015 11:53	WG782256
Lead	ND		0.00200	1	04/20/2015 17:57	WG782256

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Vanadium	ND		0.00200	1	04/20/2015 11:53	WG782256

Method Blank (MB)

(MB) 04/16/15 03:24

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Suspended Solids	ND		2.50

L758583-01 Original Sample (OS) • Duplicate (DUP)

(OS) 04/16/15 03:29 • (DUP) 04/16/15 03:29

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Suspended Solids	70.4	72.0	1	2.25		5

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/16/15 03:26 • (LCSD) 04/16/15 03:24

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Suspended Solids	773	780	808	101	105	85.0-115			3.53	5

Method Blank (MB)

(MB) 04/16/15 07:42

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Suspended Solids	ND		2.50

L758532-01 Original Sample (OS) • Duplicate (DUP)

(OS) 04/16/15 07:41 • (DUP) 04/16/15 07:40

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Suspended Solids	27.0	29.3	1	8.00	J3	5

L758694-01 Original Sample (OS) • Duplicate (DUP)

(OS) 04/16/15 07:44 • (DUP) 04/16/15 07:39

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Suspended Solids	134	130	1	2.84		5

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/16/15 07:42 • (LCSD) 04/16/15 07:32

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Suspended Solids	773	816	824	106	107	85.0-115			0.976	5

Method Blank (MB)

(MB) 04/20/15 01:46

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Acidity	ND		10.0

L758754-02 Original Sample (OS) • Duplicate (DUP)

(OS) 04/20/15 01:46 • (DUP) 04/20/15 01:46

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Acidity	170	160	1	3.6		20

L758754-09 Original Sample (OS) • Duplicate (DUP)

(OS) 04/20/15 01:46 • (DUP) 04/20/15 01:46

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Acidity	ND	ND	1	0.00		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/20/15 01:46 • (LCSD) 04/20/15 01:46

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Acidity	20.0	20.0	20.0	100	100	85.0-115			0.000	20

Method Blank (MB)

(MB) 04/16/15 18:57

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Alkalinity	ND		20.0

L758739-02 Original Sample (OS) • Duplicate (DUP)

(OS) 04/16/15 18:57 • (DUP) 04/16/15 18:57

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Alkalinity	ND	ND	1	0.00		20

L758739-04 Original Sample (OS) • Duplicate (DUP)

(OS) 04/16/15 18:57 • (DUP) 04/16/15 18:57

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Alkalinity	24	23	1	4.7		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/16/15 18:57 • (LCSD) 04/16/15 18:57

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Alkalinity	100	101	102	101	102	85.0-115			0.985	20

L758739-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/16/15 18:57 • (MS) 04/16/15 18:57 • (MSD) 04/16/15 18:57

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Alkalinity	100	ND	110	111	110	111	1	80.0-120			0.905	20

Method Blank (MB)

(MB) 04/21/15 08:46

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Alkalinity	ND		20.0

L758718-01 Original Sample (OS) • Duplicate (DUP)

(OS) 04/21/15 08:46 • (DUP) 04/21/15 08:46

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Alkalinity	190	190	1	0.52		20

L759289-04 Original Sample (OS) • Duplicate (DUP)

(OS) 04/21/15 08:46 • (DUP) 04/21/15 08:46

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Alkalinity	76	75	1	1.3		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/21/15 08:46 • (LCSD) 04/21/15 08:46

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Alkalinity	100	106	111	110	110	85.0-115			0.000	20

L759289-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/21/15 08:46 • (MS) 04/21/15 08:46 • (MSD) 04/21/15 08:46

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Alkalinity	100	350	816	829	94.0	96.0	5	80.0-120			1.21	20

Method Blank (MB)

(MB) 04/21/15 10:46

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Ammonia Nitrogen	ND		0.250

L758754-15 Original Sample (OS) • Duplicate (DUP)

(OS) 04/21/15 11:51 • (DUP) 04/21/15 11:54

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Ammonia Nitrogen	ND	ND	1	0.00		20

L758239-01 Original Sample (OS) • Duplicate (DUP)

(OS) 04/21/15 11:01 • (DUP) 04/21/15 11:04

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Ammonia Nitrogen	3.8	3.7	1	2.7		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/21/15 10:51 • (LCSD) 04/21/15 10:54

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Ammonia Nitrogen	7.50	7.66	7.81	102	104	90.0-110			1.94	20

L758754-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/21/15 11:06 • (MS) 04/21/15 11:09 • (MSD) 04/21/15 11:11

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Ammonia Nitrogen	10.0	ND	10.5	10.5	105	105	1	90.0-110			0.000	20

Method Blank (MB)

(MB) 04/21/15 10:51

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Nitrate-Nitrite	ND		0.100

L758754-02 Original Sample (OS) • Duplicate (DUP)

(OS) 04/21/15 11:02 • (DUP) 04/21/15 11:03

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Nitrate-Nitrite	ND	ND	1	0.00		20

L758754-15 Original Sample (OS) • Duplicate (DUP)

(OS) 04/21/15 11:25 • (DUP) 04/21/15 11:26

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Nitrate-Nitrite	ND	ND	1	200		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/21/15 10:55 • (LCSD) 04/21/15 10:56

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Nitrate-Nitrite	5.00	5.43	5.42	109	108	90.0-110			0.184	20

L758754-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/21/15 11:04 • (MS) 04/21/15 11:06 • (MSD) 04/21/15 11:07

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Nitrate-Nitrite	5.00	0.120	6.07	6.05	119	119	1	90.0-110	J5	J5	0.330	20

Method Blank (MB)

(MB) 04/16/15 12:57

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Sulfate	ND		5.00

L758765-03 Original Sample (OS) • Duplicate (DUP)

(OS) 04/16/15 14:45 • (DUP) 04/16/15 15:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Sulfate	1.04	1.09	1	5		20

L758739-06 Original Sample (OS) • Duplicate (DUP)

(OS) 04/16/15 18:21 • (DUP) 04/16/15 18:36

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Sulfate	13.7	13.6	2	1		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/16/15 13:13 • (LCSD) 04/16/15 13:28

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Sulfate	40.0	40.4	40.3	101	101	90-110			0	20

L758754-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/16/15 19:53 • (MS) 04/16/15 20:09 • (MSD) 04/16/15 20:24

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Sulfate	50.0	38.3	88.1	89.1	99	101	1	80-120			1	20

Method Blank (MB)

(MB) 04/16/15 09:40

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Sulfate	ND		5.00

L758305-01 Original Sample (OS) • Duplicate (DUP)

(OS) 04/16/15 14:56 • (DUP) 04/16/15 15:09

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Sulfate	12.3	12.3	1	0		20

L758754-13 Original Sample (OS) • Duplicate (DUP)

(OS) 04/16/15 20:38 • (DUP) 04/16/15 20:52

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Sulfate	0.105	0.0301	1	111	P1	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/16/15 11:38 • (LCSD) 04/16/15 11:52

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Sulfate	40.0	38.9	38.9	97	97	90-110			0	20

L758754-12 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/16/15 17:23 • (MS) 04/16/15 17:37 • (MSD) 04/16/15 17:51

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Sulfate	50.0	35.3	80.0	83.2	89	96	1	80-120			4	20

Method Blank (MB)

(MB) 04/17/15 11:58

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Sulfate	ND		5.00

L759901-01 Original Sample (OS) • Duplicate (DUP)

(OS) 04/17/15 16:24 • (DUP) 04/17/15 16:39

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Sulfate	72.9	73.0	1	0		20

L758636-01 Original Sample (OS) • Duplicate (DUP)

(OS) 04/17/15 18:54 • (DUP) 04/17/15 19:09

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Sulfate	7.94	8.01	1	1		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/17/15 12:13 • (LCSD) 04/17/15 12:29

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Sulfate	40.0	39.8	39.9	99	100	90-110			0	20

L759917-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/17/15 17:10 • (MS) 04/17/15 17:25 • (MSD) 04/17/15 17:41

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Sulfate	50.0	5.29	56.6	56.6	103	103	1	80-120			0	20

Method Blank (MB)

(MB) 04/21/15 15:29

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Total Phenol by 4AAP	ND		0.0400

L758925-02 Original Sample (OS) • Duplicate (DUP)

(OS) 04/21/15 15:40 • (DUP) 04/21/15 15:41

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Total Phenol by 4AAP	ND	ND	1	0.00		20

L759184-02 Original Sample (OS) • Duplicate (DUP)

(OS) 04/21/15 15:49 • (DUP) 04/21/15 15:50

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Total Phenol by 4AAP	0.062	0.059	1	5.0		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/21/15 15:31 • (LCSD) 04/21/15 15:32

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Total Phenol by 4AAP	0.500	0.489	0.474	97.8	94.8	90.0-110			3.12	20

Method Blank (MB)

(MB) 04/21/15 14:12

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Total Phenol by 4AAP	ND		0.0400

L758754-02 Original Sample (OS) • Duplicate (DUP)

(OS) 04/21/15 14:23 • (DUP) 04/21/15 14:24

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Total Phenol by 4AAP	ND	ND	1	0.00		20

L758754-06 Original Sample (OS) • Duplicate (DUP)

(OS) 04/21/15 14:34 • (DUP) 04/21/15 14:34

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Total Phenol by 4AAP	ND	ND	1	200		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/21/15 14:14 • (LCSD) 04/21/15 14:14

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Total Phenol by 4AAP	0.500	0.521	0.527	104	105	90.0-110			1.15	20

L758754-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/21/15 14:30 • (MS) 04/21/15 14:31 • (MSD) 04/21/15 14:32

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Total Phenol by 4AAP	1.00	ND	0.922	0.909	92.2	90.9	1	90.0-110			1.42	20

Method Blank (MB)

(MB) 04/14/15 02:42

Analyte	MB Result mg/l	MB Qualifier	MB RDL mg/l
Aluminum	ND		0.100
Boron	ND		0.200
Chromium	ND		0.0100
Copper	ND		0.0200
Iron	ND		0.100
Lithium	ND		0.0500
Manganese	ND		0.0100
Molybdenum	ND		0.00500
Strontium	ND		0.0100
Zinc	ND		0.0500

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/14/15 02:46 • (LCSD) 04/14/15 02:51

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Aluminum	1.00	1.10	1.14	110	114	80-120			4	20
Boron	1.00	1.01	1.04	101	104	80-120			2	20
Chromium	1.00	1.11	1.13	111	113	80-120			2	20
Copper	1.00	0.972	0.993	97	99	80-120			2	20
Iron	1.00	1.04	1.05	104	105	80-120			1	20
Lithium	1.00	1.01	1.03	101	103	80-120			2	20
Manganese	1.00	1.08	1.10	108	110	80-120			2	20
Molybdenum	1.00	0.994	1.01	99	101	80-120			2	20
Strontium	1.00	1.01	1.02	101	102	80-120			2	20
Zinc	1.00	1.05	1.06	105	106	80-120			1	20

L758718-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/14/15 02:56 • (MS) 04/14/15 03:18 • (MSD) 04/14/15 03:23

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aluminum	1.00	0.124	1.23	1.28	110	115	1	75-125			4	20
Boron	1.00	1.30	2.30	2.32	101	102	1	75-125			0	20
Chromium	1.00	0.0297	1.14	1.14	111	111	1	75-125			0	20
Copper	1.00	0.00566	0.987	0.989	98	98	1	75-125			0	20
Iron	1.00	0.332	1.13	1.16	80	83	1	75-125			3	20
Lithium	1.00	0.182	1.19	1.19	101	101	1	75-125			0	20

L758718-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/14/15 02:56 • (MS) 04/14/15 03:18 • (MSD) 04/14/15 03:23

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Manganese	1.00	0.0150	1.11	1.11	109	109	1	75-125			0	20
Molybdenum	1.00	0.0417	1.03	1.03	98	99	1	75-125			1	20
Strontium	1.00	0.549	1.53	1.54	98	99	1	75-125			0	20
Zinc	1.00	0.0227	1.10	1.09	107	107	1	75-125			0	20

Method Blank (MB)

(MB) 04/14/15 21:23

Analyte	MB Result mg/l	MB Qualifier	MB RDL mg/l
Aluminum,Dissolved	ND		0.100
Boron,Dissolved	ND		0.200
Chromium,Dissolved	ND		0.0100
Copper,Dissolved	ND		0.0200
Iron,Dissolved	ND		0.100
Lithium,Dissolved	ND		0.0500
Manganese,Dissolved	ND		0.0100
Molybdenum,Dissolved	ND		0.00500
Strontium,Dissolved	ND		0.0100
Zinc,Dissolved	ND		0.0500

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/14/15 21:27 • (LCSD) 04/14/15 21:32

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Aluminum,Dissolved	1.00	1.04	1.02	104	102	80-120			2	20
Boron,Dissolved	1.00	1.03	1.03	103	103	80-120			1	20
Chromium,Dissolved	1.00	1.03	1.03	103	103	80-120			0	20
Copper,Dissolved	1.00	1.01	1.01	101	101	80-120			0	20
Iron,Dissolved	1.00	1.00	0.996	100	100	80-120			1	20
Lithium,Dissolved	1.00	1.02	1.02	102	102	80-120			0	20
Manganese,Dissolved	1.00	1.02	1.02	102	102	80-120			0	20
Molybdenum,Dissolved	1.00	1.02	1.01	102	101	80-120			0	20
Strontium,Dissolved	1.00	1.01	1.01	101	101	80-120			0	20
Zinc,Dissolved	1.00	0.987	0.986	99	99	80-120			0	20

L758478-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/14/15 21:36 • (MS) 04/14/15 21:55 • (MSD) 04/14/15 22:00

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aluminum,Dissolved	1.00	0.0702	1.05	1.17	98	110	1	75-125			10	20
Boron,Dissolved	1.00	3.07	4.05	4.09	98	102	1	75-125			1	20
Chromium,Dissolved	1.00	0.0167	1.03	1.06	102	105	1	75-125			3	20
Copper,Dissolved	1.00	ND	1.04	1.05	104	105	1	75-125			1	20
Iron,Dissolved	1.00	0.113	1.09	1.10	98	99	1	75-125			1	20
Lithium,Dissolved	1.00	0.791	1.91	1.89	111	110	1	75-125			1	20

L758478-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/14/15 21:36 • (MS) 04/14/15 21:55 • (MSD) 04/14/15 22:00

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Manganese,Dissolved	1.00	ND	1.01	1.03	101	103	1	75-125			2	20
Molybdenum,Dissolved	1.00	0.0191	0.997	1.00	98	98	1	75-125			1	20
Strontium,Dissolved	1.00	12.5	13.3	13.5	80	100	1	75-125			2	20
Zinc,Dissolved	1.00	0.108	1.09	1.12	98	101	1	75-125			3	20

Method Blank (MB)

(MB) 04/16/15 08:58

Analyte	MB Result mg/l	MB Qualifier	MB RDL mg/l
Aluminum	ND		0.100
Boron	ND		0.200
Chromium	ND		0.0100
Copper	ND		0.0200
Iron	ND		0.100
Lithium	ND		0.0500
Manganese	ND		0.0100
Molybdenum	ND		0.00500
Strontium	ND		0.0100
Zinc	ND		0.0500

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/16/15 09:02 • (LCSD) 04/16/15 09:07

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Aluminum	1.00	1.03	1.08	103	108	80-120			5	20
Boron	1.00	0.992	1.01	99	101	80-120			1	20
Chromium	1.00	1.01	1.02	101	102	80-120			0	20
Copper	1.00	0.994	0.986	99	99	80-120			1	20
Iron	1.00	1.00	0.997	100	100	80-120			0	20
Lithium	1.00	1.02	1.02	102	102	80-120			0	20
Manganese	1.00	1.00	1.00	100	100	80-120			0	20
Molybdenum	1.00	0.988	0.995	99	99	80-120			1	20
Strontium	1.00	0.984	0.987	98	99	80-120			0	20
Zinc	1.00	0.976	0.985	98	99	80-120			1	20

L758754-15 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/16/15 09:11 • (MS) 04/16/15 09:20 • (MSD) 04/16/15 09:25

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aluminum	1.00	0.0236	1.08	1.10	105	107	1	75-125			2	20
Boron	1.00	0.113	1.15	1.13	104	102	1	75-125			1	20
Chromium	1.00	0.00231	1.00	1.03	100	102	1	75-125			2	20
Copper	1.00	0.00561	1.02	1.03	101	102	1	75-125			1	20
Iron	1.00	0.516	1.52	1.52	100	100	1	75-125			0	20
Lithium	1.00	0.00435	1.06	1.06	106	105	1	75-125			0	20

L758754-15 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/16/15 09:11 • (MS) 04/16/15 09:20 • (MSD) 04/16/15 09:25

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Manganese	1.00	1.98	2.91	2.93	92	95	1	75-125			1	20
Molybdenum	1.00	0.000383	0.991	0.992	99	99	1	75-125			0	20
Strontium	1.00	0.199	1.19	1.19	99	99	1	75-125			0	20
Zinc	1.00	0.0297	1.01	1.03	98	100	1	75-125			1	20

Method Blank (MB)

(MB) 04/16/15 14:14

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Antimony	ND		0.00200
Arsenic	ND		0.00200
Lead	ND		0.00200
Vanadium	ND		0.00500

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/16/15 14:17 • (LCSD) 04/16/15 14:19

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Antimony	0.0500	0.0553	0.0523	111	105	80-120			5	20
Arsenic	0.0500	0.0540	0.0514	108	103	80-120			5	20
Lead	0.0500	0.0506	0.0503	101	101	80-120			1	20
Vanadium	0.0500	0.0521	0.0507	104	101	80-120			3	20

L758801-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/16/15 14:22 • (MS) 04/16/15 14:27 • (MSD) 04/16/15 14:30

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Antimony	0.0500	0.000821	0.0543	0.0544	107	107	1	75-125			0	20
Arsenic	0.0500	0.000943	0.0538	0.0524	106	103	1	75-125			3	20
Lead	0.0500	0.000830	0.0509	0.0505	100	99	1	75-125			1	20
Vanadium	0.0500	0.000671	0.0500	0.0494	99	97	1	75-125			1	20

Method Blank (MB)

(MB) 04/20/15 11:38

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Antimony	ND		0.00200
Arsenic	ND		0.00200
Vanadium	ND		0.00500

Method Blank (MB)

(MB) 04/20/15 17:42

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Lead	ND		0.00200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/20/15 11:43 • (LCSD) 04/20/15 11:47

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Antimony	0.0500	0.0465	0.0457	93	91	80-120			2	20
Arsenic	0.0500	0.0490	0.0491	98	98	80-120			0	20
Vanadium	0.0500	0.0472	0.0463	94	93	80-120			2	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/20/15 17:48 • (LCSD) 04/20/15 17:52

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Lead	0.0500	0.0448	0.0445	90	89	80-120			1	20

L758754-15 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/20/15 11:53 • (MS) 04/20/15 12:03 • (MSD) 04/20/15 12:08

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Antimony	0.0500	0.000132	0.0459	0.0461	92	92	1	75-125			0	20
Arsenic	0.0500	0.00123	0.0489	0.0499	95	97	1	75-125			2	20
Vanadium	0.0500	0.0000693	0.0464	0.0465	93	93	1	75-125			0	20

L758754-15 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/20/15 17:57 • (MS) 04/20/15 18:07 • (MSD) 04/20/15 18:12

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Lead	0.0500	0.000543	0.0438	0.0437	87	86	1	75-125			0	20

Method Blank (MB)

(MB) 04/17/15 09:44

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Antimony,Dissolved	ND		0.00200
Arsenic,Dissolved	ND		0.00200
Lead,Dissolved	ND		0.00200
Vanadium,Dissolved	ND		0.00500

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/17/15 09:47 • (LCSD) 04/17/15 12:42

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Antimony,Dissolved	0.0500	0.0514	0.0542	103	108	80-120			5	20
Arsenic,Dissolved	0.0500	0.0517	0.0511	103	102	80-120			1	20
Lead,Dissolved	0.0500	0.0509	0.0520	102	104	80-120			2	20
Vanadium,Dissolved	0.0500	0.0499	0.0513	100	103	80-120			3	20

L758718-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/17/15 09:52 • (MS) 04/17/15 09:57 • (MSD) 04/17/15 10:00

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Antimony,Dissolved	0.0500	0.00236	0.108	0.110	211	216	1	75-125	J5	J5	2	20
Arsenic,Dissolved	0.0500	0.00385	0.0517	0.0518	96	96	1	75-125			0	20
Lead,Dissolved	0.0500	0.00172	0.0495	0.0515	95	100	1	75-125			4	20
Vanadium,Dissolved	0.0500	0.00902	0.0542	0.0551	90	92	1	75-125			2	20

Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND,U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.
SDL	Sample Detection Limit.
MQL	Method Quantitation Limit.
Unadj. MQL	Unadjusted Method Quantitation Limit.

Qualifier	Description
J3	The associated batch QC was outside the established quality control range for precision.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.**

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Conneticut	PH-0197	North Carolina [1]	DW21704
Florida	E87487	North Carolina [2]	41
Georgia	NELAP	North Dakota	R-140
Georgia [1]	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky [1]	90010	South Dakota	n/a
Kentucky [2]	16	Tennessee [1 4]	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

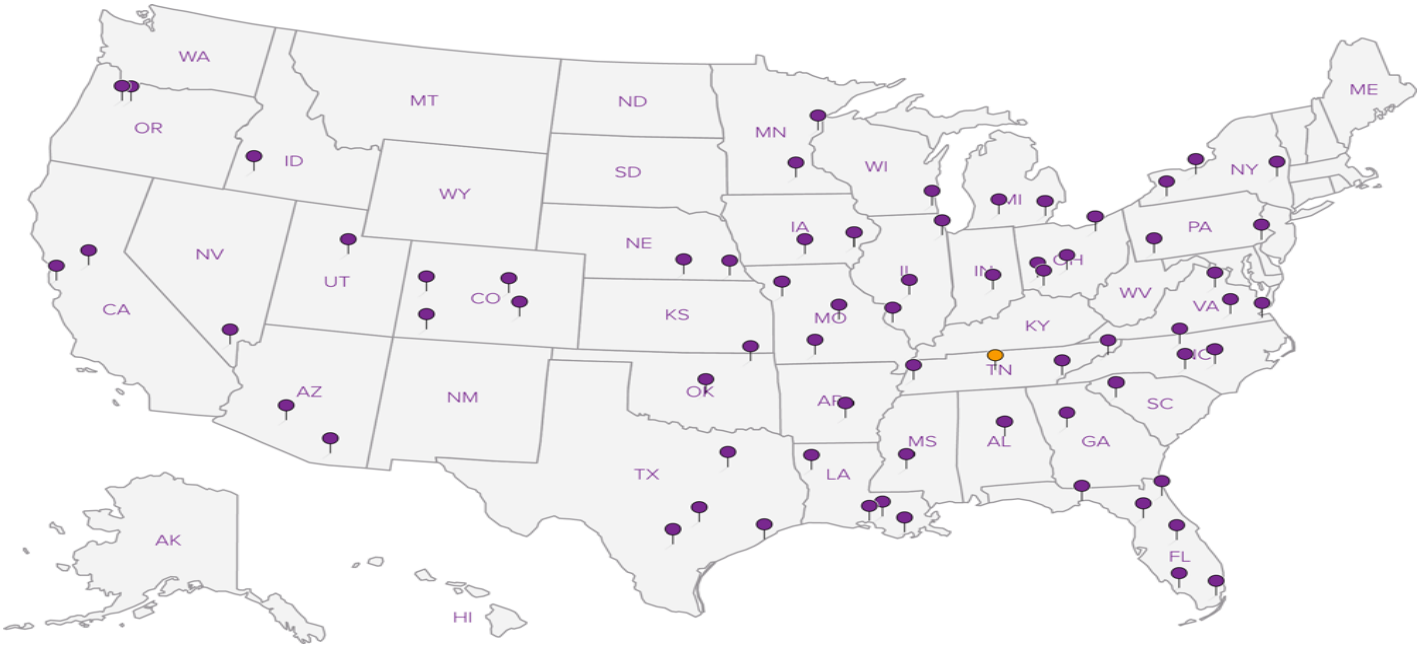
[1.] Drinking Water [2.] Underground Storage Tanks [3.] Aquatic Toxicity [4.] Chemical/Microbiological [5.] Mold [n/a] Accreditation not applicable

Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA	100789
Canada	1461.01	DOD	1461.01
EPA–Crypto	TN00003	USDA	S-67674

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



Billing Information:
TVA Accounts Payable
1101 Market St. Mailstop: LP-5D-C
Chattanooga, TN 37402

Report to: Matthew Williams

Email To: edmsvk@tva.gov, mdwilliams@tva.gov,MAGeane@tva.gov

Project Description: COF Groundwater

City/State Collected: Muscle Shoals AL

Phone: 865-632-6941
Fax:

Client Project #

Lab Project #

Collected by (print): Ray Duncan A. Nesbitt Ralph E. Minor

Site/Facility ID #

P.O. # 727549

Collected by (signature): Ray Duncan A. Nesbitt Ralph E. Minor

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed: Standard

Email? ___No _X_Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntr	METALS 500mL HDPE-HNO3	NH3 125mL HDPE-H2SO4	NO2NO3 250mL HDPE-H2SO4	PHT 250mLAmb-H2SO4	SULFATE 125mL HDPE-NoPRES	TSS 1L-HDPE NoPRES	ACIDITY AND ALKALINITY 1L-HDPE No PRES	Dissolved Metals (Same List)			Rem./Contaminant	Sample # (lab only)
COF-CA9R-0415	Grab	GW	21.1	4/8/15	1615	2	X							X				-01
COF-CA5-0415	Grab	GW	1.3	4/8/15	1145	8	X	X	X	X	X	X	X	X				02
COF-CA29AR-0415	Grab	GW	8.0	4/8/15	1432	7	X	X	X	X	X	X	X					03
COF-CA6-0415	Grab	GW	15.0	4/8/15	1308	7	X	X	X	X	X	X	X					04
COF-CA11-0415	Grab	GW	18.0	4/8/15	1003	7	X	X	X	X	X	X	X					05
COF-CA31A-0415	Grab	GW	4.1	4/8/15	1520	7	X	X	X	X	X	X	X					06
COF-CA31ADup-0415	Grab	GW	4.1	4/8/15	1522	7	X	X	X	X	X	X	X					07
COF-CA20A-0415	Grab	GW	13.7	4/9/15	1441	8	X	X	X	X	X	X	X	X				08
COF-P8-0415	Grab	GW	NA	4/9/15	1543	7	X	X	X	X	X	X	X					09
COF-mc1-0415	Grab	GW	12.0	4/9/15	1037	7	X	X	X	X	X	X	X					16

627286225805 627286225790
627286225816
627286225786
627286225779

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other

Remarks: Dissolved Metals PRES HNO3

pH ___ Temp ___

Flow ___ Other ___

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Ray Duncan	4/10/15	1330	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ ___

Temp: 3.6 °C Bottles Received: 102

Date: 4/11/15 Time: 0920

Hold #

Condition: (lab use only)

COC Seal Intact: ___Y ___N ___NA

pH Checked: NCF: /

Chain of Custody Page ___ of ___

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Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L758754

Tab C067

Acctnum: TVAENVAFF
Template: T101255
Prelogin: P503726
TSR: 633- Pam Langford
PB:
Shipped Via: FedEx Ground

Billing Information:
TVA Accounts Payable
1101 Market St. Mailstop: LP-5D-C
Chattanooga, TN 37402

Report to: Matthew Williams

Email To: edmsvk@tva.gov, mdwilliams@tva.gov,MAGeane@tva.gov

Project Description: COF Groundwater

City/State Collected: Muscle Shoals AL

Phone: 865-632-6941
Fax:

Client Project #

Lab Project #

Collected by (print): Ray Duncan A. Nesbitt Ralph E. Minor

Site/Facility ID #

P.O. # 727549

Collected by (signature): Ray Duncan a. Nesbitt Ralph E. Minor

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed: Standard

Email? ___No _X_Yes
FAX? ___No ___Yes

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntr	METALS 500mL HDPE-HNO3	NH3 125mL HDPE-H2SO4	NO2NO3 250mL HDPE-H2SO4	PHT 250mLAmb-H2SO4	SULFATE 125mL HDPE-NoPRES	TSS 1L-HDPE NoPRES	ACIDITY AND ALKALINITY 1L-HDPE No PRES			Rem./Contaminant	Sample # (lab only)
COF-MC4-0415	Grab	GW	5.0	4/9/15	1132	7	X	X	X	X	X	X	X				11
COF-MC5A-0415	Grab	GW	6.5	4/9/15	1032	7	X	X	X	X	X	X	X				12
COF-Field Blank-0415	Grab	DI		4/9/15	1410	7	X	X	X	X	X	X	X				13
COF-Eq Blank-0415	Grab	DI		4/9/15	1400	7	X	X	X	X	X	X	X				14

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Ray Duncan	4/10/15	1330	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ _____

Temp: 3.4 °C Bottles Received: 102

Date: 4/11/15 Time: 0900

Chain of Custody Page ___ of ___

ESC LAB SCIENCES
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12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L758754

Table #

Acctnum: TVAENVAFF

Template: T101255

Prelogin: P503726

TSR: 633- Pam Langford

PB:

Shipped Via: FedEX Ground

Hold #

Condition: (lab use only) OK SW

COC Seal Intact: ___Y ___N ___NA

pH Checked: NCF: ✓

Andy Vann

ESC Lab Sciences
Non-Conformance Form

Login #: L758754	Client: TVAENVAFF	Date: 4/11/15	Evaluated by: Nikki

Non-Conformance (check applicable items)

	Sample Integrity		Chain of Custody Clarification		
	Parameter(s) past holding time	x	Login Clarification Needed		**If Broken Container:**
	Improper temperature		Chain of custody is incomplete		Insufficient packing material around container
	Improper container type		Please specify Metals requested.		Insufficient packing material inside cooler
	Improper preservation		Please specify TCLP requested.		Improper handling by carrier (FedEx / UPS / Courie
	Insufficient sample volume.		Received additional samples not listed on coc.		Sample was frozen
	Sample is biphasic.		Sample ids on containers do not match ids on coc		Container lid not intact
	Vials received with headspace.		Trip Blank not received.		**If no Chain of Custody:**
	Broken container		Client did not "X" analysis.		Received by:
	Broken container:		Chain of Custody is missing		Date/Time:
	Sufficient sample remains				Temp./Cont. Rec./pH:
					Carrier:
					Tracking#

Login Comments: Received COF-CA-30B-0415 @1357 4/9/15 not on COC.

Client informed by:		Call		Email		Voice Mail		Date:	Time:
TSR Initials:	Client Contact:								

Login Instructions:

Please perform all analysis on this sample per Michael Gean.

This E-mail and any attached files are confidential, and may be copyright protected. If you are not the addressee, any dissemination of this communication is strictly prohibited. If you have received this message in error, please contact the sender immediately and delete/destroy all information received.

ANALYTICAL REPORT

May 13, 2015

TVA-Environmental Affairs

Sample Delivery Group:	L759988
Samples Received:	04/17/2015
Project Number:	COF GW
Description:	Colbert Ground Water Wells
Site:	ASH STACK 5
Report To:	Matthew Williams 400 W. Summit Hill Mailstop TVA WT 9A Knoxville, TN 37902

Entire Report Reviewed By:

Pamela A. Langford

Pam Langford

Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



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COF-A-0415 18.0FT L759988-01 GW

Collected by: Duncan-Minor | Collected date/time: 04/15/15 17:32 | Received date/time: 04/17/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 D-2011	WG783245	1	04/20/15 13:25	04/22/15 07:32	MF
Mercury by Method 7470A	WG783355	1	04/20/15 23:05	04/21/15 10:29	RDS
Metals (ICP) by Method 6010B	WG783145	1	04/21/15 16:35	04/23/15 20:20	RDS
Metals (ICPMS) by Method 6020	WG783161	1	04/25/15 05:57	04/27/15 10:51	AB
Wet Chemistry by Method 2310 B-2011	WG784236	1	04/25/15 10:49	04/25/15 10:49	DR
Wet Chemistry by Method 2320 B-2011	WG784318	5	04/24/15 12:47	04/24/15 12:47	LLS

COF-B-0415 30.0FT L759988-02 GW

Collected by: Duncan-Minor | Collected date/time: 04/16/15 09:07 | Received date/time: 04/17/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 D-2011	WG783690	1	04/22/15 12:39	04/23/15 09:06	JG
Mercury by Method 7470A	WG783355	1	04/20/15 23:05	04/21/15 10:37	RDS
Metals (ICP) by Method 6010B	WG783145	1	04/21/15 16:35	04/23/15 20:24	RDS
Metals (ICPMS) by Method 6020	WG783161	1	04/25/15 05:57	04/27/15 11:00	AB
Wet Chemistry by Method 2310 B-2011	WG784236	1	04/25/15 10:49	04/25/15 10:49	DR
Wet Chemistry by Method 2320 B-2011	WG784318	1	04/24/15 12:47	04/24/15 12:47	LLS

COF-D-0415 31.4FT L759988-03 GW

Collected by: Duncan-Minor | Collected date/time: 04/15/15 10:54 | Received date/time: 04/17/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 D-2011	WG783245	1	04/20/15 13:25	04/22/15 07:28	MF
Mercury by Method 7470A	WG783355	1	04/20/15 23:05	04/21/15 10:54	RDS
Mercury by Method 7470A	WG783721	1	04/22/15 15:33	04/22/15 20:11	RDS
Metals (ICP) by Method 6010B	WG783145	1	04/21/15 16:35	04/23/15 20:29	RDS
Metals (ICP) by Method 6010B	WG783809	1	04/24/15 09:40	04/24/15 19:29	WBD
Metals (ICPMS) by Method 6020	WG783161	1	04/25/15 05:57	04/27/15 11:02	AB
Metals (ICPMS) by Method 6020	WG783963	1	04/23/15 07:25	04/24/15 01:30	JD
Wet Chemistry by Method 2310 B-2011	WG784236	1	04/25/15 10:49	04/25/15 10:49	DR
Wet Chemistry by Method 2320 B-2011	WG784318	1	04/24/15 12:47	04/24/15 12:47	LLS

COF-CO20B-0415 17.3FT L759988-04 GW

Collected by: Duncan-Minor | Collected date/time: 04/16/15 10:40 | Received date/time: 04/17/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Mercury by Method 7470A	WG783355	1	04/20/15 23:05	04/21/15 10:56	RDS
Metals (ICP) by Method 6010B	WG783145	1	04/21/15 16:35	04/23/15 20:34	RDS
Metals (ICPMS) by Method 6020	WG783161	1	04/25/15 05:57	04/27/15 11:04	AB
Wet Chemistry by Method 2310 B-2011	WG784236	1	04/25/15 10:49	04/25/15 10:49	DR
Wet Chemistry by Method 2320 B-2011	WG784318	1	04/24/15 12:47	04/24/15 12:47	LLS

COF-EQ BLANK-0415 L759988-05 GW

Collected by: Duncan-Minor | Collected date/time: 04/16/15 11:18 | Received date/time: 04/17/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 D-2011	WG783690	1	04/22/15 12:39	04/23/15 09:13	JG
Mercury by Method 7470A	WG783355	1	04/20/15 23:05	04/21/15 10:59	RDS
Metals (ICP) by Method 6010B	WG783145	1	04/21/15 16:35	04/23/15 20:38	RDS
Metals (ICPMS) by Method 6020	WG783161	1	04/25/15 05:57	04/27/15 11:12	AB
Wet Chemistry by Method 2310 B-2011	WG784236	1	04/25/15 10:49	04/25/15 10:49	DR
Wet Chemistry by Method 2320 B-2011	WG784318	1	04/24/15 12:47	04/24/15 12:47	LLS

COF-FIELD BLANK-0415 L759988-06 GW

Collected by: Duncan-Minor
Collected date/time: 04/16/15 11:23
Received date/time: 04/17/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 D-2011	WG783690	1	04/22/15 12:39	04/23/15 09:12	JG
Mercury by Method 7470A	WG783355	1	04/20/15 23:05	04/21/15 11:01	RDS
Metals (ICP) by Method 6010B	WG783145	1	04/21/15 16:35	04/23/15 20:51	RDS
Metals (ICPMS) by Method 6020	WG783161	1	04/25/15 05:57	04/27/15 11:14	AB
Wet Chemistry by Method 2310 B-2011	WG784236	1	04/25/15 10:49	04/25/15 10:49	DR
Wet Chemistry by Method 2320 B-2011	WG784318	1	04/24/15 12:47	04/24/15 12:47	LLS

COF-B DUP-0415 30.0FT L759988-07 GW

Collected by: Duncan-Minor
Collected date/time: 04/16/15 09:09
Received date/time: 04/17/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 D-2011	WG783690	1	04/22/15 12:39	04/23/15 09:12	JG
Mercury by Method 7470A	WG783355	1	04/20/15 23:05	04/21/15 11:04	RDS
Metals (ICP) by Method 6010B	WG783145	1	04/21/15 16:35	04/23/15 20:58	RDS
Metals (ICPMS) by Method 6020	WG783161	1	04/25/15 05:57	04/27/15 11:17	AB
Wet Chemistry by Method 2310 B-2011	WG784236	1	04/25/15 10:49	04/25/15 10:49	DR
Wet Chemistry by Method 2320 B-2011	WG784318	1	04/24/15 12:47	04/24/15 12:47	LLS

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Pamela A. Langford

Pam Langford

Pam Langford
Technical Service Representative

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	ND		2.50	1	04/22/2015 07:32	WG783245

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	ND		10.0	1	04/25/2015 10:49	WG784236

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	340		100	5	04/24/2015 12:47	WG784318

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	04/21/2015 10:29	WG783355

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.0274		0.00500	1	04/23/2015 20:20	WG783145
Beryllium	ND		0.00200	1	04/23/2015 20:20	WG783145
Chromium	ND		0.0100	1	04/23/2015 20:20	WG783145
Cobalt	ND		0.0100	1	04/23/2015 20:20	WG783145
Copper	ND		0.0200	1	04/23/2015 20:20	WG783145
Vanadium	ND		0.0200	1	04/23/2015 20:20	WG783145
Zinc	ND		0.0500	1	04/23/2015 20:20	WG783145

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	04/27/2015 10:51	WG783161
Arsenic	ND		0.00200	1	04/27/2015 10:51	WG783161
Cadmium	ND		0.00100	1	04/27/2015 10:51	WG783161
Lead	ND		0.00200	1	04/27/2015 10:51	WG783161
Nickel	0.00323		0.00200	1	04/27/2015 10:51	WG783161
Selenium	0.00768		0.00200	1	04/27/2015 10:51	WG783161
Silver	ND		0.00200	1	04/27/2015 10:51	WG783161
Thallium	ND		0.00200	1	04/27/2015 10:51	WG783161
Vanadium	ND		0.00500	1	04/27/2015 10:51	WG783161

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	ND		2.50	1	04/23/2015 09:06	WG783690

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	ND		10.0	1	04/25/2015 10:49	WG784236

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	280		20.0	1	04/24/2015 12:47	WG784318

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	04/21/2015 10:37	WG783355

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.0282		0.00500	1	04/23/2015 20:24	WG783145
Beryllium	ND		0.00200	1	04/23/2015 20:24	WG783145
Chromium	ND		0.0100	1	04/23/2015 20:24	WG783145
Cobalt	ND		0.0100	1	04/23/2015 20:24	WG783145
Copper	ND		0.0200	1	04/23/2015 20:24	WG783145
Vanadium	ND		0.0200	1	04/23/2015 20:24	WG783145
Zinc	ND		0.0500	1	04/23/2015 20:24	WG783145

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	04/27/2015 11:00	WG783161
Arsenic	ND		0.00200	1	04/27/2015 11:00	WG783161
Cadmium	ND		0.00100	1	04/27/2015 11:00	WG783161
Lead	ND		0.00200	1	04/27/2015 11:00	WG783161
Nickel	0.00259		0.00200	1	04/27/2015 11:00	WG783161
Selenium	ND		0.00200	1	04/27/2015 11:00	WG783161
Silver	ND		0.00200	1	04/27/2015 11:00	WG783161
Thallium	ND		0.00200	1	04/27/2015 11:00	WG783161
Vanadium	ND		0.00500	1	04/27/2015 11:00	WG783161

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	2.50		2.50	1	04/22/2015 07:28	WG783245

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	ND		10.0	1	04/25/2015 10:49	WG784236

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	280		20.0	1	04/24/2015 12:47	WG784318

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	04/21/2015 10:54	WG783355
Mercury,Dissolved	ND		0.000200	1	04/22/2015 20:11	WG783721

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.0326		0.00500	1	04/23/2015 20:29	WG783145
Barium,Dissolved	0.0305		0.00500	1	04/24/2015 19:29	WG783809
Beryllium	ND		0.00200	1	04/23/2015 20:29	WG783145
Beryllium,Dissolved	ND		0.00200	1	04/24/2015 19:29	WG783809
Chromium	ND		0.0100	1	04/23/2015 20:29	WG783145
Chromium,Dissolved	ND		0.0100	1	04/24/2015 19:29	WG783809
Cobalt	ND		0.0100	1	04/23/2015 20:29	WG783145
Cobalt,Dissolved	ND		0.0100	1	04/24/2015 19:29	WG783809
Copper	ND		0.0200	1	04/23/2015 20:29	WG783145
Copper,Dissolved	ND		0.0200	1	04/24/2015 19:29	WG783809
Vanadium	ND		0.0200	1	04/23/2015 20:29	WG783145
Vanadium,Dissolved	ND		0.0200	1	04/24/2015 19:29	WG783809
Zinc	ND		0.0500	1	04/23/2015 20:29	WG783145
Zinc,Dissolved	ND		0.0500	1	04/24/2015 19:29	WG783809

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	04/27/2015 11:02	WG783161
Antimony,Dissolved	ND	J4	0.00200	1	04/24/2015 01:30	WG783963
Arsenic	ND		0.00200	1	04/27/2015 11:02	WG783161
Arsenic,Dissolved	ND		0.00200	1	04/24/2015 01:30	WG783963
Cadmium	ND		0.00100	1	04/27/2015 11:02	WG783161
Cadmium,Dissolved	ND	J4	0.00100	1	04/24/2015 01:30	WG783963
Lead	ND		0.00200	1	04/27/2015 11:02	WG783161
Lead,Dissolved	ND		0.00200	1	04/24/2015 01:30	WG783963
Nickel	0.00308		0.00200	1	04/27/2015 11:02	WG783161
Nickel,Dissolved	0.00263		0.00200	1	04/24/2015 01:30	WG783963
Selenium	ND		0.00200	1	04/27/2015 11:02	WG783161
Selenium,Dissolved	ND		0.00200	1	04/24/2015 01:30	WG783963
Silver	ND		0.00200	1	04/27/2015 11:02	WG783161
Silver,Dissolved	ND	J4	0.00200	1	04/24/2015 01:30	WG783963
Thallium	ND		0.00200	1	04/27/2015 11:02	WG783161

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Thallium,Dissolved	ND		0.00200	1	04/24/2015 01:30	WG783963
Vanadium	ND		0.00500	1	04/27/2015 11:02	WG783161
Vanadium,Dissolved	ND		0.00500	1	04/24/2015 01:30	WG783963

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	ND		10.0	1	04/25/2015 10:49	WG784236

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	330		20.0	1	04/24/2015 12:47	WG784318

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	04/21/2015 10:56	WG783355

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.0295		0.00500	1	04/23/2015 20:34	WG783145
Beryllium	ND		0.00200	1	04/23/2015 20:34	WG783145
Cobalt	ND		0.0100	1	04/23/2015 20:34	WG783145

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Cadmium	ND		0.00100	1	04/27/2015 11:04	WG783161
Nickel	ND		0.00200	1	04/27/2015 11:04	WG783161
Selenium	ND		0.00200	1	04/27/2015 11:04	WG783161
Silver	ND		0.00200	1	04/27/2015 11:04	WG783161
Thallium	ND		0.00200	1	04/27/2015 11:04	WG783161
Vanadium	ND		0.00500	1	04/27/2015 11:04	WG783161

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	ND		2.50	1	04/23/2015 09:13	WG783690

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	ND		10.0	1	04/25/2015 10:49	WG784236

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	ND		20.0	1	04/24/2015 12:47	WG784318

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	04/21/2015 10:59	WG783355

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	ND		0.00500	1	04/23/2015 20:38	WG783145
Beryllium	ND		0.00200	1	04/23/2015 20:38	WG783145
Chromium	ND		0.0100	1	04/23/2015 20:38	WG783145
Cobalt	ND		0.0100	1	04/23/2015 20:38	WG783145
Copper	ND		0.0200	1	04/23/2015 20:38	WG783145
Vanadium	ND		0.0200	1	04/23/2015 20:38	WG783145
Zinc	ND		0.0500	1	04/23/2015 20:38	WG783145

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	04/27/2015 11:12	WG783161
Arsenic	ND		0.00200	1	04/27/2015 11:12	WG783161
Cadmium	ND		0.00100	1	04/27/2015 11:12	WG783161
Lead	ND		0.00200	1	04/27/2015 11:12	WG783161
Nickel	ND		0.00200	1	04/27/2015 11:12	WG783161
Selenium	ND		0.00200	1	04/27/2015 11:12	WG783161
Silver	ND		0.00200	1	04/27/2015 11:12	WG783161
Thallium	ND		0.00200	1	04/27/2015 11:12	WG783161
Vanadium	ND		0.00500	1	04/27/2015 11:12	WG783161

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	ND		2.50	1	04/23/2015 09:12	WG783690

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	ND		10.0	1	04/25/2015 10:49	WG784236

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	ND		20.0	1	04/24/2015 12:47	WG784318

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	04/21/2015 11:01	WG783355

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	ND		0.00500	1	04/23/2015 20:51	WG783145
Beryllium	ND		0.00200	1	04/23/2015 20:51	WG783145
Chromium	ND		0.0100	1	04/23/2015 20:51	WG783145
Cobalt	ND		0.0100	1	04/23/2015 20:51	WG783145
Copper	ND		0.0200	1	04/23/2015 20:51	WG783145
Vanadium	ND		0.0200	1	04/23/2015 20:51	WG783145
Zinc	ND		0.0500	1	04/23/2015 20:51	WG783145

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	04/27/2015 11:14	WG783161
Arsenic	ND		0.00200	1	04/27/2015 11:14	WG783161
Cadmium	ND		0.00100	1	04/27/2015 11:14	WG783161
Lead	ND		0.00200	1	04/27/2015 11:14	WG783161
Nickel	ND		0.00200	1	04/27/2015 11:14	WG783161
Selenium	ND		0.00200	1	04/27/2015 11:14	WG783161
Silver	ND		0.00200	1	04/27/2015 11:14	WG783161
Thallium	ND		0.00200	1	04/27/2015 11:14	WG783161
Vanadium	ND		0.00500	1	04/27/2015 11:14	WG783161

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	ND		2.50	1	04/23/2015 09:12	WG783690

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	ND		10.0	1	04/25/2015 10:49	WG784236

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	270		20.0	1	04/24/2015 12:47	WG784318

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	04/21/2015 11:04	WG783355

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.0277		0.00500	1	04/23/2015 20:58	WG783145
Beryllium	ND		0.00200	1	04/23/2015 20:58	WG783145
Chromium	ND		0.0100	1	04/23/2015 20:58	WG783145
Cobalt	ND		0.0100	1	04/23/2015 20:58	WG783145
Copper	ND		0.0200	1	04/23/2015 20:58	WG783145
Vanadium	ND		0.0200	1	04/23/2015 20:58	WG783145
Zinc	ND		0.0500	1	04/23/2015 20:58	WG783145

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	04/27/2015 11:17	WG783161
Arsenic	ND		0.00200	1	04/27/2015 11:17	WG783161
Cadmium	ND		0.00100	1	04/27/2015 11:17	WG783161
Lead	ND		0.00200	1	04/27/2015 11:17	WG783161
Nickel	0.00313		0.00200	1	04/27/2015 11:17	WG783161
Selenium	ND		0.00200	1	04/27/2015 11:17	WG783161
Silver	ND		0.00200	1	04/27/2015 11:17	WG783161
Thallium	ND		0.00200	1	04/27/2015 11:17	WG783161
Vanadium	ND		0.00500	1	04/27/2015 11:17	WG783161

Method Blank (MB)

(MB) 04/22/15 07:29

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Suspended Solids	ND		2.50

L759615-01 Original Sample (OS) • Duplicate (DUP)

(OS) 04/22/15 07:31 • (DUP) 04/22/15 07:31

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Suspended Solids	72.0	71.0	1	1.40		5

L760020-01 Original Sample (OS) • Duplicate (DUP)

(OS) 04/22/15 07:30 • (DUP) 04/22/15 07:30

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Suspended Solids	50.7	52.3	1	3.24		5

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/22/15 07:29 • (LCSD) 04/22/15 07:29

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Suspended Solids	773	728	740	94.2	95.7	85.0-115			1.63	5

Method Blank (MB)

(MB) 04/23/15 09:01

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Suspended Solids	ND		2.50

L760021-01 Original Sample (OS) • Duplicate (DUP)

(OS) 04/23/15 09:03 • (DUP) 04/23/15 09:04

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Suspended Solids	178	195	1	8.94	J3	5

L760024-01 Original Sample (OS) • Duplicate (DUP)

(OS) 04/23/15 09:04 • (DUP) 04/23/15 09:04

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Suspended Solids	90.8	92.5	1	1.82		5

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/23/15 09:01 • (LCSD) 04/23/15 09:02

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Suspended Solids	773	768	772	99.4	99.9	85.0-115			0.519	5

Method Blank (MB)

(MB) 04/25/15 10:49

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Acidity	ND		10.0

L759988-01 Original Sample (OS) • Duplicate (DUP)

(OS) 04/25/15 10:49 • (DUP) 04/25/15 10:49

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Acidity	ND	ND	1	0.00		20

L760001-11 Original Sample (OS) • Duplicate (DUP)

(OS) 04/25/15 10:49 • (DUP) 04/25/15 10:49

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Acidity	ND	ND	1	0.00		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/25/15 10:49 • (LCSD) 04/25/15 10:49

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Acidity	20.0	22.0	20.0	110	100	85.0-115			9.52	20

Method Blank (MB)

(MB) 04/24/15 12:47

Analyte	MB Result mg/l	MB Qualifier	MB RDL mg/l
Alkalinity	ND		20.0

L759988-03 Original Sample (OS) • Duplicate (DUP)

(OS) 04/24/15 12:47 • (DUP) 04/24/15 12:47

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	280	280	1	0.72		20

L759988-06 Original Sample (OS) • Duplicate (DUP)

(OS) 04/24/15 12:47 • (DUP) 04/24/15 12:47

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	ND	ND	1	0.00		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/24/15 12:47 • (LCSD) 04/24/15 12:47

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Alkalinity	100	109	111	109	111	85.0-115			1.82	20

L759988-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/24/15 12:47 • (MS) 04/24/15 12:47 • (MSD) 04/24/15 12:47

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Alkalinity	100	340	781	792	88.2	90.4	5	80.0-120			1.40	20

Method Blank (MB)

(MB) 04/21/15 10:21

Analyte	MB Result mg/l	MB Qualifier	MB RDL mg/l
Mercury	ND		0.000200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/21/15 10:24 • (LCSD) 04/21/15 10:26

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Mercury	0.00300	0.00310	0.00317	103	106	80-120			2	20

L759988-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/21/15 10:29 • (MS) 04/21/15 10:32 • (MSD) 04/21/15 10:34

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.00300	ND	0.00300	0.00312	100	104	1	75-125			4	20

Method Blank (MB)

(MB) 04/22/15 18:57

Analyte	MB Result mg/l	MB Qualifier	MB RDL mg/l
Mercury,Dissolved	ND		0.000200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/22/15 19:00 • (LCSD) 04/22/15 19:02

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Mercury,Dissolved	0.00300	0.00269	0.00281	90	94	80-120			4	20

L760491-09 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/22/15 19:05 • (MS) 04/22/15 19:08 • (MSD) 04/22/15 19:15

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury,Dissolved	0.00300	ND	0.00107	0.00102	36	34	1	75-125	J6	J6	5	20

Method Blank (MB)

(MB) 04/23/15 19:34

Analyte	MB Result mg/l	MB Qualifier	MB RDL mg/l
Barium	ND		0.00500
Beryllium	ND		0.00200
Chromium	ND		0.0100
Cobalt	ND		0.0100
Copper	ND		0.0200
Vanadium	ND		0.0200
Zinc	ND		0.0500

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/23/15 19:39 • (LCSD) 04/23/15 19:43

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Barium	1.00	1.04	1.04	104	104	80-120			0	20
Beryllium	1.00	1.09	1.09	109	109	80-120			0	20
Chromium	1.00	1.04	1.03	104	103	80-120			1	20
Cobalt	1.00	1.04	1.04	104	104	80-120			0	20
Copper	1.00	0.978	0.976	98	98	80-120			0	20
Vanadium	1.00	1.01	1.02	101	102	80-120			1	20
Zinc	1.00	1.02	1.03	102	103	80-120			1	20

L760435-07 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/23/15 19:57 • (MS) 04/23/15 20:06 • (MSD) 04/23/15 20:11

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Barium	1.00	0.0942	1.13	1.11	104	101	1	75-125			2	20
Beryllium	1.00	0.0000540	1.16	1.13	116	113	1	75-125			3	20
Chromium	1.00	0.000862	1.05	1.03	105	103	1	75-125			2	20
Cobalt	1.00	0.00203	1.11	1.09	111	109	1	75-125			2	20
Copper	1.00	0.000202	0.990	0.971	99	97	1	75-125			2	20
Vanadium	1.00	ND	1.04	1.01	104	101	1	75-125			3	20
Zinc	1.00	0.00248	1.08	1.06	108	106	1	75-125			2	20

Method Blank (MB)

(MB) 04/24/15 19:15

Analyte	MB Result mg/l	MB Qualifier	MB RDL mg/l
Barium,Dissolved	ND		0.00500
Beryllium,Dissolved	ND		0.00200
Chromium,Dissolved	ND		0.0100
Cobalt,Dissolved	ND		0.0100
Copper,Dissolved	ND		0.0200
Vanadium,Dissolved	ND		0.0200
Zinc,Dissolved	ND		0.0500

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/24/15 19:19 • (LCSD) 04/24/15 19:24

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Barium,Dissolved	1.00	1.02	1.00	102	100	80-120			2	20
Beryllium,Dissolved	1.00	0.990	0.980	99	98	80-120			1	20
Chromium,Dissolved	1.00	1.00	0.983	100	98	80-120			2	20
Cobalt,Dissolved	1.00	1.02	1.01	102	101	80-120			1	20
Copper,Dissolved	1.00	0.977	0.970	98	97	80-120			1	20
Vanadium,Dissolved	1.00	0.995	0.969	100	97	80-120			3	20
Zinc,Dissolved	1.00	0.966	0.950	97	95	80-120			2	20

L759988-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/24/15 19:29 • (MS) 04/24/15 19:38 • (MSD) 04/24/15 19:42

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Barium,Dissolved	1.00	0.0305	1.04	1.05	101	102	1	75-125			1	20
Beryllium,Dissolved	1.00	0.000138	0.980	0.995	98	99	1	75-125			1	20
Chromium,Dissolved	1.00	0.00216	0.992	0.998	99	100	1	75-125			1	20
Cobalt,Dissolved	1.00	0.000358	1.03	1.04	103	104	1	75-125			1	20
Copper,Dissolved	1.00	0.000507	0.979	1.00	98	100	1	75-125			3	20
Vanadium,Dissolved	1.00	0.00115	0.986	0.997	98	100	1	75-125			1	20
Zinc,Dissolved	1.00	0.00508	0.958	0.968	95	96	1	75-125			1	20

Method Blank (MB)

(MB) 04/27/15 10:44

Analyte	MB Result mg/l	MB Qualifier	MB RDL mg/l
Antimony	ND		0.00200
Arsenic	ND		0.00200
Cadmium	ND		0.00100
Lead	ND		0.00200
Nickel	ND		0.00200
Selenium	ND		0.00200
Silver	ND		0.00200
Thallium	ND		0.00200
Vanadium	ND		0.00500

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/27/15 10:46 • (LCSD) 04/27/15 10:49

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Antimony	0.0500	0.0562	0.0562	112	112	80-120			0	20
Arsenic	0.0500	0.0525	0.0520	105	104	80-120			1	20
Cadmium	0.0500	0.0529	0.0531	106	106	80-120			0	20
Lead	0.0500	0.0542	0.0533	108	107	80-120			2	20
Nickel	0.0500	0.0536	0.0524	107	105	80-120			2	20
Selenium	0.0500	0.0528	0.0507	106	101	80-120			4	20
Silver	0.0500	0.0557	0.0548	111	110	80-120			2	20
Thallium	0.0500	0.0534	0.0524	107	105	80-120			2	20
Vanadium	0.0500	0.0527	0.0499	105	100	80-120			6	20

L759988-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/27/15 10:51 • (MS) 04/27/15 10:55 • (MSD) 04/27/15 10:58

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Antimony	0.0500	0.000281	0.0562	0.0538	112	107	1	75-125			4	20
Arsenic	0.0500	0.000255	0.0500	0.0496	100	99	1	75-125			1	20
Cadmium	0.0500	0.000163	0.0497	0.0493	99	98	1	75-125			1	20
Lead	0.0500	0.000155	0.0505	0.0508	101	101	1	75-125			1	20
Nickel	0.0500	0.00323	0.0546	0.0518	103	97	1	75-125			5	20
Selenium	0.0500	0.00768	0.0593	0.0602	103	105	1	75-125			2	20
Silver	0.0500	0.000589	0.0542	0.0534	107	106	1	75-125			2	20
Thallium	0.0500	0.0000492	0.0503	0.0510	100	102	1	75-125			1	20

L759988-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/27/15 10:51 • (MS) 04/27/15 10:55 • (MSD) 04/27/15 10:58

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Vanadium	0.0500	0.000672	0.0504	0.0502	99	99	1	75-125			0	20

Method Blank (MB)

(MB) 04/24/15 01:12

Analyte	MB Result mg/l	MB Qualifier	MB RDL mg/l
Antimony,Dissolved	ND		0.00200
Arsenic,Dissolved	ND		0.00200
Cadmium,Dissolved	ND		0.00100
Lead,Dissolved	ND		0.00200
Nickel,Dissolved	ND		0.00200
Selenium,Dissolved	ND		0.00200
Silver,Dissolved	ND		0.00200
Thallium,Dissolved	ND		0.00200
Vanadium,Dissolved	ND		0.00500

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/24/15 05:43 • (LCSD) 04/24/15 05:45

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Antimony,Dissolved	0.0500	0.0617	0.0627	123	125	80-120	J4	J4	2	20
Arsenic,Dissolved	0.0500	0.0579	0.0601	116	120	80-120			4	20
Cadmium,Dissolved	0.0500	0.0584	0.0613	117	123	80-120		J4	5	20
Lead,Dissolved	0.0500	0.0583	0.0585	117	117	80-120			0	20
Nickel,Dissolved	0.0500	0.0534	0.0550	107	110	80-120			3	20
Selenium,Dissolved	0.0500	0.0561	0.0581	112	116	80-120			4	20
Silver,Dissolved	0.0500	0.0599	0.0606	120	121	80-120		J4	1	20
Thallium,Dissolved	0.0500	0.0583	0.0580	117	116	80-120			1	20
Vanadium,Dissolved	0.0500	0.0543	0.0546	109	109	80-120			1	20

L759705-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/24/15 01:19 • (MS) 04/24/15 01:23 • (MSD) 04/24/15 01:25

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Antimony,Dissolved	0.0500	0.000155	0.0628	0.0622	125	124	1	75-125			1	20
Arsenic,Dissolved	0.0500	0.000456	0.0610	0.0591	121	117	1	75-125			3	20
Cadmium,Dissolved	0.0500	0.0000457	0.0595	0.0593	119	119	1	75-125			0	20
Lead,Dissolved	0.0500	0.0000869	0.0575	0.0586	115	117	1	75-125			2	20
Nickel,Dissolved	0.0500	0.00154	0.0541	0.0561	105	109	1	75-125			4	20
Selenium,Dissolved	0.0500	0.0000365	0.0588	0.0573	118	115	1	75-125			3	20
Silver,Dissolved	0.0500	0.0000734	0.0595	0.0603	119	121	1	75-125			1	20
Thallium,Dissolved	0.0500	0.0000809	0.0550	0.0568	110	113	1	75-125			3	20

L759705-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/24/15 01:19 • (MS) 04/24/15 01:23 • (MSD) 04/24/15 01:25

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Vanadium,Dissolved	0.0500	0.000235	0.0533	0.0541	106	108	1	75-125			1	20

Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND,U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.
SDL	Sample Detection Limit.
MQL	Method Quantitation Limit.
Unadj. MQL	Unadjusted Method Quantitation Limit.

Qualifier	Description
J3	The associated batch QC was outside the established quality control range for precision.
J4	The associated batch QC was outside the established quality control range for accuracy.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.**

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Conneticut	PH-0197	North Carolina [1]	DW21704
Florida	E87487	North Carolina [2]	41
Georgia	NELAP	North Dakota	R-140
Georgia [1]	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky [1]	90010	South Dakota	n/a
Kentucky [2]	16	Tennessee [1 4]	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

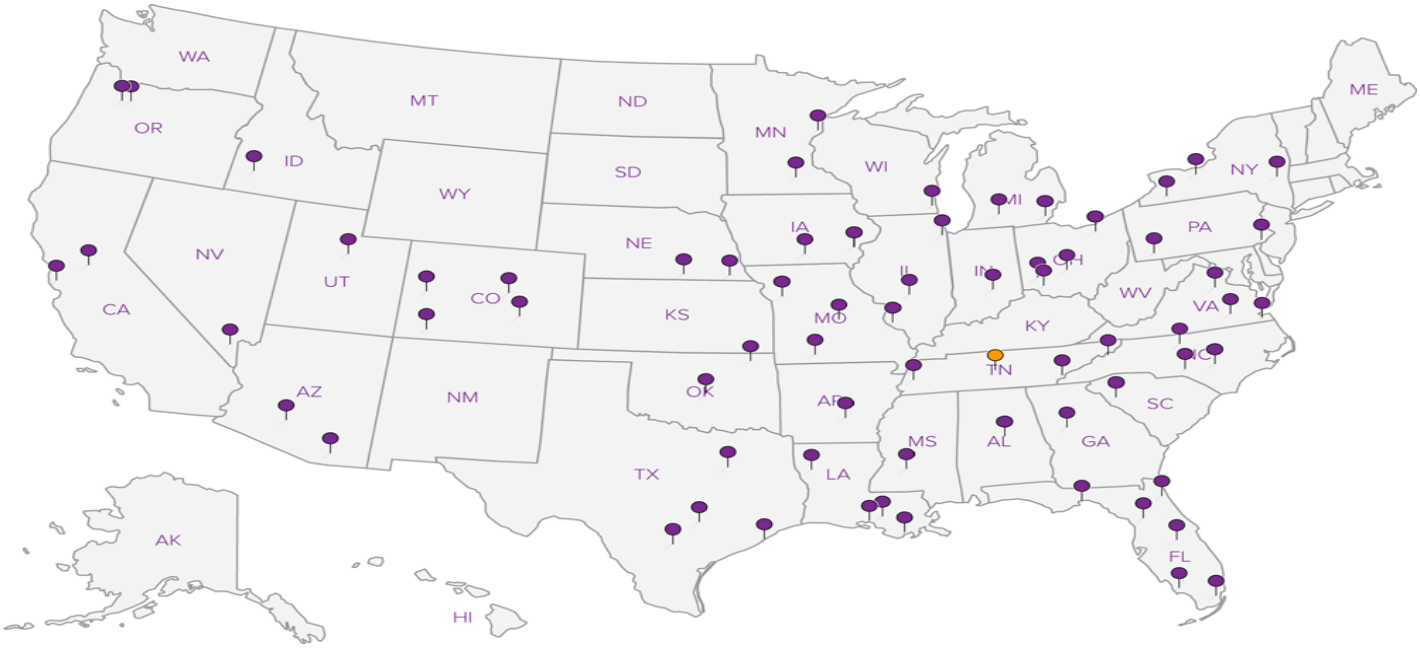
[1.] Drinking Water [2.] Underground Storage Tanks [3.] Aquatic Toxicity [4.] Chemical/Microbiological [5.] Mold [n/a] Accreditation not applicable

Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA	100789
Canada	1461.01	DOD	1461.01
EPA–Crypto	TN00003	USDA	S-67674

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



TVA-Environmental Affairs

400 W. Summit Hill Mailstop TVA WT 9A
Knoxville, TN 37902

Billing Information:
TVA Accounts Payable
1101 Market St. Mailstop: LP-5D-C
Chattanooga, TN 37402

Report to: Matthew Williams

Email To: edmsvk@tva.gov,mdwilliams@tva.gov,mwstarks@

Project Description: Colbert Ground Water wells

City/State Collected: Muscle Shoals AL

Phone: 865-632-6941
Fax:

Client Project # COF GW

Lab Project #

Collected by (print): Ray Duncan RALPH minor

Site/Facility ID # Ash stack 5

P.O. # 727549

Collected by (signature): Ray Duncan

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed: Standard

Email? ___No X_Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	METALS 500mlHDPE-HNO3 (2)	TSS 1L-HDPE NoPres	Alkalinity & Acidity	Rem./Contaminant	Sample # (lab only)
COF-A -0415	Grab	GW	18.0	4-15-15	1732	3	X	X	X		-01
COF-B -0415	Grab	GW	30.0	4-16-15	0907	3	X	X	X		02
COF-D -0415	Grab	GW	31.4	4-15-15	1054	3	X	X	X		03
COF-CO20B-0415	Grab	GW	17.3	4-16-15	1040	3	X	X	X		04
COF-EQ Blank-0415	Grab		NA	4-16-15	1118	3	X	X	X		05
COF-Field Blank-0415	Grab		NA	4-16-15	1123	3	X	X	X		06
COF-B Dup-0415	Grab	GW	30.0	4-16-15	0909	3	X	X	X		07

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other _____

Remarks: 6272 8622 5735 6272 8622 5746 6272 8622 5713 6272 8622 5724 6272 8622 5698 6272 8622 5702

pH _____ Temp _____
Flow _____ Other _____

Chain of Custody Page ___ of ___

ESC LABSCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L # L759988

E113

Acctnum: TVAENVAFF
Template: T101230
Prelogin: P503727
TSR: 633 - Pam Langford
PB: 3.20 MS
Shipped Via: FedEX Ground

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Ray Duncan	4-16-15	1600	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____
Temp: 2.7 °C Bottles Received: 21
Date: 4/17/15 Time: 0900

Hold #

Condition: (lab use only) OK TOC

COC Seal Intact: ✓ Y ___N ___NA

pH Checked: <2 NCF:

Andy Vann

From: Pam Langford
Sent: Monday, April 20, 2015 10:57 AM
To: Andy Vann; Login
Subject: L759988-04

Please cancel Antimony, Arsenic, Chromium, Copper, Lead, Vanadium, Zinc and TSS for L759988-04. (This sample is shared with the site wide monitoring event and is also logged as L760001-06. Client did not want to duplicate any analysis).

Thanks!

Pamela A. Langford
Lab Documentation Chemist
ESC Lab Sciences
12065 Lebanon Road
Mt. Juliet, TN 37122
Direct: 615-773-9687
plangford@esclabsciences.com

Troy Dunlap

ESC Lab Sciences
Non-Conformance Form

Login #:L759988	Client: TVAENVAFF	Date:04/17/15	Evaluated by:Shawn M

Non-Conformance (check applicable items)

	Sample Integrity		Chain of Custody Clarification		
	Parameter(s) past holding time	x	Login Clarification Needed		**If Broken Container:**
	Improper temperature		Chain of custody is incomplete		Insufficient packing material around container
	Improper container type		Please specify Metals requested.		Insufficient packing material inside cooler
	Improper preservation		Please specify TCLP requested.		Improper handling by carrier (FedEx / UPS / Courie
	Insufficient sample volume.		Received additional samples not listed on coc.		Sample was frozen
	Sample is biphasic.		Sample ids on containers do not match ids on coc		Container lid not intact
	Vials received with headspace.		Trip Blank not received.		**If no Chain of Custody:**
	Broken container		Client did not "X" analysis.		Received by:
	Broken container:		Chain of Custody is missing		Date/Time:
	Sufficient sample remains				Temp./Cont. Rec./pH:
					Carrier:
					Tracking#

Login Comments:Received a container for dissolved metals for COF-D-0415 31.4FT. Chain does not request diss. metals.

Client informed by:		Call		Email		Voice Mail		Date:	Time:
TSR Initials:	Client Contact:								

Login Instructions:

Please analyze sample COF-D-0415 31.4 Ft for dissolved metals (same parameters at total metals list of analytes) per Matt Williams

ANALYTICAL REPORT

June 09, 2015

TVA-Environmental Affairs

Sample Delivery Group:	L760001
Samples Received:	04/17/2015
Project Number:	COF-CA16
Description:	Colbert Groundwater Wells
Site:	SITE WIDE
Report To:	Matthew Williams 400 W. Summit Hill Mailstop TVA WT 9A Knoxville, TN 37902

Entire Report Reviewed By:

Pam Langford

Pam Langford
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



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COF-MC5C-0415 L760001-01 GW

Collected by: Duncan-Minor
Collected date/time: 04/15/15 08:44
Received date/time: 04/17/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 D-2011	WG783245	1	04/20/15 13:25	04/22/15 07:27	MF
Metals (ICP) by Method 6010B	WG783448	1	04/21/15 11:38	04/22/15 00:01	ST
Metals (ICPMS) by Method 6020	WG783161	1	04/25/15 05:57	04/27/15 11:19	AB
Wet Chemistry by Method 2310 B-2011	WG784236	1	04/25/15 10:49	04/25/15 10:49	DR
Wet Chemistry by Method 2320 B-2011	WG784940	1	04/28/15 16:00	04/28/15 16:00	RBS
Wet Chemistry by Method 350.1	WG784272	1	04/27/15 13:24	04/27/15 13:24	MCG
Wet Chemistry by Method 353.2	WG784279	1	04/27/15 01:06	04/27/15 01:06	MCG
Wet Chemistry by Method 365.4	WG784573	1	04/25/15 01:25	04/27/15 16:35	ASK
Wet Chemistry by Method 9056MOD	WG785209	1	04/28/15 18:32	04/28/15 18:32	NJM

COF-CA16-0415 L760001-02 GW

Collected by: Duncan-Minor
Collected date/time: 04/14/15 13:05
Received date/time: 04/17/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 D-2011	WG783202	1	04/19/15 22:08	04/21/15 10:07	JM
Metals (ICP) by Method 6010B	WG783448	1	04/21/15 11:38	04/22/15 00:05	ST
Metals (ICPMS) by Method 6020	WG783161	1	04/25/15 05:57	04/27/15 11:21	AB
Wet Chemistry by Method 2310 B-2011	WG784236	1	04/25/15 10:49	04/25/15 10:49	DR
Wet Chemistry by Method 2320 B-2011	WG784940	1	04/28/15 16:00	04/28/15 16:00	RBS
Wet Chemistry by Method 350.1	WG784272	1	04/27/15 13:26	04/27/15 13:26	MCG
Wet Chemistry by Method 353.2	WG784279	1	04/27/15 01:07	04/27/15 01:07	MCG
Wet Chemistry by Method 365.4	WG784573	1	04/25/15 01:25	04/27/15 16:36	ASK
Wet Chemistry by Method 9056MOD	WG785209	1	04/28/15 19:03	04/28/15 19:03	NJM

COF-CA17A-0415 L760001-03 GW

Collected by: Duncan-Minor
Collected date/time: 04/14/15 11:00
Received date/time: 04/17/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 D-2011	WG783202	1	04/19/15 22:08	04/21/15 10:07	JM
Metals (ICP) by Method 6010B	WG783448	1	04/21/15 11:38	04/22/15 00:09	ST
Metals (ICPMS) by Method 6020	WG783161	1	04/25/15 05:57	04/27/15 11:23	AB
Wet Chemistry by Method 2310 B-2011	WG784236	1	04/25/15 10:49	04/25/15 10:49	DR
Wet Chemistry by Method 2320 B-2011	WG784940	1	04/28/15 16:00	04/28/15 16:00	RBS
Wet Chemistry by Method 350.1	WG784272	1	04/27/15 13:29	04/27/15 13:29	MCG
Wet Chemistry by Method 353.2	WG784279	1	04/27/15 01:08	04/27/15 01:08	MCG
Wet Chemistry by Method 365.4	WG784573	1	04/25/15 01:25	04/27/15 16:39	ASK
Wet Chemistry by Method 9056MOD	WG785209	1	04/28/15 19:49	04/28/15 19:49	NJM

COF-CA17B-0415 L760001-04 GW

Collected by: Duncan-Minor
Collected date/time: 04/13/15 09:57
Received date/time: 04/17/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 D-2011	WG783202	1	04/19/15 22:08	04/21/15 10:08	JM
Metals (ICP) by Method 6010B	WG783041	1	04/19/15 09:33	04/20/15 12:51	LTB
Metals (ICP) by Method 6010B	WG783448	1	04/21/15 11:38	04/22/15 00:14	ST
Metals (ICPMS) by Method 6020	WG783161	1	04/25/15 05:57	04/27/15 11:26	AB
Metals (ICPMS) by Method 6020	WG783963	1	04/23/15 07:25	04/24/15 01:32	AB
Wet Chemistry by Method 2310 B-2011	WG784236	1	04/25/15 10:49	04/25/15 10:49	DR
Wet Chemistry by Method 2320 B-2011	WG784940	1	04/28/15 16:00	04/28/15 16:00	RBS
Wet Chemistry by Method 350.1	WG784272	1	04/27/15 13:31	04/27/15 13:31	MCG
Wet Chemistry by Method 353.2	WG784279	1	04/27/15 01:09	04/27/15 01:09	MCG
Wet Chemistry by Method 365.4	WG784573	1	04/25/15 01:25	04/27/15 16:44	ASK
Wet Chemistry by Method 9056MOD	WG785637	10	04/30/15 03:32	04/30/15 03:32	NJM

COF-CA19B-0415 L760001-05 GW

Collected by: Duncan-Minor
Collected date/time: 04/15/15 14:44
Received date/time: 04/17/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 D-2011	WG783245	1	04/20/15 13:25	04/22/15 07:27	MF
Metals (ICP) by Method 6010B	WG783041	1	04/19/15 09:33	04/20/15 12:56	LTB
Metals (ICP) by Method 6010B	WG783448	1	04/21/15 11:38	04/22/15 00:18	ST
Metals (ICPMS) by Method 6020	WG783161	1	04/25/15 05:57	04/27/15 11:28	AB
Metals (ICPMS) by Method 6020	WG783963	1	04/23/15 07:25	04/24/15 01:39	AB
Wet Chemistry by Method 2310 B-2011	WG784236	1	04/25/15 10:49	04/25/15 10:49	DR
Wet Chemistry by Method 2320 B-2011	WG784940	1	04/28/15 16:00	04/28/15 16:00	RBS
Wet Chemistry by Method 350.1	WG784272	1	04/27/15 13:41	04/27/15 13:41	MCG
Wet Chemistry by Method 353.2	WG784279	1	04/27/15 01:11	04/27/15 01:11	MCG
Wet Chemistry by Method 365.4	WG784573	1	04/25/15 01:25	04/27/15 16:45	ASK
Wet Chemistry by Method 9056MOD	WG785637	10	04/30/15 03:47	04/30/15 03:47	NJM

COF-CA20B-0415 L760001-06 GW

Collected by: Duncan-Minor
Collected date/time: 04/16/15 10:40
Received date/time: 04/17/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 D-2011	WG783690	1	04/22/15 12:39	04/23/15 09:05	JG
Metals (ICP) by Method 6010B	WG783448	1	04/21/15 11:38	04/21/15 20:09	ST
Metals (ICPMS) by Method 6020	WG783161	1	04/25/15 05:57	04/27/15 11:30	AB
Wet Chemistry by Method 2310 B-2011	WG784236	1	04/25/15 10:49	04/25/15 10:49	DR
Wet Chemistry by Method 2320 B-2011	WG784940	1	04/28/15 16:00	04/28/15 16:00	RBS
Wet Chemistry by Method 350.1	WG784272	1	04/27/15 13:46	04/27/15 13:46	MCG
Wet Chemistry by Method 353.2	WG784279	1	04/27/15 01:15	04/27/15 01:15	MCG
Wet Chemistry by Method 365.4	WG784573	1	04/25/15 01:25	04/27/15 16:46	ASK
Wet Chemistry by Method 9056MOD	WG785209	1	04/28/15 20:36	04/28/15 20:36	NJM

COF-CA21B-0415 L760001-07 GW

Collected by: Duncan-Minor
Collected date/time: 04/16/15 07:38
Received date/time: 04/17/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 D-2011	WG783690	1	04/22/15 12:39	04/23/15 09:09	JG
Metals (ICP) by Method 6010B	WG783041	1	04/19/15 09:33	04/20/15 13:00	LTB
Metals (ICP) by Method 6010B	WG783448	1	04/21/15 11:38	04/22/15 00:22	ST
Metals (ICPMS) by Method 6020	WG783161	1	04/25/15 05:57	04/27/15 11:32	AB
Metals (ICPMS) by Method 6020	WG783963	1	04/23/15 07:25	04/24/15 01:41	AB
Wet Chemistry by Method 2310 B-2011	WG784236	1	04/25/15 10:49	04/25/15 10:49	DR
Wet Chemistry by Method 2320 B-2011	WG784940	1	04/28/15 16:00	04/28/15 16:00	RBS
Wet Chemistry by Method 350.1	WG785015	1	04/29/15 15:52	04/29/15 15:52	JAL
Wet Chemistry by Method 353.2	WG784279	1	04/27/15 01:18	04/27/15 01:18	MCG
Wet Chemistry by Method 365.4	WG784573	1	04/25/15 01:25	04/27/15 16:48	ASK
Wet Chemistry by Method 9056MOD	WG785209	1	04/28/15 20:51	04/28/15 20:51	NJM

COF-CA22B-0415 L760001-08 GW

Collected by: Duncan-Minor
Collected date/time: 04/13/15 15:46
Received date/time: 04/17/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 D-2011	WG783202	1	04/19/15 22:08	04/21/15 10:08	JM
Metals (ICP) by Method 6010B	WG783448	1	04/21/15 11:38	04/22/15 00:27	ST
Metals (ICPMS) by Method 6020	WG783161	1	04/25/15 05:57	04/27/15 11:47	AB
Wet Chemistry by Method 2310 B-2011	WG784236	1	04/25/15 10:49	04/25/15 10:49	DR
Wet Chemistry by Method 2320 B-2011	WG784940	1	04/28/15 16:00	04/28/15 16:00	RBS
Wet Chemistry by Method 350.1	WG785015	1	04/29/15 15:55	04/29/15 15:55	JAL
Wet Chemistry by Method 353.2	WG784279	1	04/27/15 01:19	04/27/15 01:19	MCG
Wet Chemistry by Method 365.4	WG784573	1	04/25/15 01:25	04/27/15 16:49	ASK

COF-CA22B-0415 L760001-08 GW

Collected by: Duncan-Minor | Collected date/time: 04/13/15 15:46 | Received date/time: 04/17/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Wet Chemistry by Method 9056MOD	WG785209	1	04/28/15 21:06	04/28/15 21:06	NJM

COF-CA27BR-0415 L760001-09 GW

Collected by: Duncan-Minor | Collected date/time: 04/14/15 13:45 | Received date/time: 04/17/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 D-2011	WG783202	1	04/19/15 22:08	04/21/15 10:07	JM
Metals (ICP) by Method 6010B	WG783448	1	04/21/15 11:38	04/22/15 00:31	ST
Metals (ICPMS) by Method 6020	WG783161	1	04/25/15 05:57	04/27/15 11:54	AB
Wet Chemistry by Method 2310 B-2011	WG784236	1	04/25/15 10:49	04/25/15 10:49	DR
Wet Chemistry by Method 2320 B-2011	WG784940	1	04/28/15 16:00	04/28/15 16:00	RBS
Wet Chemistry by Method 350.1	WG785015	1	04/29/15 15:57	04/29/15 15:57	JAL
Wet Chemistry by Method 353.2	WG784279	1	04/27/15 01:20	04/27/15 01:20	MCG
Wet Chemistry by Method 365.4	WG784574	1	04/25/15 01:13	04/27/15 14:00	ASK
Wet Chemistry by Method 9056MOD	WG785209	1	04/28/15 21:22	04/28/15 21:22	NJM

COF-CA28B-0415 L760001-10 GW

Collected by: Duncan-Minor | Collected date/time: 04/15/15 12:44 | Received date/time: 04/17/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 D-2011	WG783245	1	04/20/15 13:25	04/22/15 07:31	MF
Metals (ICP) by Method 6010B	WG783041	1	04/19/15 09:33	04/20/15 13:05	LTB
Metals (ICP) by Method 6010B	WG783448	1	04/21/15 11:38	04/22/15 00:36	ST
Metals (ICPMS) by Method 6020	WG783161	1	04/25/15 05:57	04/27/15 11:57	AB
Metals (ICPMS) by Method 6020	WG783963	1	04/23/15 07:25	04/24/15 01:43	AB
Wet Chemistry by Method 2310 B-2011	WG784236	1	04/25/15 10:49	04/25/15 10:49	DR
Wet Chemistry by Method 2320 B-2011	WG784940	1	04/28/15 16:00	04/28/15 16:00	RBS
Wet Chemistry by Method 350.1	WG785015	1	04/29/15 16:00	04/29/15 16:00	JAL
Wet Chemistry by Method 353.2	WG784279	1	04/27/15 01:21	04/27/15 01:21	MCG
Wet Chemistry by Method 365.4	WG784574	1	04/25/15 01:13	04/27/15 14:01	ASK
Wet Chemistry by Method 9056MOD	WG784439	1	04/25/15 02:24	04/25/15 02:24	NJM

COF-CA12A-0415 L760001-11 GW

Collected by: Duncan-Minor | Collected date/time: 04/14/15 11:34 | Received date/time: 04/17/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 D-2011	WG783202	1	04/19/15 22:08	04/21/15 10:08	JM
Metals (ICP) by Method 6010B	WG783448	1	04/21/15 11:38	04/22/15 00:49	ST
Metals (ICPMS) by Method 6020	WG783161	1	04/25/15 05:57	04/27/15 11:59	AB
Wet Chemistry by Method 2310 B-2011	WG784236	1	04/25/15 10:49	04/25/15 10:49	DR
Wet Chemistry by Method 2320 B-2011	WG784940	1	04/28/15 16:00	04/28/15 16:00	RBS
Wet Chemistry by Method 350.1	WG785015	1	04/29/15 16:02	04/29/15 16:02	JAL
Wet Chemistry by Method 353.2	WG784279	1	04/27/15 01:23	04/27/15 01:23	MCG
Wet Chemistry by Method 365.4	WG784574	1	04/25/15 01:13	04/27/15 14:02	ASK
Wet Chemistry by Method 9056MOD	WG785209	1	04/28/15 14:03	04/28/15 14:03	NJM

All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Pamela A. Langford

Pam Langford

Pam Langford
Technical Service Representative

Sample Handling and Receiving

Sample quantity was not sufficient to complete analysis per recommended method guidelines for the following samples.

ESC Sample ID	Project Sample ID	Method
L760001-06	COF-CA20B-0415	2540 D-2011

The following samples were prepared and/or analyzed past recommended holding time. Concentrations should be considered minimum values.

ESC Sample ID	Project Sample ID	Method
L760001-08	COF-CA22B-0415	2320 B-2011

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	ND		2.50	1	04/22/2015 07:27	WG783245

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	ND		10.0	1	04/25/2015 10:49	WG784236

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	99.0		20.0	1	04/28/2015 16:00	WG784940

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	ND		0.250	1	04/27/2015 13:24	WG784272

Wet Chemistry by Method 353.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Nitrate-Nitrite	ND		0.100	1	04/27/2015 01:06	WG784279

Wet Chemistry by Method 365.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Phosphorus,Total	ND		0.100	1	04/27/2015 16:35	WG784573

Wet Chemistry by Method 9056MOD

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Sulfate	76.5		5.00	1	04/28/2015 18:32	WG785209

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	ND		0.100	1	04/22/2015 00:01	WG783448
Boron	1.65		0.200	1	04/22/2015 00:01	WG783448
Chromium	ND		0.0100	1	04/22/2015 00:01	WG783448
Copper	ND		0.0200	1	04/22/2015 00:01	WG783448
Iron	0.111		0.100	1	04/22/2015 00:01	WG783448
Lithium	0.0270		0.0150	1	04/22/2015 00:01	WG783448
Manganese	0.0433		0.0100	1	04/22/2015 00:01	WG783448
Molybdenum	0.0616		0.00500	1	04/22/2015 00:01	WG783448
Strontium	1.12		0.0100	1	04/22/2015 00:01	WG783448
Zinc	ND		0.0500	1	04/22/2015 00:01	WG783448

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	0.00264		0.00200	1	04/27/2015 11:19	WG783161
Arsenic	ND		0.00200	1	04/27/2015 11:19	WG783161
Lead	ND		0.00200	1	04/27/2015 11:19	WG783161

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Vanadium	ND		0.00200	1	04/27/2015 11:19	WG783161



Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	ND		2.50	1	04/21/2015 10:07	WG783202

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	ND		10.0	1	04/25/2015 10:49	WG784236

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	270		20.0	1	04/28/2015 16:00	WG784940

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	ND		0.250	1	04/27/2015 13:26	WG784272

Wet Chemistry by Method 353.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Nitrate-Nitrite	1.92		0.100	1	04/27/2015 01:07	WG784279

Wet Chemistry by Method 365.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Phosphorus,Total	ND		0.100	1	04/27/2015 16:36	WG784573

Wet Chemistry by Method 9056MOD

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Sulfate	11.3		5.00	1	04/28/2015 19:03	WG785209

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	ND		0.100	1	04/22/2015 00:05	WG783448
Boron	ND		0.200	1	04/22/2015 00:05	WG783448
Chromium	ND		0.0100	1	04/22/2015 00:05	WG783448
Copper	ND		0.0200	1	04/22/2015 00:05	WG783448
Iron	ND		0.100	1	04/22/2015 00:05	WG783448
Lithium	ND		0.0150	1	04/22/2015 00:05	WG783448
Manganese	ND		0.0100	1	04/22/2015 00:05	WG783448
Molybdenum	ND		0.00500	1	04/22/2015 00:05	WG783448
Strontium	0.0886		0.0100	1	04/22/2015 00:05	WG783448
Zinc	ND		0.0500	1	04/22/2015 00:05	WG783448

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	04/27/2015 11:21	WG783161
Arsenic	ND		0.00200	1	04/27/2015 11:21	WG783161
Lead	ND		0.00200	1	04/27/2015 11:21	WG783161

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Vanadium	ND		0.00200	1	04/27/2015 11:21	WG783161



Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	ND		2.50	1	04/21/2015 10:07	WG783202

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	ND		10.0	1	04/25/2015 10:49	WG784236

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	38.0		20.0	1	04/28/2015 16:00	WG784940

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	ND		0.250	1	04/27/2015 13:29	WG784272

Wet Chemistry by Method 353.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Nitrate-Nitrite	ND		0.100	1	04/27/2015 01:08	WG784279

Wet Chemistry by Method 365.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Phosphorus,Total	ND		0.100	1	04/27/2015 16:39	WG784573

Wet Chemistry by Method 9056MOD

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Sulfate	8.94		5.00	1	04/28/2015 19:49	WG785209

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	ND		0.100	1	04/22/2015 00:09	WG783448
Boron	ND		0.200	1	04/22/2015 00:09	WG783448
Chromium	ND		0.0100	1	04/22/2015 00:09	WG783448
Copper	ND		0.0200	1	04/22/2015 00:09	WG783448
Iron	ND		0.100	1	04/22/2015 00:09	WG783448
Lithium	ND		0.0150	1	04/22/2015 00:09	WG783448
Manganese	ND		0.0100	1	04/22/2015 00:09	WG783448
Molybdenum	ND		0.00500	1	04/22/2015 00:09	WG783448
Strontium	0.0366		0.0100	1	04/22/2015 00:09	WG783448
Zinc	ND		0.0500	1	04/22/2015 00:09	WG783448

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	04/27/2015 11:23	WG783161
Arsenic	ND		0.00200	1	04/27/2015 11:23	WG783161
Lead	ND		0.00200	1	04/27/2015 11:23	WG783161

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Vanadium	ND		0.00200	1	04/27/2015 11:23	WG783161

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	32.0		2.50	1	04/21/2015 10:08	WG783202

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	ND		10.0	1	04/25/2015 10:49	WG784236

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	290		20.0	1	04/28/2015 16:00	WG784940

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	ND		0.250	1	04/27/2015 13:31	WG784272

Wet Chemistry by Method 353.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Nitrate-Nitrite	ND		0.100	1	04/27/2015 01:09	WG784279

Wet Chemistry by Method 365.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Phosphorus,Total	ND		0.100	1	04/27/2015 16:44	WG784573

Wet Chemistry by Method 9056MOD

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Sulfate	239		50.0	10	04/30/2015 03:32	WG785637

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	ND		0.100	1	04/22/2015 00:14	WG783448
Aluminum,Dissolved	ND		0.100	1	04/20/2015 12:51	WG783041
Boron	ND		0.200	1	04/22/2015 00:14	WG783448
Boron,Dissolved	ND		0.200	1	04/20/2015 12:51	WG783041
Chromium	ND		0.0100	1	04/22/2015 00:14	WG783448
Chromium,Dissolved	ND		0.0100	1	04/20/2015 12:51	WG783041
Copper	ND		0.0200	1	04/22/2015 00:14	WG783448
Copper,Dissolved	ND		0.0200	1	04/20/2015 12:51	WG783041
Iron	15.6		0.100	1	04/22/2015 00:14	WG783448
Iron,Dissolved	0.602		0.100	1	04/20/2015 12:51	WG783041
Lithium	ND		0.0150	1	04/22/2015 00:14	WG783448
Lithium,Dissolved	ND		0.0150	1	04/20/2015 12:51	WG783041
Manganese	0.891		0.0100	1	04/22/2015 00:14	WG783448
Manganese,Dissolved	0.406		0.0100	1	04/20/2015 12:51	WG783041
Molybdenum	ND		0.00500	1	04/22/2015 00:14	WG783448
Molybdenum,Dissolved	ND		0.00500	1	04/20/2015 12:51	WG783041
Strontium	0.202		0.0100	1	04/22/2015 00:14	WG783448
Strontium,Dissolved	0.201		0.0100	1	04/20/2015 12:51	WG783041

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Zinc	0.0689		0.0500	1	04/22/2015 00:14	WG783448
Zinc,Dissolved	ND		0.0500	1	04/20/2015 12:51	WG783041

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	04/27/2015 11:26	WG783161
Antimony,Dissolved	ND	J4	0.00200	1	04/24/2015 01:32	WG783963
Arsenic	0.00631		0.00200	1	04/27/2015 11:26	WG783161
Arsenic,Dissolved	ND		0.00200	1	04/24/2015 01:32	WG783963
Lead	0.00746		0.00200	1	04/27/2015 11:26	WG783161
Lead,Dissolved	ND		0.00200	1	04/24/2015 01:32	WG783963
Vanadium	ND		0.00200	1	04/27/2015 11:26	WG783161
Vanadium,Dissolved	ND		0.00200	1	04/24/2015 01:32	WG783963

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	4.00		2.50	1	04/22/2015 07:27	WG783245

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	ND		10.0	1	04/25/2015 10:49	WG784236

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	360		20.0	1	04/28/2015 16:00	WG784940

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	ND		0.250	1	04/27/2015 13:41	WG784272

Wet Chemistry by Method 353.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Nitrate-Nitrite	1.50		0.100	1	04/27/2015 01:11	WG784279

Wet Chemistry by Method 365.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Phosphorus,Total	ND		0.100	1	04/27/2015 16:45	WG784573

Wet Chemistry by Method 9056MOD

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Sulfate	184		50.0	10	04/30/2015 03:47	WG785637

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	ND		0.100	1	04/22/2015 00:18	WG783448
Aluminum,Dissolved	0.133		0.100	1	04/20/2015 12:56	WG783041
Boron	0.346		0.200	1	04/22/2015 00:18	WG783448
Boron,Dissolved	0.327		0.200	1	04/20/2015 12:56	WG783041
Chromium	ND		0.0100	1	04/22/2015 00:18	WG783448
Chromium,Dissolved	ND		0.0100	1	04/20/2015 12:56	WG783041
Copper	ND		0.0200	1	04/22/2015 00:18	WG783448
Copper,Dissolved	ND		0.0200	1	04/20/2015 12:56	WG783041
Iron	ND		0.100	1	04/22/2015 00:18	WG783448
Iron,Dissolved	ND		0.100	1	04/20/2015 12:56	WG783041
Lithium	ND		0.0150	1	04/22/2015 00:18	WG783448
Lithium,Dissolved	ND		0.0150	1	04/20/2015 12:56	WG783041
Manganese	0.0651		0.0100	1	04/22/2015 00:18	WG783448
Manganese,Dissolved	0.0404		0.0100	1	04/20/2015 12:56	WG783041
Molybdenum	ND		0.00500	1	04/22/2015 00:18	WG783448
Molybdenum,Dissolved	ND		0.00500	1	04/20/2015 12:56	WG783041
Strontium	0.309		0.0100	1	04/22/2015 00:18	WG783448
Strontium,Dissolved	0.306		0.0100	1	04/20/2015 12:56	WG783041

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Zinc	ND		0.0500	1	04/22/2015 00:18	WG783448
Zinc,Dissolved	ND		0.0500	1	04/20/2015 12:56	WG783041

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	04/27/2015 11:28	WG783161
Antimony,Dissolved	ND	J4	0.00200	1	04/24/2015 01:39	WG783963
Arsenic	ND		0.00200	1	04/27/2015 11:28	WG783161
Arsenic,Dissolved	ND		0.00200	1	04/24/2015 01:39	WG783963
Lead	ND		0.00200	1	04/27/2015 11:28	WG783161
Lead,Dissolved	ND		0.00200	1	04/24/2015 01:39	WG783963
Vanadium	ND		0.00200	1	04/27/2015 11:28	WG783161
Vanadium,Dissolved	ND		0.00200	1	04/24/2015 01:39	WG783963

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	ND		2.50	1	04/23/2015 09:05	WG783690

Sample Narrative:

2540 D-2011 L760001-06 WG783690: Used all available sample.

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	ND		10.0	1	04/25/2015 10:49	WG784236

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	330		20.0	1	04/28/2015 16:00	WG784940

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	ND		0.250	1	04/27/2015 13:46	WG784272

Wet Chemistry by Method 353.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Nitrate-Nitrite	2.80		0.100	1	04/27/2015 01:15	WG784279

Wet Chemistry by Method 365.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Phosphorus,Total	ND		0.100	1	04/27/2015 16:46	WG784573

Wet Chemistry by Method 9056MOD

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Sulfate	14.1		5.00	1	04/28/2015 20:36	WG785209

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	ND		0.100	1	04/21/2015 20:09	WG783448
Boron	ND		0.200	1	04/21/2015 20:09	WG783448
Chromium	ND		0.0100	1	04/21/2015 20:09	WG783448
Copper	ND		0.0200	1	04/21/2015 20:09	WG783448
Iron	ND		0.100	1	04/21/2015 20:09	WG783448
Lithium	ND		0.0150	1	04/21/2015 20:09	WG783448
Manganese	ND		0.0100	1	04/21/2015 20:09	WG783448
Molybdenum	ND		0.00500	1	04/21/2015 20:09	WG783448
Strontium	0.162		0.0100	1	04/21/2015 20:09	WG783448
Zinc	ND		0.0500	1	04/21/2015 20:09	WG783448

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Antimony	ND		0.00200	1	04/27/2015 11:30	WG783161
Arsenic	ND		0.00200	1	04/27/2015 11:30	WG783161
Lead	ND		0.00200	1	04/27/2015 11:30	WG783161
Vanadium	ND		0.00200	1	04/27/2015 11:30	WG783161

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	217		2.50	1	04/23/2015 09:09	WG783690

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	ND		10.0	1	04/25/2015 10:49	WG784236

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	340		20.0	1	04/28/2015 16:00	WG784940

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	ND		0.250	1	04/29/2015 15:52	WG785015

Wet Chemistry by Method 353.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Nitrate-Nitrite	1.85		0.100	1	04/27/2015 01:18	WG784279

Wet Chemistry by Method 365.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Phosphorus,Total	0.386		0.100	1	04/27/2015 16:48	WG784573

Wet Chemistry by Method 9056MOD

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Sulfate	39.3		5.00	1	04/28/2015 20:51	WG785209

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	1.60		0.100	1	04/22/2015 00:22	WG783448
Aluminum,Dissolved	ND		0.100	1	04/20/2015 13:00	WG783041
Boron	1.48		0.200	1	04/22/2015 00:22	WG783448
Boron,Dissolved	1.27		0.200	1	04/20/2015 13:00	WG783041
Chromium	ND		0.0100	1	04/22/2015 00:22	WG783448
Chromium,Dissolved	ND		0.0100	1	04/20/2015 13:00	WG783041
Copper	ND		0.0200	1	04/22/2015 00:22	WG783448
Copper,Dissolved	ND		0.0200	1	04/20/2015 13:00	WG783041
Iron	1.06		0.100	1	04/22/2015 00:22	WG783448
Iron,Dissolved	ND		0.100	1	04/20/2015 13:00	WG783041
Lithium	0.0329		0.0150	1	04/22/2015 00:22	WG783448
Lithium,Dissolved	0.0252		0.0150	1	04/20/2015 13:00	WG783041
Manganese	0.242		0.0100	1	04/22/2015 00:22	WG783448
Manganese,Dissolved	ND		0.0100	1	04/20/2015 13:00	WG783041
Molybdenum	0.00955		0.00500	1	04/22/2015 00:22	WG783448
Molybdenum,Dissolved	0.0158		0.00500	1	04/20/2015 13:00	WG783041
Strontium	0.221		0.0100	1	04/22/2015 00:22	WG783448
Strontium,Dissolved	0.193		0.0100	1	04/20/2015 13:00	WG783041

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Zinc	0.148		0.0500	1	04/22/2015 00:22	WG783448
Zinc,Dissolved	ND		0.0500	1	04/20/2015 13:00	WG783041

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	04/27/2015 11:32	WG783161
Antimony,Dissolved	ND	J4	0.00200	1	04/24/2015 01:41	WG783963
Arsenic	ND		0.00200	1	04/27/2015 11:32	WG783161
Arsenic,Dissolved	ND		0.00200	1	04/24/2015 01:41	WG783963
Lead	0.00404		0.00200	1	04/27/2015 11:32	WG783161
Lead,Dissolved	ND		0.00200	1	04/24/2015 01:41	WG783963
Vanadium	0.00696		0.00200	1	04/27/2015 11:32	WG783161
Vanadium,Dissolved	ND		0.00200	1	04/24/2015 01:41	WG783963

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	ND		2.50	1	04/21/2015 10:08	WG783202

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	ND		10.0	1	04/25/2015 10:49	WG784236

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	330	J6	20.0	1	04/28/2015 16:00	WG784940

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	ND		0.250	1	04/29/2015 15:55	WG785015

Wet Chemistry by Method 353.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Nitrate-Nitrite	ND		0.100	1	04/27/2015 01:19	WG784279

Wet Chemistry by Method 365.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Phosphorus,Total	ND		0.100	1	04/27/2015 16:49	WG784573

Wet Chemistry by Method 9056MOD

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Sulfate	93.0		5.00	1	04/28/2015 21:06	WG785209

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	ND		0.100	1	04/22/2015 00:27	WG783448
Boron	ND		0.200	1	04/22/2015 00:27	WG783448
Chromium	ND		0.0100	1	04/22/2015 00:27	WG783448
Copper	ND		0.0200	1	04/22/2015 00:27	WG783448
Iron	ND		0.100	1	04/22/2015 00:27	WG783448
Lithium	ND		0.0150	1	04/22/2015 00:27	WG783448
Manganese	ND		0.0100	1	04/22/2015 00:27	WG783448
Molybdenum	ND		0.00500	1	04/22/2015 00:27	WG783448
Strontium	0.279		0.0100	1	04/22/2015 00:27	WG783448
Zinc	ND		0.0500	1	04/22/2015 00:27	WG783448

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	04/27/2015 11:47	WG783161
Arsenic	ND		0.00200	1	04/27/2015 11:47	WG783161
Lead	ND		0.00200	1	04/27/2015 11:47	WG783161

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Vanadium	ND		0.00200	1	04/27/2015 11:47	WG783161

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	ND		2.50	1	04/21/2015 10:07	WG783202

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	ND		10.0	1	04/25/2015 10:49	WG784236

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	170		20.0	1	04/28/2015 16:00	WG784940

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	ND		0.250	1	04/29/2015 15:57	WG785015

Wet Chemistry by Method 353.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Nitrate-Nitrite	ND		0.100	1	04/27/2015 01:20	WG784279

Wet Chemistry by Method 365.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Phosphorus,Total	ND		0.100	1	04/27/2015 14:00	WG784574

Wet Chemistry by Method 9056MOD

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Sulfate	ND		5.00	1	04/28/2015 21:22	WG785209

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	ND		0.100	1	04/22/2015 00:31	WG783448
Boron	ND		0.200	1	04/22/2015 00:31	WG783448
Chromium	ND		0.0100	1	04/22/2015 00:31	WG783448
Copper	ND		0.0200	1	04/22/2015 00:31	WG783448
Iron	ND		0.100	1	04/22/2015 00:31	WG783448
Lithium	ND		0.0150	1	04/22/2015 00:31	WG783448
Manganese	ND		0.0100	1	04/22/2015 00:31	WG783448
Molybdenum	ND		0.00500	1	04/22/2015 00:31	WG783448
Strontium	0.166		0.0100	1	04/22/2015 00:31	WG783448
Zinc	ND		0.0500	1	04/22/2015 00:31	WG783448

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	04/27/2015 11:54	WG783161
Arsenic	ND		0.00200	1	04/27/2015 11:54	WG783161
Lead	ND		0.00200	1	04/27/2015 11:54	WG783161

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Vanadium	ND		0.00200	1	04/27/2015 11:54	WG783161

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	38.8		2.50	1	04/22/2015 07:31	WG783245

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	ND		10.0	1	04/25/2015 10:49	WG784236

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	340		20.0	1	04/28/2015 16:00	WG784940

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	3.49		0.250	1	04/29/2015 16:00	WG785015

Wet Chemistry by Method 353.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Nitrate-Nitrite	ND		0.100	1	04/27/2015 01:21	WG784279

Wet Chemistry by Method 365.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Phosphorus,Total	0.484		0.100	1	04/27/2015 14:01	WG784574

Wet Chemistry by Method 9056MOD

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Sulfate	ND		5.00	1	04/25/2015 02:24	WG784439

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	ND		0.100	1	04/22/2015 00:36	WG783448
Aluminum,Dissolved	ND		0.100	1	04/20/2015 13:05	WG783041
Boron	ND		0.200	1	04/22/2015 00:36	WG783448
Boron,Dissolved	ND		0.200	1	04/20/2015 13:05	WG783041
Chromium	ND		0.0100	1	04/22/2015 00:36	WG783448
Chromium,Dissolved	ND		0.0100	1	04/20/2015 13:05	WG783041
Copper	ND		0.0200	1	04/22/2015 00:36	WG783448
Copper,Dissolved	ND		0.0200	1	04/20/2015 13:05	WG783041
Iron	19.1		0.100	1	04/22/2015 00:36	WG783448
Iron,Dissolved	10.8		0.100	1	04/20/2015 13:05	WG783041
Lithium	ND		0.0150	1	04/22/2015 00:36	WG783448
Lithium,Dissolved	ND		0.0150	1	04/20/2015 13:05	WG783041
Manganese	0.579		0.0100	1	04/22/2015 00:36	WG783448
Manganese,Dissolved	0.589		0.0100	1	04/20/2015 13:05	WG783041
Molybdenum	ND		0.00500	1	04/22/2015 00:36	WG783448
Molybdenum,Dissolved	ND		0.00500	1	04/20/2015 13:05	WG783041
Strontium	0.200		0.0100	1	04/22/2015 00:36	WG783448
Strontium,Dissolved	0.192		0.0100	1	04/20/2015 13:05	WG783041

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Zinc	ND		0.0500	1	04/22/2015 00:36	WG783448
Zinc,Dissolved	ND		0.0500	1	04/20/2015 13:05	WG783041

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	04/27/2015 11:57	WG783161
Antimony,Dissolved	ND	J4	0.00200	1	04/24/2015 01:43	WG783963
Arsenic	ND		0.00200	1	04/27/2015 11:57	WG783161
Arsenic,Dissolved	ND		0.00200	1	04/24/2015 01:43	WG783963
Lead	ND		0.00200	1	04/27/2015 11:57	WG783161
Lead,Dissolved	ND		0.00200	1	04/24/2015 01:43	WG783963
Vanadium	ND		0.00200	1	04/27/2015 11:57	WG783161
Vanadium,Dissolved	ND		0.00200	1	04/24/2015 01:43	WG783963

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	ND		2.50	1	04/21/2015 10:08	WG783202

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	ND		10.0	1	04/25/2015 10:49	WG784236

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	200		20.0	1	04/28/2015 16:00	WG784940

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	ND		0.250	1	04/29/2015 16:02	WG785015

Wet Chemistry by Method 353.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Nitrate-Nitrite	ND		0.100	1	04/27/2015 01:23	WG784279

Wet Chemistry by Method 365.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Phosphorus,Total	ND		0.100	1	04/27/2015 14:02	WG784574

Wet Chemistry by Method 9056MOD

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Sulfate	7.90		5.00	1	04/28/2015 14:03	WG785209

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	0.120		0.100	1	04/22/2015 00:49	WG783448
Boron	ND		0.200	1	04/22/2015 00:49	WG783448
Chromium	ND		0.0100	1	04/22/2015 00:49	WG783448
Copper	ND		0.0200	1	04/22/2015 00:49	WG783448
Iron	ND		0.100	1	04/22/2015 00:49	WG783448
Lithium	ND		0.0150	1	04/22/2015 00:49	WG783448
Manganese	ND		0.0100	1	04/22/2015 00:49	WG783448
Molybdenum	ND		0.00500	1	04/22/2015 00:49	WG783448
Strontium	0.183		0.0100	1	04/22/2015 00:49	WG783448
Zinc	ND		0.0500	1	04/22/2015 00:49	WG783448

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	0.00426		0.00200	1	04/27/2015 11:59	WG783161
Arsenic	ND		0.00200	1	04/27/2015 11:59	WG783161
Lead	0.00851		0.00200	1	04/27/2015 11:59	WG783161

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Vanadium	ND		0.00200	1	04/27/2015 11:59	WG783161

Method Blank (MB)

(MB) 04/21/15 10:06

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Suspended Solids	ND		2.50

L760001-04 Original Sample (OS) • Duplicate (DUP)

(OS) 04/21/15 10:08 • (DUP) 04/21/15 10:09

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Suspended Solids	32.0	32.7	1	2.06		5

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/21/15 10:06 • (LCSD) 04/21/15 10:07

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Suspended Solids	773	824	808	107	105	85.0-115			1.96	5

Method Blank (MB)

(MB) 04/22/15 07:29

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Suspended Solids	ND		2.50

L759615-01 Original Sample (OS) • Duplicate (DUP)

(OS) 04/22/15 07:31 • (DUP) 04/22/15 07:31

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Suspended Solids	72.0	71.0	1	1.40		5

L760020-01 Original Sample (OS) • Duplicate (DUP)

(OS) 04/22/15 07:30 • (DUP) 04/22/15 07:30

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Suspended Solids	50.7	52.3	1	3.24		5

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/22/15 07:29 • (LCSD) 04/22/15 07:29

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Suspended Solids	773	728	740	94.2	95.7	85.0-115			1.63	5

Method Blank (MB)

(MB) 04/23/15 09:01

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Suspended Solids	ND		2.50

L760021-01 Original Sample (OS) • Duplicate (DUP)

(OS) 04/23/15 09:03 • (DUP) 04/23/15 09:04

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Suspended Solids	178	195	1	8.94	J3	5

L760024-01 Original Sample (OS) • Duplicate (DUP)

(OS) 04/23/15 09:04 • (DUP) 04/23/15 09:04

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Suspended Solids	90.8	92.5	1	1.82		5

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/23/15 09:01 • (LCSD) 04/23/15 09:02

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Suspended Solids	773	768	772	99.4	99.9	85.0-115			0.519	5

Method Blank (MB)

(MB) 04/25/15 10:49

Analyte	MB Result mg/l	MB Qualifier	MB RDL mg/l
Acidity	ND		10.0

L759988-01 Original Sample (OS) • Duplicate (DUP)

(OS) 04/25/15 10:49 • (DUP) 04/25/15 10:49

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Acidity	ND	ND	1	0.00		20

L760001-11 Original Sample (OS) • Duplicate (DUP)

(OS) 04/25/15 10:49 • (DUP) 04/25/15 10:49

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Acidity	ND	ND	1	0.00		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/25/15 10:49 • (LCSD) 04/25/15 10:49

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acidity	20.0	22.0	20.0	110	100	85.0-115			9.52	20



Method Blank (MB)

(MB) 04/28/15 16:00

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Alkalinity	ND		20.0

L760001-01 Original Sample (OS) • Duplicate (DUP)

(OS) 04/28/15 16:00 • (DUP) 04/28/15 16:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Alkalinity	99	100	1	1.0		20

L760763-01 Original Sample (OS) • Duplicate (DUP)

(OS) 04/28/15 16:00 • (DUP) 04/28/15 16:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Alkalinity	170	180	1	4.0		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/28/15 16:00 • (LCSD) 04/28/15 16:00

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Alkalinity	100	114	110	114	110	85.0-115			3.57	20

L760001-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/28/15 16:00 • (MS) 04/28/15 16:00 • (MSD) 04/28/15 16:00

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Alkalinity	100	330	378	375	48.0	45.0	1	80.0-120	J6	J6	0.797	20

Method Blank (MB)

(MB) 04/27/15 12:49

Analyte	MB Result mg/l	MB Qualifier	MB RDL mg/l
Ammonia Nitrogen	ND		0.250

L760001-05 Original Sample (OS) • Duplicate (DUP)

(OS) 04/27/15 13:41 • (DUP) 04/27/15 13:44

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Ammonia Nitrogen	ND	ND	1	0.00		20

L759606-01 Original Sample (OS) • Duplicate (DUP)

(OS) 04/27/15 13:09 • (DUP) 04/27/15 13:11

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Ammonia Nitrogen	ND	ND	1	0.00		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/27/15 12:54 • (LCSD) 04/27/15 12:56

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Ammonia Nitrogen	7.50	7.59	7.45	101	99.3	90.0-110			1.86	20

L759575-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/27/15 13:01 • (MS) 04/27/15 13:04 • (MSD) 04/27/15 13:06

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Ammonia Nitrogen	10.0	9.41	19.5	19.6	101	102	1	90.0-110			0.512	20

Method Blank (MB)

(MB) 04/29/15 15:20

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Ammonia Nitrogen	ND		0.250

L759566-01 Original Sample (OS) • Duplicate (DUP)

(OS) 04/29/15 15:35 • (DUP) 04/29/15 15:37

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Ammonia Nitrogen	5.6	5.4	1	3.6		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/29/15 15:25 • (LCSD) 04/29/15 15:27

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Ammonia Nitrogen	7.50	8.15	8.10	109	108	90.0-110			0.615	20

L759707-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/29/15 16:15 • (MS) 04/29/15 16:17 • (MSD) 04/29/15 16:20

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Ammonia Nitrogen	10.0	120	127	119	70.0	-10.0	100	90.0-110	V	V	6.50	20

Method Blank (MB)

(MB) 04/27/15 12:48

Analyte	MB Result mg/l	MB Qualifier	MB RDL mg/l
Nitrate-Nitrite	ND		0.100

L759694-02 Original Sample (OS) • Duplicate (DUP)

(OS) 04/27/15 01:02 • (DUP) 04/27/15 01:03

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Nitrate-Nitrite	9.3	9.6	1	3.2		20

L760001-06 Original Sample (OS) • Duplicate (DUP)

(OS) 04/27/15 01:15 • (DUP) 04/27/15 01:17

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Nitrate-Nitrite	2.8	2.8	1	0.00		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/27/15 12:51 • (LCSD) 04/27/15 12:53

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Nitrate-Nitrite	5.00	5.14	5.47	103	109	90.0-110			6.22	20

L759694-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/27/15 12:59 • (MS) 04/27/15 01:00 • (MSD) 04/27/15 01:01

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Nitrate-Nitrite	5.00	9.42	13.9	14.0	90.0	92.0	1	90.0-110			0.717	20

Method Blank (MB)

(MB) 04/27/15 16:20

Analyte	MB Result mg/l	MB Qualifier	MB RDL mg/l
Phosphorus,Total	ND		0.100

L760001-08 Original Sample (OS) • Duplicate (DUP)

(OS) 04/27/15 16:49 • (DUP) 04/27/15 16:50

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Phosphorus,Total	ND	ND	1	0.00		20

L759799-01 Original Sample (OS) • Duplicate (DUP)

(OS) 04/27/15 16:30 • (DUP) 04/27/15 16:31

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Phosphorus,Total	0.25	0.25	1	0.00		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/27/15 16:23 • (LCSD) 04/27/15 16:24

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Phosphorus,Total	1.00	0.988	0.950	98.8	95.0	90.0-110			3.92	20

L760001-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/27/15 16:36 • (MS) 04/27/15 16:37 • (MSD) 04/27/15 16:38

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Phosphorus,Total	2.50	0.0440	2.35	2.43	94.0	97.2	1	90.0-110			3.35	20

Method Blank (MB)

(MB) 04/27/15 13:49

Analyte	MB Result mg/l	MB Qualifier	MB RDL mg/l
Phosphorus,Total	ND		0.100

L760379-02 Original Sample (OS) • Duplicate (DUP)

(OS) 04/27/15 14:13 • (DUP) 04/27/15 14:14

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Phosphorus,Total	ND	0.10	1	200	P1	20

L759931-02 Original Sample (OS) • Duplicate (DUP)

(OS) 04/27/15 13:57 • (DUP) 04/27/15 13:59

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Phosphorus,Total	0.83	0.78	1	6.2		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/27/15 13:51 • (LCSD) 04/27/15 13:53

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Phosphorus,Total	1.00	0.939	0.960	93.9	96.0	90.0-110			2.21	20

L760332-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/27/15 14:04 • (MS) 04/27/15 14:06 • (MSD) 04/27/15 14:07

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Phosphorus,Total	2.50	0.185	2.80	2.76	105	103	1	90.0-110			1.44	20

Method Blank (MB)

(MB) 04/24/15 20:36

Analyte	MB Result mg/l	MB Qualifier	MB RDL mg/l
Sulfate	ND		5.00

L759566-01 Original Sample (OS) • Duplicate (DUP)

(OS) 04/24/15 21:59 • (DUP) 04/24/15 22:13

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	16.7	16.8	1	0		20

L760125-01 Original Sample (OS) • Duplicate (DUP)

(OS) 04/25/15 03:06 • (DUP) 04/25/15 03:19

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	36.6	36.6	1	0		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/24/15 20:50 • (LCSD) 04/24/15 21:04

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Sulfate	40.0	40.2	40.6	100	102	90-110			1	20

Method Blank (MB)

(MB) 04/27/15 10:47

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Sulfate	ND		5.00

L760001-11 Original Sample (OS) • Duplicate (DUP)

(OS) 04/28/15 14:03 • (DUP) 04/28/15 14:18

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Sulfate	7.90	7.92	1	0		20

L760001-01 Original Sample (OS) • Duplicate (DUP)

(OS) 04/28/15 18:32 • (DUP) 04/28/15 18:48

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Sulfate	76.5	76.4	1	0		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/27/15 11:02 • (LCSD) 04/27/15 11:18

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Sulfate	40.0	40.2	40.2	101	101	90-110			0	20

L760001-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/28/15 19:03 • (MS) 04/28/15 19:18 • (MSD) 04/28/15 19:34

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Sulfate	50.0	11.3	60.8	60.5	99	98	1	80-120			0	20

Method Blank (MB)

(MB) 04/29/15 10:39

Analyte	MB Result mg/l	MB Qualifier	MB RDL mg/l
Sulfate	ND		5.00

L761158-01 Original Sample (OS) • Duplicate (DUP)

(OS) 04/29/15 20:49 • (DUP) 04/29/15 21:04

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	63.7	63.6	1	0		20

L761181-19 Original Sample (OS) • Duplicate (DUP)

(OS) 04/30/15 01:18 • (DUP) 04/30/15 01:32

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	3.52	3.57	1	0		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/29/15 18:35 • (LCSD) 04/29/15 18:50

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Sulfate	40.0	41.4	41.2	103	103	90-110			0	20

Method Blank (MB)

(MB) 04/20/15 11:35

Analyte	MB Result mg/l	MB Qualifier	MB RDL mg/l
Aluminum,Dissolved	ND		0.100
Boron,Dissolved	ND		0.200
Chromium,Dissolved	ND		0.0100
Copper,Dissolved	ND		0.0200
Iron,Dissolved	ND		0.100
Lithium,Dissolved	ND		0.0500
Manganese,Dissolved	ND		0.0100
Molybdenum,Dissolved	ND		0.00500
Strontium,Dissolved	ND		0.0100
Zinc,Dissolved	ND		0.0500

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/20/15 11:39 • (LCSD) 04/20/15 11:43

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Aluminum,Dissolved	1.00	1.13	1.12	113	112	80-120			0	20
Boron,Dissolved	1.00	1.05	1.09	105	109	80-120			4	20
Chromium,Dissolved	1.00	1.10	1.14	110	114	80-120			4	20
Copper,Dissolved	1.00	1.02	1.06	102	106	80-120			4	20
Iron,Dissolved	1.00	1.04	1.09	104	109	80-120			5	20
Lithium,Dissolved	1.00	1.02	1.06	102	106	80-120			4	20
Manganese,Dissolved	1.00	1.07	1.11	107	111	80-120			4	20
Molybdenum,Dissolved	1.00	1.02	1.06	102	106	80-120			3	20
Strontium,Dissolved	1.00	1.01	1.05	101	105	80-120			3	20
Zinc,Dissolved	1.00	1.03	1.08	103	108	80-120			4	20

L759795-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/20/15 11:48 • (MS) 04/20/15 11:57 • (MSD) 04/20/15 12:01

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aluminum,Dissolved	1.00	0.0908	1.14	1.15	104	106	1	75-125			1	20
Boron,Dissolved	1.00	0.0350	1.10	1.11	107	108	1	75-125			1	20
Chromium,Dissolved	1.00	0.000508	1.11	1.09	111	109	1	75-125			2	20
Copper,Dissolved	1.00	0.00424	1.04	1.02	103	101	1	75-125			2	20
Iron,Dissolved	1.00	0.0261	1.09	1.08	106	106	1	75-125			0	20
Lithium,Dissolved	1.00	0.00244	1.04	1.03	104	103	1	75-125			1	20

L759795-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/20/15 11:48 • (MS) 04/20/15 11:57 • (MSD) 04/20/15 12:01

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Manganese,Dissolved	1.00	0.00774	1.08	1.07	107	107	1	75-125			1	20
Molybdenum,Dissolved	1.00	0.0000477	1.03	1.02	103	102	1	75-125			1	20
Strontium,Dissolved	1.00	0.0703	1.09	1.08	102	101	1	75-125			2	20
Zinc,Dissolved	1.00	0.0202	1.06	1.05	104	103	1	75-125			1	20

Method Blank (MB)

(MB) 04/21/15 19:54

Analyte	MB Result mg/l	MB Qualifier	MB RDL mg/l
Aluminum	ND		0.100
Boron	ND		0.200
Chromium	ND		0.0100
Copper	ND		0.0200
Iron	ND		0.100
Lithium	ND		0.0500
Manganese	ND		0.0100
Molybdenum	ND		0.00500
Strontium	ND		0.0100
Zinc	ND		0.0500

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/21/15 19:59 • (LCSD) 04/21/15 20:04

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Aluminum	1.00	0.995	0.999	100	100	80-120			0	20
Boron	1.00	1.01	1.02	101	102	80-120			0	20
Chromium	1.00	1.06	1.05	106	105	80-120			1	20
Copper	1.00	0.965	0.962	97	96	80-120			0	20
Iron	1.00	1.03	1.03	103	103	80-120			0	20
Lithium	1.00	1.06	1.06	106	106	80-120			0	20
Manganese	1.00	1.03	1.04	103	104	80-120			1	20
Molybdenum	1.00	0.997	1.00	100	100	80-120			0	20
Strontium	1.00	0.996	1.01	100	101	80-120			1	20
Zinc	1.00	1.02	1.01	102	101	80-120			1	20

L760001-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/21/15 20:09 • (MS) 04/21/15 20:18 • (MSD) 04/21/15 20:23

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aluminum	1.00	0.0467	1.04	1.07	99	102	1	75-125			3	20
Boron	1.00	0.183	1.23	1.23	105	105	1	75-125			0	20
Chromium	1.00	0.00369	1.05	1.05	104	104	1	75-125			0	20
Copper	1.00	0.00134	0.998	0.983	100	98	1	75-125			1	20
Iron	1.00	0.0308	1.04	1.07	101	104	1	75-125			2	20
Lithium	1.00	0.00703	1.07	1.07	106	106	1	75-125			0	20

L760001-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/21/15 20:09 • (MS) 04/21/15 20:18 • (MSD) 04/21/15 20:23

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Manganese	1.00	0.00103	1.03	1.02	103	102	1	75-125			1	20
Molybdenum	1.00	0.0000877	1.01	1.00	101	100	1	75-125			1	20
Strontium	1.00	0.162	1.16	1.17	100	100	1	75-125			0	20
Zinc	1.00	0.0130	1.02	1.01	101	99	1	75-125			1	20

Method Blank (MB)

(MB) 04/27/15 10:44

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Antimony	ND		0.00200
Arsenic	ND		0.00200
Lead	ND		0.00200
Vanadium	ND		0.00500

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/27/15 10:46 • (LCSD) 04/27/15 10:49

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Antimony	0.0500	0.0562	0.0562	112	112	80-120			0	20
Arsenic	0.0500	0.0525	0.0520	105	104	80-120			1	20
Lead	0.0500	0.0542	0.0533	108	107	80-120			2	20
Vanadium	0.0500	0.0527	0.0499	105	100	80-120			6	20

L759988-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/27/15 10:51 • (MS) 04/27/15 10:55 • (MSD) 04/27/15 10:58

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Antimony	0.0500	0.000281	0.0562	0.0538	112	107	1	75-125			4	20
Arsenic	0.0500	0.000255	0.0500	0.0496	100	99	1	75-125			1	20
Lead	0.0500	0.000155	0.0505	0.0508	101	101	1	75-125			1	20
Vanadium	0.0500	0.000672	0.0504	0.0502	99	99	1	75-125			0	20

Method Blank (MB)

(MB) 04/24/15 01:12

Analyte	MB Result mg/l	MB Qualifier	MB RDL mg/l
Antimony,Dissolved	ND		0.00200
Arsenic,Dissolved	ND		0.00200
Lead,Dissolved	ND		0.00200
Vanadium,Dissolved	ND		0.00500

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 04/24/15 05:43 • (LCSD) 04/24/15 05:45

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Antimony,Dissolved	0.0500	0.0617	0.0627	123	125	80-120	J4	J4	2	20
Arsenic,Dissolved	0.0500	0.0579	0.0601	116	120	80-120			4	20
Lead,Dissolved	0.0500	0.0583	0.0585	117	117	80-120			0	20
Vanadium,Dissolved	0.0500	0.0543	0.0546	109	109	80-120			1	20

L759705-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 04/24/15 01:19 • (MS) 04/24/15 01:23 • (MSD) 04/24/15 01:25

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Antimony,Dissolved	0.0500	0.000155	0.0628	0.0622	125	124	1	75-125			1	20
Arsenic,Dissolved	0.0500	0.000456	0.0610	0.0591	121	117	1	75-125			3	20
Lead,Dissolved	0.0500	0.0000869	0.0575	0.0586	115	117	1	75-125			2	20
Vanadium,Dissolved	0.0500	0.000235	0.0533	0.0541	106	108	1	75-125			1	20

Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND,U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.
SDL	Sample Detection Limit.
MQL	Method Quantitation Limit.
Unadj. MQL	Unadjusted Method Quantitation Limit.

Qualifier	Description
J3	The associated batch QC was outside the established quality control range for precision.
J4	The associated batch QC was outside the established quality control range for accuracy.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.
V	The sample concentration is too high to evaluate accurate spike recoveries.

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.**

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Conneticut	PH-0197	North Carolina [1]	DW21704
Florida	E87487	North Carolina [2]	41
Georgia	NELAP	North Dakota	R-140
Georgia [1]	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky [1]	90010	South Dakota	n/a
Kentucky [2]	16	Tennessee [1 4]	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

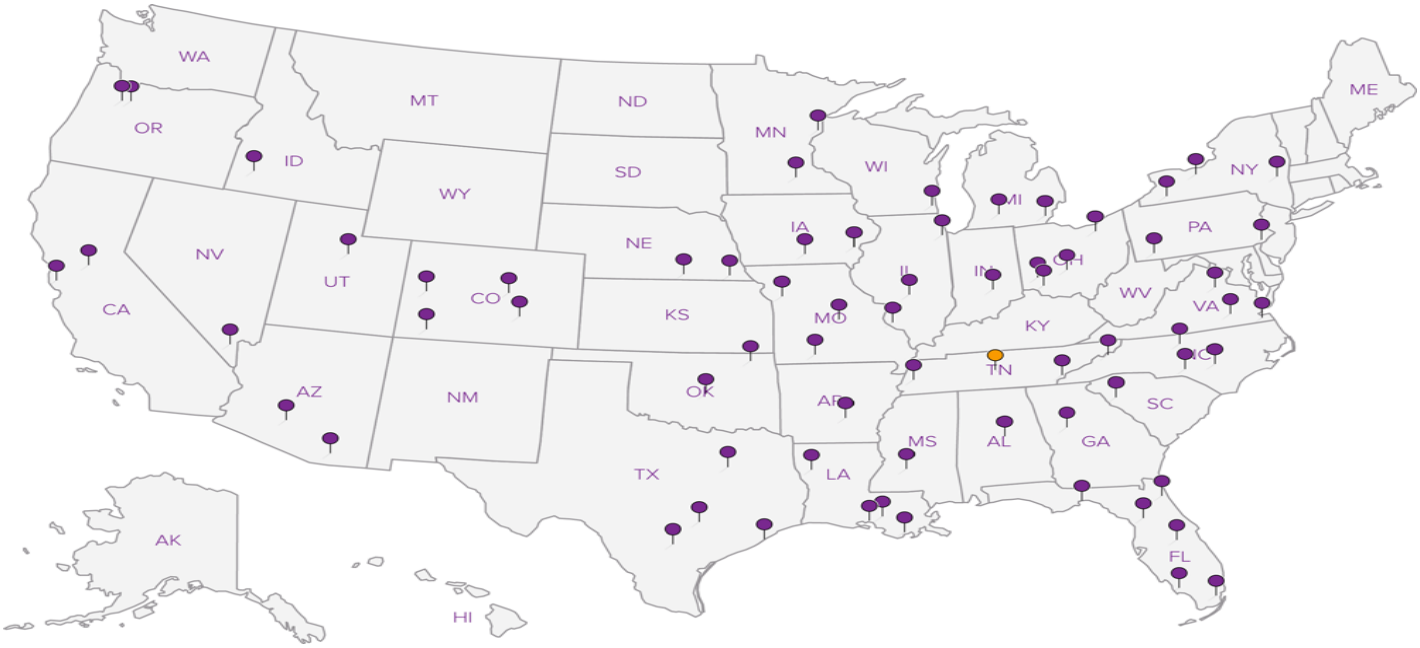
[1.] Drinking Water [2.] Underground Storage Tanks [3.] Aquatic Toxicity [4.] Chemical/Microbiological [5.] Mold [n/a] Accreditation not applicable

Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA	100789
Canada	1461.01	DOD	1461.01
EPA–Crypto	TN00003	USDA	S-67674

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



Billing Information:
TVA Accounts Payable
1101 Market St. Mailstop: LP-5D-C
Chattanooga, TN 37402

Report to: Matthew Williams

Email To: edmsvk@tva.gov, mdwilliams@tva.gov, MAGeane@tva.gov

Project Description: Colbert Groundwater wells

City/State Collected: Muscle Shoals AL

Phone: 865-632-6941
Fax:

Client Project # COF GW

Lab Project #

Collected by (print): Ray Duncan
RALPH Mixon

Site/Facility ID # Site wide

P.O. # 727549

Collected by (signature): Ray Duncan

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed: Standard

Email? ___No _X_Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

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12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L # E112 176001

Acctnum: TVAENVAFF
Template: T101255
Prelogin: P503726
TSR: 633- Pam Langford
PB:
Shipped Via: FedEX Ground

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntr	METALS 500mL HDPE-HNO3 ⊄2	NH3 125mL HDPE-H2SO4 ⊄2	NO2NO3 250mL HDPE-H2SO4 ⊄2	PHT 250mLAmb-H2SO4	SULFATE 125mL HDPE-NoPRES	TSS 1L-HDPE NoPRES	ACIDITY AND ALKALINITY	Dissolved Metals (Same List)			Rem./Contaminant	Sample # (lab only)
COF-MC5C-0415	Grab	GW	1.4	4-15-15	0844	7	X	X	X	X	X	X	X				-01	
COF-CA16-0415	Grab	GW	17.2	4-14-15	1305	7	X	X	X	X	X	X	X				02	
COF-CA17A-0415	Grab	GW	2.3	4-14-15	1100	7	X	X	X	X	X	X	X				03	
COF-CA17B-0415	Grab	GW	28.0	4-13-15	0957	8	X	X	X	X	X	X	X	X			04	
COF-CA19B-0415	Grab	GW	20.0	4-15-15	1444	8	X	X	X	X	X	X	X	X			05	
COF-CA20B-0415	Grab	GW	17.3	4-16-15	1040	7	X	X	X	X	X	X	X				06	
COF-CA21B-0415	Grab	GW	17.0	4-16-15	0738	8	X	X	X	X	X	X	X	X			07	
COF-CA22B-0415	Grab	GW	18.0	4-15-15	1546	7	X	X	X	X	X	X	X				08	
COF-CA27BR-0415	Grab	GW	19.6	4-14-15	1345	7	X	X	X	X	X	X	X				09	
COF-CA28B-0415	Grab	GW	13.3	4-15-15	1244	8	X	X	X	X	X	X	X	X			10	

SM SM

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other ___

Remarks: 6272 8622 5735 6272 8622 5741 6272 8622 5713 6272 8622 5724 6272 8622 5698 6272 8622 5702

pH ___ Temp ___
Flow ___ Other ___

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Ray Duncan	4-16-15	1600	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ___
Temp: 2.7° °C Bottles Received: 82
Date: 4/17/15 Time: 0900

Condition: (lab use only) TP!
COC Seal Intact: ✓ Y ___ N ___ NA
pH Checked: 2 NCF:

L760001

Billing Information:
TVA Accounts Payable
1101 Market St. Mailstop: LP-5D-C
Chattanooga, TN 37402

Report to: Matthew Williams

Email To: edmsvk@tva.gov, mdwilliams@tva.gov,MAGeane@tva.gov

Project Description: Colbert Groundwater Wells

City/State Collected: Muscle Shoals AL

Phone: 865-632-6941
Fax:

Client Project # COF GW

Lab Project #

Collected by (print): Ray Duncan / Ralph Mixon

Site/Facility ID # Site wide

P.O. # 727549

Collected by (signature): Ray Duncan / Ralph Mixon
Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed: Standard

Email? ___No _X_Yes
FAX? ___No ___Yes

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntr	METALS 500mL HDPE-HNO3 (2)	NH3 125mL HDPE-H2SO4 (2)	NO2NO3 250mL HDPE-H2SO4 (2)	PHT 250mLAmb-H2SO4 (2)	SULFATE 125mL HDPE-NoPRES	TSS 1L-HDPE NoPRES	ACIDITY AND ALKALINITY	Dissolved Metals (same list)			Rem./Contaminant	Sample # (lab only)
COF-CA12A-0415	Grab	GW	27.5	4-14-15	1134	7	X	X	X	X	X	X	X				11	

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

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Phone: 800-767-5859
Fax: 615-758-5859

L#
Table #
Acctnum: TVAENVAFF
Template: T101255
Prelogin: P503726
TSR: 633- Pam Langford
PB:
Shipped Via: FedEx Ground

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other ___

Remarks: 6272 8622 5724 6272 8622 5746 6272 8622 5713 6272 8622 5735 6272 8622 5698 6272 8622 5702

pH ___ Temp ___
Flow ___ Other ___

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Ray Duncan	4-16-15	1600	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ ___
Temp: 2.7 °C Bottles Received: 84 80
Date: 4/17/15 Time: 0905

Condition: (lab use only) TO1
COC Seal Intact: ___ Y ___ N ___ NA
pH Checked: 12 NCF:

Jason Romer

From: Pam Langford
Sent: Friday, April 17, 2015 10:11 AM
To: Andy Vann; Login
Subject: TVA COF Site Wide sampling

6 coolers should arrive from TVACOF this morning. Please cancel total phenols on all samples/ please add total phosphorus to all samples.
Thank you!

Pamela A. Langford
Lab Documentation Chemist
ESC Lab Sciences
12065 Lebanon Road
Mt. Juliet, TN 37122
Direct: 615-773-9687
plangford@esclabsciences.com

ANALYTICAL REPORT

July 09, 2015

TVA-Environmental Affairs

Sample Delivery Group:	L771673
Samples Received:	06/17/2015
Project Number:	COF-CA29AR
Description:	Colbert Fossil Groundwater
Report To:	Maggie Gilliland
	Knoxville, TN 37902

Entire Report Reviewed By:

Pamela A. Langford

Pam Langford

Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



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COF-CA6-0615 L771673-03 8

COF-CA11-0615 L771673-04 9

COF-MC1-0615 L771673-05 10

COF-MC4-0615 L771673-06 11

COF-MC5A-0615 L771673-07 12

COF-CA30B-0615 L771673-08 13

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COF-CA5-0615 L771673-01 GW

Collected by: RM/RD | Collected date/time: 06/16/15 08:36 | Received date/time: 06/17/15 10:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Wet Chemistry by Method 365.4	WG797665	1	06/23/15 23:23	06/25/15 10:05	DR

COF-CA29AR-0615 L771673-02 GW

Collected by: RM/RD | Collected date/time: 06/16/15 10:17 | Received date/time: 06/17/15 10:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Wet Chemistry by Method 365.4	WG797665	1	06/23/15 23:23	06/25/15 10:06	DR

COF-CA6-0615 L771673-03 GW

Collected by: RM/RD | Collected date/time: 06/15/15 13:05 | Received date/time: 06/17/15 10:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Wet Chemistry by Method 365.4	WG797665	1	06/23/15 23:23	06/25/15 10:08	DR

COF-CA11-0615 L771673-04 GW

Collected by: RM/RD | Collected date/time: 06/15/15 11:25 | Received date/time: 06/17/15 10:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Wet Chemistry by Method 365.4	WG797665	1	06/23/15 23:23	06/25/15 10:09	DR

COF-MC1-0615 L771673-05 GW

Collected by: RM/RD | Collected date/time: 06/15/15 16:07 | Received date/time: 06/17/15 10:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Wet Chemistry by Method 365.4	WG797665	1	06/23/15 23:23	06/25/15 10:10	DR

COF-MC4-0615 L771673-06 GW

Collected by: RM/RD | Collected date/time: 06/15/15 15:17 | Received date/time: 06/17/15 10:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Wet Chemistry by Method 365.4	WG797665	1	06/23/15 23:23	06/25/15 10:11	DR

COF-MC5A-0615 L771673-07 GW

Collected by: RM/RD | Collected date/time: 06/16/15 11:30 | Received date/time: 06/17/15 10:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Wet Chemistry by Method 365.4	WG797665	1	06/23/15 23:23	06/25/15 10:13	DR

COF-CA30B-0615 L771673-08 GW

Collected by: RM/RD | Collected date/time: 06/16/15 13:54 | Received date/time: 06/17/15 10:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Wet Chemistry by Method 365.4	WG797665	1	06/23/15 23:23	06/25/15 10:14	DR

COF-FIELD BLANK-0615 L771673-09 GW

Collected by: RM/RD
Collected date/time: 06/16/15 14:08
Received date/time: 06/17/15 10:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 C-2011	WG796777	1	06/19/15 14:03	06/22/15 13:42	MF
Gravimetric Analysis by Method 2540 D-2011	WG797028	1	06/22/15 11:15	06/23/15 09:13	MF
Wet Chemistry by Method 2310 B-2011	WG797653	1	06/24/15 04:00	06/24/15 04:00	TOF
Wet Chemistry by Method 2320 B-2011	WG797748	1	06/26/15 11:21	06/26/15 11:21	LLS
Wet Chemistry by Method 350.1	WG798149	1	06/25/15 14:36	06/25/15 14:36	JAL
Wet Chemistry by Method 353.2	WG798414	1	06/26/15 02:18	06/26/15 02:18	ASK
Wet Chemistry by Method 365.4	WG797665	1	06/23/15 23:23	06/25/15 10:15	DR
Wet Chemistry by Method 9056MOD	WG797945	1	06/24/15 17:29	06/24/15 17:29	NJM

COF-EQ BLANK-0615 L771673-10 GW

Collected by: RM/RD
Collected date/time: 06/16/15 14:15
Received date/time: 06/17/15 10:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 C-2011	WG796777	1	06/19/15 14:03	06/22/15 13:47	MF
Gravimetric Analysis by Method 2540 D-2011	WG797028	1	06/22/15 11:15	06/23/15 09:12	MF
Wet Chemistry by Method 2310 B-2011	WG797653	1	06/24/15 04:00	06/24/15 04:00	TOF
Wet Chemistry by Method 2320 B-2011	WG797748	1	06/26/15 11:21	06/26/15 11:21	LLS
Wet Chemistry by Method 350.1	WG798149	1	06/25/15 14:39	06/25/15 14:39	JAL
Wet Chemistry by Method 353.2	WG798414	1	06/26/15 02:19	06/26/15 02:19	ASK
Wet Chemistry by Method 365.4	WG798584	1	06/26/15 10:47	06/26/15 14:09	ASK
Wet Chemistry by Method 9056MOD	WG797945	1	06/24/15 17:44	06/24/15 17:44	NJM

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Pamela A. Langford

Pam Langford

Pam Langford
Technical Service Representative

Wet Chemistry by Method 365.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Phosphorus,Total	ND		0.100	1	06/25/2015 10:05	WG797665

Wet Chemistry by Method 365.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Phosphorus,Total	ND		0.100	1	06/25/2015 10:06	WG797665

Wet Chemistry by Method 365.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Phosphorus,Total	ND		0.100	1	06/25/2015 10:08	WG797665

Wet Chemistry by Method 365.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Phosphorus,Total	ND		0.100	1	06/25/2015 10:09	WG797665

Wet Chemistry by Method 365.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Phosphorus,Total	ND		0.100	1	06/25/2015 10:10	WG797665

Wet Chemistry by Method 365.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Phosphorus,Total	ND		0.100	1	06/25/2015 10:11	WG797665

Wet Chemistry by Method 365.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Phosphorus,Total	ND		0.100	1	06/25/2015 10:13	WG797665

Wet Chemistry by Method 365.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Phosphorus,Total	ND		0.100	1	06/25/2015 10:14	WG797665

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	ND		10.0	1	06/22/2015 13:42	WG796777

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	ND		2.50	1	06/23/2015 09:13	WG797028

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	384		10.0	1	06/24/2015 04:00	WG797653

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	ND		20.0	1	06/26/2015 11:21	WG797748

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	ND		0.250	1	06/25/2015 14:36	WG798149

Wet Chemistry by Method 353.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Nitrate-Nitrite	ND		0.100	1	06/26/2015 02:18	WG798414

Wet Chemistry by Method 365.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Phosphorus,Total	ND		0.100	1	06/25/2015 10:15	WG797665

Wet Chemistry by Method 9056MOD

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Sulfate	ND		5.00	1	06/24/2015 17:29	WG797945

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	ND		10.0	1	06/22/2015 13:47	WG796777

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	ND		2.50	1	06/23/2015 09:12	WG797028

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	380		10.0	1	06/24/2015 04:00	WG797653

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	ND		20.0	1	06/26/2015 11:21	WG797748

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	ND		0.250	1	06/25/2015 14:39	WG798149

Wet Chemistry by Method 353.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Nitrate-Nitrite	ND		0.100	1	06/26/2015 02:19	WG798414

Wet Chemistry by Method 365.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Phosphorus,Total	ND		0.100	1	06/26/2015 14:09	WG798584

Wet Chemistry by Method 9056MOD

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Sulfate	ND		5.00	1	06/24/2015 17:44	WG797945

Method Blank (MB)

(MB) 06/22/15 13:42

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Dissolved Solids	ND		10.0

L771624-01 Original Sample (OS) • Duplicate (DUP)

(OS) 06/22/15 13:53 • (DUP) 06/22/15 13:53

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Dissolved Solids	691	699	1	1.15		5

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 06/22/15 13:52 • (LCSD) 06/22/15 13:51

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Dissolved Solids	8800	8910	9030	101	103	85.0-115			1.34	5

Method Blank (MB)

(MB) 06/23/15 09:18

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Suspended Solids	ND		2.50

L771636-05 Original Sample (OS) • Duplicate (DUP)

(OS) 06/23/15 09:18 • (DUP) 06/23/15 09:19

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Suspended Solids	6.00	6.44	1	7.14	P1	5

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 06/23/15 09:15 • (LCSD) 06/23/15 09:18

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Suspended Solids	773	860	828	111	107	85.0-115			3.79	5

Method Blank (MB)

(MB) 06/24/15 04:00

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Acidity	ND		10.0

L771957-07 Original Sample (OS) • Duplicate (DUP)

(OS) 06/24/15 04:00 • (DUP) 06/24/15 04:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Acidity	150	150	1	1.3		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 06/24/15 04:00 • (LCSD) 06/24/15 04:00

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Acidity	20.0	22.0	22.0	110	110	85.0-115			0.000	20

Method Blank (MB)

(MB) 06/26/15 11:21

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Alkalinity	ND		20.0

L771871-21 Original Sample (OS) • Duplicate (DUP)

(OS) 06/26/15 11:21 • (DUP) 06/26/15 11:21

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Alkalinity	310	400	5	3.9		20

L771871-23 Original Sample (OS) • Duplicate (DUP)

(OS) 06/26/15 11:21 • (DUP) 06/26/15 11:21

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Alkalinity	350	350	5	0.57		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 06/26/15 11:21 • (LCSD) 06/26/15 11:21

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Alkalinity	100	108	112	108	112	85.0-115			3.64	20

L771871-20 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 06/26/15 11:21 • (MS) 06/26/15 11:21 • (MSD) 06/26/15 11:21

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Alkalinity	100	321	823	840	101	104	5	80.0-120			2.04	20

Method Blank (MB)

(MB) 06/25/15 14:01

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Ammonia Nitrogen	ND		0.250

L771810-02 Original Sample (OS) • Duplicate (DUP)

(OS) 06/25/15 16:12 • (DUP) 06/25/15 16:15

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Ammonia Nitrogen	6.4	6.2	1	3.2		20

L771336-01 Original Sample (OS) • Duplicate (DUP)

(OS) 06/25/15 14:14 • (DUP) 06/25/15 14:16

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Ammonia Nitrogen	ND	ND	1	0.00		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 06/25/15 14:46 • (LCSD) 06/25/15 14:09

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Ammonia Nitrogen	7.50	7.85	7.56	105	101	90.0-110			3.76	20

L771336-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 06/25/15 14:19 • (MS) 06/25/15 14:21 • (MSD) 06/25/15 14:24

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Ammonia Nitrogen	10.0	0.139	8.10	10.6	81.0	106	1	90.0-110	J6	J3	26.7	20

Method Blank (MB)

(MB) 06/26/15 02:08

Analyte	MB Result mg/l	MB Qualifier	MB RDL mg/l
Nitrate-Nitrite	ND		0.100

L771735-01 Original Sample (OS) • Duplicate (DUP)

(OS) 06/26/15 02:20 • (DUP) 06/26/15 02:22

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Nitrate-Nitrite	0.13	0.13	1	0.00		20

L772437-01 Original Sample (OS) • Duplicate (DUP)

(OS) 06/26/15 03:19 • (DUP) 06/26/15 03:20

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Nitrate-Nitrite	26	25	5	3.9		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 06/26/15 02:12 • (LCSD) 06/26/15 02:13

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Nitrate-Nitrite	5.00	5.10	5.07	102	101	90.0-110			0.590	20

L772197-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 06/26/15 02:26 • (MS) 06/26/15 02:28 • (MSD) 06/26/15 02:29

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Nitrate-Nitrite	5.00	0.0131	5.01	5.02	100	100	1	90.0-110			0.199	20

Method Blank (MB)

(MB) 06/25/15 09:59

Analyte	MB Result mg/l	MB Qualifier	MB RDL mg/l
Phosphorus,Total	ND		0.100

L771673-09 Original Sample (OS) • Duplicate (DUP)

(OS) 06/25/15 10:15 • (DUP) 06/25/15 10:17

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Phosphorus,Total	ND	ND	1	0.00		20

L771714-05 Original Sample (OS) • Duplicate (DUP)

(OS) 06/25/15 10:28 • (DUP) 06/25/15 10:29

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Phosphorus,Total	0.91	0.79	1	14		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 06/25/15 10:01 • (LCSD) 06/25/15 10:03

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Phosphorus,Total	1.00	1.05	1.03	105	103	90.0-110			1.92	20

L771714-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 06/25/15 10:22 • (MS) 06/25/15 10:23 • (MSD) 06/25/15 10:24

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Phosphorus,Total	2.50	1.48	3.97	4.19	98.8	108	1	90.0-110			5.39	20

Method Blank (MB)

(MB) 06/26/15 14:03

Analyte	MB Result mg/l	MB Qualifier	MB RDL mg/l
Phosphorus,Total	ND		0.100

L771673-10 Original Sample (OS) • Duplicate (DUP)

(OS) 06/26/15 14:09 • (DUP) 06/26/15 14:10

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Phosphorus,Total	ND	ND	1	0.00		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 06/26/15 14:05 • (LCSD) 06/26/15 14:06

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Phosphorus,Total	1.00	0.975	0.995	97.5	99.5	90.0-110			2.03	20

L772115-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 06/26/15 14:12 • (MS) 06/26/15 14:13 • (MSD) 06/26/15 14:14

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Phosphorus,Total	2.50	0.0461	2.51	2.40	98.6	94.2	1	90.0-110			4.48	20

Method Blank (MB)

(MB) 06/24/15 09:05

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Sulfate	ND		5.00

L771437-02 Original Sample (OS) • Duplicate (DUP)

(OS) 06/24/15 12:59 • (DUP) 06/24/15 13:14

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Sulfate	ND	0.000	1	0		20

L771649-01 Original Sample (OS) • Duplicate (DUP)

(OS) 06/24/15 16:46 • (DUP) 06/24/15 17:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Sulfate	724	736	10	2		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 06/24/15 09:20 • (LCSD) 06/24/15 09:34

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Sulfate	40.0	40.6	40.7	102	102	90-110			0	20

L771625-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 06/24/15 13:43 • (MS) 06/24/15 13:57 • (MSD) 06/24/15 14:12

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Sulfate	25.0	134	230	230	95	96	2	80-120			0	20

Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND,U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.
SDL	Sample Detection Limit.
MQL	Method Quantitation Limit.
Unadj. MQL	Unadjusted Method Quantitation Limit.

Qualifier	Description
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.**

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Conneticut	PH-0197	North Carolina [1]	DW21704
Florida	E87487	North Carolina [2]	41
Georgia	NELAP	North Dakota	R-140
Georgia [1]	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky [1]	90010	South Dakota	n/a
Kentucky [2]	16	Tennessee [1 4]	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

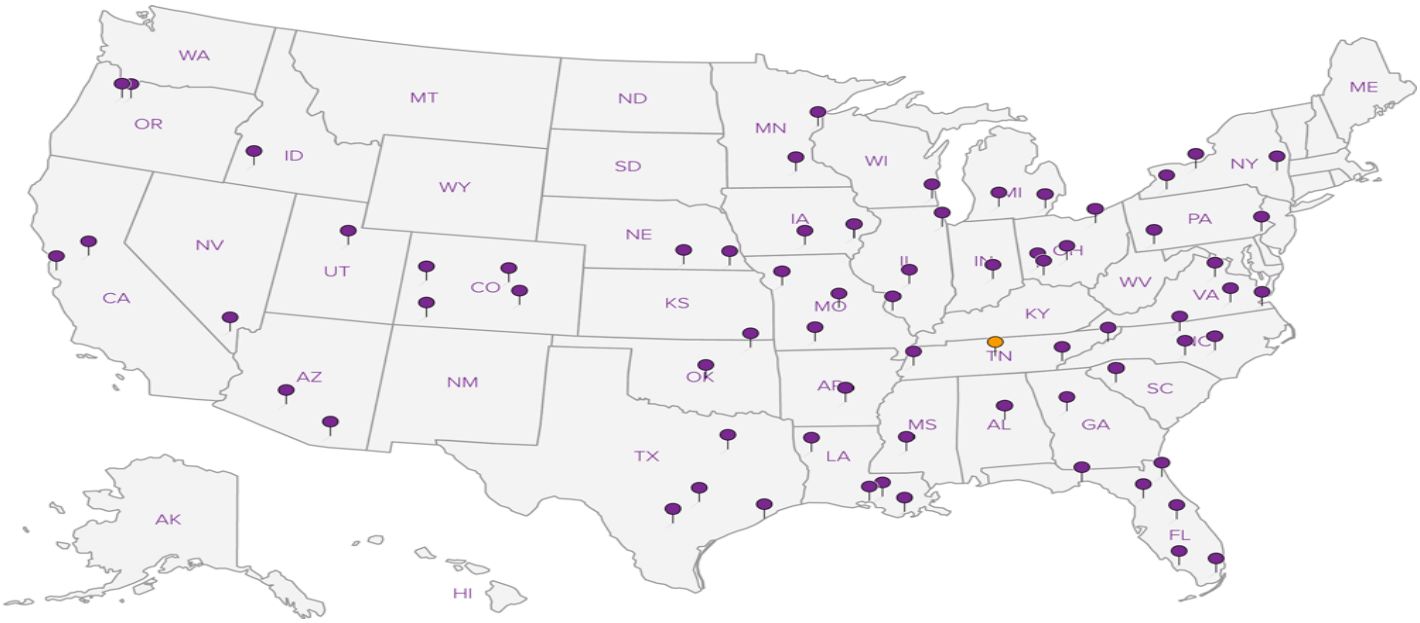
[1.] Drinking Water [2.] Underground Storage Tanks [3.] Aquatic Toxicity [4.] Chemical/Microbiological [5.] Mold [n/a] Accreditation not applicable

Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA	100789
Canada	1461.01	DOD	1461.01
EPA–Crypto	TN00003	USDA	S-67674

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



TVA-Environmental Affairs

Knoxville, TN 37902

Billing Information:

Account Payable
1101 Market St. Mailstop: LP-5D-C
Chattanooga, TN 37402

Report to: **Maggie Gilliland**

Email To: **mggilliland@tva.gov, npagano@tva.gov,EDMSVK@tva.gov;magean@tva**

Project Description: **Colbert Fossil Groundwater**

City/State Collected: **Muscle Shoals AL**

Phone:
Fax:

Client Project # **COF GW**

Lab Project # **TVAENVAFF-COFGW**

Collected by (print): Ralph Minor Ray Duncan

Site/Facility ID #

P.O. # **727549**

Collected by (signature): Ray Duncan Ralph Minor

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed: Standard

Email? ___No X_Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth m	Date	Time	No. of Cntrs	ACIDITY, TDS 250mlHDPE-NoPres	ALK, SULFATE 125mlHDPE-NoPres	NH3 125mlHDPE-H2SO4	NO2/NO3, TOT PHOS 250mlHDPE-H2SO4	PT 250mlHDPE-H2SO4	TSS 1L-HDPE NoPres	Rem./Contaminant	Sample # (lab only)
COF-CA5-~~0715~~ 0615	G	GW	2.28	6-16-15	0836	1					X			-01
COF-CA29AR-~~0715~~ 0615	G	GW	8.0	6-16-15	1017	1					X			02
COF-CA6-~~0715~~ 0615	G	GW	15.0	6-15-15	1305	1					X			03
COF-CA11-~~0715~~ 0615	G	GW	18.0	6-15-15	1125	1					X			04
~~COF-CA31A-0715~~		GW				1					X			
~~COF-CA31A-DUP-0715~~		GW				1					X			
~~COF-CA20A-0715~~		GW				1					X			
~~COF-P8-0715~~		GW				1					X			
COF-MC1-~~0715~~ 0615	G	GW	12.0	6-15-15	1607	1					X			05
COF-MC4-~~0715~~ 0615	G	GW	5.0	6-15-15	1517	1					X			06

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Chain of Custody Page ___ of ___

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L771673

Table # I232

Acctnum: **TVAENVAFF**
Template: **T103259**
Prelogin: **P513970**
TSR: **633 - Pam Langford**
PB: 6-10 KW
Shipped Via: **FedEX Standard**

Hold #

Condition: (lab use only) ✓

COC Seal Intact: ___Y ___N ___NA

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Ray Duncan	6-16-15	1800	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ _____

Temp: 2.1 °C Bottles Received: 18

Date: 06-17-15 Time: 1030

pH Checked: C2 NCF:

TVA-Environmental Affairs

Knoxville, TN 37902

Billing Information:

Account Payable
1101 Market St. Mailstop: LP-5D-C
Chattanooga, TN 37402

Report to: **Maggie Gilliland**

Email To: **mggilliland@tva.gov, npagano@tva.gov,EDMSVK@tva.gov;magean@tva**

Project Description: **Colbert Fossil Groundwater**

City/State Collected: Muscle Shoals AL

Phone:
Fax:

Client Project # **COF GW**

Lab Project # **TVAENVAFF-COFGW**

Collected by (print): Ray Duncan Ralph Minor

Site/Facility ID #

P.O. # **727549**

Collected by (signature): Ray Duncan Ralph Minor

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed: Standard

Email? ___No X__Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	ACIDITY, TDS 250mlHDPE-NoPres	ALK, SULFATE 125mlHDPE-NoPres	NH3 125mlHDPE-H2SO4 ✓2	NO2/NO3, TOT PHOS 250mlHDPE-H2SO4 ✓2	PT 250mlHDPE-H2SO4 ✓2	TSS 1L-HDPE NoPres					Rem./Contaminant	Sample # (lab only)
COF-MC5A ~~0715~~ 0615	G	GW	6.5m	6/16/15	1130	1					X							-07
~~COF-FIELD BLANK-0715~~		GW				1					X							
~~COF-EQ BLANK-0715~~		GW				1					X							
COF-CA30B-~~0715~~ 0615	G	GW	16.0m	6-16-15	1354	1					X							08
~~COF-CA9R-0715~~		GW				5	X	X	X	X		X						
~~COF-CA9R-DUP-0715~~		GW				5	X	X	X	X		X						
COF-FIELD BLANK-~~0715~~ 0615	G	GW	NA	6-16-15	1408	5	X	X	X	X		X						09
COF-EQ BLANK-~~0715~~ 0615	G	GW	NA	6-16-15	1415	5	X	X	X	X		X						10

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Chain of Custody Page ___ of ___

ESC LABORATORY SCIENCES

YOUR LAB OF CHOICE

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L771673

Table #

Acctnum: **TVAENVAFF**

Template: **T103259**

Prelogin: **P513970**

TSR: **633 - Pam Langford**

PB: 6-10 KLW

Shipped Via: **FedEX Standard**

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Ray Duncan	6-16-15	1800	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☒ FedEx ☐ Courier ☐ _____

Temp: 2.1°C °C Bottles Received: 18

Date: 06-17-15 Time: 1030

Condition: (lab use only) YD

COC Seal Intact: ___Y ___N ✓NA

pH Checked: ✓ NCF:

ANALYTICAL REPORT

July 01, 2015

TVA-Environmental Affairs

Sample Delivery Group:	L771957
Samples Received:	06/18/2015
Project Number:	COF GW
Description:	Colbert Fossil Groundwater
Report To:	Maggie Gilliland
	Knoxville, TN 37902

Entire Report Reviewed By:

Pamela A. Langford

Pam Langford

Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



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COF-CA31A-0615 L771957-01 GW

Collected by: RD / RM
Collected date/time: 06/17/15 11:20
Received date/time: 06/18/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Wet Chemistry by Method 365.4	WG798068	1	06/25/15 10:38	06/25/15 14:23	DR

COF-CA31A-DUP-0615 L771957-02 GW

Collected by: RD / RM
Collected date/time: 06/17/15 11:20
Received date/time: 06/18/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Wet Chemistry by Method 365.4	WG798068	1	06/25/15 10:38	06/25/15 14:24	DR

COF-CA20A-0615 L771957-03 GW

Collected by: RD / RM
Collected date/time: 06/17/15 12:10
Received date/time: 06/18/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Wet Chemistry by Method 365.4	WG798068	1	06/25/15 10:38	06/25/15 14:25	DR

COF-P8-0615 L771957-04 GW

Collected by: RD / RM
Collected date/time: 06/17/15 10:58
Received date/time: 06/18/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Wet Chemistry by Method 365.4	WG798068	1	06/25/15 10:38	06/25/15 14:27	DR

COF-FIELD BLANK-0615 L771957-05 GW

Collected by: RD / RM
Collected date/time: 06/17/15 12:03
Received date/time: 06/18/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Wet Chemistry by Method 365.4	WG798068	1	06/25/15 10:38	06/25/15 14:28	DR

COF-EQ BLANK-0615 L771957-06 GW

Collected by: RD / RM
Collected date/time: 06/17/15 12:00
Received date/time: 06/18/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Wet Chemistry by Method 365.4	WG798068	1	06/25/15 10:38	06/25/15 14:29	DR

COF-CA9R-0615 L771957-07 GW

Collected by: RD / RM
Collected date/time: 06/17/15 13:14
Received date/time: 06/18/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analysis Analyst
Gravimetric Analysis by Method 2540 C-2011	WG797674	1	06/24/15 15:36	06/25/15 14:48	MF
Gravimetric Analysis by Method 2540 D-2011	WG797417	1	06/23/15 16:11	06/24/15 09:52	MF
Wet Chemistry by Method 2310 B-2011	WG797653	1	06/24/15 04:00	06/24/15 04:00	TOF
Wet Chemistry by Method 2320 B-2011	WG797748	1	06/26/15 11:21	06/26/15 11:21	LLS
Wet Chemistry by Method 350.1	WG798154	1	06/26/15 09:12	06/26/15 09:12	JAL
Wet Chemistry by Method 353.2	WG798414	1	06/26/15 02:24	06/26/15 02:24	ASK
Wet Chemistry by Method 365.4	WG798068	1	06/25/15 10:38	06/25/15 14:30	DR
Wet Chemistry by Method 9056MOD	WG798880	1	06/29/15 11:18	06/29/15 11:18	NJM

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Pamela A. Langford

Pam Langford

Pam Langford
Technical Service Representative

Wet Chemistry by Method 365.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Phosphorus,Total	0.121		0.100	1	06/25/2015 14:23	WG798068

Wet Chemistry by Method 365.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Phosphorus,Total	ND		0.100	1	06/25/2015 14:24	WG798068

Wet Chemistry by Method 365.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Phosphorus,Total	0.104		0.100	1	06/25/2015 14:25	WG798068

Wet Chemistry by Method 365.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Phosphorus,Total	ND		0.100	1	06/25/2015 14:27	WG798068

Wet Chemistry by Method 365.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Phosphorus,Total	ND		0.100	1	06/25/2015 14:28	WG798068

Wet Chemistry by Method 365.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Phosphorus,Total	ND		0.100	1	06/25/2015 14:29	WG798068

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	461		10.0	1	06/25/2015 14:48	WG797674

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	5.00		2.50	1	06/24/2015 09:52	WG797417

Wet Chemistry by Method 2310 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acidity	150		10.0	1	06/24/2015 04:00	WG797653

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	238		20.0	1	06/26/2015 11:21	WG797748

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	ND		0.250	1	06/26/2015 09:12	WG798154

Wet Chemistry by Method 353.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Nitrate-Nitrite	ND		0.100	1	06/26/2015 02:24	WG798414

Wet Chemistry by Method 365.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Phosphorus,Total	0.225		0.100	1	06/25/2015 14:30	WG798068

Wet Chemistry by Method 9056MOD

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Sulfate	85.2		5.00	1	06/29/2015 11:18	WG798880

Method Blank (MB)

(MB) 06/25/15 14:48

Analyte	MB Result mg/l	MB Qualifier	MB RDL mg/l
Dissolved Solids	ND		10.0

L771871-29 Original Sample (OS) • Duplicate (DUP)

(OS) 06/25/15 14:50 • (DUP) 06/25/15 14:49

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	551	564	1	2.33		5

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 06/25/15 14:50 • (LCSD) 06/25/15 14:50

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Dissolved Solids	8800	8650	8720	98.3	99.1	85.0-115			0.806	5

Method Blank (MB)

(MB) 06/24/15 09:48

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Suspended Solids	ND		2.50

L771840-01 Original Sample (OS) • Duplicate (DUP)

(OS) 06/24/15 09:50 • (DUP) 06/24/15 09:50

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Suspended Solids	257	245	1	4.65		5

L771889-04 Original Sample (OS) • Duplicate (DUP)

(OS) 06/24/15 09:53 • (DUP) 06/24/15 09:53

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Suspended Solids	8.67	8.89	1	2.53		5

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 06/24/15 09:46 • (LCSD) 06/24/15 09:46

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Suspended Solids	773	796	768	103	99.4	85.0-115			3.58	5

Method Blank (MB)

(MB) 06/24/15 04:00

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Acidity	ND		10.0

L771957-07 Original Sample (OS) • Duplicate (DUP)

(OS) 06/24/15 04:00 • (DUP) 06/24/15 04:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Acidity	150	150	1	1.3		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 06/24/15 04:00 • (LCSD) 06/24/15 04:00

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Acidity	20.0	22.0	22.0	110	110	85.0-115			0.000	20

Method Blank (MB)

(MB) 06/26/15 11:21

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Alkalinity	ND		20.0

L771871-21 Original Sample (OS) • Duplicate (DUP)

(OS) 06/26/15 11:21 • (DUP) 06/26/15 11:21

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Alkalinity	310	400	5	3.9		20

L771871-23 Original Sample (OS) • Duplicate (DUP)

(OS) 06/26/15 11:21 • (DUP) 06/26/15 11:21

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Alkalinity	350	350	5	0.57		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 06/26/15 11:21 • (LCSD) 06/26/15 11:21

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Alkalinity	100	108	112	108	112	85.0-115			3.64	20

L771871-20 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 06/26/15 11:21 • (MS) 06/26/15 11:21 • (MSD) 06/26/15 11:21

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Alkalinity	100	321	823	840	101	104	5	80.0-120			2.04	20

Method Blank (MB)

(MB) 06/26/15 09:00

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Ammonia Nitrogen	ND		0.250

L772123-06 Original Sample (OS) • Duplicate (DUP)

(OS) 06/26/15 10:15 • (DUP) 06/26/15 10:17

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Ammonia Nitrogen	ND	ND	1	0.00		20

L771957-07 Original Sample (OS) • Duplicate (DUP)

(OS) 06/26/15 09:12 • (DUP) 06/26/15 09:15

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Ammonia Nitrogen	ND	ND	1	0.00		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 06/26/15 09:05 • (LCSD) 06/26/15 09:07

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Ammonia Nitrogen	7.50	7.67	7.35	102	98.0	90.0-110			4.26	20

L772123-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 06/26/15 10:02 • (MS) 06/26/15 10:22 • (MSD) 06/26/15 10:25

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Ammonia Nitrogen	10.0	0.0560	9.53	10.1	95.3	101	1	90.0-110			5.81	20

L772015-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 06/26/15 09:17 • (MS) 06/26/15 09:20 • (MSD) 06/26/15 09:22

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%

Ammonia Nitrogen	10.0	0.382	11.3	11.2	109	108	1	90.0-110			0.889	20

Method Blank (MB)

(MB) 06/26/15 02:08

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Nitrate-Nitrite	ND		0.100

L771735-01 Original Sample (OS) • Duplicate (DUP)

(OS) 06/26/15 02:20 • (DUP) 06/26/15 02:22

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Nitrate-Nitrite	0.13	0.13	1	0.00		20

L772437-01 Original Sample (OS) • Duplicate (DUP)

(OS) 06/26/15 03:19 • (DUP) 06/26/15 03:20

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Nitrate-Nitrite	26	25	5	3.9		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 06/26/15 02:12 • (LCSD) 06/26/15 02:13

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Nitrate-Nitrite	5.00	5.10	5.07	102	101	90.0-110			0.590	20

L772197-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 06/26/15 02:26 • (MS) 06/26/15 02:28 • (MSD) 06/26/15 02:29

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Nitrate-Nitrite	5.00	0.0131	5.01	5.02	100	100	1	90.0-110			0.199	20

Method Blank (MB)

(MB) 06/25/15 14:11

Analyte	MB Result mg/l	MB Qualifier	MB RDL mg/l
Phosphorus,Total	ND		0.100

L771667-02 Original Sample (OS) • Duplicate (DUP)

(OS) 06/25/15 14:48 • (DUP) 06/25/15 14:50

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Phosphorus,Total	ND	ND	1	200		20

L771667-03 Original Sample (OS) • Duplicate (DUP)

(OS) 06/25/15 14:18 • (DUP) 06/25/15 14:19

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Phosphorus,Total	0.16	ND	1	200	P1	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 06/25/15 14:14 • (LCSD) 06/25/15 14:15

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Phosphorus,Total	1.00	1.01	0.993	101	99.3	90.0-110			1.70	20

Method Blank (MB)

(MB) 06/29/15 08:34

Analyte	MB Result	MB Qualifier	MB RDL
	mg/l		mg/l
Sulfate	ND		5.00

L772128-02 Original Sample (OS) • Duplicate (DUP)

(OS) 06/29/15 12:59 • (DUP) 06/29/15 13:13

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Sulfate	2.65	2.59	1	2	J	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 06/29/15 08:48 • (LCSD) 06/29/15 09:03

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Sulfate	40.0	40.6	40.4	101	101	90-110			0	20

L771957-07 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 06/29/15 11:18 • (MS) 06/29/15 11:32 • (MSD) 06/29/15 11:47

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Sulfate	50.0	85.2	126	127	82	84	1	80-120			1	20

Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND,U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.
SDL	Sample Detection Limit.
MQL	Method Quantitation Limit.
Unadj. MQL	Unadjusted Method Quantitation Limit.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.**

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Conneticut	PH-0197	North Carolina [1]	DW21704
Florida	E87487	North Carolina [2]	41
Georgia	NELAP	North Dakota	R-140
Georgia [1]	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky [1]	90010	South Dakota	n/a
Kentucky [2]	16	Tennessee [1 4]	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

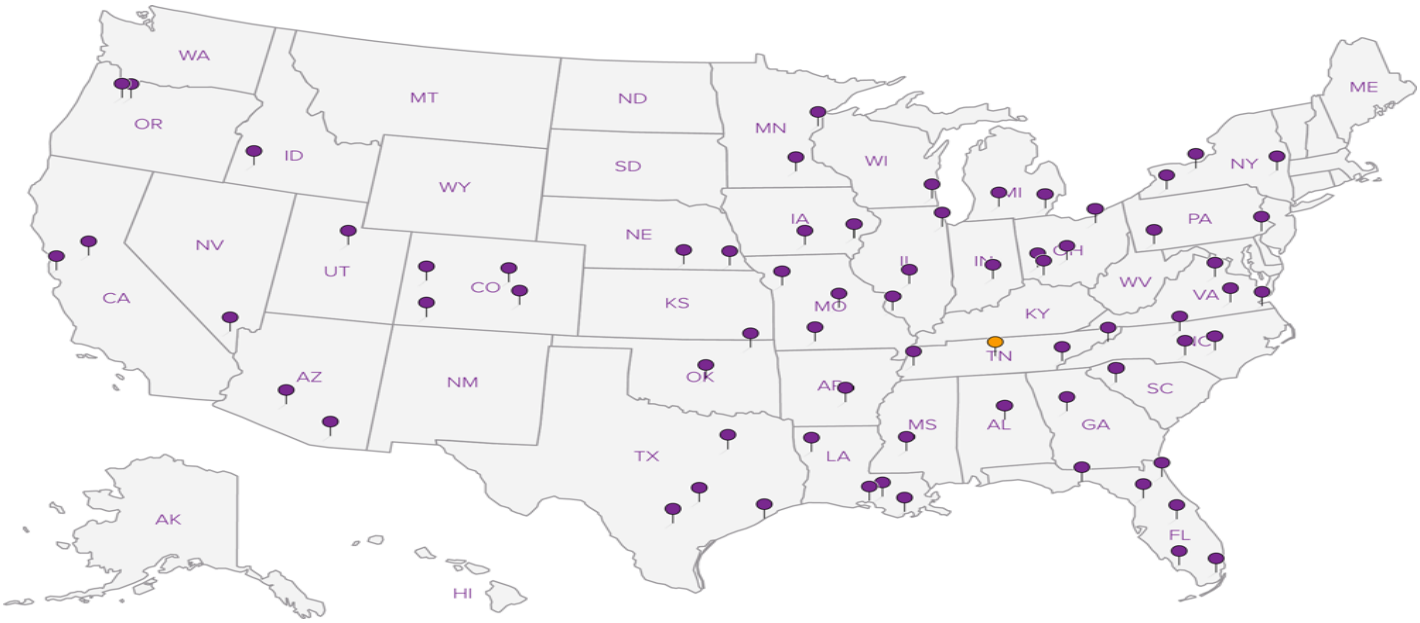
[1.] Drinking Water [2.] Underground Storage Tanks [3.] Aquatic Toxicity [4.] Chemical/Microbiological [5.] Mold [n/a] Accreditation not applicable

Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA	100789
Canada	1461.01	DOD	1461.01
EPA–Crypto	TN00003	USDA	S-67674

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



TVA-Environmental Affairs

Knoxville, TN 37902

Billing Information:

Account Payable
1101 Market St. Mailstop: LP-5D-C
Chattanooga, TN 37402

Report to: **Maggie Gilliland**

Email To: **mggilliland@tva.gov, npagano@tva.gov,EDMSVK@tva.gov;magean@tva**

Project Description: **Colbert Fossil Groundwater**

City/State Collected: **Muscle Shoals AL**

Phone:
Fax:

Client Project # **COF GW**

Lab Project # **TVAENVAFF-COFGW**

Collected by (print): **Ray Duncan** **Ralph Miron**

Site/Facility ID #

P.O. # **727549**

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed: **Standard**

Email? ___No X__Yes
FAX? ___No ___Yes

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	ACIDITY, TDS 250mlHDPE-NoPres	ALK, SULFATE 125mlHDPE-NoPres	NH2 [illegible] H2SO4	NO2/NO3, TOT PHOS 250mlHDPE-H2SO4	PT 250mlHDPE-H2SO4	TSS 1L-HDPE NoPres	Rem./Contaminant	Sample # (lab only)
~~COF-CA5-0715~~		GW				1					X			
~~COF-CA29AR-0715~~		GW				1					X			
~~COF-CA6-0715~~		GW				1					X			
~~COF-CA11-0715~~		GW				1					X			
COF-CA31A-~~0715~~ 0615	G	GW	4.3	6/17/15	1120	1					X			01
COF-CA31A-DUP-~~0715~~ 0615	G	GW	4.3	6/17/15	1120	1					X			02
COF-CA20A-~~0715~~ 0615	G	GW	13.3	6/17/15	1210	1					X			03
COF-P8-~~0715~~ 0615	G	GW	NA	6/17/15	1058	1					X			01
~~COF-MC1-0715~~		GW				1					X			
~~COF-MC4-0715~~		GW				1					X			

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: 7808 3706 9774

pH _____ Temp _____

Flow _____ Other _____

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____

Temp: 24°C Bottles Received: 11

Date: 6/18/15 Time: 0900

Hold #

Condition: (lab use only)

COC Seal Intact: ✓ Y ___N ___NA

pH Checked: 2 NCF:

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Ray Duncan	6/17/15	1500	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Chain of Custody Page ___ of ___

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 771957

T: I017

Acctnum: **TVAENVAFF**
Template: **T103259**
Prelogin: **P513970**
TSR: **633 - Pam Langford**
PB: 6-10 KW
Shipped Via: **FedEX Standard**

Chain of Custody Page ___ of ___

ESC LAB SCIENCES

YOUR LAB OF CHOICE

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

TVA-Environmental Affairs

Knoxville, TN 37902

Billing Information:
Account Payable
1101 Market St. Mailstop: LP-5D-C
Chattanooga, TN 37402

Email To: mggilliland@tva.gov, npagano@tva.gov,EDMSVK@tva.gov;magean@tva

Report to: Maggie Gilliland

Project Description: Colbert Fossil Groundwater

City/State Collected: Muscle Shoals AL

Phone:
Fax:

Client Project # COF GW

Lab Project # TVAENVAFF-COFGW

Collected by (print): Ray Duncan RALPH MINOR

Site/Facility ID #

P.O. # 727549

Collected by (signature): Ray Duncan Ralph M

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed: Standard

Email? ___No X Yes
FAX? ___No ___Yes

L# 771559

Table #

Acctnum: TVAENVAFF
Template: T103259
Prelogin: P513970
TSR: 633 - Pam Langford
PB: 6-10 KW
Shipped Via: FedEX Standard

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	ACIDITY, TDS 250mlHDPE-NoPres	ALK, SULFATE 125mlHDPE-NoPres	NH3 125mlHDPE-H2SO4 <2	NO2/NO3, TOT PHOS 250mlHDPE-H2SO4 <2	PT 250mlHDPE-H2SO4 <2	TSS 1L-HDPE NoPres					Rem./Contaminant	Sample # (lab only)
~~COF-MC5A-0715~~		GW				1					X							
COF-FIELD BLANK-~~0715~~ 0615	G	GW	NA	6/17/15	1203	1					X							05
COF-EQ BLANK-~~0715~~ 0615	G	GW	NA	6/17/15	1200	1					X							06
~~COF-CA30B-0715~~		GW				1					X							
COF-CA9R-~~0715~~ 0615	G	GW	21.3	6/17/15	1314	5	X	X	X	X		X						07
~~COF-CA9R-DUP-0715~~		GW				5	X	X	X	X		X						
~~COF-FIELD BLANK-0715~~		GW				5	X	X	X	X		X						
~~COF-EQ BLANK-0715~~		GW				5	X	X	X	X		X						

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Ray Duncan	6/17/15	1500	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☒ FedEx ☐ Courier ☐ _____

Temp: 2.4°C °C Bottles Received: 11

Date: 6/18/15 Time: 0900

Condition: (lab use only) for TDI

COC Seal Intact: ✓ Y ___N ___NA

pH Checked: NCF:

APPENDIX C

STATISTICAL SUMMARY OF BACKGROUND MONITORING DATA

This appendix contains background groundwater quality data for monitoring well CA5, completed in the soil zone, and wells CA6 and CA11, completed in the Fort Payne - Tuscumbia bedrock aquifer. Statistics are based upon background monitoring data collected since January 2000.

Colbert
Statistical Summary for Multiple Parameters (100)

User Supplied Information

Date Range: 01/01/2000 to 06/17/2015 **Option for LT Pts:** **x 1.0**

Locations: **COF-CA11,COF-CA5,COF-CA6,COF-P8**

Parameter **Units**

Aluminum, total **mg/L**

Location	Class	Count	Mean	Median	Maximum	Minimum	Std Dev	Sen Slope Units/yr	Normal / Log Normal	% of Non-Detects
COF-CA11	Compliance	31	0.271	0.100	1.990	0.050	0.391	0.00	No / No	54.84
COF-CA5	Compliance	29	3.608	1.500	49.000	0.140	8.978	-0.09	No / Yes	0.00
COF-CA6	Compliance	31	0.218	0.110	0.800	0.050	0.222	0.00	No / No	58.06
COF-P8	Compliance	31	0.100	0.100	0.500	0.050	0.084	0.00	No / No	100.00

Shapiro-Wilk Normality test performed at 0.05 significance level.

Colbert
Statistical Summary for Multiple Parameters (100)

User Supplied Information

Date Range: 01/01/2000 to 06/17/2015 **Option for LT Pts:** **x 1.0**
Locations: **COF-CA11,COF-CA5,COF-CA6,COF-P8**
Parameter **Units**
Antimony, total **ug/L**

Location	Class	Count	Mean	Median	Maximum	Minimum	Std Dev	Sen Slope Units/yr	Normal / Log Normal	% of Non-Detects
COF-CA11	Compliance	31	1.327	1.000	3.000	0.100	0.797	0.00	No / No	90.32
COF-CA5	Compliance	29	1.335	1.000	3.000	0.100	0.828	0.00	No / No	93.10
COF-CA6	Compliance	32	1.337	1.000	3.000	0.100	0.808	0.00	No / No	93.75
COF-P8	Compliance	31	1.314	1.000	3.000	0.520	0.785	0.00	No / No	96.77

Shapiro-Wilk Normality test performed at 0.05 significance level.

Colbert
Statistical Summary for Multiple Parameters (100)

User Supplied Information

Date Range: 01/01/2000 to 06/17/2015 **Option for LT Pts:** **x 1.0**
Locations: **COF-CA11,COF-CA5,COF-CA6,COF-P8**
Parameter **Units**
Arsenic, total **ug/L**

Location	Class	Count	Mean	Median	Maximum	Minimum	Std Dev	Sen Slope Units/yr	Normal / Log Normal	% of Non-Detects
COF-CA11	Compliance	31	1.148	1.000	3.300	0.100	0.564	0.00	No / No	83.87
COF-CA5	Compliance	29	2.129	1.000	9.700	0.330	2.304	0.00	No / No	51.72
COF-CA6	Compliance	32	1.269	1.000	3.000	0.100	0.614	0.00	No / No	71.88
COF-P8	Compliance	31	1.057	1.000	3.700	0.100	0.593	0.00	No / No	80.65

Shapiro-Wilk Normality test performed at 0.05 significance level.

Colbert
Statistical Summary for Multiple Parameters (100)

User Supplied Information

Date Range: 01/01/2000 to 06/17/2015 **Option for LT Pts:** **x 1.0**
Locations: **COF-CA11,COF-CA5,COF-CA6,COF-P8**
Parameter **Units**
Boron, total **ug/L**

Location	Class	Count	Mean	Median	Maximum	Minimum	Std Dev	Sen Slope Units/yr	Normal / Log Normal	% of Non-Detects
COF-CA11	Compliance	31	186.516	200.000	200.000	32.000	42.852	0.00	No / No	96.77
COF-CA5	Compliance	29	186.483	200.000	200.000	50.000	41.129	0.00	No / No	93.10
COF-CA6	Compliance	31	610.613	600.000	900.000	200.000	145.644	-13.94	Yes / No	3.23
COF-P8	Compliance	31	186.677	200.000	200.000	37.000	42.256	0.00	No / No	96.77

Shapiro-Wilk Normality test performed at 0.05 significance level.

Colbert
Statistical Summary for Multiple Parameters (100)

User Supplied Information

Date Range: 01/01/2000 to 06/17/2015 **Option for LT Pts:** **x 1.0**
Locations: **COF-CA11,COF-CA5,COF-CA6,COF-P8**
Parameter **Units**
Chromium, total **ug/L**

Location	Class	Count	Mean	Median	Maximum	Minimum	Std Dev	Sen Slope Units/yr	Normal / Log Normal	% of Non-Detects
COF-CA11	Compliance	31	5.204	4.000	19.000	1.000	3.937	0.00	No / Yes	3.23
COF-CA5	Compliance	29	5.224	3.000	40.000	1.000	7.554	0.00	No / No	34.48
COF-CA6	Compliance	32	2.644	2.000	10.000	0.100	2.127	0.09	No / No	43.75
COF-P8	Compliance	31	1.774	1.000	10.000	0.100	1.952	0.10	No / No	87.10

Shapiro-Wilk Normality test performed at 0.05 significance level.

Colbert
Statistical Summary for Multiple Parameters (100)

User Supplied Information

Date Range: 01/01/2000 to 06/17/2015 **Option for LT Pts:** **x 1.0**
Locations: **COF-CA11,COF-CA5,COF-CA6,COF-P8**
Parameter **Units**
Copper, total **ug/L**

Location	Class	Count	Mean	Median	Maximum	Minimum	Std Dev	Sen Slope Units/yr	Normal / Log Normal	% of Non-Detects
COF-CA11	Compliance	31	6.584	10.000	20.000	1.000	4.830	0.00	No / No	90.32
COF-CA5	Compliance	29	15.052	10.000	160.000	1.300	28.842	-0.09	No / No	55.17
COF-CA6	Compliance	32	6.950	10.000	20.000	1.000	4.736	0.00	No / No	90.63
COF-P8	Compliance	31	8.229	10.000	40.000	1.500	7.362	0.00	No / No	70.97

Shapiro-Wilk Normality test performed at 0.05 significance level.

Colbert
Statistical Summary for Multiple Parameters (100)

User Supplied Information

Date Range: 01/01/2000 to 06/17/2015 **Option for LT Pts:** **x 1.0**
Locations: **COF-CA11,COF-CA5,COF-CA6,COF-P8**
Parameter **Units**
Iron, total **ug/L**

Location	Class	Count	Mean	Median	Maximum	Minimum	Std Dev	Sen Slope Units/yr	Normal / Log Normal	% of Non-Detects
COF-CA11	Compliance	31	255.581	100.000	2,340.000	26.000	432.631	0.00	No / No	29.03
COF-CA5	Compliance	29	6,175.448	1,200.000	100,000.000	180.000	18,953.537	-13.58	No / No	0.00
COF-CA6	Compliance	31	242.484	170.000	1,150.000	51.000	228.859	0.00	No / Yes	9.68
COF-P8	Compliance	31	223.742	100.000	980.000	58.000	268.421	0.00	No / No	35.48

Shapiro-Wilk Normality test performed at 0.05 significance level.

Colbert
Statistical Summary for Multiple Parameters (100)

User Supplied Information

Date Range: 01/01/2000 to 06/17/2015 **Option for LT Pts:** **x 1.0**
Locations: **COF-CA11,COF-CA5,COF-CA6,COF-P8**
Parameter **Units**
Lead, total **ug/L**

Location	Class	Count	Mean	Median	Maximum	Minimum	Std Dev	Sen Slope Units/yr	Normal / Log Normal	% of Non-Detects
COF-CA11	Compliance	31	2.877	2.300	11.000	0.500	2.265	-0.06	No / Yes	29.03
COF-CA5	Compliance	29	6.728	1.900	100.000	1.000	18.705	0.00	No / No	41.38
COF-CA6	Compliance	32	1.266	1.000	5.000	0.400	0.851	0.00	No / No	84.38
COF-P8	Compliance	31	7.461	2.500	39.000	1.000	10.587	-0.14	No / No	16.13

Shapiro-Wilk Normality test performed at 0.05 significance level.

Colbert
Statistical Summary for Multiple Parameters (100)

User Supplied Information

Date Range: 01/01/2000 to 06/17/2015 **Option for LT Pts:** **x 1.0**
Locations: **COF-CA11,COF-CA5,COF-CA6,COF-P8**
Parameter **Units**
Lithium, total **ug/L**

Location	Class	Count	Mean	Median	Maximum	Minimum	Std Dev	Sen Slope Units/yr	Normal / Log Normal	% of Non-Detects
COF-CA11	Compliance	31	12.665	15.000	20.000	2.600	3.581	0.33	No / No	90.32
COF-CA5	Compliance	29	12.134	10.000	20.000	1.900	3.451	0.36	No / No	89.66
COF-CA6	Compliance	31	57.116	60.000	71.000	10.000	14.948	0.40	No / No	3.23
COF-P8	Compliance	31	12.548	10.000	23.000	1.000	3.974	0.42	No / No	96.77

Shapiro-Wilk Normality test performed at 0.05 significance level.

Colbert
Statistical Summary for Multiple Parameters (100)

User Supplied Information

Date Range: 01/01/2000 to 06/17/2015 **Option for LT Pts:** **x 1.0**
Locations: **COF-CA11,COF-CA5,COF-CA6,COF-P8**
Parameter **Units**
Manganese, total **ug/L**

Location	Class	Count	Mean	Median	Maximum	Minimum	Std Dev	Sen Slope Units/yr	Normal / Log Normal	% of Non-Detects
COF-CA11	Compliance	31	35.587	23.000	200.000	2.400	40.472	-0.24	No / Yes	16.13
COF-CA5	Compliance	29	141.621	38.000	920.000	6.000	218.220	-0.33	No / No	6.90
COF-CA6	Compliance	31	11.690	10.000	34.000	3.800	6.798	0.00	No / Yes	35.48
COF-P8	Compliance	31	15.781	10.000	250.000	5.000	43.569	0.40	No / No	80.65

Shapiro-Wilk Normality test performed at 0.05 significance level.

Colbert
Statistical Summary for Multiple Parameters (100)

User Supplied Information

Date Range: 01/01/2000 to 06/17/2015 **Option for LT Pts:** **x 1.0**
Locations: **COF-CA11,COF-CA5,COF-CA6,COF-P8**
Parameter **Units**
Molybdenum, total **ug/L**

Location	Class	Count	Mean	Median	Maximum	Minimum	Std Dev	Sen Slope Units/yr	Normal / Log Normal	% of Non-Detects
COF-CA11	Compliance	31	14.258	20.000	50.000	2.000	9.811	-0.50	No / No	90.32
COF-CA5	Compliance	29	15.190	20.000	50.000	2.000	11.985	-1.07	No / No	93.10
COF-CA6	Compliance	31	14.135	20.000	50.000	2.000	10.080	0.00	No / No	96.77
COF-P8	Compliance	31	13.723	20.000	50.000	2.000	10.103	0.00	No / No	96.77

Shapiro-Wilk Normality test performed at 0.05 significance level.

Colbert
Statistical Summary for Multiple Parameters (100)

User Supplied Information

Date Range: 01/01/2000 to 06/17/2015 **Option for LT Pts:** **x 1.0**
Locations: **COF-CA11,COF-CA5,COF-CA6,COF-P8**
Parameter **Units**
Nitrite + Nitrate **mg/L**

Location	Class	Count	Mean	Median	Maximum	Minimum	Std Dev	Sen Slope Units/yr	Normal / Log Normal	% of Non-Detects
COF-CA11	Compliance	18	0.536	0.550	0.680	0.360	0.082	0.00	Yes / Yes	0.00
COF-CA5	Compliance	16	0.108	0.100	0.250	0.040	0.042	0.00	No / No	87.50
COF-CA6	Compliance	17	0.104	0.100	0.250	0.020	0.042	0.00	No / No	94.12
COF-P8	Compliance	26	0.517	0.440	1.100	0.010	0.314	-0.05	Yes / No	15.38

Shapiro-Wilk Normality test performed at 0.05 significance level.

Colbert
Statistical Summary for Multiple Parameters (100)

User Supplied Information

Date Range: 01/01/2000 to 06/17/2015 **Option for LT Pts:** **x 1.0**
Locations: **COF-CA11,COF-CA5,COF-CA6,COF-P8**
Parameter **Units**
Nitrogen, Ammonia **mg/L**

Location	Class	Count	Mean	Median	Maximum	Minimum	Std Dev	Sen Slope Units/yr	Normal / Log Normal	% of Non-Detects
COF-CA11	Compliance	18	0.136	0.100	0.500	0.010	0.106	0.00	No / No	94.44
COF-CA5	Compliance	16	0.150	0.100	0.500	0.070	0.107	0.01	No / No	75.00
COF-CA6	Compliance	17	0.379	0.370	0.501	0.250	0.077	0.01	Yes / Yes	11.76
COF-P8	Compliance	26	0.097	0.100	0.500	0.010	0.106	0.01	No / No	92.31

Shapiro-Wilk Normality test performed at 0.05 significance level.

Colbert
Statistical Summary for Multiple Parameters (100)

User Supplied Information

Date Range: 01/01/2000 to 06/17/2015 **Option for LT Pts:** **x 1.0**
Locations: **COF-CA11,COF-CA5,COF-CA6,COF-P8**
Parameter **Units**
Phosphorus, total **mg/L**

Location	Class	Count	Mean	Median	Maximum	Minimum	Std Dev	Sen Slope Units/yr	Normal / Log Normal	% of Non-Detects
COF-CA11	Compliance	17	0.126	0.100	0.400	0.100	0.078	0.00	No / No	94.12
COF-CA5	Compliance	15	0.186	0.100	0.620	0.100	0.173	0.00	No / No	80.00
COF-CA6	Compliance	16	0.190	0.115	0.800	0.100	0.180	0.01	No / No	43.75
COF-P8	Compliance	17	0.146	0.100	0.480	0.100	0.114	0.00	No / No	88.24

Shapiro-Wilk Normality test performed at 0.05 significance level.

Colbert
Statistical Summary for Multiple Parameters (100)

User Supplied Information

Date Range: 01/01/2000 to 06/17/2015 **Option for LT Pts:** **x 1.0**
Locations: **COF-CA11,COF-CA5,COF-CA6,COF-P8**
Parameter **Units**
Strontium, total **ug/L**

Location	Class	Count	Mean	Median	Maximum	Minimum	Std Dev	Sen Slope Units/yr	Normal / Log Normal	% of Non-Detects
COF-CA11	Compliance	31	141.129	140.000	200.000	90.000	29.245	4.45	Yes / Yes	0.00
COF-CA5	Compliance	29	126.714	97.000	330.000	42.000	80.577	1.14	No / No	13.79
COF-CA6	Compliance	31	3,563.871	3,730.000	4,300.000	10.000	922.806	-35.19	No / No	3.23
COF-P8	Compliance	31	155.935	160.000	230.000	110.000	22.184	0.83	No / No	0.00

Shapiro-Wilk Normality test performed at 0.05 significance level.

Colbert
Statistical Summary for Multiple Parameters (100)

User Supplied Information

Date Range: 01/01/2000 to 06/17/2015 **Option for LT Pts:** **x 1.0**
Locations: **COF-CA11,COF-CA5,COF-CA6,COF-P8**
Parameter **Units**
Sulfate, total **mg/L**

Location	Class	Count	Mean	Median	Maximum	Minimum	Std Dev	Sen Slope Units/yr	Normal / Log Normal	% of Non-Detects
COF-CA11	Compliance	31	4.214	5.000	9.800	1.200	2.044	0.05	No / No	45.16
COF-CA5	Compliance	29	9.441	9.000	18.000	1.800	3.773	-0.55	Yes / No	3.45
COF-CA6	Compliance	31	35.652	31.000	79.000	5.200	22.838	-3.89	No / Yes	0.00
COF-P8	Compliance	31	8.477	8.300	11.000	5.400	1.295	-0.05	Yes / Yes	0.00

Shapiro-Wilk Normality test performed at 0.05 significance level.

Colbert
Statistical Summary for Multiple Parameters (100)

User Supplied Information

Date Range: 01/01/2000 to 06/17/2015 **Option for LT Pts:** **x 1.0**
Locations: **COF-CA11,COF-CA5,COF-CA6,COF-P8**
Parameter **Units**
Vanadium, total **ug/L**

Location	Class	Count	Mean	Median	Maximum	Minimum	Std Dev	Sen Slope Units/yr	Normal / Log Normal	% of Non-Detects
COF-CA11	Compliance	31	6.578	10.000	10.000	0.920	4.101	-0.61	No / No	96.77
COF-CA5	Compliance	29	9.587	10.000	82.000	0.730	14.432	-0.64	No / No	82.76
COF-CA6	Compliance	32	6.669	10.000	10.000	0.410	4.103	-0.62	No / No	96.88
COF-P8	Compliance	31	6.575	10.000	10.000	0.840	4.104	-0.61	No / No	96.77

Shapiro-Wilk Normality test performed at 0.05 significance level.

Colbert
Statistical Summary for Multiple Parameters (100)

User Supplied Information

Date Range: 01/01/2000 to 06/17/2015 **Option for LT Pts:** **x 1.0**
Locations: **COF-CA11,COF-CA5,COF-CA6,COF-P8**
Parameter **Units**
Zinc, total **ug/L**

Location	Class	Count	Mean	Median	Maximum	Minimum	Std Dev	Sen Slope Units/yr	Normal / Log Normal	% of Non-Detects
COF-CA11	Compliance	31	12.903	10.000	50.000	8.000	9.460	0.00	No / No	87.10
COF-CA5	Compliance	29	33.828	20.000	200.000	10.000	44.101	0.91	No / No	27.59
COF-CA6	Compliance	32	17.188	10.000	50.000	10.000	12.419	0.48	No / No	59.38
COF-P8	Compliance	31	894.097	850.000	3,200.000	140.000	626.108	-18.92	No / Yes	0.00

Shapiro-Wilk Normality test performed at 0.05 significance level.

Colbert
Statistical Summary for Multiple Parameters (100)

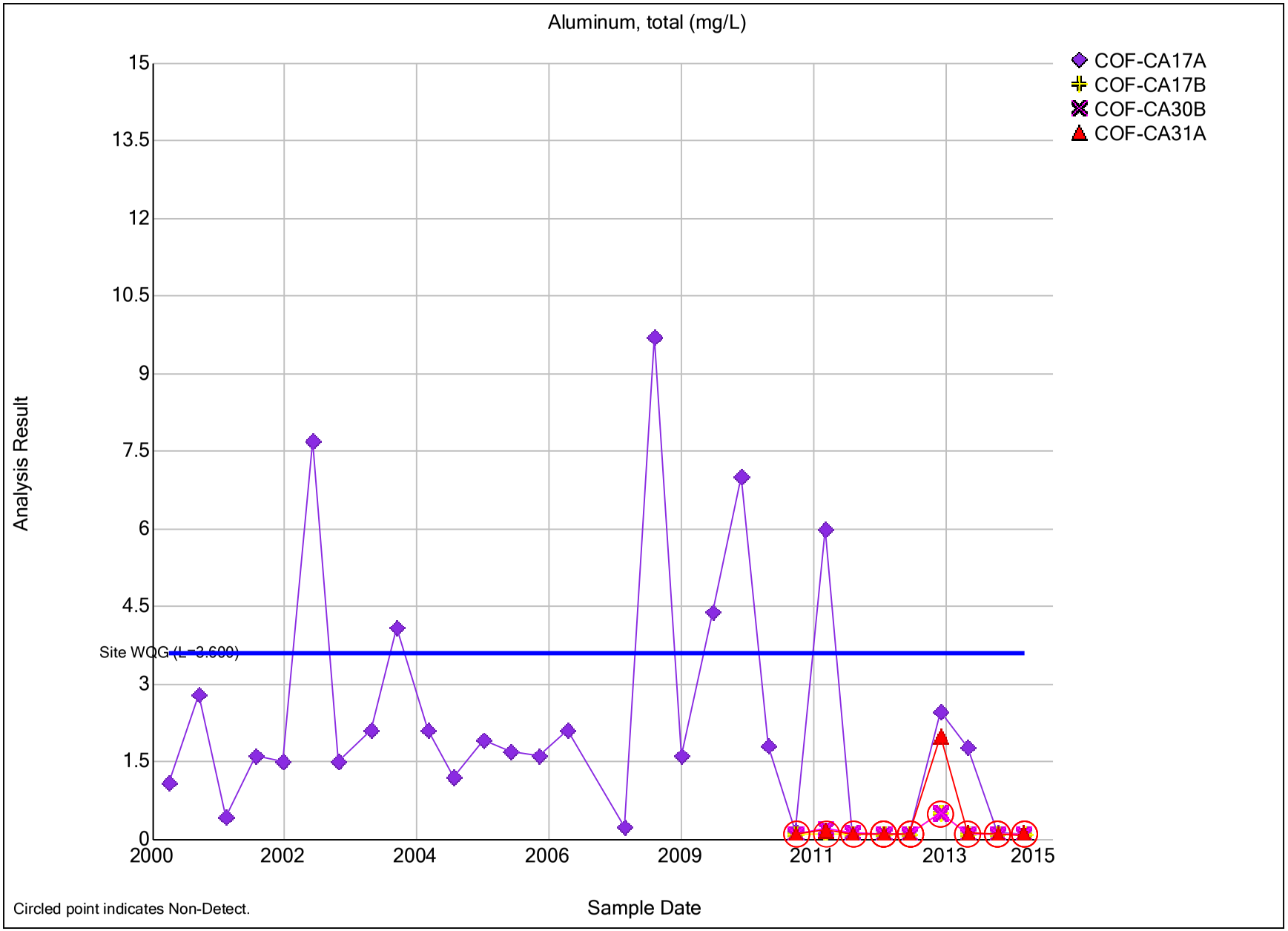
User Supplied Information

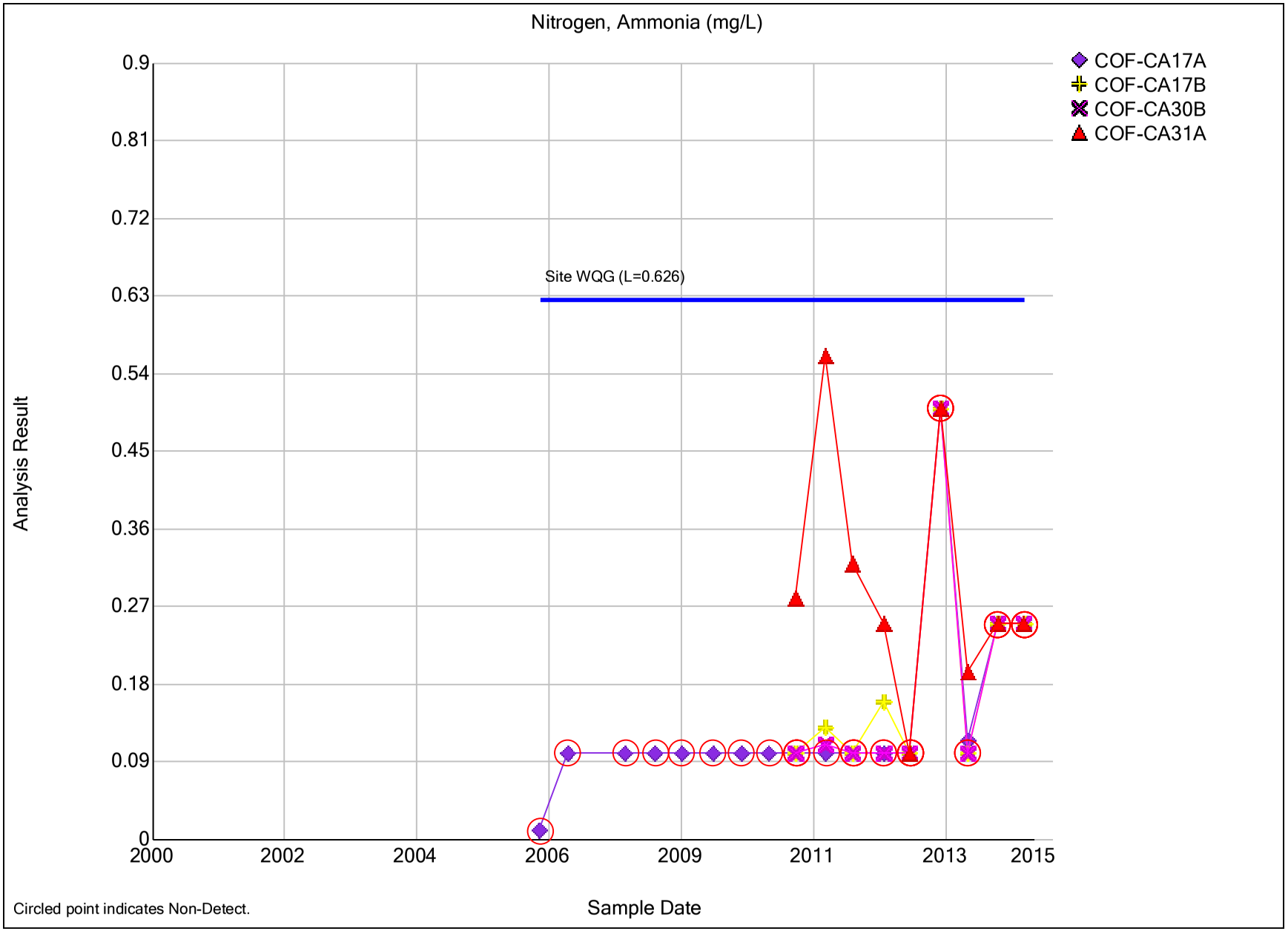
Date Range: 01/01/2000 to 06/17/2015 **Option for LT Pts:** **x 1.0**
Locations: **COF-CA11,COF-CA5,COF-CA6,COF-P8**

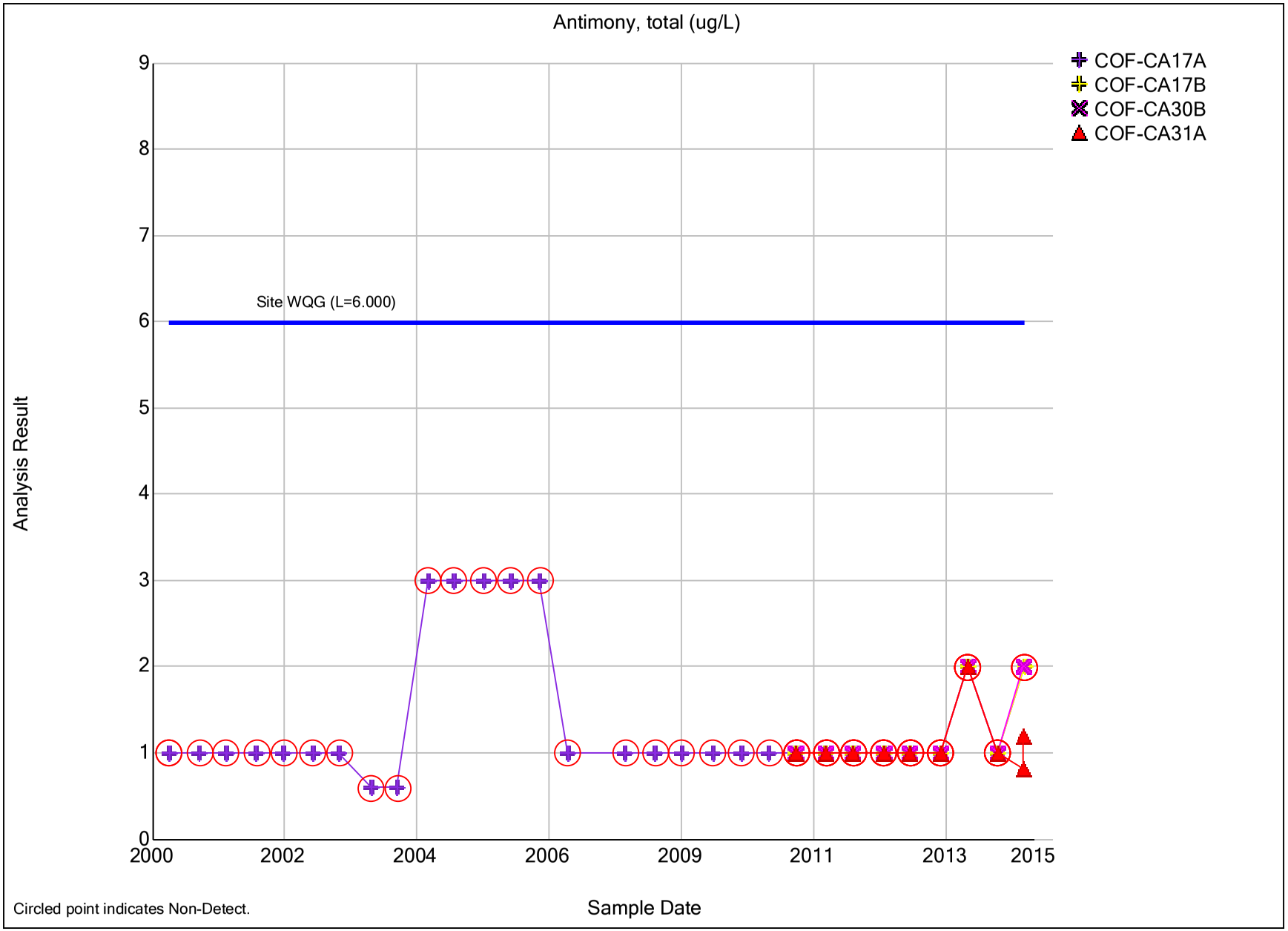
APPENDIX D

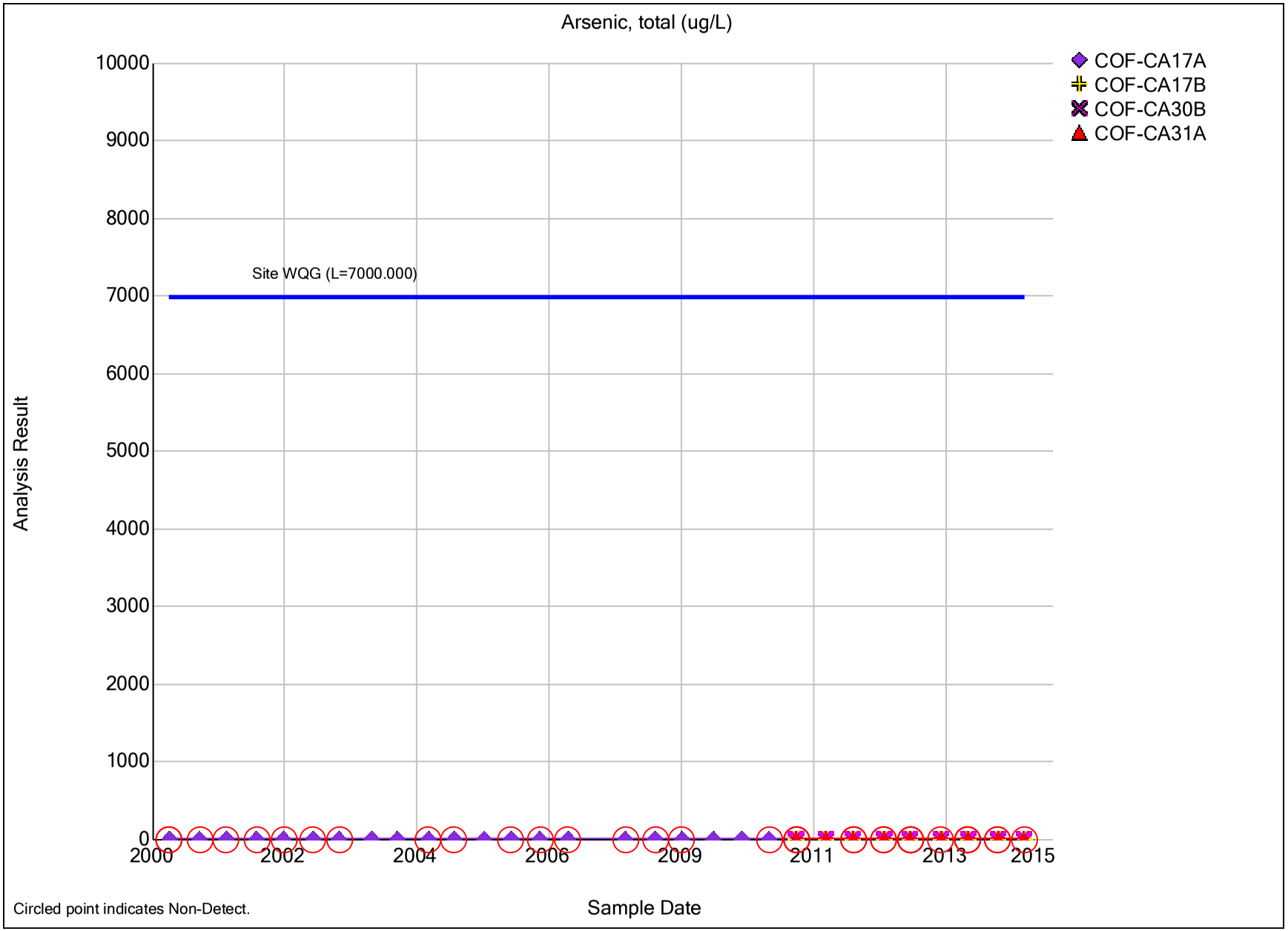
SAMPLE CONSTITUENT TIME SERIES FOR ASH POND 4 WELLS

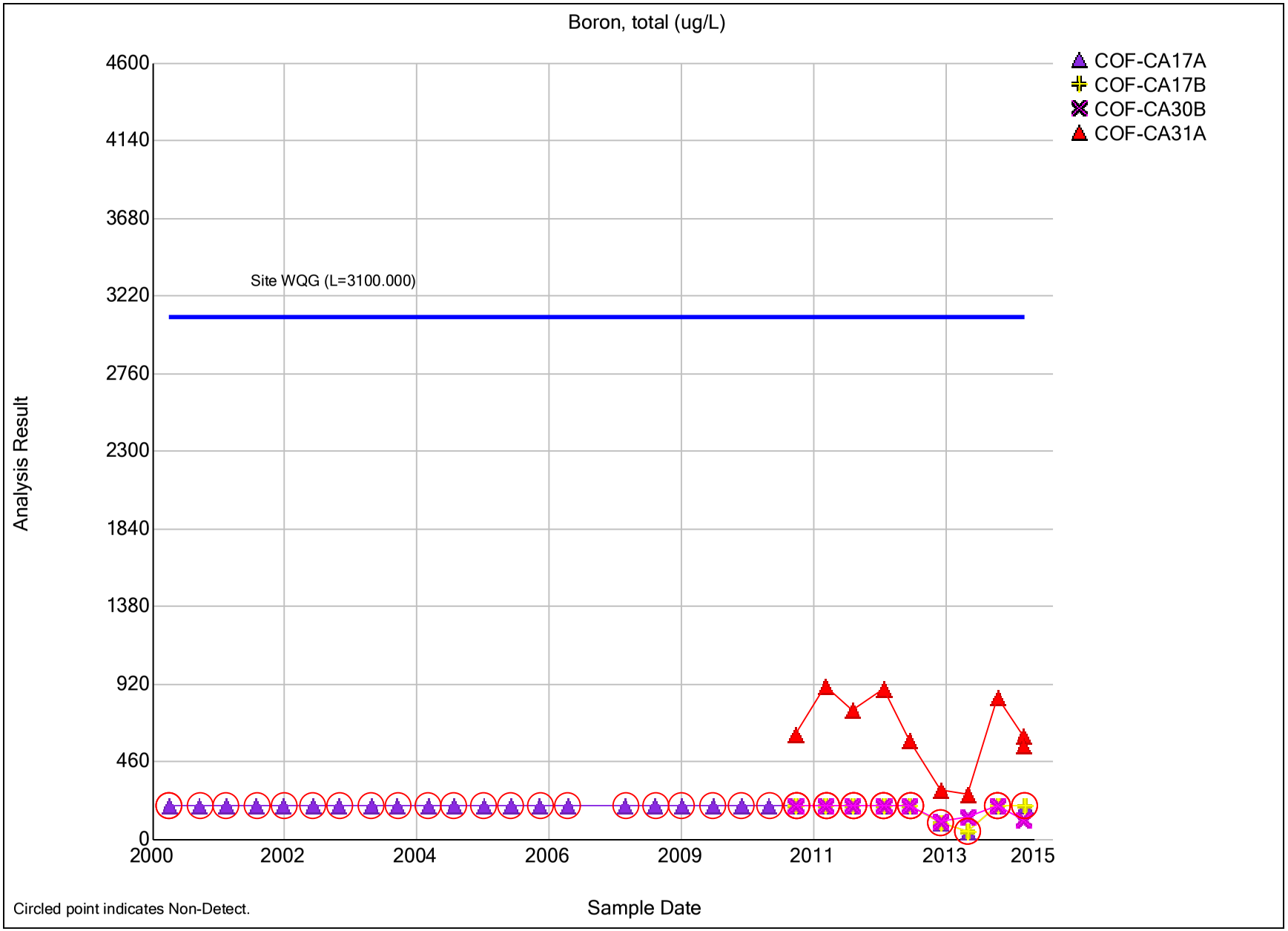
Note that open circle symbols on graphs denote measurements below analytical reporting limits, and nondetect measurements are displayed at the reporting limit. The site water quality goal (WQG) for each constituent is included on graphs for reference.

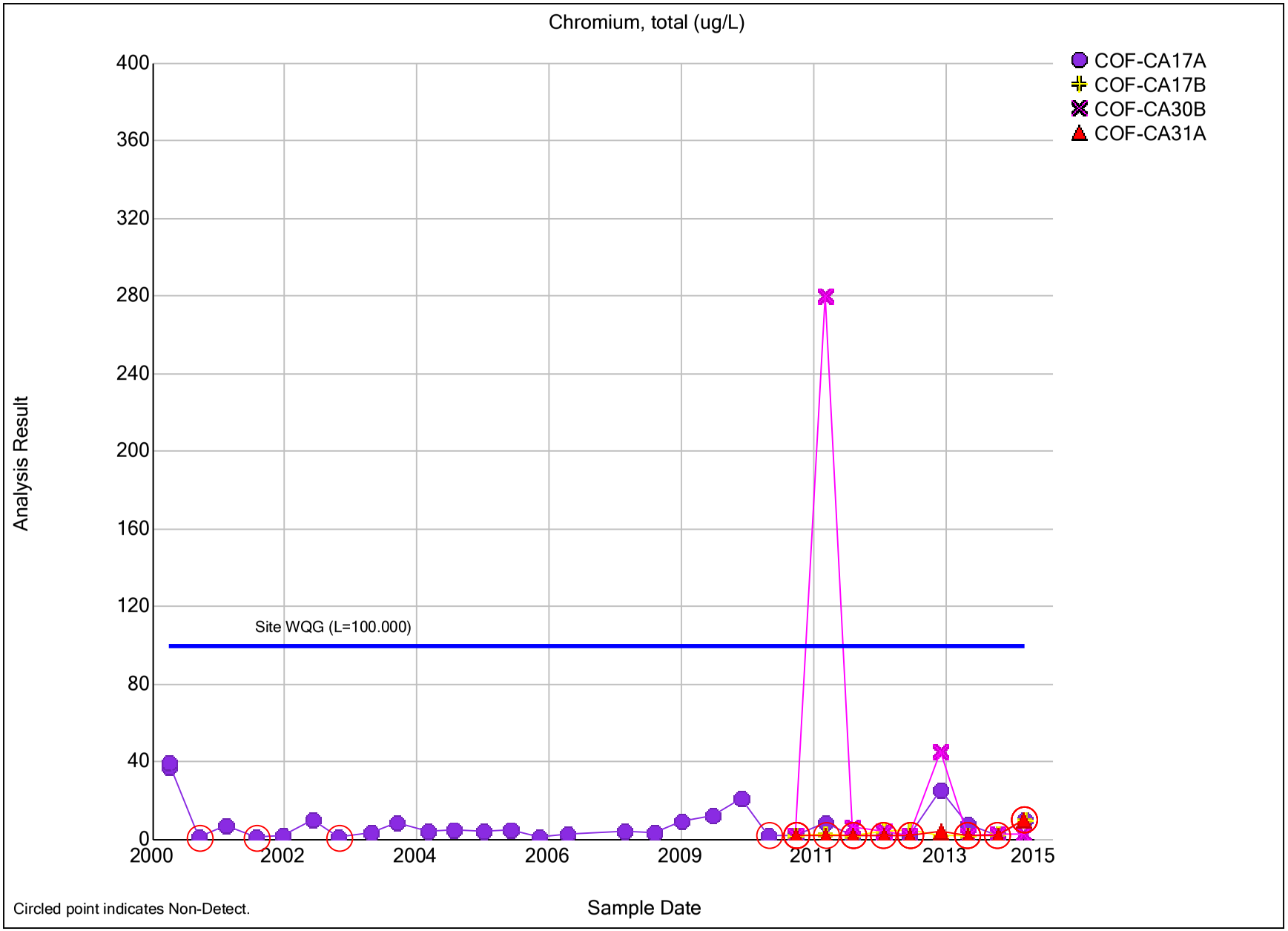

Aluminum, total (mg/L)
COF-CA17A
COF-CA17B
COF-CA30B
COF-CA31A
Analysis Result
15
13.5
12
10.5
9
7.5
6
4.5
3
1.5
0
Site WQG (L=3.600)
2000
2002
2004
2006
2009
2011
2013
2015
Sample Date
Circled point indicates Non-Detect.

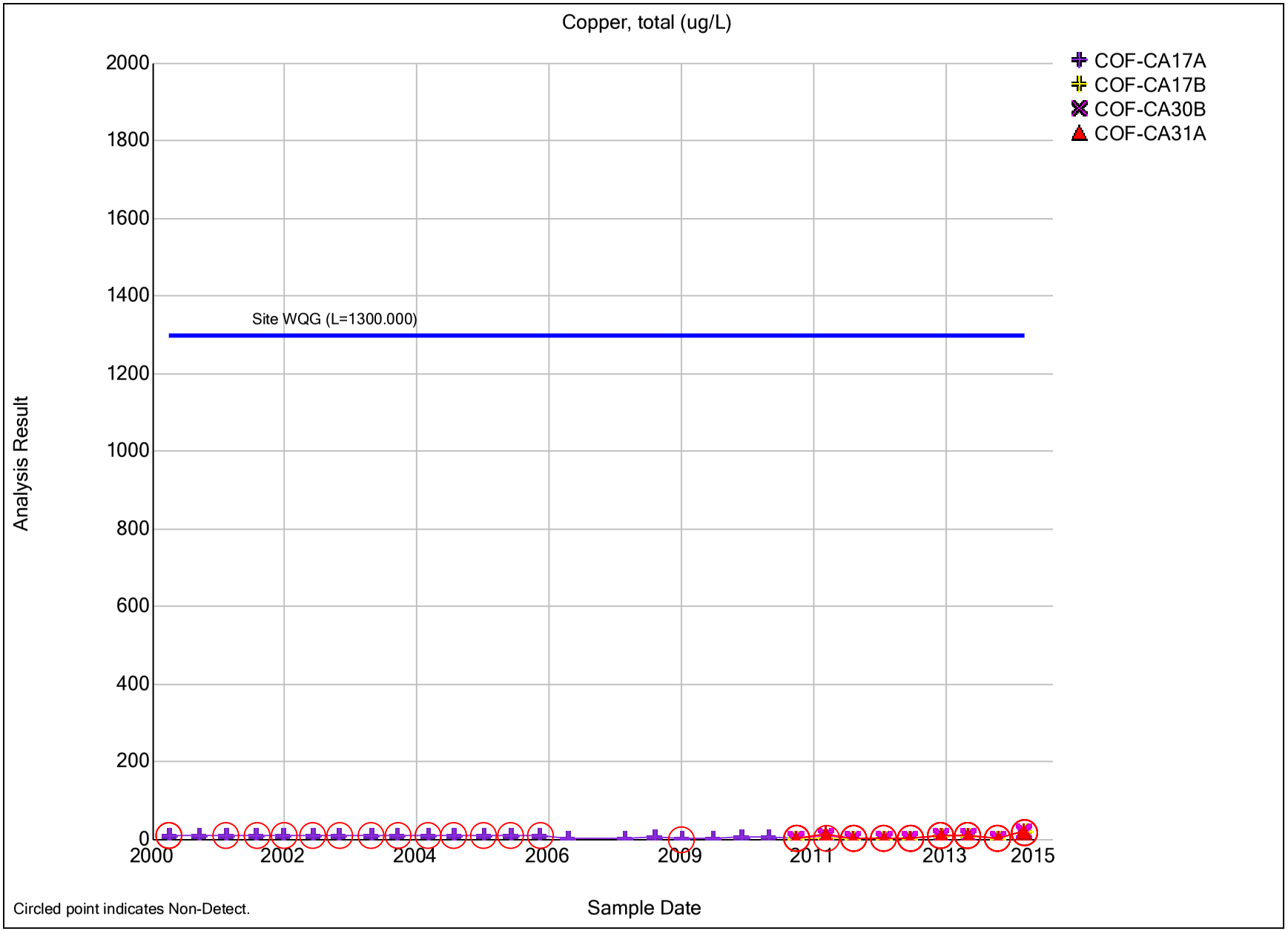

Nitrogen, Ammonia (mg/L)
COF-CA17A
COF-CA17B
COF-CA30B
COF-CA31A
Site WQG (L=0.626)
0.9
0.81
0.72
0.63
0.54
0.45
0.36
0.27
0.18
0.09
0
2000
2002
2004
2006
2009
2011
2013
2015
Analysis Result
Sample Date
Circled point indicates Non-Detect.

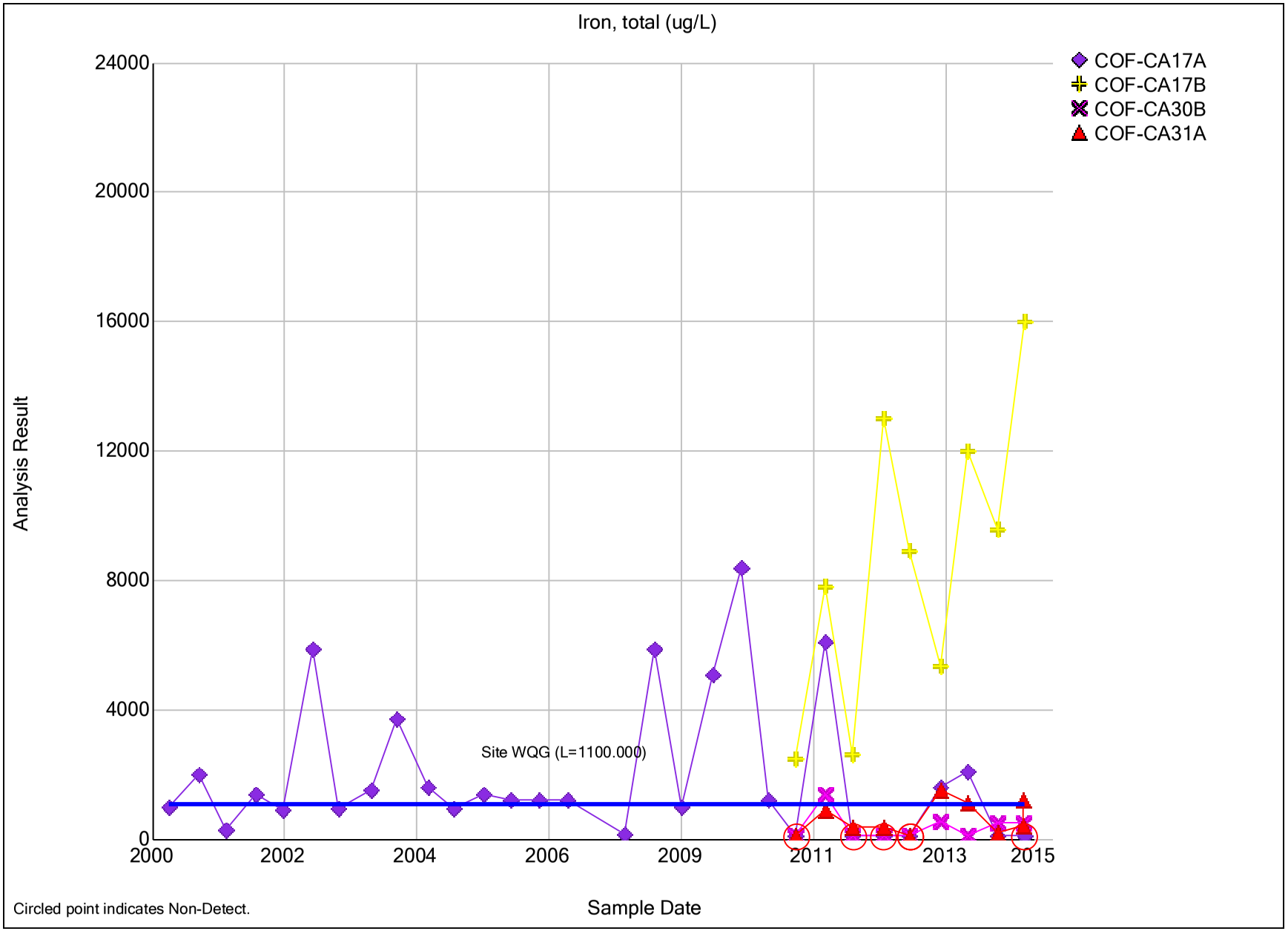

Antimony, total (ug/L)
COF-CA17A
COF-CA17B
COF-CA30B
COF-CA31A
Site WQG (L=6.000)
Analysis Result
0
1
2
3
4
5
6
7
8
9
2000
2002
2004
2006
2009
2011
2013
2015
Sample Date
Circled point indicates Non-Detect.

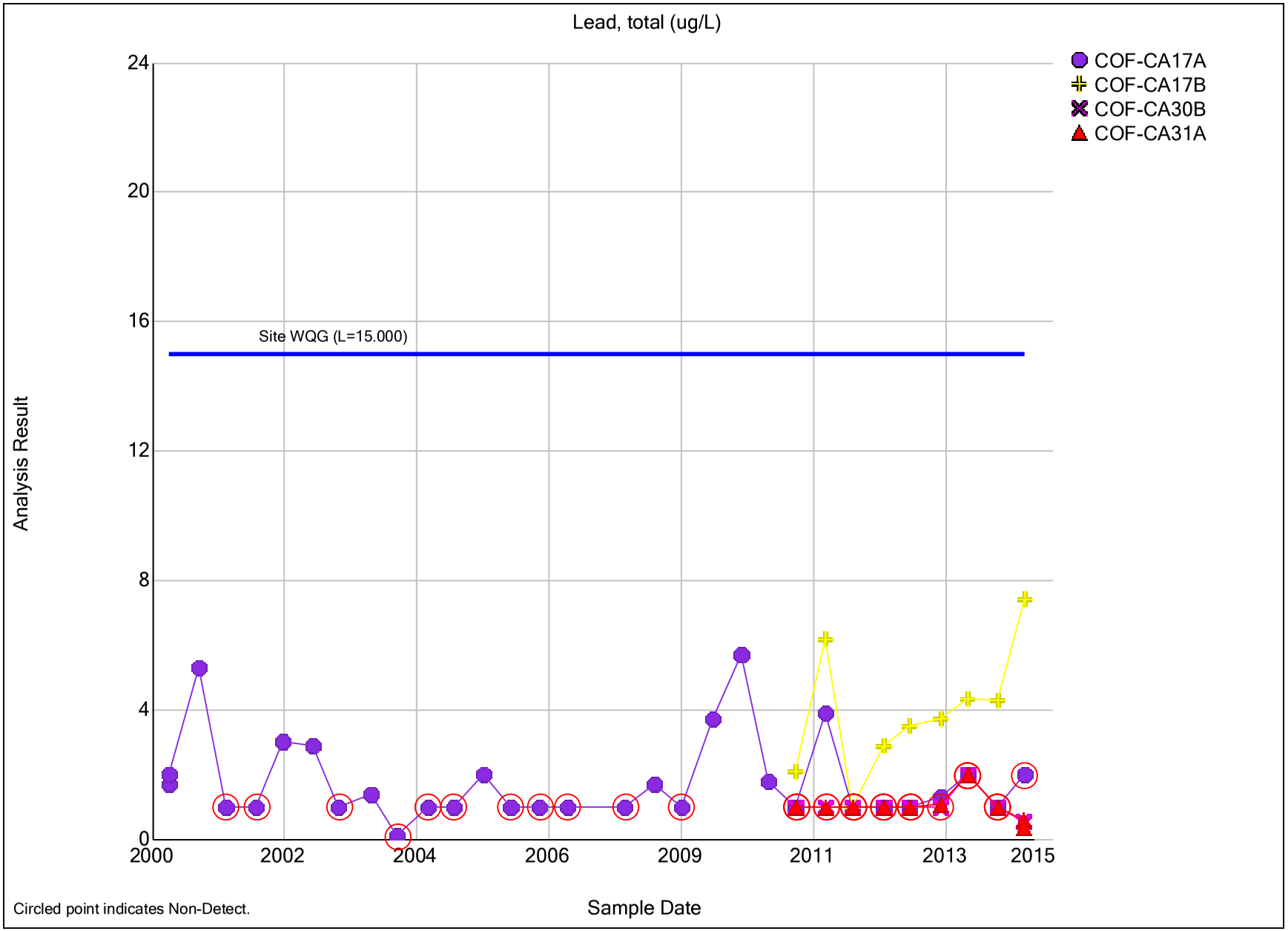

Arsenic, total (ug/L)
COF-CA17A
COF-CA17B
COF-CA30B
COF-CA31A
Site WQG (L=7000.000)
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Analysis Result
2000
2002
2004
2006
2009
2011
2013
2015
Sample Date
Circled point indicates Non-Detect.

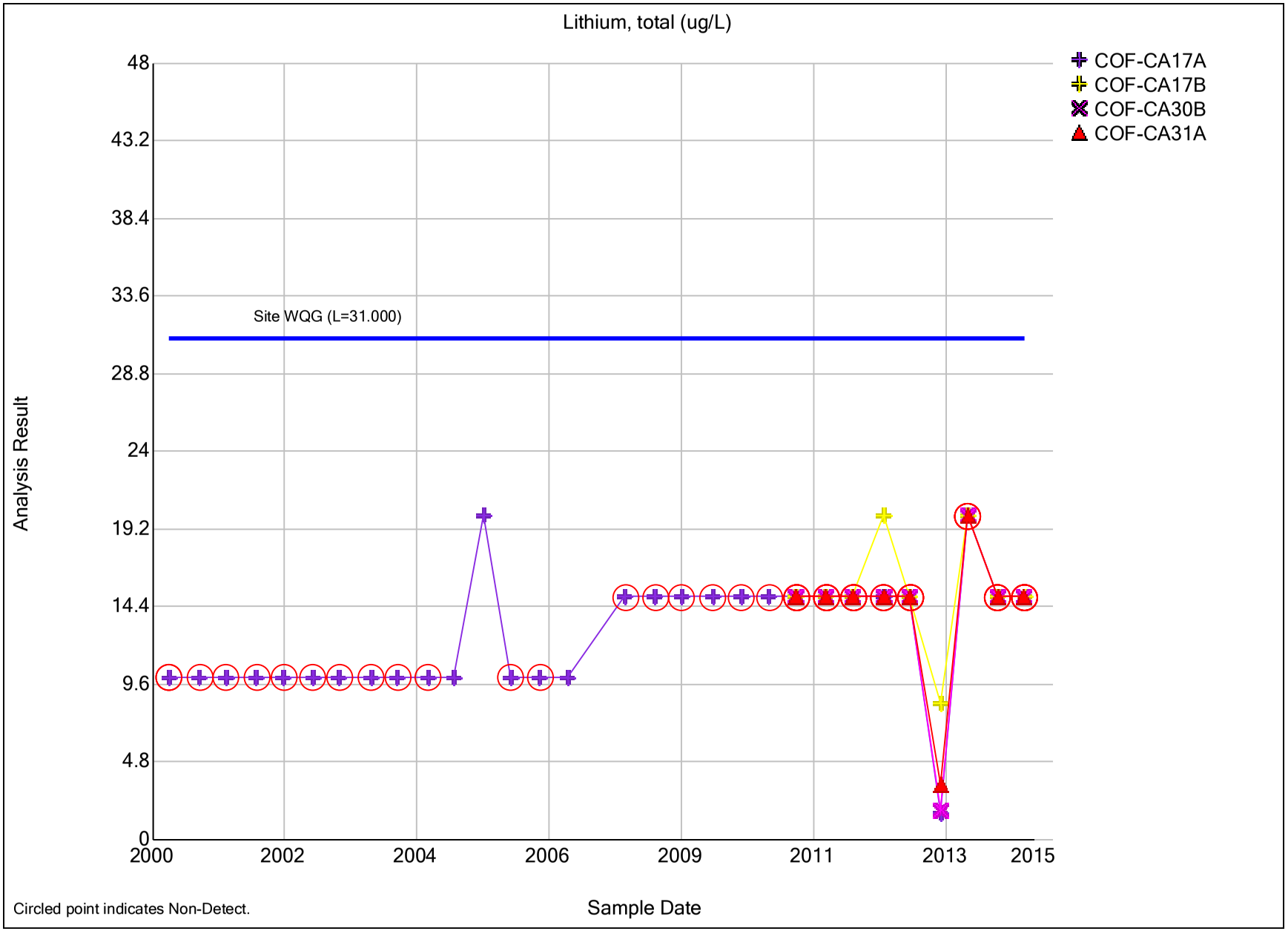

Boron, total (ug/L)
COF-CA17A
COF-CA17B
COF-CA30B
COF-CA31A
Site WQG (L=3100.000)
4600
4140
3680
3220
2760
2300
1840
1380
920
460
0
2000
2002
2004
2006
2009
2011
2013
2015
Analysis Result
Sample Date
Circled point indicates Non-Detect.

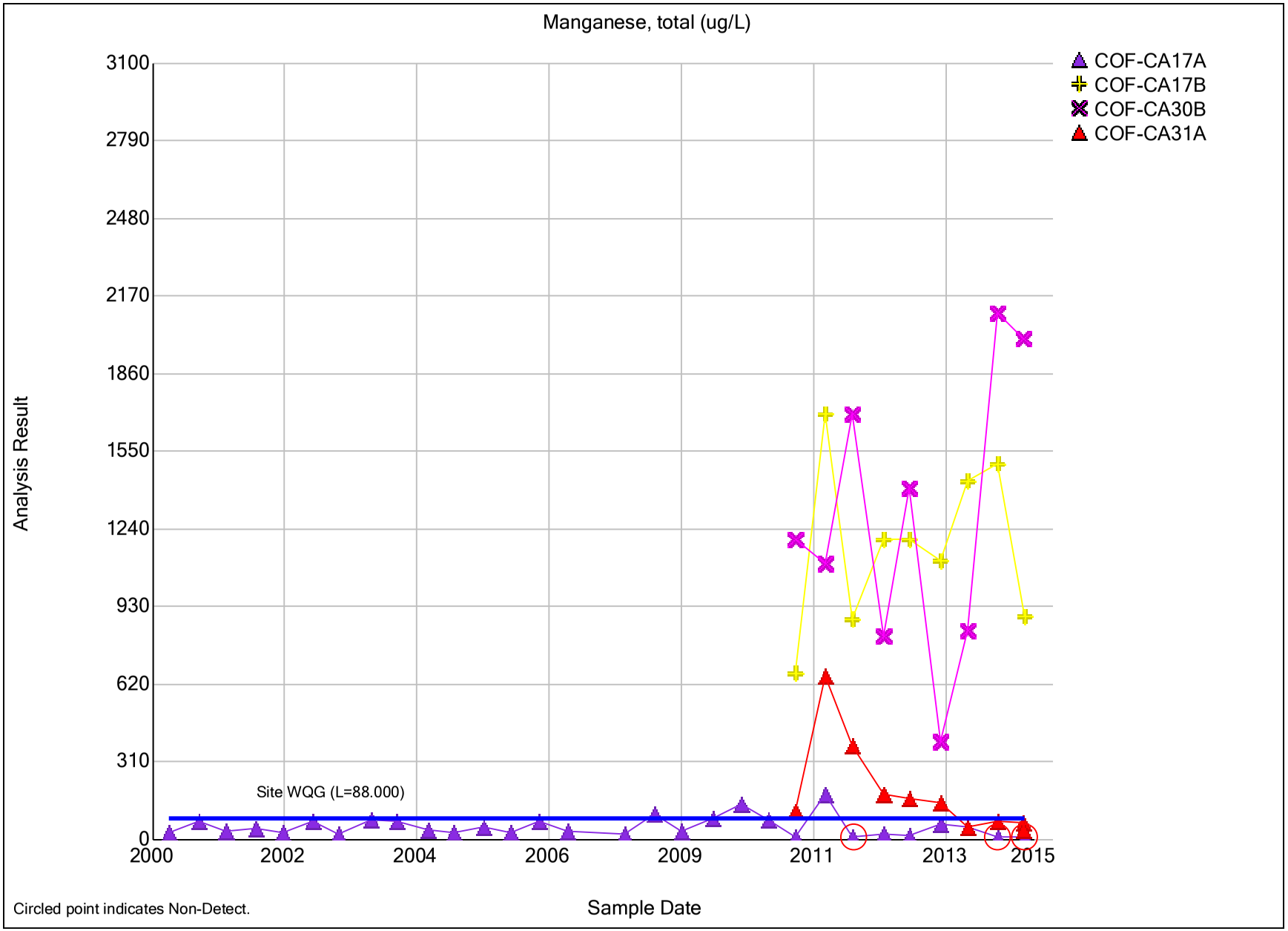

Chromium, total (ug/L)
COF-CA17A
COF-CA17B
COF-CA30B
COF-CA31A
Analysis Result
400
360
320
280
240
200
160
120
80
40
0
Site WQG (L=100.000)
2000
2002
2004
2006
2009
2011
2013
2015
Sample Date
Circled point indicates Non-Detect.

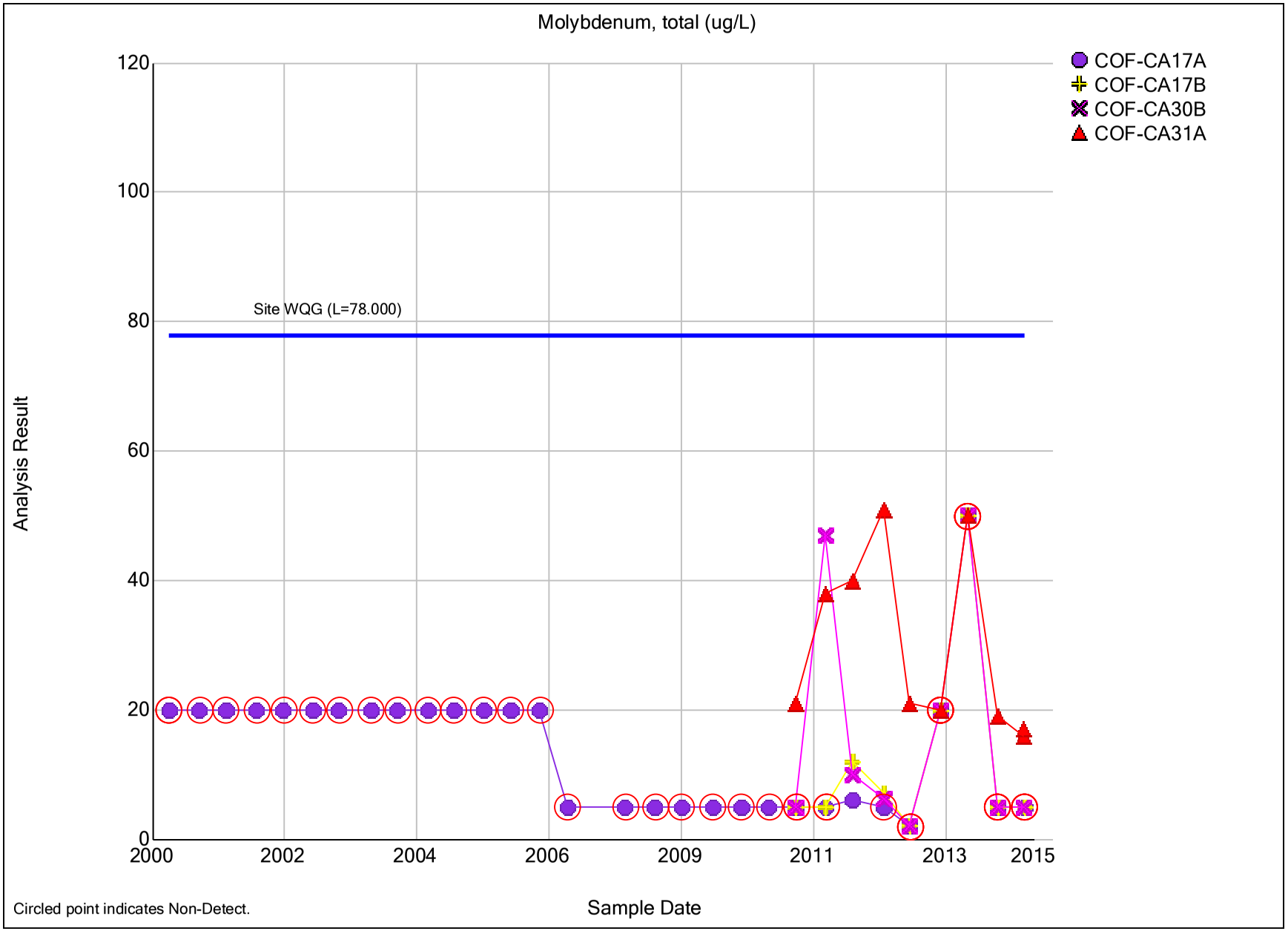

Copper, total (ug/L)
COF-CA17A
COF-CA17B
COF-CA30B
COF-CA31A
Site WQG (L=1300.000)
Analysis Result
2000
1800
1600
1400
1200
1000
800
600
400
200
0
2000
2002
2004
2006
2009
2011
2013
2015
Circled point indicates Non-Detect.
Sample Date

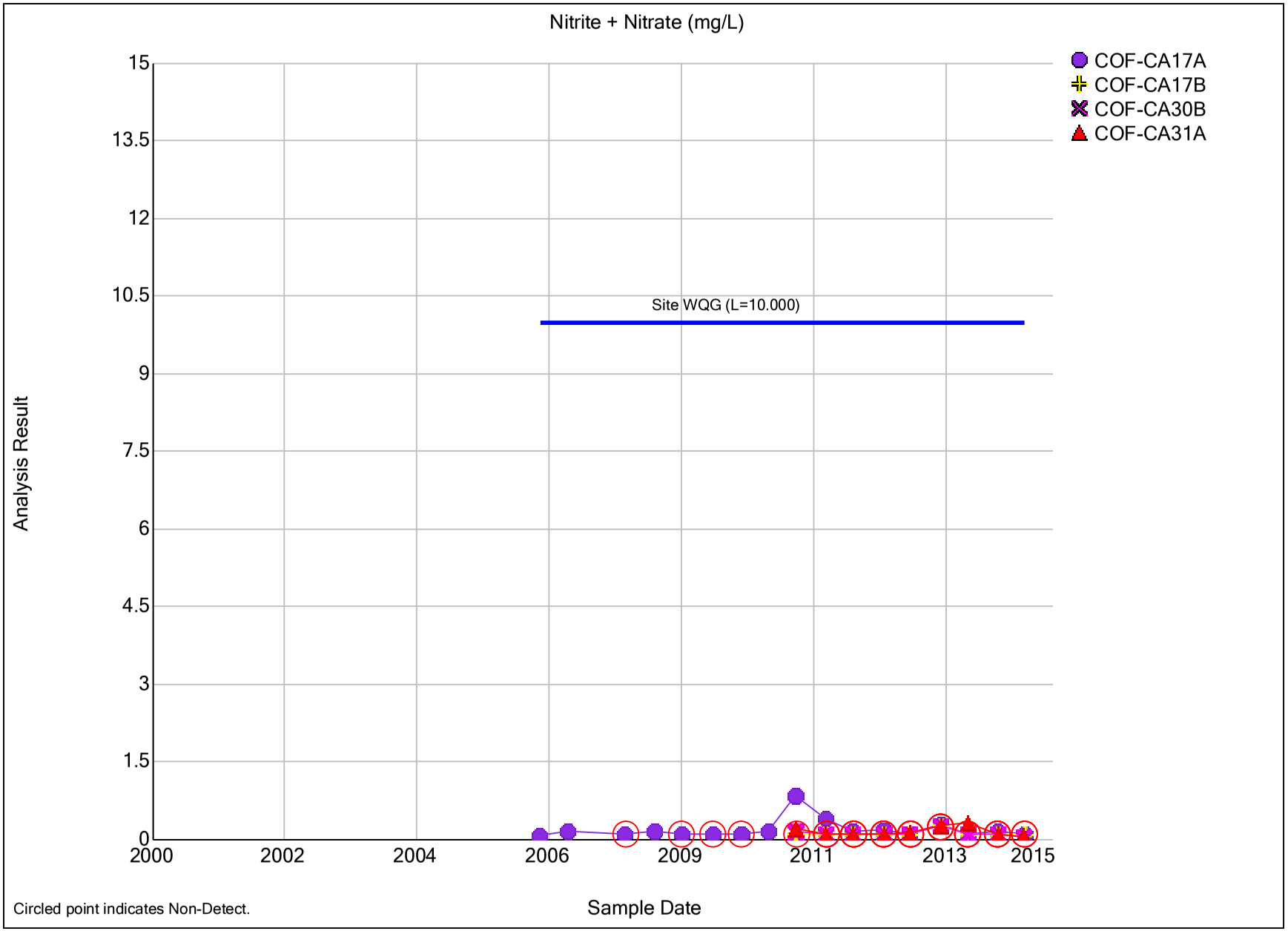

Iron, total (ug/L)
COF-CA17A
COF-CA17B
COF-CA30B
COF-CA31A
24000
20000
16000
12000
8000
4000
0
Analysis Result
Site WQG (L=1100.000)
2000
2002
2004
2006
2009
2011
2013
2015
Sample Date
Circled point indicates Non-Detect.

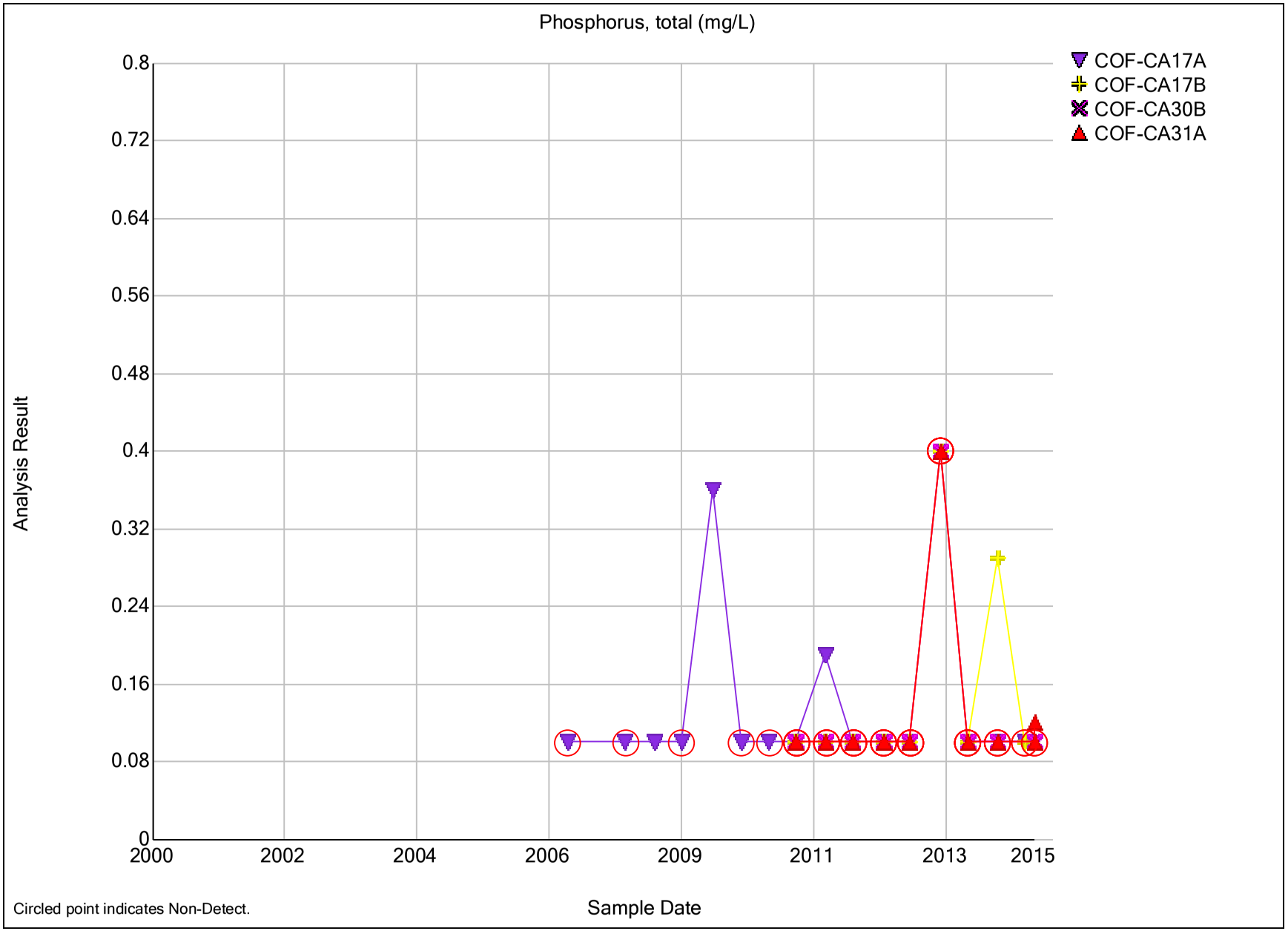

Lead, total (ug/L)
COF-CA17A
COF-CA17B
COF-CA30B
COF-CA31A
Site WQG (L=15.000)
Analysis Result
24
20
16
12
8
4
0
2000
2002
2004
2006
2009
2011
2013
2015
Sample Date
Circled point indicates Non-Detect.

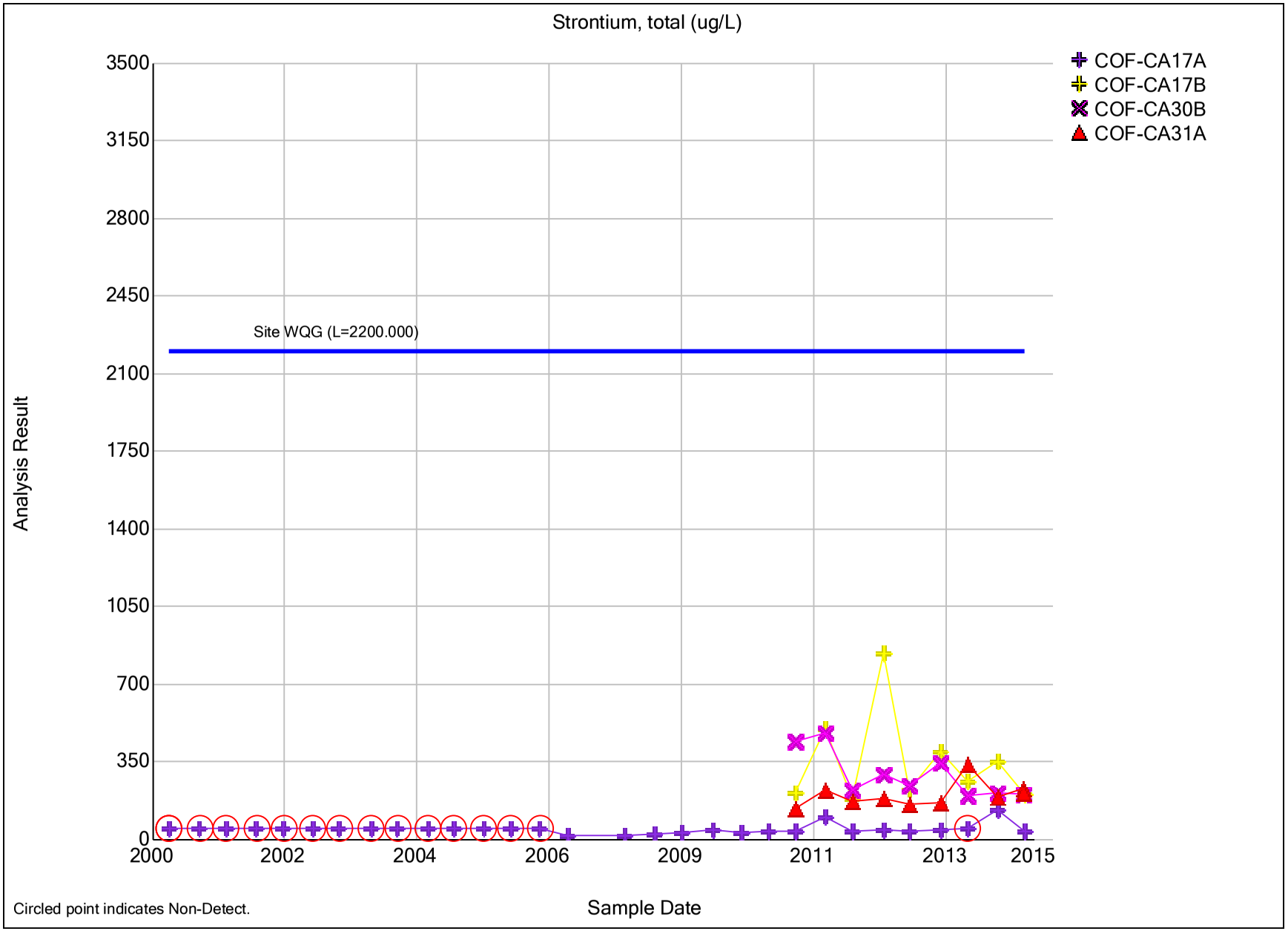

Lithium, total (ug/L)
COF-CA17A
COF-CA17B
COF-CA30B
COF-CA31A
Site WQG (L=31.000)
Analysis Result
48
43.2
38.4
33.6
28.8
24
19.2
14.4
9.6
4.8
0
2000
2002
2004
2006
2009
2011
2013
2015
Sample Date
Circled point indicates Non-Detect.

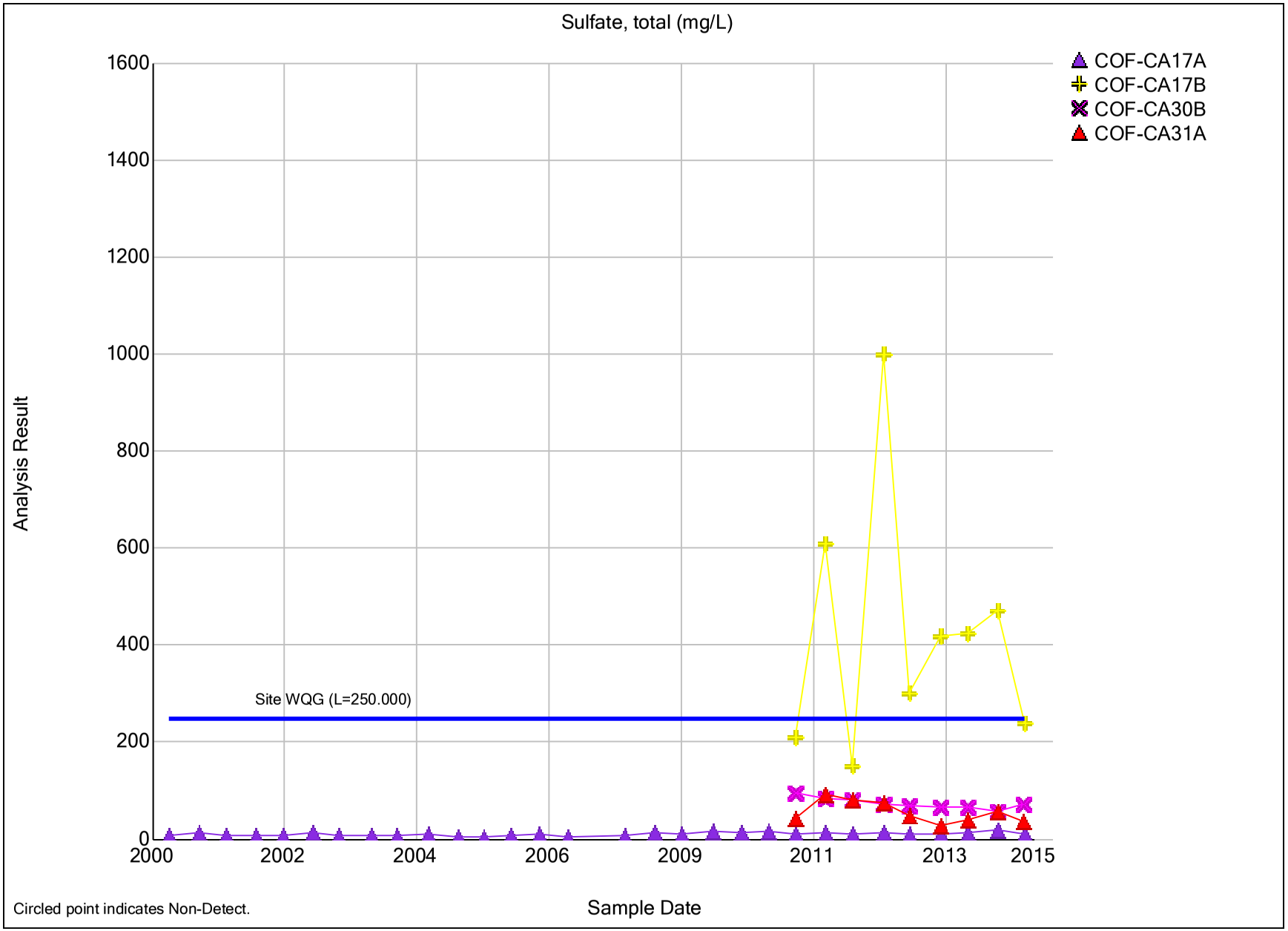

Manganese, total (ug/L)
COF-CA17A
COF-CA17B
COF-CA30B
COF-CA31A
3100
2790
2480
2170
1860
1550
1240
930
620
310
0
Analysis Result
Site WQG (L=88.000)
2000
2002
2004
2006
2009
2011
2013
2015
Sample Date
Circled point indicates Non-Detect.

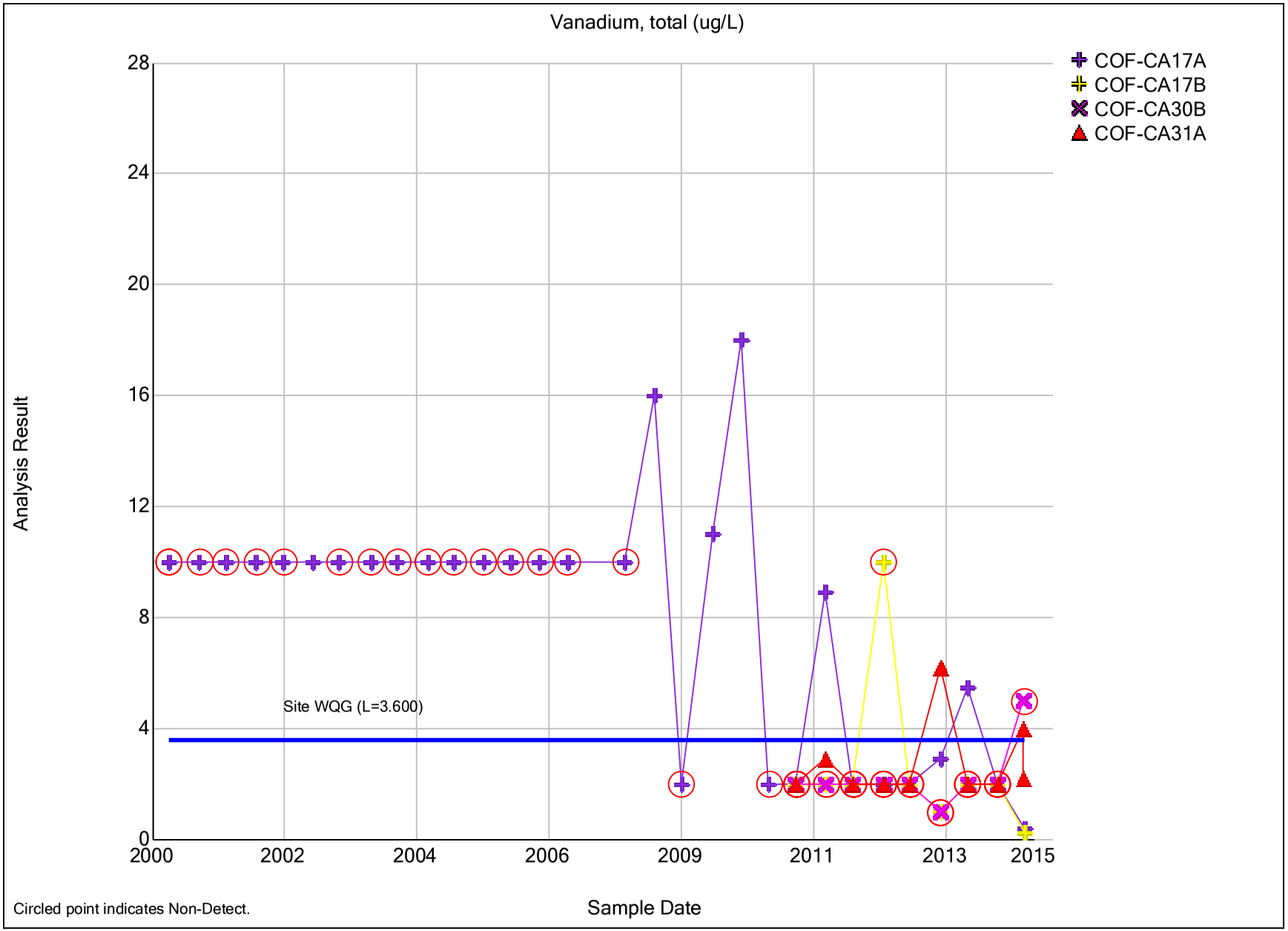

Molybdenum, total (ug/L)
COF-CA17A
COF-CA17B
COF-CA30B
COF-CA31A
Site WQG (L=78.000)
Analysis Result
120
100
80
60
40
20
0
2000
2002
2004
2006
2009
2011
2013
2015
Sample Date
Circled point indicates Non-Detect.

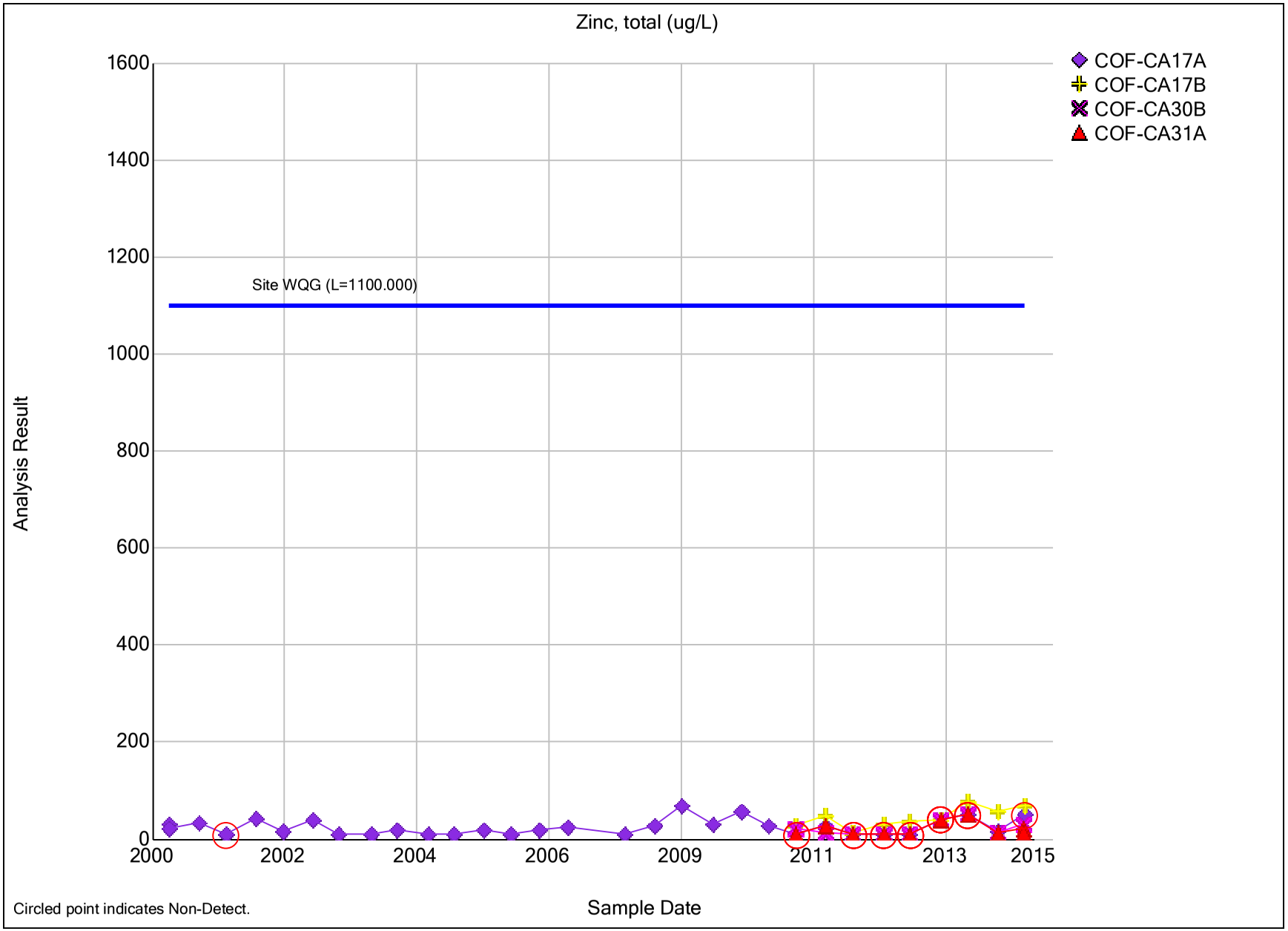

Nitrite + Nitrate (mg/L)
COF-CA17A
COF-CA17B
COF-CA30B
COF-CA31A
Site WQG (L=10.000)
Analysis Result
15
13.5
12
10.5
9
7.5
6
4.5
3
1.5
0
2000
2002
2004
2006
2009
2011
2013
2015
Sample Date
Circled point indicates Non-Detect.


Phosphorus, total (mg/L)
COF-CA17A
COF-CA17B
COF-CA30B
COF-CA31A
Analysis Result
0.8
0.72
0.64
0.56
0.48
0.4
0.32
0.24
0.16
0.08
0
2000
2002
2004
2006
2009
2011
2013
2015
Sample Date
Circled point indicates Non-Detect.


Strontium, total (ug/L)
COF-CA17A
COF-CA17B
COF-CA30B
COF-CA31A
Site WQG (L=2200.000)
Analysis Result
3500
3150
2800
2450
2100
1750
1400
1050
700
350
0
2000
2002
2004
2006
2009
2011
2013
2015
Sample Date
Circled point indicates Non-Detect.


Sulfate, total (mg/L)
COF-CA17A
COF-CA17B
COF-CA30B
COF-CA31A
1600
1400
1200
1000
800
600
400
200
0
Analysis Result
Site WQG (L=250.000)
2000
2002
2004
2006
2009
2011
2013
2015
Sample Date
Circled point indicates Non-Detect.


Vanadium, total (ug/L)
COF-CA17A
COF-CA17B
COF-CA30B
COF-CA31A
Analysis Result
28
24
20
16
12
8
4
0
Site WQG (L=3.600)
2000
2002
2004
2006
2009
2011
2013
2015
Sample Date
Circled point indicates Non-Detect.


Zinc, total (ug/L)
COF-CA17A
COF-CA17B
COF-CA30B
COF-CA31A
Site WQG (L=1100.000)
Analysis Result
1600
1400
1200
1000
800
600
400
200
0
2000
2002
2004
2006
2009
2011
2013
2015
Sample Date
Circled point indicates Non-Detect.