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Colonel Tom D. Miller
377 ABW/CC
2000 Wyoming Blvd SE
Kirtland AFB, NM 87117-5000

Mr. John Kieling, Chief
Hazardous Waste Bureau (HWB)
New Mexico Environment Department (NMED)
2905 Rodeo Park Road
Santa Fe, New Mexico 87505

Dear Mr. Kieling

Kirtland Air Force Base (AFB) is pleased to submit *Groundwater Extraction Pilot Implementation and Additional Plume Characterization Letter Work Plan, Addendum #3* for the Bulk Fuels Facility Spill, Solid Waste Management Units ST-106 and SS-111, for your review.

The attached Addendum #3 outlines groundwater analytical results and geotechnical data derived from deep probe well KAFB-106212. The results are used to help define vertical dissolved-phase ethylene di-bromide (EDB) plume extent and will also be utilized to design an extraction well and five deep groundwater monitoring wells. The probe well data, along with the five deep monitoring wells will aid in additional vertical and lateral EDB plume characterization. The installation of the extraction well will aid in implementation of the groundwater extraction pilot test.

Please contact Mr. L. Wayne Bitner at (505) 853-3484 or ludie.bitner@us.af.mil or Mrs. Victoria R. Branson at 505-846-6362 or victoria.branson@us.af.mil if you have any questions.

Sincerely

TOM D. MILLER, Colonel, USAF
Commander

cc:
NMED (Roberts) w/ attach
NMED-HWB (Cobrain, McDonald) w/attch
NMED (McQuillan, Longmire) w/attch
NMED-PSTB (Reuter) w/attch
NMED-OGC (Kendall) w/attch
EPA Region 6 (King) w/attch

KAFB4247

40 CFR 270.11
DOCUMENT CERTIFICATION
MARCH 2015

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

TOM D. MILLER, Colonel, USAF
Commander, 377th Air Base Wing

This document has been approved for public release.

KIRTLAND AIR FORCE BASE
377th Air Base Wing Public Affairs

CB&I Federal Services LLC
2440 Louisiana Blvd. NE, Suite 300
Albuquerque, NM 87110
Tel: +1 505 262 8800
Fax: +1 505 262 8855
www.CBI.com

March 19, 2015

Subject: Kirtland Air Force Base Bulk Fuel Facility – Groundwater Extraction Pilot Implementation and Additional Plume Characterization Letter Work Plan Addendum #3

This Kirtland Air Force Base (KAFB) Bulk Fuel Facility (BFF) Groundwater Extraction Pilot Implementation and Additional Plume Characterization Letter Work Plan Addendum #3 has been prepared by CB&I Federal Services LLC (CB&I) for the U.S. Army Corps of Engineers (USACE), Albuquerque District, under Contract No. W912DY-10-D-0014. Groundwater analytical results and geotechnical data collected from deep probe well KAFB-106212 are presented herein. Results are used to further characterize the vertical extent of the dissolved-phase ethylene dibromide (EDB) plume, and to design an extraction well and five deep groundwater monitoring wells. Data from those groundwater monitoring wells will further characterize the vertical and lateral extent of the EDB plume. The extraction well will be used for aquifer testing and implementation of the groundwater extraction pilot test. Results from the aquifer test will be used to update the conceptual site model (CSM), refine the groundwater model, and to determine the optimal design and placement of three additional extraction wells, which will be covered under a subsequent work plan.

Deep Probe Well KAFB-106212

Installation and Sampling

Deep probe well KAFB-106212 was installed between January 19 and February 16, 2015 to delineate the vertical extent of the EDB plume in the vicinity of monitoring wells KAFB-106035, KAFB-106036, and KAFB-106037. KAFB-106212 is located approximately 50 feet from the planned location of extraction well KAFB-106228. The deep probe well was developed on February 18 and 19, 2015, in accordance with the August 1, 2014 Work Plan (USACE, 2014a), herein referred to as "Work Plan." The well completion diagram, boring log, and development log for the deep probe well are included in Appendix A.

Continuous core sampling was performed from 10 feet above the water table (447.75 feet below ground surface [bgs]) to the total depth of the borehole (564.9 feet bgs) during drilling of the borehole for KAFB-106212 in accordance with the Work Plan. The cores were retrieved and logged for lithology and sub-portions of selected cores were submitted for particle-size, permeability, hydraulic conductivity, effective porosity, and mass of solid organic carbon analysis. Continuous core sampling was performed in accordance with the August 1, 2014 Work Plan (USACE, 2014a). In the interval that was continuously cored, material downhole was characterized as primarily well graded and poorly graded sand with occasional layers of increased clay or silt content, as well as silty or clayey sand. Clay lenses were present in the borehole at 467 feet, and from 547 feet to 550 feet. Results of the geotechnical analyses are included in Appendix C.

Groundwater sampling was performed on March 2 through 4, 2015, in accordance with the Work Plan, the approach described in Work Plan Addendum #2 (USACE, 2015), and as approved in the subsequent response from the New Mexico Environment Department (NMED) (NMED, 2015). Triplicate groundwater samples were collected from KAFB-106212 on three successive days for a total of nine samples. Replicate samples were collected to provide sufficient data to statistically determine if

EDB concentrations were greater than or less than, the 0.05 micrograms per liter (µg/L) maximum contaminant level (MCL). The samples were analyzed for the following: field parameters, EDB detection/quantification by U.S. Environmental Protection Agency Method SW8011 (EPA, 1986), volatile organic compounds, target analyte list (TAL) metals, inorganic anions, and cations.

Groundwater Sampling Analytical Results and Statistical Analysis

Results from all nine groundwater samples were sent to Empirical Laboratories in Nashville, Tennessee for analysis. Concentrations of EDB were analyzed using two different methods: SW8260B (volatile organic compounds by gas chromatography/mass spectrometry) and SW8011 (gas chromatrography). All 18 results were nondetect. The results and the detection limit (DL), limit of detection (LOD), and limit of quantitation (LOQ) for each analysis are provided in Table 1. Definitions for the three types of reporting limits, as defined by the laboratory, are provided below the table.

Method SW8260B was performed to quantify the concentrations of hydrocarbon fuel constituents such as benzene. The reporting limits for EDB (a halogenated hydrocarbon) with this method are above the MCL. Method SW8011 provides DLs, LODs, and LOQs that are all below the MCL of 0.05 µg/L. The nine SW8011 nondetect results provide high confidence that EDB concentrations sampled during March 2, 3, and 4, 2015 were below the average DL of 0.00939 µg/L, and provide extremely high confidence that the EDB concentrations were below the MCL of 0.05 µg/L during this 3-day sampling period. Full analytical results are provided in Appendix B. It is concluded that the vertical extent of the EDB plume has been defined in this area, and the design and installation of extraction well KAFB-106228 and the five deep groundwater monitoring wells can proceed. The design of both extraction well KAFB-106228 and the five deep groundwater monitoring well are described below.

Extraction Well KAFB-106228

Extraction Well KAFB-106228 Design

The average groundwater quality analytical results from the KAFB-106212 samples indicate that the EDB concentration is below the 0.05 µg/L MCL, and that the vertical extent of the plume has been delineated. Extraction well KAFB-106228 has been designed based upon the groundwater analytical results described above, the evaluation of geotechnical grain-size distribution results from core samples (Driscoll, 2003), and a preliminary groundwater flow model that established the target groundwater withdrawal rates. The model-derived pumping rate was designed to ensure hydrologic control of the aqueous phase EDB plume and the consequent design criteria were engineered to make that performance possible. KAFB-106228 will be installed in accordance with the Work Plan and Addendum #2 (USACE, 2015), and based upon NMED approval of the final design. Results of the continuous core samples are located in Appendix C.

As described in the Work Plan, KAFB-106228 will be installed approximately 50 feet from deep probe well KAFB-106212, and approximately 25 feet to 70 feet from existing well cluster KAFB-106035, KAFB-106036, and KAFB-106037. The water table is expected at approximately 458 feet bgs, and the extraction well will be screened to extract water from the shallow, intermediate and deep aquifer zones to maximize the capture zone radius of influence. Due to the well depth of approximately 545 feet bgs, the extraction pump will be a multi-stage open impeller electric submersible pump designed to meet the total system head at the targeted extraction rate. This pump will be sufficiently flexible to allow adjustments to optimize pump placement, which will achieve the rate required for a given groundwater drawdown level. The required drawdown level will be determined during the aquifer step-test phase.

At the current stage in the design process as described herein, it has not yet been determined if the water-bearing units encountered in the well bore will exhibit semi-confined or unconfined conditions. Such

conditions will influence the amount of water that can be extracted from the formation, and consequently, influence the construction and well capacity in order to extract that volume of water.

Well Design and Construction Materials

The borehole for extraction well KAFB-106228 will be drilled with an air rotary casing hammer rig, using a $13^{3}/_{8}$-inch-diameter driven casing to a 200-feet bgs, and an 11¾-inch-diameter driven casing using Stratex™ to under ream the borehole to a 13¼-inch diameter, to the planned total depth of 545 feet bgs.

Drilling, well installation, and well development will be supervised by a qualified CB&I geologist, who will prepare a boring log based on cuttings returns. A typical soil boring log (Visual Classification of Soils) is included in Appendix D. During well construction, the geologist will document well construction using basic quality check methods: inspecting materials before well construction, recording materials used during construction, and inspecting materials after construction. The geologist will keep CB&I staff apprised of drilling conditions and sediments encountered, so that decisions can be made in a timely fashion, particularly if it becomes apparent that design changes may be necessary.

Installation of the extraction well will conform to KAFB SOP B1.3, "Monitoring Well Installation," and will include a 5-foot sump constructed of the same stainless steel materials as the well screen to minimize potential electrolysis (Tetra Tech, 2004). The well borehole and casing must be straight and plumb with no more than a 5.5-foot deviation at the total depth of 545 feet bgs.

The extraction well construction materials and intervals will be as follows:

- The well will be constructed using 8-inch-diameter mild steel casing extending from the ground surface to a depth of approximately 420 feet bgs, and 8-inch-diameter 304 stainless steel casing extending from 420 feet bgs to the top of the screen at approximately 440 feet bgs. One hundred linear feet of 304 stainless steel high-flow wire-wrap screen will be installed from 440 feet bgs to 540 feet bgs (approximately 20 feet of screen above the expected static water level [458 feet bgs] and 80 feet of screen below the static water level). A 5-feet-long casing sump composed of 8-inch-diameter 304 stainless steel will be added to the bottom of the screen, which will require the well string (casing, screen, and sump) to extend to a depth of approximately 545 feet bgs.

- It is planned to use a 304 stainless steel continuous wire wrap well screen with a 0.060-inch slot size for a total open area of 112 square inches per linear foot of screen, and a screen capacity of approximately 31 gallons per minute (gpm) per linear foot of screen at an entrance velocity less than 0.1 feet per second. The slot size may be refined based on a comparison of sieve analyses of the sediments encountered during KAFB-106228 boring with the lithological descriptions from the deep probe well KAFB-106212 boring. The screen slot size and the filter-pack gradation may be modified to better suit the KAFB-106228 location based on the lithic log generated by the supervising geologist from samples taken during drilling of KAFB-106228, and compared to the sieve analyses results of samples collected during the coring of the KAFB-106212 location.

- Stainless steel centralizers will be placed at the top, center, and bottom of the screen, and at 100-foot intervals above the screen.

- It is planned to place a 6/9 filter pack, composed of Colorado silica sand (CSS), in the annulus between the well string and the borehole. The filter pack will extend from the bottom of the borehole at approximately 545 feet bgs, to a minimum of 80 feet above the top of the well screen, or approximately 360 feet bgs. The moderately aggressive 6-9 filter pack may be modified based on the sieve analyses comparison with the KAFB-106212 boring.

- A minimum one foot of 20/40 Colorado silica sand (CSS) seal or pad will be placed in the borehole annulus on top of the filter pack to reduce potential cement slurry intrusion into the filter pack.

- A bentonite chip seal will be installed on top of the CSS pad . Bentonite chips (⅜-inch) will be placed in the annulus from the CSS to between 30 and to 40 feet above the top of the filter pack, or approximately 325 feet bgs. The bentonite chip seal will be hydrated in lifts using potable water.

- Cement/bentonite grout will be emplaced as slurry on top of the bentonite chip seal. The slurry will be composed of Portland I cement with up to 5 percent (%) bentonite by weight and will extend to within 30 feet bgs.

- A Portland I Neat cement or concrete surface seal will be placed from 30 feet bgs to ground surface.

A draft extraction well completion design based on the above design criteria is depicted on Figure 1.

Extraction Well KAFB-106228 Well Construction Procedures

The geologist will inventory all the well materials before well construction begins. Materials will be measured and compared against the planned placement of the sump, screen, well casing, and centralizers. The inventory results will be communicated to the drilling crew for review and concurrence. Any issues that may arise, will be resolved prior to initiating well installation.

A tally will be kept of each joint or section of screen and casing installed, and a record of placement of the screens, depths, and volume of sand and bentonite seal installed. A sample of cement slurry will be kept at the drill site and observed to support that cement curing occurred.

The well string will be kept under tension during installation of the well string and emplacement of the filter pack and seals. Sufficient tension (or hold back) will be applied to keep the screen and casing straight in the borehole, and to support the weight of the well string and prevent damaging weight from being placed on the well screen until the filter pack and cement slurry are installed and hardened.

It is planned for the filter-pack material to extend approximately 80 feet above the top of the screened interval for a total of 185 linear feet in the borehole. Consequently, great care will be taken during installation to prevent bridging. The filter pack will be tremied into place to reduce possible bridging and to ensure continuous placement while the casing is slowly removed. If measurement of the filter pack height during sand-lift installation indicates bridging, it may be necessary to gently surge the well in order to settle the bridge. However, the filter pack will be gently surged every 20 feet of vertical lift throughout the saturated interval to minimize the bridging potential and ensure proper placement. The CSS pad will placed on top of the coarser filter pack to both reduce either bentonite or cement slurry infiltration into the filter pack, and to act as a warning if severe filter pack subsidence were to occur during well development or later operation of the extraction well.

A 30 to 40-foot hydrated bentonite seal will be emplaced above the sand filter pack. The seal will be installed well above groundwater so the bentonite will be emplaced dry and incrementally hydrated with potable water in 5-foot lifts for the first 10 feet and then in 10-foot intervals thereafter. Portland I cement grout with a maximum of 5% bentonite by weight will be emplaced by tremie pipe from the top of the bentonite seal to within 30 feet of the surface. The grout will be placed in lifts with the first lift no greater than 100 feet in length. Subsequent lifts will be no greater than approximately 200 feet. All lifts shall be allowed to cure until stable before the next lift is placed. A neat cement or concrete seal will installed to the ground surface and will serve as both a seal and structural support for the casing at ground surface and will support the well housing to protect the well head and controls.

Preliminary Modeling

Groundwater modeling was completed both by CB&I and Intera, Inc. (Intera) to help evaluate expected hydrogeologic responses during the KAFB-106228 constant rate aquifer test. CB&I model runs were completed through use of the EPA model provided by Scott Ellinger, EPA Region 6. The two models utilized in this evaluation are still under development. Iterative revisions will occur based on the availability new field data and input from the Modeler's Working Group. The models use different methods to simulate hydrogeologic responses. The EPA/CB&I model uses a 3-dimensional numerical finite-difference process and the Intera model uses an analytical equation to evaluate groundwater flow across the model domain.

The EPA/CB&I model runs were completed to assess the KAFB-106228 capture zone and to estimate potential drawdown at KAFB-106228 and nearby monitoring wells. Model runs were completed through use of the Visual Modflow™ (Shlumberger Water Services) graphic user interface. The MODFLOW 2000 (Harbaugh et. al, 2000) and MODPATH (Pollock, 1994) codes were run within Visual Modflow™ to simulate groundwater flow and particle tracking, respectively. Scott Ellinger and CB&I worked collaboratively to refine the model stratigraphy. Specifically, a prominent package of fine grained materials, located nominally at 450 feet bgs, were incorporated within the model. The fine grained materials were represented both laterally and vertically as a zone of reduced hydraulic conductivity (approximately 1/10th the original model conductivity). Following this change the EPA/CB&I model was run in Steady State mode and particle tracking was completed.

Concurrent to the EPA/CB&I model runs, Intera also ran model simulations to evaluate the planned KAFB-106228 constant rate aquifer test. Intera model runs were completed through the use of an analytical element model and the Tim^{ML} steady state flow code (Delft University). The Intera model solution included not only components that represent the flow system (i.e. pumping wells, regional gradient, boundaries, etc.), but also a detailed representation of the site specific stratigraphy. The site stratigraphy was represented as 18 model layers and included the aforementioned fine grained materials at 450 feet bgs.

Results from the two model runs were in close agreement, and indicate the following:

- Simulated drawdown in extraction well KAFB-106228 ranges between 3 feet and 6 feet, assuming that the well is 100% efficient.

- Simulated drawdown ranges between 1 foot and 3 feet in in nearby monitoring wells (KAFB-106035, KAFB-106036, and KAFB-106037). These monitoring wells are located less than 75 feet away from KAFB-106228 and are screened in the shallow, intermediate, and deep zones.

- Simulated drawdown in monitoring wells located further than 75 feet away is less than 1 foot.

The measured drawdown in the field may differ from the simulated drawdown as a result of the field sustainable pumping rate at KAFB-106228 during the constant rate aquifer test.

Modeling figures are presented in Appendix E.

Extraction Well KAFB-106228 Development

Groundwater extraction well KAFB-106228 will be developed as an extraction well to meet a target well efficiency of 70% or better, with a preferred target of 80% or better prior to conducting aquifer testing. Well development will be an iterative process of repeating steps as while measuring performance as the metric for deciding the type and length of development necessary to achieve an estimated specific capacity between 5 gpm per feet and 30 gpm per feet is reached.

Well development must entail the professional judgment of the supervising geologist, task management, and senior staff to apply these procedures successfully. The filter pack will extend sufficiently above the screen to ensure that the volume of filter pack material is sufficient to prevent the filter pack level from subsiding below the top of the well screen in the event of settling during well development.

An Imhoff cone method will be used during the development process to evaluate the effectiveness and completeness of the development process. Standard Imhoff cone procedures are designed for semi-quantitative results; however, the application during development is qualitative and is less stringent than standard procedures.

The well development process will consist of the following four steps, described below. Additional detail on each step follows.

- **Step 1: Initial Well Bore Clean Out—**The initial step will remove mud and cuttings from the well bore and filter pack generated during the drilling process to prevent or mitigate cuttings and sediment generated during drilling from being driven back into the filter pack and formation, and avoid complicating well development.

- **Step 2: Physical Well Development Using Surging, Bailing, and Pumping—**This process will include measurements of sediment content in the water using an Imhoff cone technique, and drawdown during pumping to assess development effectiveness, determine the length of time for development, and determine if the more vigorous jetting process is necessary.

- **Step 3: Physical Well Development Using Jetting—**This process will include measurements of sediment content in the water using an Imhoff cone technique, injection rates, and drawdown during pumping to assess development effectiveness.

- **Step 4: Final Well Development Pumping—**When development appears to be at or near completion, a brief period of sustained pumping will be used to assess the effectiveness of development of the entire saturated interval, and to select possible pumping rates for the step drawdown test. Once again, an Imhoff cone will be used to evaluate discharged water for sand content, and to evaluate potential impacts to the mechanical parts of the extraction pump during the longer term aquifer test and to the treatment system during sustained operations once the system is brought on line.

Step 1: Initial Well Clean Out

Initial bailing will be conducted to remove drilling by-product silt and sand from the well bore and filter pack before beginning well development. This is done to prevent the material from being driven into the filter pack and formation to avoid possibly complicating development. An Imhoff cone technique will be used to collect water from the first bailer run to evaluate the amount of silt and sediment in the water. Sediment will be allowed to settle in the Imhoff cone for up to 5 minutes before a reading is taken.

The initial well clean out will be conducted using the following procedure:

1. The bailer will be lowered to the bottom of the well, surged, and used to remove sediment and as much silty water as possible from the well. This process will be repeated until water discharged from the bailer has less than 2 milliliters of sediment per 1 liter of water, as measured in the Imhoff cone. Sediment will be allowed to settle in the Imhoff cone for up to 5 minutes before a reading is made.
2. Bailing will be followed by initial gentle surging with a surge block, starting at the top of the screen and working down in 5-foot stroke intervals. Each interval will be surged for 3 to 5 minutes. As sediment collects in the well, it may be necessary to bail in order to clean out sediment and access the lower screen interval.

3. Following surging, bailing will be conducted to remove accumulated sediment from the well.

4. Initial over-pumping will be conducted at a flow rate of approximately 20 gpm with the pump set in the lower 5 to 10 feet of the screen to remove sufficient water, thus ensuring a relatively clean well before physical development begins.

Step 2: Physical Well Development using Bailing, Surging, and Pumping

After initial bailing and over-pumping are conducted, the following procedure will be used cyclically and iteratively:

1. Bailing will be conducted to remove silt and sand that has entered the well during over-pumping.

2. Surging will be conducted in 5-foot intervals for a time period of 5 minutes per interval by starting at the top interval of saturated screen and working toward the lowest interval.

3. Following surging, bailing will be conducted until water has less than 2 milliliters of sediment per liter of water, measured by using an Imhoff cone. The sample will be collected from the first discharge from the bailer into the 1-liter Imhoff cone, and the sediment will be allowed to settle for up to 5 minutes. These numbers will be recorded by the geologist. As development progresses, these numbers should become smaller, and perhaps unmeasureable.

4. Finally, over-pumping will be conducted. Initially, the pump will be placed approximately 5 feet above the bottom of the screen, and pumped for 3 to 5 minutes. The pump will then be raised by 5-foot increments, and pumped for 3 to 5 minutes at each depth. This will continue until the uppermost 5 feet of the submerged screen is reached. After the pump has been lowered across the entire screen, the pump will be set approximately 5 to 10 feet above the bottom of the screen, and pumped for 20 minutes at 40 gpm. During over-pumping, the depth to water, temperature, pH, specific conductivity, and turbidity of the water will be monitored. Imhoff cone measurements will be collected during the first few minutes of pumping and at the last few minutes of the pumping cycle. Depth to water will be monitored using a pressure transducer, or manually, depending on the equipment at hand to implement the measurements. The drawdown and pumping rate observed during the final 20 minutes will be used to calculate the specific capacity of the well.

Step 3: Physical Well Development using Jetting

Jetting may be conducted depending on the results of surging and bailing operation, indicated by the preliminary specific capacity obtained during development pumping in the preceding step. The jetting device will be constructed with three to four jets that are capable of injecting water at approximately 140 feet per second. An extraction pump will be attached to, or part of, the jetting device and will run at a rate slightly higher than the injection rate in order to maintain a slightly lower water level in the well bore

than in the formation. For example, if the jetting flow rate is 40 gpm, then extraction pumping will occur at 45 gpm. Water used for jetting may be either clean potable water, or water recirculated from the injection process if it is free of fines, but clean potable water is preferred. During the jetting process, it is anticipated that the discharged water at the start of jetting will become sediment-laden and then become clear again. Periodic Imhoff cone readings will be collected during this process to document sediment removal.

1. The jetting procedure will be conducted only in the saturated screen section.

2. Jetting will be conducted in 1 to 3-foot intervals starting at the top of the saturated screen and working downward.

3. The discharge water generated during jetting of each interval will be checked using an Imhoff cone to help assess the intervals that are producing more fines versus the intervals that may need further development or extended development.

4. Water levels during pumping will be measured using a pressure transducer to ensure that the jetting water level is lower than the static water level in groundwater.

At any time, if there is an unexpected result or indication of dropped filter pack, jetting should be stopped, the filter pack refilled, or other issues addressed. Jetting is a powerful tool for well development, but is sensitive to development issues, and progress must be monitored closely by the supervising geologist.

Step 4: Final Well Development Pumping

Following jetting, the jetting and extraction pump unit will be lowered to the bottom 5 feet of screen. The injection pump will be turned off, and the extraction pump will run at 40 gpm to sustain pumping for 30 minutes. Drawdown will be measured using a pressure transducer to estimate the specific capacity. During this pumping, the temperature, pH, specific conductivity, and turbidity of the water will be monitored. Imhoff cone readings should be collected periodically during pumping and at the end of pumping to document that the discharged water is sufficiently clear and that the test and operational pumps are unlikely to be damaged, and to give the treatment system engineers an estimate of what sediment load may be expected to reach the treatment system.

1. Well development will be considered complete when the following conditions have been met: the specific capacity reaches 25 gpm per foot; temperature, pH, and specific conductivity have stabilized to within 10% for three consecutive readings; and turbidity is less than 10 nephelometric turbidity units (NTU).

2. If the target specific capacity has not been reached, the jetting process will be repeated.

3. If the target specific capacity has not been reached after multiple cycles, but is greater than or equal to 5 gpm per foot, well development will be considered complete when the following conditions are achieved: temperature, pH, and specific conductivity have stabilized to within 10% for three consecutive readings; and turbidity is less than 10 NTU.

4. If a specific capacity of 5 gpm per foot has not been achieved after multiple cycles, contingency may be made. It is possible that the surging process and additional development may be repeated.

The development process will be supervised by a CB&I geologist and recorded on development logs. An example development log is included in Appendix D.

Installation of this extraction well is scheduled to begin April 20, 2015.

Deep Groundwater Monitoring Wells KAFB-106215, KAFB-106218, KAFB-106221, KAFB-106224, and KAFB-106227

Deep Monitoring Well Design

In addition to the installation of extraction well KAFB-106228, groundwater sampling results and geophysical data from KAFB-106212 will be used to design five deep groundwater monitoring wells - KAFB-106215, KAFB-106218, KAFB-106221, KAFB-106224, and KAFB-106227. These wells will be installed and developed in accordance with the approved Groundwater Investigation Work Plan (USACE, 2011) and the Work Plan using air rotary casing hammer drilling to further delineate the horizontal and vertical extent of the EDB plume. Additional details of the well installation, including a figure showing the well design and completion, are provided in the Work Plan Addendum (USACE, 2014b).

The five deep monitoring wells will be installed in five clusters of three wells each. Shallow and intermediate monitoring wells have already been installed at each of the five clusters. The screen intervals for the deep wells are determined based upon the EDB results of probe well KAFB-106212 and will, therefore, be screened at an interval extending approximately 85 to 100 feet below the water table.

A draft monitoring well design is depicted on Figure 2 with the depths based on probe well KAFB-106212 and completion information from surrounding shallow and intermediate wells. Proposed screen placement and well depths are detailed in Table 1.

The five monitoring wells are scheduled to be installed beginning April 6, 2015.

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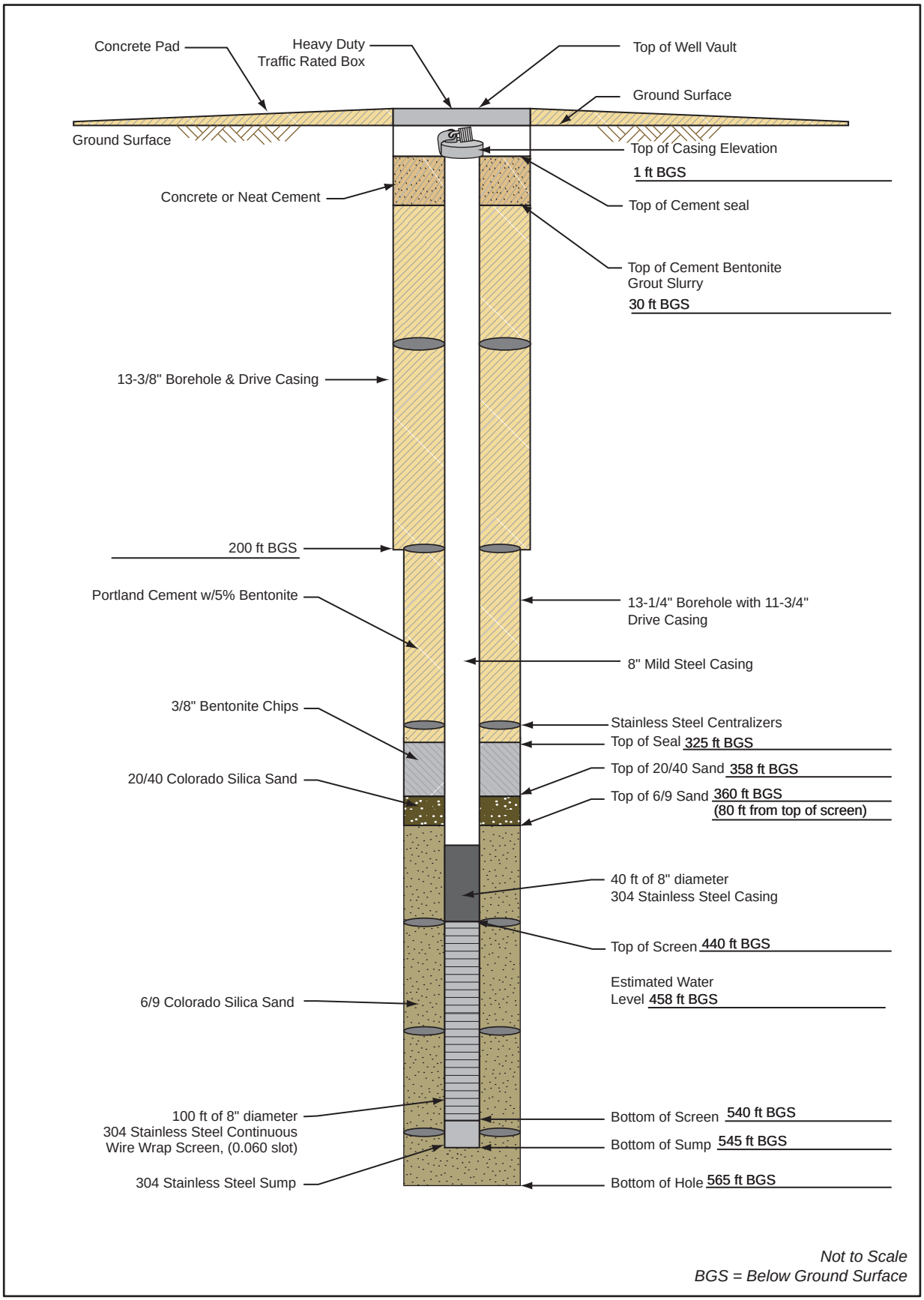
USACE. 2014a. *Groundwater Extraction Pilot Implementation and Additional Plume Characterization Work Plan, Bulk Fuels Facility Spill, Solid Waste Management Units ST-106 and SS-111, Kirtland Air Force Base, Albuquerque, New Mexico.* Prepared by CB&I Federal Services LLC for the USACE Albuquerque District under USACE Contract No. W912DY-10-D-0014, Delivery Order 0002. August 1, 2014.

USACE. 2014b. *Groundwater Extraction Pilot Implementation and Additional Plume Characterization Letter Work Plan Addendum - Final, Bulk Fuels Facility Spill, Solid Waste Management Units ST-106 and SS-111, Kirtland Air Force Base, Albuquerque, New Mexico.* Prepared by CB&I Federal Services LLC for the USACE Albuquerque District under USACE Contract No. W912DY-10-D-0014, Delivery Order 0002. October 3, 2014.

USACE. 2011. *Groundwater Investigation Work Plan, Bulk Fuels Facility Spill, Solid Waste Management Units ST-106 and SS-111, Kirtland Air Force Base, Albuquerque, New Mexico*. Prepared by Shaw Environmental & Infrastructure, Inc. for the USACE Albuquerque District under USACE Contract No. W912DY-10-D-0014, Delivery Order 0002. March.

FIGURES

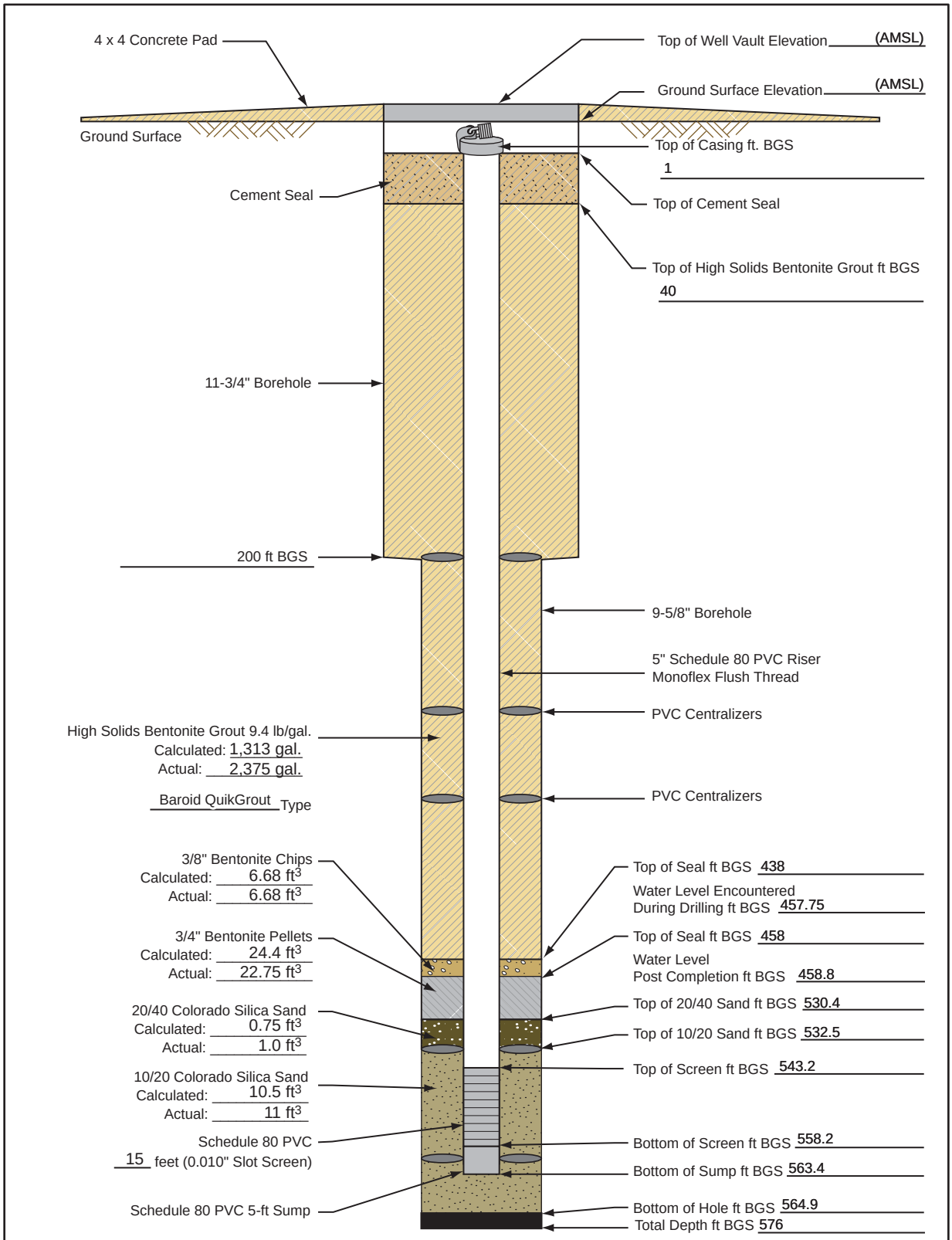
Figure 1
Extraction Well Proposed Completion Diagram KAFB-106228



140705.CB010040_MW_KAFB_EXTRACTION_TEMPLATE

Figure 2
Monitoring Well Completion Diagram KAFB-106212

Installation Start Date/Time: 2/11/2015 @ 1505
Installation End Date/Time: 2/17/2015
Surface Completion Date: 2/25/2015



(4,816.90) = *Elevations are NAVD 88 Datum values based on NGS Control Station "Hanger", Elevation = 5,343.43 ft. GPS/RTK methods and GEO1D99 model were used to determine elevations of all surveyed points.*

Not to Scale
BGS = Below Ground Surface

140705.CB020403.A10

TABLE

Table 1. Ethylene Dibromide Analytical Results

Sample Date	Replicate	Result	DL[a]	LOD[b]	LOQ[c]	Units	Dilution	Method[d]
3/2/2015	1	ND	0.0093	0.0186	0.0279	µg/L	1	SW8011
	2	ND	0.0094	0.0188	0.0282	µg/L	1	SW8011
	3	ND	0.00944	0.0189	0.0283	µg/L	1	SW8011
3/3/2015	1	ND	0.00933	0.0187	0.028	µg/L	1	SW8011
	2	ND	0.00922	0.0184	0.0277	µg/L	1	SW8011
	3	ND	0.00944	0.0189	0.0283	µg/L	1	SW8011
3/4/2015	1	ND	0.00954	0.0191	0.0286	µg/L	1	SW8011
	2	ND	0.0092	0.0184	0.0276	µg/L	1	SW8011
	3	ND	0.00965	0.0193	0.029	µg/L	1	SW8011
3/2/2015	1	ND	0.25	0.5	1	µg/L	1	SW8260B
	2	ND	0.25	0.5	1	µg/L	1	SW8260B
	3	ND	0.25	0.5	1	µg/L	1	SW8260B
3/3/2015	1	ND	0.25	0.5	1	µg/L	1	SW8260B
	2	ND	0.25	0.5	1	µg/L	1	SW8260B
	3	ND	0.25	0.5	1	µg/L	1	SW8260B
3/4/2015	1	ND	0.25	0.5	1	µg/L	1	SW8260B
	2	ND	0.25	0.5	1	µg/L	1	SW8260B
	3	ND	0.25	0.5	1	µg/L	1	SW8260B

[a] **DL:** The detection limit is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero.

[b] **LOD**: The limit of detection is an estimate of the minimum amount of a substance that an analytical process can reliably detect. An LOD is analyte- and matrix-specific and may be laboratory-dependent. This definition is further clarified in the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories (2010) as the smallest amount or concentration of a substance that must be present in a sample in order to be detected at a high level of confidence (99%). At the LOD, the false negative rate (Type II error) is 1%.

[c] **LOQ**: The limit of quantitation is the minimum level, concentration, or quantity of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. This term is further clarified within the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories (2010) as the lowest concentration that produces a quantitative result within specified limits of precision and bias.

[d] EPA. 1986 (and updates). *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, 3rd ed., U.S. Environmental Protection Agency, Washington, D.C.

µg/L micrograms per liter
ND nondetect

APPENDIX A

KAFB-106212 Logs

Borehole ID: KAFB-106212

Client: US Army Corps of Engineers
Project Location: KAFB, Albuquerque, NM
Project Name: KAFB BFF SWMU ST-106 and SS-111
Project Number: 140705

Date Started: 1/19/2015
Date TD Reached: 1/22/2015
Date Completed: 2/25/2015

Ground Elevation AMSL (ft): Not Recorded
Y Coordinate:
X Coordinate:

Hole Diameter Upper (in.): 11-3/4
Hole Diameter Lower (in.): 9-5/8
Surface Completion Type: Flush mount

Groundwater Levels BGS (ft):
At Time of Drilling: 457.75
At End of Drilling: Not Recorded
After Drilling: 458.8

Drillling Contractor: Yellow Jacket
Drilling Method: Air Rotary Casing Hammer
Logged By: M. Giles

LICENSED PROFESSIONAL GEOLOGIST
VIRGINIA BRACHT
8881903-2250
STATE OF UTAH
3/12/15

Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
0					ASPHALT			
					No Lithologic Description.		Top of Casing/ Top of Cement Seal	Borehole was water knifed from 0 - 5 ft for utility clearance on an earlier date.
5					Clayey GRAVEL (GC); reddish yellow (7.5YR 7/6); 85% fine to coarse gravel; subangular to subrounded; 15% clay.			Began drilling @ 1112 on 1/19/15. Used water for dust control.
10					Same as above (5 ft); 80% fine to coarse gravel to 1"; angular to subrounded; 20% clay.	GC		
15					Same as above (5 ft); 60% fine to coarse gravel; 10% medium to coarse sand; 30% clay.		Cement Seal	Kelly down @ 1132. New 20' connection. Resumed drilling @ 1142.
20					Well graded GRAVEL with Sand (GW); brown (7.5YR 5/3); 50% fine to coarse gravel; angular to subrounded; 45% coarse to very coarse sand; subangular to subrounded; 5% clay. Note: gravel is granite with some feldspar.			
25					Same as above (20 ft); higher percent of coarse grains.	GW		
30								

Borehole ID: KAFB-106212

Client: US Army Corps of Engineers
Project Location: KAFB, Albuquerque, NM
Project Name: KAFB BFF SWMU ST-106 and SS-111
Project Number: 140705

Date Started: 1/19/2015
Date TD Reached: 1/22/2015
Date Completed: 2/25/2015

Ground Elevation AMSL (ft): Not Recorded
Y Coordinate:
X Coordinate:

Hole Diameter Upper (in.): 11-3/4
Hole Diameter Lower (in.): 9-5/8
Surface Completion Type: Flush mount

Groundwater Levels BGS (ft):
At Time of Drilling: 457.75
At End of Drilling: Not Recorded
After Drilling: 458.8

Drillling Contractor: Yellow Jacket
Drilling Method: Air Rotary Casing Hammer
Logged By: M. Giles

Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
30					SILT (ML); yellow (10YR 7/6); 90% silt; 5% medium sand; 5% fine gravel.	ML		Cuttings are partially saturated.
35					Sandy SILT (ML); yellow (10YR 7/6); 60% silt; 40% coarse sand; subangular to subrounded.	ML		Cuttings are partially saturated. Kelly down @ 1200. New 20' connection. Resumed drilling @ 1217.
40					Silty GRAVEL (GM); yellow (10YR 7/6); 70% fine to coarse gravel; subangular to subrounded; 25% silt; 5% sand.	GM	Top of High Solids Bentonite Grout	
45					Sandy Lean CLAY (CL); yellow (10YR 7/6); >30% medium to coarse sand. Note: unable to determine exact percentages.	CL		Cuttings are partially saturated.
50					Lean CLAY (CL); yellow (10YR 7/6); medium plasticity; 90% clay; 5% coarse sand; 5% fine gravel; subangular.	CL	High Solids Bentonite Grout	Cuttings are partially saturated.
55					Same as above (50 ft).	CL		Kelly down @ 1237. New 20' connection. Resumed drilling @ 1313.
60								

KAFB_BOREHOLE_LOG - SHAW_DRILLING.GDT - 3/12/15 11:29 - Z:\KAFB BFF\GINT\KAFB_PROJECT\KAFB_BFF.GPJ

Borehole ID: KAFB-106212

Client: US Army Corps of Engineers
Project Location: KAFB, Albuquerque, NM
Project Name: KAFB BFF SWMU ST-106 and SS-111
Project Number: 140705

Date Started: 1/19/2015
Date TD Reached: 1/22/2015
Date Completed: 2/25/2015

Ground Elevation AMSL (ft): Not Recorded
Y Coordinate:
X Coordinate:

Hole Diameter Upper (in.): 11-3/4
Hole Diameter Lower (in.): 9-5/8
Surface Completion Type: Flush mount

Groundwater Levels BGS (ft):
At Time of Drilling: 457.75
At End of Drilling: Not Recorded
After Drilling: 458.8

Drillling Contractor: Yellow Jacket
Drilling Method: Air Rotary Casing Hammer
Logged By: M. Giles

Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
60					Lean CLAY with Gravel (CL); reddish yellow (7.5YR 6/6); >15% fine gravel to 3/8"; subangular. Note: unable to determine exact percentages.	CL		Material is wet and runs through strainer.
65					SILT (ML); reddish yellow (7.5YR 6/6); silt; trace gravel. Note: unable to determine percentages.	ML		Material is wet and runs through strainer.
70					Same as above (65 ft).			Material is wet and runs through strainer.
75					Same as above (65 ft).		High Solids Bentonite Grout	Material is wet and runs through strainer. Kelly down @ 1344. New 20' connection. Resumed drilling @ 1355.
80					Same as above (65 ft).			Material is wet and runs through strainer.
85					Same as above (65 ft).			Material is wet and runs through strainer.
90								

KAFB_BOREHOLE_LOG - SHAW_DRILLING.GDT - 3/12/15 11:29 - Z:\KAFB BFF\GINT\KAFB_PROJECT\KAFB_BFF.GPJ

Borehole ID: KAFB-106212

Client: US Army Corps of Engineers
Project Location: KAFB, Albuquerque, NM
Project Name: KAFB BFF SWMU ST-106 and SS-111
Project Number: 140705

Date Started: 1/19/2015
Date TD Reached: 1/22/2015
Date Completed: 2/25/2015

Ground Elevation AMSL (ft): Not Recorded
Y Coordinate:
X Coordinate:

Hole Diameter Upper (in.): 11-3/4
Hole Diameter Lower (in.): 9-5/8
Surface Completion Type: Flush mount

Groundwater Levels BGS (ft):
At Time of Drilling: 457.75
At End of Drilling: Not Recorded
After Drilling: 458.8

Drillling Contractor: Yellow Jacket
Drilling Method: Air Rotary Casing Hammer
Logged By: M. Giles

Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
90					Lean CLAY (CL); yellowish brown (10YR 5/6); medium plasticity; trace gravel. Note: unable to determine percentages.			
95					Same as above (90 ft).			
100					Same as above (90 ft).			Kelly down @ 1415. Repair line. Resumed drilling @ 1608.
105					Same as above (90 ft).	CL	High Solids Bentonite Grout	
110					Same as above (90 ft).			
115					Same as above (90 ft).			
120								Kelly down @ 1435. End of 1/19/15. New 20' connection. Resumed drilling @ 0902 on

KAFB_BOREHOLE_LOG - SHAW_DRILLING.GDT - 3/12/15 11:29 - Z:\KAFB BFF\GINT\KAFB_PROJECT\KAFB_BFF.GPJ

Borehole ID: KAFB-106212

Client: US Army Corps of Engineers
Project Location: KAFB, Albuquerque, NM
Project Name: KAFB BFF SWMU ST-106 and SS-111
Project Number: 140705

Date Started: 1/19/2015
Date TD Reached: 1/22/2015
Date Completed: 2/25/2015

Ground Elevation AMSL (ft): Not Recorded
Y Coordinate:
X Coordinate:

Hole Diameter Upper (in.): 11-3/4
Hole Diameter Lower (in.): 9-5/8
Surface Completion Type: Flush mount

Groundwater Levels BGS (ft):
At Time of Drilling: 457.75
At End of Drilling: Not Recorded
After Drilling: 458.8

Drillling Contractor: Yellow Jacket
Drilling Method: Air Rotary Casing Hammer
Logged By: M. Giles

Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
120					Lean CLAY with Gravel (CL); reddish yellow (7.5YR 7/6); medium plasticity; clay; >15% coarse gravel to 1"; subrounded. Note: unable to determine exact percentages.			1/20/15. Cuttings are very saturated.
125					CLAY (CL); reddish yellow (7.5YR 7/6); medium plasticity.			Cuttings are very saturated.
130					Same as above (125 ft).			Cuttings are very saturated.
135					Same as above (125 ft).	CL	High Solids Bentonite Grout	Cuttings are very saturated. Kelly down @ 0930. New 20' connection. Resumed drilling @ 0937.
140					Same as above (125 ft); reddish yellow (7.5YR 6/6); trace gravel to 1/2".			Cuttings are very saturated.
145					Same as above (140 ft).			Cuttings are very saturated.
150								

KAFB_BOREHOLE_LOG - SHAW_DRILLING.GDT - 3/12/15 11:29 - Z:\KAFB BFF\GINT\KAFB_PROJECT\KAFB_BFF.GPJ

Borehole ID: KAFB-106212

Client: US Army Corps of Engineers
Project Location: KAFB, Albuquerque, NM
Project Name: KAFB BFF SWMU ST-106 and SS-111
Project Number: 140705

Date Started: 1/19/2015
Date TD Reached: 1/22/2015
Date Completed: 2/25/2015

Ground Elevation AMSL (ft): Not Recorded
Y Coordinate:
X Coordinate:

Hole Diameter Upper (in.): 11-3/4
Hole Diameter Lower (in.): 9-5/8
Surface Completion Type: Flush mount

Groundwater Levels BGS (ft):
At Time of Drilling: 457.75
At End of Drilling: Not Recorded
After Drilling: 458.8

Drillling Contractor: Yellow Jacket
Drilling Method: Air Rotary Casing Hammer
Logged By: M. Giles

Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
150					Lean CLAY with Gravel (CL); reddish yellow (7.5YR 6/8); medium plasticity; clay; >15% coarse gravel to 2"; subrounded. Note: unable to determine exact percentages.	CL		Cuttings are very saturated.
155					Same as above (150 ft); fine to coarse gravel; subangular; trace coarse sand.			Cuttings are very saturated. Kelly down @ 0959. New 20' connection. Resumed drilling @ 1057.
160					Poorly graded GRAVEL with Clay (GP-GC); brownish yellow (10YR 6/8); 85% fine gravel; subangular to subrounded; trace coarse gravel; subrounded; 10% clay; 5% coarse sand.	GP-GC		
165					Well graded SAND with Gravel and Clay (SW-SC); brownish yellow (10YR 6/8); 70% medium to very coarse sand; subangular; 20% fine to coarse gravel; fine gravel is subangular; coarse gravel is subrounded; 10% clay.	SW-SC	High Solids Bentonite Grout	
170					Clayey SAND (SC); brownish yellow (10YR 6/8); 60% medium sand; subangular; trace coarse sand; 40% clay.	SC		
175					Sandy Lean CLAY (CL); brownish yellow (10YR 6/8); soft; 70% clay; 30% medium sand.	CL		Kelly down @ 1123. New 20' connection. Resumed drilling @ 1335. Collar is stuck and had to be cut
180								

KAFB_BOREHOLE_LOG - SHAW_DRILLING.GDT - 3/12/15 11:29 - Z:\KAFB BFF\GINT\KAFB_PROJECT\KAFB_BFF.GPJ

Borehole ID: KAFB-106212

Client: US Army Corps of Engineers
Project Location: KAFB, Albuquerque, NM
Project Name: KAFB BFF SWMU ST-106 and SS-111
Project Number: 140705

Date Started: 1/19/2015
Date TD Reached: 1/22/2015
Date Completed: 2/25/2015

Ground Elevation AMSL (ft): Not Recorded
Y Coordinate:
X Coordinate:

Hole Diameter Upper (in.): 11-3/4
Hole Diameter Lower (in.): 9-5/8
Surface Completion Type: Flush mount

Groundwater Levels BGS (ft):
At Time of Drilling: 457.75
At End of Drilling: Not Recorded
After Drilling: 458.8

Drillling Contractor: Yellow Jacket
Drilling Method: Air Rotary Casing Hammer
Logged By: M. Giles

Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
180								
					Poorly graded SAND (SP); 95% coarse to very coarse sand; subangular; 5% clay. Note: sand is black feldspar and red granite.	SP		off.
185								
					Well graded GRAVEL with Sand (GW); 60% fine gravel; subangular; 40% fine to very coarse sand; subangular. Note: gravel is black mafics; sand is black mafics and red granite.	GW		
190								
					Poorly graded GRAVEL with Sand (GP); 65% fine gravel; subangular; trace coarse gravel; subrounded; 35% fine to coarse sand.	GP		
195							High Solids Bentonite Grout	
					SILT (ML); brown (7.5YR 5/4); greater than 85% silt; less than 15% fine to coarse sand. Note: unable to determine exact percentages.	ML		Used 300 gallons of water. Total gallons used to date = 600 gallons. Material runs through strainer. Kelly down @ 1410. End of 1/20/15. New 20' connection. Resumed drilling @ 0847 on 1/22/15.
200								
					Well graded GRAVEL (GW); 60% coarse gravel to 2"; subrounded; 40% fine gravel; subangular to subrounded; trace sand.	GW		
205								
					Well graded GRAVEL with Sand (GW); 60% fine to coarse gravel to 3/4"; subangular to subrounded; 40% coarse to very coarse sand; subangular to subrounded.			After advancing 11" casing to 197' the driller pulled up 40' of casing and readvanced it.
210								

KAFB_BOREHOLE_LOG - SHAW_DRILLING.GDT - 3/12/15 11:29 - Z:\KAFB BFF\GINT\KAFB_PROJECT\KAFB_BFF.GPJ

Borehole ID: KAFB-106212

Client: US Army Corps of Engineers
Project Location: KAFB, Albuquerque, NM
Project Name: KAFB BFF SWMU ST-106 and SS-111
Project Number: 140705

Date Started: 1/19/2015
Date TD Reached: 1/22/2015
Date Completed: 2/25/2015

Ground Elevation AMSL (ft): Not Recorded
Y Coordinate:
X Coordinate:

Hole Diameter Upper (in.): 11-3/4
Hole Diameter Lower (in.): 9-5/8
Surface Completion Type: Flush mount

Groundwater Levels BGS (ft):
At Time of Drilling: 457.75
At End of Drilling: Not Recorded
After Drilling: 458.8

Drillling Contractor: Yellow Jacket
Drilling Method: Air Rotary Casing Hammer
Logged By: M. Giles

Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
210								
					Well graded SAND with Gravel (SW); strong brown (7.5YR 5/6); 85% fine to coarse sand; subangular; 15% fine gravel to 1/2"; subrounded.	SW		
215								
					Poorly graded SAND (SP); brownish yellow (10YR 6/6); 100% fine sand; trace coarse sand.	SP		Kelly down @ 0858. New 20' connection. Resumed drilling @ 0906.
220								
					Lean CLAY (CL); strong brown (7.5YR 5/6); low plasticity; greater than 85% clay; less than 15% very fine to fine sand.			
225					Same as above (220 ft).	CL	High Solids Bentonite Grout	
230								
					Poorly graded GRAVEL (GP); 70% fine gravel; 30% coarse gravel; subangular to subrounded.			
235					Same as above (230 ft).	GP		Kelly down @ 0912. New 20' connection. Resumed drilling @ 0926.
240								

KAFB_BOREHOLE_LOG - SHAW_DRILLING.GDT - 3/12/15 11:29 - Z:\KAFB BFF\GINT\KAFB_PROJECT\KAFB_BFF.GPJ

Borehole ID: KAFB-106212

Client: US Army Corps of Engineers
Project Location: KAFB, Albuquerque, NM
Project Name: KAFB BFF SWMU ST-106 and SS-111
Project Number: 140705

Date Started: 1/19/2015
Date TD Reached: 1/22/2015
Date Completed: 2/25/2015

Ground Elevation AMSL (ft): Not Recorded
Y Coordinate:
X Coordinate:

Hole Diameter Upper (in.): 11-3/4
Hole Diameter Lower (in.): 9-5/8
Surface Completion Type: Flush mount

Groundwater Levels BGS (ft):
At Time of Drilling: 457.75
At End of Drilling: Not Recorded
After Drilling: 458.8

Drillling Contractor: Yellow Jacket
Drilling Method: Air Rotary Casing Hammer
Logged By: M. Giles

Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
240					Well graded GRAVEL with Sand (GW); 85% fine to coarse gravel to 1-1/2"; subrounded; 15% coarse sand. Note: fine gravel is to 1/2".	GW		
245					Well graded GRAVEL with Silt and Sand (GW-GM); yellowish brown (10YR 5/4); 50% fine to coarse gravel; subangular to subrounded; 40% fine to medium sand; 10% fines. Note: gravel is black feldspar and red granite. Same as above (245 ft).	GW-GM		
250								
255					SILT with Sand (ML); yellowish brown (10YR 5/4); 80% silt; 20% fine to medium sand. Note: sand is black with some frosted quartz.	ML	High Solids Bentonite Grout	Cuttings are very saturated. Kelly down @ 0940. New 20' connection. Resumed drilling @ 0949.
260					Well graded SAND (SW); 90% fine to coarse sand; 10% fine gravel. Note: sand is feldspar and granite. Same as above (260 ft).	SW		
265								
270								

KAFB_BOREHOLE_LOG - SHAW_DRILLING.GDT - 3/12/15 11:29 - Z:\KAFB BFF\GINT\KAFB_PROJECT\KAFB_BFF.GPJ

Borehole ID: KAFB-106212

Client: US Army Corps of Engineers
Project Location: KAFB, Albuquerque, NM
Project Name: KAFB BFF SWMU ST-106 and SS-111
Project Number: 140705

Date Started: 1/19/2015
Date TD Reached: 1/22/2015
Date Completed: 2/25/2015

Ground Elevation AMSL (ft): Not Recorded
Y Coordinate:
X Coordinate:

Hole Diameter Upper (in.): 11-3/4
Hole Diameter Lower (in.): 9-5/8
Surface Completion Type: Flush mount

Groundwater Levels BGS (ft):
At Time of Drilling: 457.75
At End of Drilling: Not Recorded
After Drilling: 458.8

Drillling Contractor: Yellow Jacket
Drilling Method: Air Rotary Casing Hammer
Logged By: M. Giles

Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
270					SILT with Sand (ML); light yellowish brown (10YR 6/4); 85% silt; 15% medium sand.	ML		Cuttings are very saturated.
275					Lean CLAY (CL); light yellowish brown (10YR 6/4); slightly firm to firm; medium plasticity; 100% clay.	CL		Kelly down @ 1003. New 20' connection. Resumed drilling @ 1013.
280					Same as above (275 ft).			
285					Silty GRAVEL (GM); light yellowish brown (10YR 6/4); 70% fine to coarse gravel; subrounded; 20% silt; 10% coarse sand. Note: gravel is black mafics.	GM	High Solids Bentonite Grout	
290					Silty GRAVEL with Sand (GM); light yellowish brown (10YR 6/4); 60% fine gravel; subrounded; trace coarse gravel; 20% medium sand; 20% silt.			
295					Poorly graded GRAVEL with Silt (GP-GM); 90% fine gravel to 3/8"; subangular; 10% silt.	GP-GM		Kelly down @ 1025. New 20' connection. Resumed drilling @ 1100.
300								

KAFB_BOREHOLE_LOG - SHAW_DRILLING.GDT - 3/12/15 11:29 - Z:\KAFB BFF\GINT\KAFB_PROJECT\KAFB_BFF.GPJ

Borehole ID: KAFB-106212

Client: US Army Corps of Engineers
Project Location: KAFB, Albuquerque, NM
Project Name: KAFB BFF SWMU ST-106 and SS-111
Project Number: 140705

Date Started: 1/19/2015
Date TD Reached: 1/22/2015
Date Completed: 2/25/2015

Ground Elevation AMSL (ft): Not Recorded
Y Coordinate:
X Coordinate:

Hole Diameter Upper (in.): 11-3/4
Hole Diameter Lower (in.): 9-5/8
Surface Completion Type: Flush mount

Groundwater Levels BGS (ft):
At Time of Drilling: 457.75
At End of Drilling: Not Recorded
After Drilling: 458.8

Drillling Contractor: Yellow Jacket
Drilling Method: Air Rotary Casing Hammer
Logged By: M. Giles

Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
300					Well graded GRAVEL (GW); 60% coarse gravel to 2"; 40% fine gravel; subangular. Note: gravel is black mafics, red granite, and frosted quartz.	GW		
305					Same as above (300 ft); 70% fine gravel; 30% coarse gravel; angular to subangular. Note: gravel is black mafics with some red granite.	GW		
310					Same as above (300 ft); 70% fine gravel; 20% coarse gravel; subangular to subrounded; less than 10% medium sand; trace silt. Note: gravel is black material.	GW		
315					Poorly graded GRAVEL with Sand (GP); 80% fine gravel; subangular to subrounded; trace coarse gravel; 20% coarse sand; subrounded. Note: gravel is black mafics, red granite, and pink quartz.	GP	High Solids Bentonite Grout	Kelly down @ 1118. New 20' connection. Resumed drilling @ 1124.
320					Poorly graded SAND (SP); brown (7.5YR 5/4); 100% fine sand; trace silt.	SP		
325					Same as above (320 ft).	SP		
330						GP		Lithology on next page

KAFB_BOREHOLE_LOG - SHAW_DRILLING.GDT - 3/12/15 11:29 - Z:\KAFB BFF\GINT\KAFB_PROJECT\KAFB_BFF.GPJ

Borehole ID: KAFB-106212

Client: US Army Corps of Engineers
Project Location: KAFB, Albuquerque, NM
Project Name: KAFB BFF SWMU ST-106 and SS-111
Project Number: 140705

Date Started: 1/19/2015
Date TD Reached: 1/22/2015
Date Completed: 2/25/2015

Ground Elevation AMSL (ft): Not Recorded
Y Coordinate:
X Coordinate:

Hole Diameter Upper (in.): 11-3/4
Hole Diameter Lower (in.): 9-5/8
Surface Completion Type: Flush mount

Groundwater Levels BGS (ft):
At Time of Drilling: 457.75
At End of Drilling: Not Recorded
After Drilling: 458.8

Drillling Contractor: Yellow Jacket
Drilling Method: Air Rotary Casing Hammer
Logged By: M. Giles

Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
330								
335					Poorly graded GRAVEL (GP); 90% fine gravel; subrounded; 10% fine to coarse sand. Note: gravel is black mafics, red granite, and frosted quartz.	GP		Lithology on next page
340					Gravelly SILT (ML); less than 70% silt; greater than 30% fine to coarse gravel; trace fine sand. Note: unable to determine exact percentages.	ML		Cuttings are very saturated. Kelly down @ 1150. New 20' connection. Resumed drilling @ 1300.
345					Poorly graded GRAVEL (GP); 90% fine gravel; subangular to subrounded; trace coarse gravel; 10% fine to medium sand. Note: gravel is black mafics and red granite.	GP		
350					Poorly graded SAND with Silt (SP-SM); brown (7.5YR 5/4); 90% fine sand; trace medium sand; 10% silt.	SP-SM	High Solids Bentonite Grout	
355					Same as above (345 ft).			
360					Poorly graded SAND (SP); brown (7.5YR 5/4); 95% fine sand; trace medium sand; 5% silt.	SP		Kelly down @ 1317. New 20' connection. Resumed drilling @ 1327.

KAFB_BOREHOLE_LOG - SHAW_DRILLING.GDT - 3/12/15 11:29 - Z:\KAFB BFF\GINT\KAFB_PROJECT\KAFB_BFF.GPJ

Borehole ID: KAFB-106212

Client: US Army Corps of Engineers
Project Location: KAFB, Albuquerque, NM
Project Name: KAFB BFF SWMU ST-106 and SS-111
Project Number: 140705

Date Started: 1/19/2015
Date TD Reached: 1/22/2015
Date Completed: 2/25/2015

Ground Elevation AMSL (ft): Not Recorded
Y Coordinate:
X Coordinate:

Hole Diameter Upper (in.): 11-3/4
Hole Diameter Lower (in.): 9-5/8
Surface Completion Type: Flush mount

Groundwater Levels BGS (ft):
At Time of Drilling: 457.75
At End of Drilling: Not Recorded
After Drilling: 458.8

Drillling Contractor: Yellow Jacket
Drilling Method: Air Rotary Casing Hammer
Logged By: M. Giles

Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
360					Poorly graded GRAVEL (GP); brown (7.5YR 5/4); 90% fine gravel; subangular to subrounded; 5% medium sand; 5% silt. Note: gravel is black material and frosted quartz.			
365					Same as above (360 ft).	GP		
370					Poorly graded SAND with Silt (SP-SM); yellowish brown (10YR 5/4); 90% medium sand; trace coarse sand; 10% silt.	SP-SM		
375					Poorly graded GRAVEL with Sand (SP); 70% gravel; subangular to subrounded; 30% medium sand. Note: gravel is black mafics, red granite, and white quartz; sand is mostly frosted quartz.	GP	High Solids Bentonite Grout	Kelly down @ 1315. New 20' connection. Resumed drilling.
380					Poorly graded SAND (SP); 100% medium to coarse sand; trace fine gravel. Note: sand is frosted white quartz, with some black and red grains.			
385					Same as above (380 ft).	SP		
390						GW-GM		Lithology on next page.

KAFB_BOREHOLE_LOG - SHAW_DRILLING.GDT - 3/12/15 11:29 - Z:\KAFB BFF\GINT\KAFB_PROJECT\KAFB_BFF.GPJ

Borehole ID: KAFB-106212

Client: US Army Corps of Engineers
Project Location: KAFB, Albuquerque, NM
Project Name: KAFB BFF SWMU ST-106 and SS-111
Project Number: 140705

Date Started: 1/19/2015
Date TD Reached: 1/22/2015
Date Completed: 2/25/2015

Ground Elevation AMSL (ft): Not Recorded
Y Coordinate:
X Coordinate:

Hole Diameter Upper (in.): 11-3/4
Hole Diameter Lower (in.): 9-5/8
Surface Completion Type: Flush mount

Groundwater Levels BGS (ft):
At Time of Drilling: 457.75
At End of Drilling: Not Recorded
After Drilling: 458.8

Drillling Contractor: Yellow Jacket
Drilling Method: Air Rotary Casing Hammer
Logged By: M. Giles

Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
390					Well graded GRAVEL with Silt and Sand (GW-GM); 60% fine gravel; trace coarse gravel; subangular to subrounded; 30% fine to medium sand; 10% silt. Note: gravel is black mafics and frosted quartz; sand is clear quartz.	GW-GM		
395					Same as above (390 ft).			
400								Kelly down @ 1418. New 20' connection. Resumed drilling @ 1555. Water added.
405					Poorly graded SAND (SP); 100% fine to medium sand. Note: sand is clear quartz with black mica.	SP		
410					Lean CLAY (CL); strong brown (7.5YR 5/6); medium plasticity; slightly firm; greater than 85% clay; less than 15% fine sand.	CL	High Solids Bentonite Grout	Cuttings are very saturated.
415					Silty GRAVEL (GM); 80% fine to coarse gravel; subangular to subrounded; 20% silt. Note: fine gravel is red granite and black mafics; coarse gravel is black mafics.	GM		
420					Well graded GRAVEL with Silt (GW-GM); strong brown (7.5YR 5/6); 90% fine to coarse gravel; subangular to subrounded; 10% silt. Note: fine gravel is red granite and black mafics; coarse gravel is black mafics.	GW-GM		Kelly down @ 1610. New 20' connection. Resumed drilling @ 1623.

KAFB_BOREHOLE_LOG - SHAW_DRILLING.GDT - 3/12/15 11:29 - Z:\KAFB BFF\GINT\KAFB_PROJECT\KAFB_BFF.GPJ

Borehole ID: KAFB-106212

Client: US Army Corps of Engineers
Project Location: KAFB, Albuquerque, NM
Project Name: KAFB BFF SWMU ST-106 and SS-111
Project Number: 140705

Date Started: 1/19/2015
Date TD Reached: 1/22/2015
Date Completed: 2/25/2015

Ground Elevation AMSL (ft): Not Recorded
Y Coordinate:
X Coordinate:

Hole Diameter Upper (in.): 11-3/4
Hole Diameter Lower (in.): 9-5/8
Surface Completion Type: Flush mount

Groundwater Levels BGS (ft):
At Time of Drilling: 457.75
At End of Drilling: Not Recorded
After Drilling: 458.8

Drillling Contractor: Yellow Jacket
Drilling Method: Air Rotary Casing Hammer
Logged By: M. Giles

Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
420								
425					Well graded GRAVEL with Silt (GW-GM); strong brown (7.5YR 5/6); 90% fine to coarse gravel; subangular to subrounded; 10% silt. Note: fine gravel is red granite and black mafics; coarse gravel is black mafics.	GW-GM		
430					Well graded GRAVEL with Sand (GW); 70% fine to coarse gravel; subangular to subrounded; trace cobbles; 30% medium to coarse sand. Note: gravel is black mafics and red granite, and becomes more subrounded as size increases.	GW		
435					SILT (ML); 85% silt; 15% medium sand; trace gravel.	ML		Cuttings are very saturated.
440					Poorly graded GRAVEL (GP); 80% fine gravel; 20% coarse gravel; subangular; trace coarse sand. Note: gravel is black mafics and red granite with some plagioclase.	GP	High Solids Bentonite Grout Top of Bentonite Seal	Kelly down @ 1642. New 20' connection. Resumed drilling @ 1644.
445					Well graded SAND (SW); 100% fine to coarse sand; trace fine gravel. Note: sand is clear and frosted quartz, black mafics, and black feldspar. Same as above (440 ft).	SW	Bentonite Seal	Kelly down @ 1652. End of 1/22/15. Used 600 gallons of water. Total water used to date = 1,200 gallons.
450					Additional lithologic description from Sonic drilling are presented in the following pages.			

KAFB_BOREHOLE_LOG - SHAW_DRILLING.GDT - 3/12/15 11:29 - Z:\KAFB BFF\GINT\KAFB_PROJECT\KAFB_BFF.GPJ

Borehole ID: KAFB-106212-Sonic

Client: US Army Corps of Engineers
Project Location: KAFB, Albuquerque, NM
Project Name: KAFB BFF SWMU ST-106 and SS-111
Project Number: 140705

Date Started: 2/2/2015
Date TD Reached: 2/6/2015
Date Completed: 2/25/2015

Ground Elevation AMSL (ft): Not Recorded
Y Coordinate:
X Coordinate:

Hole Diameter Upper (in.): 11-3/4
Hole Diameter Lower (in.): 9-5/8
Surface Completion Type: Flush mount

Groundwater Levels BGS (ft):
At Time of Drilling: 457.75
At End of Drilling: Not Recorded
After Drilling: 458.80

Drillling Contractor: Yellow Jacket
Drilling Method: Sonic Coring
Logged By: M. Giles

Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
435					Soil descriptions for ARCH drilling are presented in the preceding pages.		High Solids Bentonite Grout; Top of 3/8" Bentonite Seal	
440								
445								
					No core retrieval from 447 - 447.9 ft.			Began Sonic core drilling @ 1306 on 2/2/15. During the first run, the driller had problems with core barrel retrieval. Note: @ 447.9 ft sand is very friable with traces of mica.
					@ 447.9 ft: Poorly graded SAND with Clay (SP-SC); light greenish gray (GLEY 1 7/1); hard; 90% very fine sand; trace coarse sand; 5% clay; 5% silt.	SP-SC		
450		KAFB-						

KAFB_BOREHOLE_LOG - SHAW_DRILLING.GDT - 3/12/15 13:05 - Z:\KAFB BFF\GINT\KAFB_PROJECT\KAFB_BFF.GPJ

Borehole ID: KAFB-106212-Sonic

Client: US Army Corps of Engineers
Project Location: KAFB, Albuquerque, NM
Project Name: KAFB BFF SWMU ST-106 and SS-111
Project Number: 140705

Date Started: 2/2/2015
Date TD Reached: 2/6/2015
Date Completed: 2/25/2015

Ground Elevation AMSL (ft): Not Recorded
Y Coordinate:
X Coordinate:

Hole Diameter Upper (in.): 11-3/4
Hole Diameter Lower (in.): 9-5/8
Surface Completion Type: Flush mount

Groundwater Levels BGS (ft):
At Time of Drilling: 457.75
At End of Drilling: Not Recorded
After Drilling: 458.80

Drillling Contractor: Yellow Jacket
Drilling Method: Sonic Coring
Logged By: M. Giles

Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
450		106212-GEO1			@ 450 ft: Poorly graded SAND with Clay (SP-SC); light greenish gray (GLEY 1 7/1); hard; 90% very fine sand; trace coarse sand; 5% clay; 5% silt.	SP-SC		Note: @ 450 ft sand is very friable with traces of mica.
					No core retrieval from 452.3 - 454.5 ft.			Lost core from 452.3 to 456 ft during first run. Recovered 454.5 to 456.0 during second run.
455					@ 454.5 ft: Poorly graded SAND (SP); reddish brown (5YR 4/4); loose; slightly moist; 95% fine sand; subangular to subrounded; 5% silt.			End of 2/2/15 @ 456 ft. Resumed coring @ 0840 on 2/4/15. Note: @ 454.5 ft sand is predominantly clear quartz with traces of black mica and red microcline.
					Same as above (454.5 ft); very moist.	SP	- Top of 3/4" Bentonite Seal	
460					Same as above (454.5 ft); very moist.			
465								

KAFB_BOREHOLE_LOG - SHAW_DRILLING.GDT - 3/12/15 13:05 - Z:\KAFB BFF\GINT\KAFB_PROJECT\KAFB_BFF.GPJ

Borehole ID: KAFB-106212-Sonic

Client: US Army Corps of Engineers
Project Location: KAFB, Albuquerque, NM
Project Name: KAFB BFF SWMU ST-106 and SS-111
Project Number: 140705

Date Started: 2/2/2015
Date TD Reached: 2/6/2015
Date Completed: 2/25/2015

Ground Elevation AMSL (ft): Not Recorded
Y Coordinate:
X Coordinate:

Hole Diameter Upper (in.): 11-3/4
Hole Diameter Lower (in.): 9-5/8
Surface Completion Type: Flush mount

Groundwater Levels BGS (ft):
At Time of Drilling: 457.75
At End of Drilling: Not Recorded
After Drilling: 458.80

Drillling Contractor: Yellow Jacket
Drilling Method: Sonic Coring
Logged By: M. Giles

Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
465					@ 465 ft: Poorly graded SAND (SP); reddish brown (5YR 4/4); loose; very moist; 95% fine sand; subangular to subrounded; 5% silt.	SP	Bentonite Seal	
					No core retrieval from 466 - 466.5 ft.			
					@ 466.5 ft: Lean CLAY (CL); brown (7.5YR 5/4); firm; medium plasticity; 100% clay; trace sand in upper and lower 1" of core. Note: clay has blocky structure.	CL		Note: @ 467 ft sand is frosted quartz with some clear quartz and trace of black mica.
					@ 467 ft: Poorly graded SAND (SP); brown (7.5YR 4/4); loose; wet; 95% medium sand; subangular to subrounded; trace fine and coarse sand; trace fine gravel; 5% silt.	SP		
470					@ 469.3 ft: Silty SAND (SM); brown (7.5YR 4/4); loose; wet; 80% fine to medium sand; subangular to subrounded; 20% silt.	SM		Note: @ 469.3 ft sand is frosted and clear quartz with traces of red microcline and black mica.
					@ 469.5 ft: Clayey SAND (SC); brown (7.5YR 4/4); wet; 60% fine sand; 40% clay.	SC		Note: @ 470 ft 1"- thick beds of clayey sand throughout. Sand is quartz.
					@ 470 ft: Silty SAND with Gravel (SM); brown (7.5YR 4/4); loose; wet; 70% fine to medium sand; subangular to subrounded; trace coarse sand; 15% fine to coarse gravel to 3"; subrounded; 15% silt.	SM		
					No core retrieval from 472.5 - 476.5 ft.			
475								
					@ 476.5 ft: Silty SAND with Gravel (SM); brown (7.5YR 4/4); loose; wet; 70% fine to medium sand; subangular to subrounded; trace coarse sand; 15% fine to coarse gravel to 3"; subrounded; 15% silt.	SM		Note: @ 476.5 ft 1"- thick beds of clayey sand throughout. Sand is quartz.
480								

KAFB_BOREHOLE_LOG - SHAW_DRILLING.GDT - 3/12/15 13:05 - Z:\KAFB BFF\GINT\KAFB_PROJECT\KAFB_BFF.GPJ

Borehole ID: KAFB-106212-Sonic

Client: US Army Corps of Engineers
Project Location: KAFB, Albuquerque, NM
Project Name: KAFB BFF SWMU ST-106 and SS-111
Project Number: 140705

Date Started: 2/2/2015
Date TD Reached: 2/6/2015
Date Completed: 2/25/2015

Ground Elevation AMSL (ft): Not Recorded
Y Coordinate:
X Coordinate:

Hole Diameter Upper (in.): 11-3/4
Hole Diameter Lower (in.): 9-5/8
Surface Completion Type: Flush mount

Groundwater Levels BGS (ft):
At Time of Drilling: 457.75
At End of Drilling: Not Recorded
After Drilling: 458.80

Drillling Contractor: Yellow Jacket
Drilling Method: Sonic Coring
Logged By: M. Giles

Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
480								
		KAFB-106212-GEO5			@ 480 ft: Silty SAND (SM); brown (7.5YR 4/4); loose; wet; 80% fine to medium sand; subangular to subrounded; trace coarse sand; 5% fine gravel; subrounded; 15% silt.	SM		Note: @ 480 ft sand is quartz.
485					Same as above (480 ft).			Note: @ 485 ft sand is quartz.
					@ 488.2 ft: Well graded SAND with Clay and Gravel (SW-SC); dark yellowish brown (10YR 4/4); loose; wet; 70% fine to coarse sand; subangular to subrounded; 20% fine gravel; subangular; trace coarse gravel; subrounded; 10% clay.	SW-SC		Note: @ 488.2 ft sand is clear quartz with some frosted and black grains.
490					@ 488.9 ft: Poorly graded SAND (SP); brown (7.5YR 4/4); loose; moist; 95% very fine to fine sand; subangular to subrounded; 5% silt.	SP		
					@ 491.9 ft: Well graded SAND with Gravel (SW); dark yellowish brown (10YR 4/4); loose; wet; 80% medium sand; subangular to subrounded; trace fine and coarse sand; 15% fine to coarse gravel; subrounded; 5% silt.	SW		Note: @ 491.9 ft sand is clear and frosted quartz, coarse black feldspar, and red granite; gravel is black mafics.
495					@ 493.6 ft: Poorly graded SAND (SP); dark yellowish brown (10YR 4/4); loose; wet; 95% fine sand; subangular to	SP		Note: @ 493.6 ft sand is clear and frosted quartz, black feldspar; and red microcline.

KAFB_BOREHOLE_LOG - SHAW_DRILLING.GDT - 3/12/15 13:05 - Z:\KAFB BFF\GINT\KAFB_PROJECT\KAFB_BFF.GPJ

Borehole ID: KAFB-106212-Sonic

Client: US Army Corps of Engineers
Project Location: KAFB, Albuquerque, NM
Project Name: KAFB BFF SWMU ST-106 and SS-111
Project Number: 140705

Date Started: 2/2/2015
Date TD Reached: 2/6/2015
Date Completed: 2/25/2015

Ground Elevation AMSL (ft): Not Recorded
Y Coordinate:
X Coordinate:

Hole Diameter Upper (in.): 11-3/4
Hole Diameter Lower (in.): 9-5/8
Surface Completion Type: Flush mount

Groundwater Levels BGS (ft):
At Time of Drilling: 457.75
At End of Drilling: Not Recorded
After Drilling: 458.80

Drillling Contractor: Yellow Jacket
Drilling Method: Sonic Coring
Logged By: M. Giles

Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
495					subrounded; trace medium sand; 5% silt.	SP	Bentonite Seal	
					@ 495 ft: Poorly graded SAND (SP); dark yellowish brown (10YR 4/4); loose; wet; 95% fine sand; subangular to subrounded; trace medium sand; 5% silt.			Note: @ 496 ft sand is clear and frosted quartz.
					No core retrieval from 495.5 - 496 ft.	SP-SM		
					@ 496 ft: Poorly graded SAND with Silt (SP-SM); dark yellowish brown (10YR 4/4); loose; wet; 90% very fine to fine sand; subangular to subrounded; trace medium sand; 10% silt.	SP		Note: @ 497.5 ft sand is clear and frosted quartz with black mica.
					@ 497.5 ft: Poorly graded SAND (SP); dark yellowish brown (10YR 4/4); loose; wet; 95% fine sand; subangular to subrounded; trace medium sand; 5% silt.			Note: @ 498.8 ft sand is clear and frosted quartz with black feldspar and red granite.
500					@ 498.8 ft: Well graded SAND (SW); dark yellowish brown (10YR 4/4); loose; wet; 95% very fine to medium sand; subangular to subrounded; trace coarse sand; 5% silt.			Note: @ 500.5 ft occasional pieces of coarse and fine subrounded gravel.
					Same as above (498.8 ft); trace fine and coarse gravel; subrounded.			
		KAFB-106212-GEO2			Same as above (498.8 ft); sand is very fine to coarse sand.			Note: @ 502.9 ft sand is clear and frosted quartz, black fedlspar, and red granite with microcline.
						SW		
505					@ 504.7 ft: Well graded SAND (SW); brown (7.5YR 4/4); wet; loose; 90% fine to medium sand; subangular to subrounded; trace coarse sand; 5% fine gravel; 5% silt.			Note: @ 504.7 ft sand is clear and frosted quartz with black mica.
					@ 507.3 ft: Well graded SAND (SW); brown (7.5YR 4/4); wet; loose; 85% fine to medium sand; subangular to subrounded; trace coarse sand; 10% fine to coarse gravel; subrounded; 5% silt.			Note: @ 507.3 ft sand is clear and frosted quartz. Higher percent of coarse sand than @ 504.7 ft.
510								

KAFB_BOREHOLE_LOG - SHAW_DRILLING.GDT - 3/12/15 13:05 - Z:\KAFB BFF\GINT\KAFB_PROJECT\KAFB_BFF.GPJ

Borehole ID: KAFB-106212-Sonic

Client: US Army Corps of Engineers
Project Location: KAFB, Albuquerque, NM
Project Name: KAFB BFF SWMU ST-106 and SS-111
Project Number: 140705

Date Started: 2/2/2015
Date TD Reached: 2/6/2015
Date Completed: 2/25/2015

Ground Elevation AMSL (ft): Not Recorded
Y Coordinate:
X Coordinate:

Hole Diameter Upper (in.): 11-3/4
Hole Diameter Lower (in.): 9-5/8
Surface Completion Type: Flush mount

Groundwater Levels BGS (ft):
At Time of Drilling: 457.75
At End of Drilling: Not Recorded
After Drilling: 458.80

Drillling Contractor: Yellow Jacket
Drilling Method: Sonic Coring
Logged By: M. Giles

Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
510					@ 510 ft: Well graded SAND (SW); brown (7.5YR 4/4); wet; loose; 85% fine to medium sand; subangular to subrounded; trace coarse sand; 10% fine to coarse gravel; subrounded; 5% silt.	SW		Note: @ 510 ft sand is clear and frosted quartz. Higher percent of coarse sand than @ 504.7 ft.
515					@ 513.7 ft: Well graded SAND with Gravel (SW); brown (7.5YR 4/4); loose; wet; 80% coarse to very coarse sand; subangular to subrounded; trace medium sand; 15% fine to coarse gravel to 1-1/4"; subrounded to round; 5% silt.	SW		End of 2/4/15 @ 1635. Began drilling @ 0820 on 2/5/15. Note: @ 513.7 ft sand is clear and frosted quartz, black biotite, white plagioclase, and red microcline. One piece of 2" conglomerate. Gravel is fining downward.
					@ 516 ft: Silty SAND with Gravel (SM); light grey (10YR 7/2); loose; wet; 65% fine to very coarse sand; subangular to subrounded; 15% coarse gravel to 2"; subangular; 20% silt.	SM		Note: @ 516 ft sand is predominantly medium, and is composed of clear and frosted quartz.
520					@ 517.2 ft: Well graded SAND (SW); grayish brown (10YR 5/2); loose; wet; 90% fine to very coarse sand; subangular to surounded; 5% fine gravel; subrounded; 5% silt.	SW	Bentonite Seal	Note: @ 517.2 ft percentage of coarse and very coarse material decreases with depth. Only trace coarse material @ 518.5 ft. Sand is predominantly medium, and composed of clear and frosted quartz. Gravel is black mafics.
525					@ 522 ft: Poorly graded SAND (SP); yellowish brown (10YR 5/6); loose; wet; 95% very fine to medium sand; subangular to subrounded; trace fine gravel; subrounded; 5% silt.	SP		Note: @ 522 ft sand is clear and frosted quartz with very fine black mica. Gravel is quartzite.

KAFB_BOREHOLE_LOG - SHAW_DRILLING.GDT - 3/12/15 13:05 - Z:\KAFB BFF\GINT\KAFB_PROJECT\KAFB_BFF.GPJ

Borehole ID: KAFB-106212-Sonic

Client: US Army Corps of Engineers
Project Location: KAFB, Albuquerque, NM
Project Name: KAFB BFF SWMU ST-106 and SS-111
Project Number: 140705

Date Started: 2/2/2015
Date TD Reached: 2/6/2015
Date Completed: 2/25/2015

Ground Elevation AMSL (ft): Not Recorded
Y Coordinate:
X Coordinate:

Hole Diameter Upper (in.): 11-3/4
Hole Diameter Lower (in.): 9-5/8
Surface Completion Type: Flush mount

Groundwater Levels BGS (ft):
At Time of Drilling: 457.75
At End of Drilling: Not Recorded
After Drilling: 458.80

Drillling Contractor: Yellow Jacket
Drilling Method: Sonic Coring
Logged By: M. Giles

Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
525					@ 525 ft: Poorly graded SAND (SP); yellowish brown (10YR 5/6); loose; wet; 95% very fine to medium sand; subangular to subrounded; trace fine gravel; subrounded; 5% silt.	SP	5" Schedule 80 PVC Riser	Note: @ 525 ft sand is clear and frosted quartz with very fine black mica. Gravel is quartzite.
					No core retrieval from 526 - 526.2 ft.			Note: @ 526 ft sand is clear and frosted quartz. Heaving sands @ 526 ft. Driller used 50 gallons of water.
					@ 526.2 ft: Poorly graded SAND with Silt (SP-SM); dark grayish brown (10YR 4/2); loose; wet; 90% very fine to medium sand; subangular to subrounded; trace very coarse sand; rounded; 10% silt.	SP-SM		
530					@ 530.4 ft: Well graded SAND (SW); yellowish brown (10YR 5/6); loose; wet; 90% fine to very coarse sand; subangular to round; 5% fine to coarse gravel to 1"; 5% silt.	SW	Top of 20/40 Sand	@ 530 ft, there is an increase in coarse material. Note: @ 530.4 ft sand is clear and frosted quartz with red microcline and black mica. Sand is predominantly medium grained, and is more rounded as size increases.
		KAFB-106212-GEO3			@531.8 ft: Poorly graded SAND (SP); yellowish brown (10YR 5/6); loose; wet; 100% fine to medium sand; subangular to subrounded.	SP	Top of 10/20 Sand	Note: @ 531.8 ft sand is clear and frosted quartz, red microcline, and black mica.
					@532.7 ft: SILT (ML); brown (7.5YR 5/4); stiff; low plasticity; 60% silt; 40% clay.	ML		
535					@532.9 ft: Well graded SAND with Silt (SW); brown (7.5YR 5/4); 80% fine to very coarse sand; subangular to subrounded; 10% fine gravel to 1/2"; subangular; 10% silt.	SW		Note: @ 532.9 ft sand is clear and frosted quartz with red microcline, black mica, red granite, and white quartzite. Sand is predominantly medium grained. Gravel is black mafics.
					No core retrieval from 535.5 - 536 ft.			
					@ 536 ft: Well graded SAND (SW); brown (7.5YR 4/4); loose; wet; 90% fine to very coarse sand; subangular to subrounded; 5% fine gravel; trace coarse gravel to 1-1/4"; subrounded; 5% silt.	SW		Note: @ 536 ft sand is clear and frosted quartz, red microcline, red granite, and black mica. Sand is predominantly medium grained. Gravel is frosted quartzite and black mafics.
540					@ 538.5 ft: Clayey SAND with Gravel (SC); brown (7.5YR 4/4); slightly firm; medium plasticity; 40% fine to medium sand; 15% coarse gravel to 1-1/4";	SC SP		

KAFB_BOREHOLE_LOG - SHAW_DRILLING.GDT - 3/12/15 13:05 - Z:\KAFB BFF\GINT\KAFB_PROJECT\KAFB_BFF.GPJ

Borehole ID: KAFB-106212-Sonic

Client: US Army Corps of Engineers
Project Location: KAFB, Albuquerque, NM
Project Name: KAFB BFF SWMU ST-106 and SS-111
Project Number: 140705

Date Started: 2/2/2015
Date TD Reached: 2/6/2015
Date Completed: 2/25/2015

Ground Elevation AMSL (ft): Not Recorded
Y Coordinate:
X Coordinate:

Hole Diameter Upper (in.): 11-3/4
Hole Diameter Lower (in.): 9-5/8
Surface Completion Type: Flush mount

Groundwater Levels BGS (ft):
At Time of Drilling: 457.75
At End of Drilling: Not Recorded
After Drilling: 458.80

Drillling Contractor: Yellow Jacket
Drilling Method: Sonic Coring
Logged By: M. Giles

Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
540					subrounded; 45% clay.			
					@ 539 ft: Poorly graded SAND (SP); brown (7.5YR 4/4); loose; wet; 95% fine to medium sand; subangular to subrounded; trace coarse sand; 5% silt.	SP		Note: @ 538.5 ft gravel is elongated. Note: @ 539 ft sand is clear and frosted quartz with black mica.
		KAFB-106212-GEO4			@ 540 ft: Poorly graded SAND (SP); loose; wet; 95% fine to medium sand; subangular to subrounded; trace coarse sand; 5% silt.	SW		Note: @ 540 ft sand is clear and frosted quartz with black mica. Clay lense from 540.9 ft to 541.1 ft.
					@ 541.1 ft: Well graded SAND (SW); brown (7.5YR 4/4); loose; wet; 85% fine to very coarse sand; subangular to subrounded; 10 fine to coarse gravel to 1"; subrounded; 5% silt.	SM	Top of 5" Schedule 80 PVC 0.010" Slot Screen	Note: @ 541.1 ft sand is clear and frosted quartz with some red granite and black mica. Gravel is black mafics and is elongated. Sand is predominantly medium grained.
545					@ 542.9 ft: Silty SAND (SM); brown (7.5YR 4/4); loose; wet; 80% fine to medium sand; subangular to subrounded; 20% silt.	SM		Note: @ 542.9 ft sand is clear and frosted quartz with black mica.
					No core retrieval from 543.2 - 544 ft.			
					@ 544 ft: Silty SAND with Gravel (SM); brown (7.5YR 4/4); loose; wet; 65% fine to medium sand; subangular to subrounded; 20% coarse gravel to 3"; subrounded to rounded; 15% silt.	SW		Note: @ 544 ft sand is clear and frosted quartz. Gravel is black mafics. Sand is predominantly medium grained.
					@ 545.7 ft: Well graded SAND (SW); brown (7.5YR 4/4); loose; wet; 85% fine to coarse sand; subangular to subrounded; 10% fine to coarse gravel to 1-1/4"; subangular to subrounded; 5% silt.	CL		Note: @ 545.7 ft fine to medium sand is clear and frosted quartz with some red microcline and black mica; coarse sand is red granite and black mafics. Gravel is black mafics.
550					@ 547.3 ft: Sandy lean CLAY (CL); pale yellow (2.5Y 7/3); hard; medium plasticity; 70% clay; 25% fine sand; 5% coarse gravel; subrounded.	SM		End of 2/5/15 @ 1550. Began drilling @ 0821 on 2/6/15.
					@ 549.5 ft: Silty SAND (SM); pale yellow (2.5Y 7/4); wet; 75% very fine to fine sand; 25% silt.	SP-SM		Note: @ 551 ft sand is clear quartz.
					No core retrieval from 550.4 - 551 ft.			
					@ 551 ft: Poorly graded SAND with Silt (SP-SM); yellowish brown (10YR 5/4); loose; wet; 90% very fine to fine sand; 10% silt.	SP		Note: @ 552.7 ft sand is clear and frosted quartz. Sand is predominantly medium grained.
					@ 552.7 ft: Poorly graded SAND (SP); yellowish brown (10YR 5/4); loose; wet; 95% fine to medium sand; subangular to	SC		Note: @ 553.4 ft sand is predominantly coarse grained.
555						SW-SM		

KAFB_BOREHOLE_LOG - SHAW_DRILLING.GDT - 3/12/15 13:05 - Z:\KAFB BFF\GINT\KAFB_PROJECT\KAFB_BFF.GPJ

Borehole ID: KAFB-106212-Sonic

Client: US Army Corps of Engineers
Project Location: KAFB, Albuquerque, NM
Project Name: KAFB BFF SWMU ST-106 and SS-111
Project Number: 140705

Date Started: 2/2/2015
Date TD Reached: 2/6/2015
Date Completed: 2/25/2015

Ground Elevation AMSL (ft): Not Recorded
Y Coordinate:
X Coordinate:

Hole Diameter Upper (in.): 11-3/4
Hole Diameter Lower (in.): 9-5/8
Surface Completion Type: Flush mount

Groundwater Levels BGS (ft):
At Time of Drilling: 457.75
At End of Drilling: Not Recorded
After Drilling: 458.80

Drillling Contractor: Yellow Jacket
Drilling Method: Sonic Coring
Logged By: M. Giles

Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
555					subrounded; 5% silt.	SW-SM		Note: @ 554.3 ft sand is clear and frosted quartz with some black mica and red microcline. Sand is predominantly coarse grained.
					@ 553.4 ft: Clayey SAND (SC); brown (10YR 5/3); slighly firm; wet; 80% fine to very coarse sand; 20% clay.			
					@ 554.3 ft: Well graded SAND with Silt (SW-SM); yellowish brown (10YR 5/4); loose; wet; 80% fine to very coarse sand; subangular to subrounded; 10% fine gravel; subrounded; 10% silt.			Note: @ 555 ft sand is clear and frosted quartz with some black mica and red microcline. Sand is predominantly coarse grained.
					Occasional lenses of clay less than 1/2" thick.	SW-SM	- Bottom of Screen	
560					@ 555 ft: Well graded SAND with Silt (SW-SM); yellowish brown (10YR 5/4); loose; wet; 80% fine to very coarse sand; subangular to subrounded; 10% fine gravel; subrounded; 10% silt. .	SP		Driller had problems with the very fine sands @ 556 ft. Driller used approximately 100 gallons of water to clean out casing.
					No core retrieval from 556 - 558 ft.		- Sump	
					@ 558 ft: Well graded SAND with Silt and Gravel (SW-SM); yellowish brown (10YR 5/4); loose; wet; 50% very fine to medium sand; subangular to subrounded; 40% fine gravel to 3/8"; subrounded; 10% silt.	SM		Note: @ 558 ft sand is clear and frosted quartz. Gravel is back mafics. Note: @ 558.7 ft sand is clear and frosted quartz with some black mica.
					@ 558.7 ft: Poorly graded SAND (SP); brown (7.5YR 5/4); loose; wet; 100% very fine to fine sand; subangular to subrounded.	SP	- Bottom of Sump	Note: @ 561.6 ft sand is clear and frosted quartz with some black mica. Gravel is black mafics.
565					@ 561.6 ft: Silty SAND with Gravel (SM); brown (10YR 5/3); loose; wet; 65% very fine to fine sand; subangular to subrounded; 15% coarse gravel; subrounded to rounded; trace fine gravel; subangular; 20% silt.		- Bottom of Filter Pack	Note: @ 562.7 ft sand is clear and frosted quartz. Gravel is black mafics and is elongated.
					@ 562.7 ft: Poorly graded SAND (SP); brown (10YR 5/3); loose; wet; 95% very fine to fine sand; subangular to subrounded; 5% coarse gravel beginning @ 565.2 ft.	SM		Note: @ 566 ft 3" sections of hard, medium plasticity clay. Sand is clear and frosted quartz with some black mica.
					@ 566 ft: Silty SAND (SM); brown (7.5 YR 5/3); 70% very fine to fine sand; subangular to subrounded; 5% coarse gravel; subrounded; 25% silt.	SP		Note: @ 567.8 ft sand is clear and frosted quartz. Gravel is black mafics.
570					@ 567.8 ft: Poorly graded SAND (SP); brown (7.5YR 5/3); loose; wet; 90% very fine to fine sand; subangular to	SM		Note: @ 569 ft sand is clear and frosted quartz. Gravel is black mafics.

KAFB_BOREHOLE_LOG - SHAW_DRILLING.GDT - 3/12/15 13:05 - Z:\KAFB BFF\GINT\KAFB_PROJECT\KAFB_BFF.GPJ

Borehole ID: KAFB-106212-Sonic

Client: US Army Corps of Engineers
Project Location: KAFB, Albuquerque, NM
Project Name: KAFB BFF SWMU ST-106 and SS-111
Project Number: 140705

Date Started: 2/2/2015
Date TD Reached: 2/6/2015
Date Completed: 2/25/2015

Ground Elevation AMSL (ft): Not Recorded
Y Coordinate:
X Coordinate:

Hole Diameter Upper (in.): 11-3/4
Hole Diameter Lower (in.): 9-5/8
Surface Completion Type: Flush mount

Groundwater Levels BGS (ft):
At Time of Drilling: 457.75
At End of Drilling: Not Recorded
After Drilling: 458.80

Drillling Contractor: Yellow Jacket
Drilling Method: Sonic Coring
Logged By: M. Giles

Depth (ft)	Sample Type	Number	Headspace PID	Lithologic Log	Material Description	U.S.C.S.	Well Diagram	Remarks
570					subrounded. 5% coarse gravel; subrounded; 5% silt.	SM		Note: @ 570 ft sand is clear and frosted quartz. Gravel is black mafics.
					@ 569 ft: Silty SAND (SM); brown (7.5YR 4/4); loose; wet; 80% very fine to fine sand; subangular to subrounded; trace coarse gravel; subrounded; 20% silt.			Note: @ 571.1 ft sand is clear and frosted quartz with some black mica. Gravel is black mafics.
					@ 570 ft: Silty SAND (SM); brown (7.5YR 4/4); loose; wet; 80% very fine to fine sand; subangular to subrounded; trace coarse gravel; subrounded; 20% silt.	SP		
575					@ 571.1 ft: Poorly graded SAND (SP); brown (7.5YR 4/3); loose; wet; 90% very fine to fine sand; subangular to subrounded; 5% coarse gravel; subrounded; 5% silt.			Total depth = 576 ft. Reached total depth @ 1505 on 2/6/15.
					No core retrieval from 574.6 - 576 ft.			
580								
585								

KAFB_BOREHOLE_LOG - SHAW_DRILLING.GDT - 3/12/15 13:05 - Z:\KAFB BFF\GINT\KAFB_PROJECT\KAFB_BFF.GPJ

APPENDIX B

KAFB-106212 Analytical Results

Empirical Laboratories, LLC

621 Mainstream Drive, Suite 270
Nashville, TN 37228
615.345.1115 Phone
866.417.0548 Fax

04 March 2015

Susan Huang
CB&I
4005 Port Chicago Highway
Concord, CA 94520

RE: Kirtland AFB 2011 (Laboratory WorkOrder # 1503004)

Enclosed are the results of analyses for samples received by the laboratory on 03/03/2015 08:55. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

DRAFT REPORT
DATA SUBJECT TO CHANGE

Data Qualifiers

As applicable and where required, the following general qualifiers are associated with the sample results. Additional qualifiers will be specified within the reporting sections of the data package or within the body of the Case Narrative.

Analytical Report Terms and Qualifiers

DL: The detection limit (DL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The DL is supported by the method detection limit (MDL) which is determined from analysis of a sample containing the analyte in a given matrix.

LOD: The Limit of Detection is an estimate of the minimum amount of a substance that an analytical process can reliably detect. An LOD is analyte- and matrix-specific and may be laboratory-dependent. This definition is further clarified in the DoD QSM as the smallest amount or concentration of a substance that must be present in a sample in order to be detected at a high level of confidence (99%). At the LOD, the false negative rate (Type II error) is 1%.

LOQ: The Limit of Quantitation is the minimum level, concentration, or quantity of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. This term is further clarified within the DoD QSM as the lowest concentration that produces a quantitative result within specified limits of precision and bias.

***:** Exceeding quality control criteria are associated with the reported result.

B: The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.

D: When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".

E: The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound. For Metals, the qualifier indicates that the serial dilution was outside of the control limits and the compound should be considered estimated due to the presence of interference.

H1: The result was analyzed outside of the EPA recommended holding time.

H2: The result was extracted outside of the EPA recommended holding time

H3: The sample for this analyte was received outside of the EPA recommended holding time.

J: The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The mass spectral data pass the identification criteria showing that the compound is present, but the calculated result is less than the LOQ. One should feel confident that the result is greater than zero and less than the LOQ.

M: Indicates that the sample matrix interfered with the quantitation of the analyte. In dual column analysis the result is reported from the column with the lower concentration. In inorganics, it indicates that the parameters DL/LOD/LOQ have been raised.

N: The MS/MSD accuracy and/or precision are outside criteria. The predigested spike recovery is not within control limits for the associated parameter.

P: The associated numerical value is an estimated quantity. There is greater than a 40% difference between the two GC columns for the detected concentrations. The higher of the two values is reported unless matrix interference is obvious or for HPLC analysis where the primary column is reported.

Q: The relative percent difference (RPD) and/or percent recovery exceeded limits in the associated Blank Spike and/or Blank Spike Duplicate.

S: The associated internal standard exceeded criteria.

U: The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the DL.

X: The parameter shows a potential positive bias on a reported concentration due to an ICV or CCV exceeding the upper control limit on the high side.

Y: The parameter shows a potential negative bias on a reported concentration due to an ICV or CCV exceeding the lower control limit on the low side.

Z: The parameter shows lack of confirmation/detection, which may be due to a negative bias in the ICV or CCV which exceeds the lower control limit.

Laboratory Analytical Results Report

Client Sample ID: EVT1-106212-1 **Sample Collection Date/Time: 03/02/2015 14:43**

Lab Sample ID: 1503004-01 **Sample Received Date/Time: 03/03/2015 08:55**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Classical Chemistry Parameters										
Nitrate/Nitrite as N	ND	0.100	0.150	0.200	mg/L	1	03/03/15 11:59	E353.2	5C03013	U
Anions by IC										
Bromide	**0.0490**	0.0420	0.125	0.250	mg/L	1	03/03/15 11:06	E300.0	5C03004	J
Chloride	**9.74**	0.170	0.330	0.500	mg/L	1	03/03/15 11:06	E300.0	5C03004	
Sulfate as SO4	**34.8**	0.330	1.00	2.50	mg/L	1	03/03/15 11:06	E300.0	5C03004	
Metals in Water by ICP-AES										
Aluminum	**77.4**	12.5	25.0	50.0	ug/L	1	03/03/15 22:18	SW6010C	5C03012	
Antimony	ND	1.25	2.00	2.50	ug/L	1	03/03/15 22:18	SW6010C	5C03012	U
Arsenic	ND	0.750	1.50	2.50	ug/L	1	03/03/15 22:18	SW6010C	5C03012	U
Barium	**102**	1.25	2.50	10.0	ug/L	1	03/03/15 22:18	SW6010C	5C03012	
Beryllium	ND	0.250	0.500	1.25	ug/L	1	03/03/15 22:18	SW6010C	5C03012	XU
Cadmium	ND	0.250	0.500	1.25	ug/L	1	03/03/15 22:18	SW6010C	5C03012	U
Calcium	**34500**	250	500	1250	ug/L	1	03/03/15 22:18	SW6010C	5C03012	X
Chromium	**1.92**	0.500	1.00	2.50	ug/L	1	03/03/15 22:18	SW6010C	5C03012	J
Cobalt	ND	1.25	2.50	3.12	ug/L	1	03/03/15 22:18	SW6010C	5C03012	U
Copper	**3.56**	1.00	2.00	2.50	ug/L	1	03/03/15 22:18	SW6010C	5C03012	
Iron	**49.4**	7.50	15.0	25.0	ug/L	1	03/03/15 22:18	SW6010C	5C03012	
Lead	**0.770**	0.375	0.750	1.25	ug/L	1	03/03/15 22:18	SW6010C	5C03012	J
Magnesium	**4360**	250	750	1250	ug/L	1	03/03/15 22:18	SW6010C	5C03012	
Manganese	**37.7**	0.750	1.50	3.75	ug/L	1	03/03/15 22:18	SW6010C	5C03012	
Molybdenum	**8.46**	1.25	2.50	5.00	ug/L	1	03/03/15 22:18	SW6010C	5C03012	
Nickel	**1.05**	0.750	1.50	2.50	ug/L	1	03/03/15 22:18	SW6010C	5C03012	J
Potassium	**2310**	250	750	1250	ug/L	1	03/03/15 22:18	SW6010C	5C03012	X
Selenium	ND	0.750	1.25	2.50	ug/L	1	03/03/15 22:18	SW6010C	5C03012	U
Silver	ND	0.250	0.500	2.50	ug/L	1	03/03/15 22:18	SW6010C	5C03012	XU
Sodium	**24200**	250	750	1250	ug/L	1	03/03/15 22:18	SW6010C	5C03012	X
Thallium	ND	0.750	1.00	2.00	ug/L	1	03/03/15 22:18	SW6010C	5C03012	U
Vanadium	**2.34**	1.25	2.50	3.12	ug/L	1	03/03/15 22:18	SW6010C	5C03012	J
Zinc	**33.5**	1.25	2.50	5.00	ug/L	1	03/03/15 22:18	SW6010C	5C03012	B

Laboratory Analytical Results Report

Client Sample ID: EVT1-106212-1 **Sample Collection Date/Time: 03/02/2015 14:43**

Lab Sample ID: 1503004-01 **Sample Received Date/Time: 03/03/2015 08:55**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Mercury by CVAA										
Mercury	ND	0.0800	0.160	0.200	ug/L	1	03/04/15 09:53	SW7470A	5C03009	U
Volatile Organic Compounds by GC/MS										
Acetone	**10.9**	2.50	5.00	10.0	ug/L	1	03/03/15 13:55	SW8260B	5C03001	
Benzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
Bromobenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
Bromochloromethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
Bromodichloromethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
Bromoform	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
Bromomethane	ND	0.500	1.00	2.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
n-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
2-Butanone	ND	2.50	5.00	10.0	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
sec-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
tert-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
Carbon disulfide	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
Carbon tetrachloride	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
Chlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
Chloroethane	ND	0.500	1.00	2.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
Chloroform	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
Chloromethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
2-Chlorotoluene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
4-Chlorotoluene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
Dibromochloromethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
1,2-Dibromo-3-chloropropane	ND	0.500	1.00	2.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
1,2-Dibromoethane (EDB)	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
Dibromomethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
1,2-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
1,3-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
1,4-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
Dichlorodifluoromethane	ND	0.500	1.00	2.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
1,1-Dichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
1,2-Dichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
1,1-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
cis-1,2-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
trans-1,2-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
1,2-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
1,3-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
2,2-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
1,1-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
cis-1,3-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
trans-1,3-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
Ethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
Hexachlorobutadiene	ND	0.250	0.500	2.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
2-Hexanone	ND	1.25	2.50	5.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U

Laboratory Analytical Results Report

Client Sample ID: EVT1-106212-1 **Sample Collection Date/Time: 03/02/2015 14:43**

Lab Sample ID: 1503004-01 **Sample Received Date/Time: 03/03/2015 08:55**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Volatile Organic Compounds by GC/MS										
Isopropylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
p-Isopropyltoluene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
Methylene chloride	ND	0.500	1.00	2.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
Naphthalene	ND	0.250	0.500	2.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
4-Methyl-2-pentanone	ND	1.25	2.50	5.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
Methyl t-Butyl Ether	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
n-Propylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
Styrene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
1,1,2,2-Tetrachloroethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
1,1,1,2-Tetrachloroethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
Tetrachloroethene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
Toluene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
1,2,3-Trichlorobenzene	ND	0.250	0.500	2.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
1,2,4-Trichlorobenzene	ND	0.250	0.500	2.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
1,1,2-Trichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
1,1,1-Trichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
Trichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
Trichlorofluoromethane	ND	0.500	1.00	2.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
1,2,3-Trichloropropane	ND	0.500	1.00	2.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
1,3,5-Trimethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
1,2,4-Trimethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
Vinyl chloride	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
Xylenes (total)	ND	0.750	1.50	3.00	ug/L	1	03/03/15 13:55	SW8260B	5C03001	U
Surrogate: Bromofluorobenzene				*98.0 %*	*75-120*		*03/03/15 13:55*	*SW8260B*	*5C03001*	
Surrogate: Dibromofluoromethane				*98.7 %*	*85-115*		*03/03/15 13:55*	*SW8260B*	*5C03001*	
Surrogate: 1.2-Dichloroethane-d4				*95.6 %*	*70-120*		*03/03/15 13:55*	*SW8260B*	*5C03001*	
Surrogate: Toluene-d8				*93.6 %*	*85-120*		*03/03/15 13:55*	*SW8260B*	*5C03001*	

Laboratory Analytical Results Report

Client Sample ID: EVT1-106212-1

Sample Collection Date/Time: 03/02/2015 14:43

Lab Sample ID: 1503004-01

Sample Received Date/Time: 03/03/2015 08:55

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
EDB and DBCP by GC										
1,2-Dibromoethane	ND	0.00930	0.0186	0.0279	ug/L	1	03/03/15 14:10	SW8011	5C03006	U
Surrogate: 1,3-Dibromopropane				*138 %*	*55-160*		*03/03/15 14:10*	*SW8011*	*5C03006*	
Surrogate: 1,3-Dibromopropane [2C]				*149 %*	*55-160*		*03/03/15 14:10*	*SW8011*	*5C03006*	

Laboratory Analytical Results Report

Client Sample ID: EVT1-106212-2 **Sample Collection Date/Time: 03/02/2015 14:43**

Lab Sample ID: 1503004-02 **Sample Received Date/Time: 03/03/2015 08:55**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Classical Chemistry Parameters										
Nitrate/Nitrite as N	ND	0.100	0.150	0.200	mg/L	1	03/03/15 12:01	E353.2	5C03013	U
Anions by IC										
Bromide	ND	0.0420	0.125	0.250	mg/L	1	03/03/15 11:24	E300.0	5C03004	U
Chloride	**9.81**	0.170	0.330	0.500	mg/L	1	03/03/15 11:24	E300.0	5C03004	
Sulfate as SO4	**34.7**	0.330	1.00	2.50	mg/L	1	03/03/15 11:24	E300.0	5C03004	
Metals in Water by ICP-AES										
Aluminum	**73.3**	12.5	25.0	50.0	ug/L	1	03/03/15 22:23	SW6010C	5C03012	
Antimony	ND	1.25	2.00	2.50	ug/L	1	03/03/15 22:23	SW6010C	5C03012	U
Arsenic	ND	0.750	1.50	2.50	ug/L	1	03/03/15 22:23	SW6010C	5C03012	U
Barium	**102**	1.25	2.50	10.0	ug/L	1	03/03/15 22:23	SW6010C	5C03012	
Beryllium	ND	0.250	0.500	1.25	ug/L	1	03/03/15 22:23	SW6010C	5C03012	XU
Cadmium	ND	0.250	0.500	1.25	ug/L	1	03/03/15 22:23	SW6010C	5C03012	U
Calcium	**33900**	250	500	1250	ug/L	1	03/03/15 22:23	SW6010C	5C03012	X
Chromium	**1.96**	0.500	1.00	2.50	ug/L	1	03/03/15 22:23	SW6010C	5C03012	J
Cobalt	ND	1.25	2.50	3.12	ug/L	1	03/03/15 22:23	SW6010C	5C03012	U
Copper	**3.65**	1.00	2.00	2.50	ug/L	1	03/03/15 22:23	SW6010C	5C03012	
Iron	**47.8**	7.50	15.0	25.0	ug/L	1	03/03/15 22:23	SW6010C	5C03012	
Lead	**0.394**	0.375	0.750	1.25	ug/L	1	03/03/15 22:23	SW6010C	5C03012	J
Magnesium	**4370**	250	750	1250	ug/L	1	03/03/15 22:23	SW6010C	5C03012	
Manganese	**37.6**	0.750	1.50	3.75	ug/L	1	03/03/15 22:23	SW6010C	5C03012	
Molybdenum	**8.50**	1.25	2.50	5.00	ug/L	1	03/03/15 22:23	SW6010C	5C03012	
Nickel	**1.07**	0.750	1.50	2.50	ug/L	1	03/03/15 22:23	SW6010C	5C03012	J
Potassium	**2260**	250	750	1250	ug/L	1	03/03/15 22:23	SW6010C	5C03012	X
Selenium	ND	0.750	1.25	2.50	ug/L	1	03/03/15 22:23	SW6010C	5C03012	U
Silver	ND	0.250	0.500	2.50	ug/L	1	03/03/15 22:23	SW6010C	5C03012	XU
Sodium	**23400**	250	750	1250	ug/L	1	03/03/15 22:23	SW6010C	5C03012	X
Thallium	ND	0.750	1.00	2.00	ug/L	1	03/03/15 22:23	SW6010C	5C03012	U
Vanadium	**2.35**	1.25	2.50	3.12	ug/L	1	03/03/15 22:23	SW6010C	5C03012	J
Zinc	**34.2**	1.25	2.50	5.00	ug/L	1	03/03/15 22:23	SW6010C	5C03012	B

Laboratory Analytical Results Report

Client Sample ID: EVT1-106212-2 **Sample Collection Date/Time: 03/02/2015 14:43**

Lab Sample ID: 1503004-02 **Sample Received Date/Time: 03/03/2015 08:55**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Mercury by CVAA										
Mercury	ND	0.0800	0.160	0.200	ug/L	1	03/04/15 09:54	SW7470A	5C03009	U
Volatile Organic Compounds by GC/MS										
Acetone	**12.2**	2.50	5.00	10.0	ug/L	1	03/03/15 14:24	SW8260B	5C03001	
Benzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
Bromobenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
Bromochloromethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
Bromodichloromethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
Bromoform	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
Bromomethane	ND	0.500	1.00	2.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
n-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
2-Butanone	ND	2.50	5.00	10.0	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
sec-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
tert-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
Carbon disulfide	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
Carbon tetrachloride	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
Chlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
Chloroethane	ND	0.500	1.00	2.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
Chloroform	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
Chloromethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
2-Chlorotoluene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
4-Chlorotoluene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
Dibromochloromethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
1,2-Dibromo-3-chloropropane	ND	0.500	1.00	2.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
1,2-Dibromoethane (EDB)	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
Dibromomethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
1,2-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
1,3-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
1,4-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
Dichlorodifluoromethane	ND	0.500	1.00	2.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
1,1-Dichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
1,2-Dichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
1,1-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
cis-1,2-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
trans-1,2-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
1,2-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
1,3-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
2,2-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
1,1-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
cis-1,3-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
trans-1,3-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
Ethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
Hexachlorobutadiene	ND	0.250	0.500	2.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
2-Hexanone	ND	1.25	2.50	5.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U

Laboratory Analytical Results Report

Client Sample ID: EVT1-106212-2 **Sample Collection Date/Time: 03/02/2015 14:43**

Lab Sample ID: 1503004-02 **Sample Received Date/Time: 03/03/2015 08:55**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Volatile Organic Compounds by GC/MS										
Isopropylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
p-Isopropyltoluene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
Methylene chloride	ND	0.500	1.00	2.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
Naphthalene	ND	0.250	0.500	2.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
4-Methyl-2-pentanone	ND	1.25	2.50	5.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
Methyl t-Butyl Ether	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
n-Propylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
Styrene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
1,1,2,2-Tetrachloroethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
1,1,1,2-Tetrachloroethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
Tetrachloroethene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
Toluene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
1,2,3-Trichlorobenzene	ND	0.250	0.500	2.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
1,2,4-Trichlorobenzene	ND	0.250	0.500	2.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
1,1,2-Trichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
1,1,1-Trichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
Trichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
Trichlorofluoromethane	ND	0.500	1.00	2.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
1,2,3-Trichloropropane	ND	0.500	1.00	2.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
1,3,5-Trimethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
1,2,4-Trimethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
Vinyl chloride	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
Xylenes (total)	ND	0.750	1.50	3.00	ug/L	1	03/03/15 14:24	SW8260B	5C03001	U
Surrogate: Bromofluorobenzene				*97.8 %*	*75-120*		*03/03/15 14:24*	*SW8260B*	*5C03001*	
Surrogate: Dibromofluoromethane				*103 %*	*85-115*		*03/03/15 14:24*	*SW8260B*	*5C03001*	
Surrogate: 1.2-Dichloroethane-d4				*102 %*	*70-120*		*03/03/15 14:24*	*SW8260B*	*5C03001*	
Surrogate: Toluene-d8				*94.4 %*	*85-120*		*03/03/15 14:24*	*SW8260B*	*5C03001*	

Laboratory Analytical Results Report

Client Sample ID: EVT1-106212-2 **Sample Collection Date/Time: 03/02/2015 14:43**

Lab Sample ID: 1503004-02 **Sample Received Date/Time: 03/03/2015 08:55**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
EDB and DBCP by GC										
1,2-Dibromoethane	ND	0.00940	0.0188	0.0282	ug/L	1	03/03/15 14:19	SW8011	5C03006	U
Surrogate: 1,3-Dibromopropane				*134 %*	*55-160*		*03/03/15 14:19*	*SW8011*	*5C03006*	
Surrogate: 1,3-Dibromopropane [2C]				*144 %*	*55-160*		*03/03/15 14:19*	*SW8011*	*5C03006*	

Laboratory Analytical Results Report

Client Sample ID: EVT1-106212-3 **Sample Collection Date/Time: 03/02/2015 14:43**

Lab Sample ID: 1503004-03 **Sample Received Date/Time: 03/03/2015 08:55**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Classical Chemistry Parameters										
Nitrate/Nitrite as N	ND	0.100	0.150	0.200	mg/L	1	03/03/15 12:02	E353.2	5C03013	U
Anions by IC										
Bromide	ND	0.0420	0.125	0.250	mg/L	1	03/03/15 11:42	E300.0	5C03004	U
Chloride	**9.79**	0.170	0.330	0.500	mg/L	1	03/03/15 11:42	E300.0	5C03004	
Sulfate as SO4	**34.7**	0.330	1.00	2.50	mg/L	1	03/03/15 11:42	E300.0	5C03004	
Metals in Water by ICP-AES										
Aluminum	**77.1**	12.5	25.0	50.0	ug/L	1	03/03/15 22:28	SW6010C	5C03012	
Antimony	ND	1.25	2.00	2.50	ug/L	1	03/03/15 22:28	SW6010C	5C03012	U
Arsenic	ND	0.750	1.50	2.50	ug/L	1	03/03/15 22:28	SW6010C	5C03012	U
Barium	**102**	1.25	2.50	10.0	ug/L	1	03/03/15 22:28	SW6010C	5C03012	
Beryllium	ND	0.250	0.500	1.25	ug/L	1	03/03/15 22:28	SW6010C	5C03012	XU
Cadmium	ND	0.250	0.500	1.25	ug/L	1	03/03/15 22:28	SW6010C	5C03012	U
Calcium	**34400**	250	500	1250	ug/L	1	03/03/15 22:28	SW6010C	5C03012	X
Chromium	**1.98**	0.500	1.00	2.50	ug/L	1	03/03/15 22:28	SW6010C	5C03012	J
Cobalt	ND	1.25	2.50	3.12	ug/L	1	03/03/15 22:28	SW6010C	5C03012	U
Copper	**3.90**	1.00	2.00	2.50	ug/L	1	03/03/15 22:28	SW6010C	5C03012	
Iron	**49.5**	7.50	15.0	25.0	ug/L	1	03/03/15 22:28	SW6010C	5C03012	
Lead	**0.436**	0.375	0.750	1.25	ug/L	1	03/03/15 22:28	SW6010C	5C03012	J
Magnesium	**4450**	250	750	1250	ug/L	1	03/03/15 22:28	SW6010C	5C03012	
Manganese	**37.4**	0.750	1.50	3.75	ug/L	1	03/03/15 22:28	SW6010C	5C03012	
Molybdenum	**8.47**	1.25	2.50	5.00	ug/L	1	03/03/15 22:28	SW6010C	5C03012	
Nickel	**1.04**	0.750	1.50	2.50	ug/L	1	03/03/15 22:28	SW6010C	5C03012	J
Potassium	**2310**	250	750	1250	ug/L	1	03/03/15 22:28	SW6010C	5C03012	X
Selenium	ND	0.750	1.25	2.50	ug/L	1	03/03/15 22:28	SW6010C	5C03012	U
Silver	ND	0.250	0.500	2.50	ug/L	1	03/03/15 22:28	SW6010C	5C03012	XU
Sodium	**24400**	250	750	1250	ug/L	1	03/03/15 22:28	SW6010C	5C03012	X
Thallium	ND	0.750	1.00	2.00	ug/L	1	03/03/15 22:28	SW6010C	5C03012	U
Vanadium	**2.39**	1.25	2.50	3.12	ug/L	1	03/03/15 22:28	SW6010C	5C03012	J
Zinc	**33.4**	1.25	2.50	5.00	ug/L	1	03/03/15 22:28	SW6010C	5C03012	B

Laboratory Analytical Results Report

Client Sample ID: EVT1-106212-3 **Sample Collection Date/Time: 03/02/2015 14:43**

Lab Sample ID: 1503004-03 **Sample Received Date/Time: 03/03/2015 08:55**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Mercury by CVAA										
Mercury	ND	0.0800	0.160	0.200	ug/L	1	03/04/15 09:55	SW7470A	5C03009	U
Volatile Organic Compounds by GC/MS										
Acetone	**10.9**	2.50	5.00	10.0	ug/L	1	03/03/15 14:53	SW8260B	5C03001	
Benzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
Bromobenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
Bromochloromethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
Bromodichloromethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
Bromoform	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
Bromomethane	ND	0.500	1.00	2.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
n-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
2-Butanone	ND	2.50	5.00	10.0	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
sec-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
tert-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
Carbon disulfide	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
Carbon tetrachloride	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
Chlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
Chloroethane	ND	0.500	1.00	2.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
Chloroform	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
Chloromethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
2-Chlorotoluene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
4-Chlorotoluene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
Dibromochloromethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
1,2-Dibromo-3-chloropropane	ND	0.500	1.00	2.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
1,2-Dibromoethane (EDB)	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
Dibromomethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
1,2-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
1,3-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
1,4-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
Dichlorodifluoromethane	ND	0.500	1.00	2.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
1,1-Dichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
1,2-Dichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
1,1-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
cis-1,2-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
trans-1,2-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
1,2-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
1,3-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
2,2-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
1,1-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
cis-1,3-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
trans-1,3-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
Ethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
Hexachlorobutadiene	ND	0.250	0.500	2.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
2-Hexanone	ND	1.25	2.50	5.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U

Laboratory Analytical Results Report

Client Sample ID: EVT1-106212-3 **Sample Collection Date/Time: 03/02/2015 14:43**

Lab Sample ID: 1503004-03 **Sample Received Date/Time: 03/03/2015 08:55**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Volatile Organic Compounds by GC/MS										
Isopropylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
p-Isopropyltoluene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
Methylene chloride	ND	0.500	1.00	2.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
Naphthalene	ND	0.250	0.500	2.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
4-Methyl-2-pentanone	ND	1.25	2.50	5.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
Methyl t-Butyl Ether	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
n-Propylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
Styrene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
1,1,2,2-Tetrachloroethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
1,1,1,2-Tetrachloroethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
Tetrachloroethene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
Toluene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
1,2,3-Trichlorobenzene	ND	0.250	0.500	2.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
1,2,4-Trichlorobenzene	ND	0.250	0.500	2.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
1,1,2-Trichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
1,1,1-Trichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
Trichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
Trichlorofluoromethane	ND	0.500	1.00	2.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
1,2,3-Trichloropropane	ND	0.500	1.00	2.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
1,3,5-Trimethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
1,2,4-Trimethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
Vinyl chloride	ND	0.250	0.500	1.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
Xylenes (total)	ND	0.750	1.50	3.00	ug/L	1	03/03/15 14:53	SW8260B	5C03001	U
Surrogate: Bromofluorobenzene				*99.9 %*	*75-120*		*03/03/15 14:53*	*SW8260B*	*5C03001*	
Surrogate: Dibromofluoromethane				*101 %*	*85-115*		*03/03/15 14:53*	*SW8260B*	*5C03001*	
Surrogate: 1.2-Dichloroethane-d4				*93.1 %*	*70-120*		*03/03/15 14:53*	*SW8260B*	*5C03001*	
Surrogate: Toluene-d8				*94.3 %*	*85-120*		*03/03/15 14:53*	*SW8260B*	*5C03001*	

Laboratory Analytical Results Report

Client Sample ID: EVT1-106212-3

Sample Collection Date/Time: 03/02/2015 14:43

Lab Sample ID: 1503004-03

Sample Received Date/Time: 03/03/2015 08:55

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
EDB and DBCP by GC										
1,2-Dibromoethane	ND	0.00944	0.0189	0.0283	ug/L	1	03/03/15 14:31	SW8011	5C03006	U
Surrogate: 1,3-Dibromopropane				*141 %*	*55-160*		*03/03/15 14:31*	*SW8011*	*5C03006*	
Surrogate: 1,3-Dibromopropane [2C]				*152 %*	*55-160*		*03/03/15 14:31*	*SW8011*	*5C03006*	

Laboratory Analytical Results Report

Client Sample ID: GW8423-TB **Sample Collection Date/Time: 03/02/2015 08:00**

Lab Sample ID: 1503004-04 **Sample Received Date/Time: 03/03/2015 08:55**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Volatile Organic Compounds by GC/MS										
Acetone	ND	2.50	5.00	10.0	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
Benzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
Bromobenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
Bromochloromethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
Bromodichloromethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
Bromoform	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
Bromomethane	ND	0.500	1.00	2.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
n-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
2-Butanone	ND	2.50	5.00	10.0	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
sec-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
tert-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
Carbon disulfide	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
Carbon tetrachloride	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
Chlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
Chloroethane	ND	0.500	1.00	2.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
Chloroform	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
Chloromethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
2-Chlorotoluene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
4-Chlorotoluene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
Dibromochloromethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
1,2-Dibromo-3-chloropropane	ND	0.500	1.00	2.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
1,2-Dibromoethane (EDB)	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
Dibromomethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
1,2-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
1,3-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
1,4-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
Dichlorodifluoromethane	ND	0.500	1.00	2.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
1,1-Dichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
1,2-Dichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
1,1-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
cis-1,2-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
trans-1,2-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
1,2-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
1,3-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
2,2-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
1,1-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
cis-1,3-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
trans-1,3-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
Ethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
Hexachlorobutadiene	ND	0.250	0.500	2.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
2-Hexanone	ND	1.25	2.50	5.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
Isopropylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
p-Isopropyltoluene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U

Laboratory Analytical Results Report

Client Sample ID: GW8423-TB **Sample Collection Date/Time: 03/02/2015 08:00**

Lab Sample ID: 1503004-04 **Sample Received Date/Time: 03/03/2015 08:55**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Volatile Organic Compounds by GC/MS										
Methylene chloride	ND	0.500	1.00	2.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
Naphthalene	ND	0.250	0.500	2.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
4-Methyl-2-pentanone	ND	1.25	2.50	5.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
Methyl t-Butyl Ether	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
n-Propylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
Styrene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
1,1,2,2-Tetrachloroethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
1,1,1,2-Tetrachloroethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
Tetrachloroethene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
Toluene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
1,2,3-Trichlorobenzene	ND	0.250	0.500	2.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
1,2,4-Trichlorobenzene	ND	0.250	0.500	2.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
1,1,2-Trichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
1,1,1-Trichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
Trichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
Trichlorofluoromethane	ND	0.500	1.00	2.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
1,2,3-Trichloropropane	ND	0.500	1.00	2.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
1,3,5-Trimethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
1,2,4-Trimethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
Vinyl chloride	ND	0.250	0.500	1.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
Xylenes (total)	ND	0.750	1.50	3.00	ug/L	1	03/03/15 13:26	SW8260B	5C03001	U
Surrogate: Bromofluorobenzene				*96.6 %*	*75-120*		*03/03/15 13:26*	*SW8260B*	*5C03001*	
Surrogate: Dibromofluoromethane				*99.6 %*	*85-115*		*03/03/15 13:26*	*SW8260B*	*5C03001*	
Surrogate: 1,2-Dichloroethane-d4				*96.0 %*	*70-120*		*03/03/15 13:26*	*SW8260B*	*5C03001*	
Surrogate: Toluene-d8				*95.7 %*	*85-120*		*03/03/15 13:26*	*SW8260B*	*5C03001*	

Classical Chemistry Parameters - Quality Control

Analyte	Result	DL	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C03013												
Blank				Prepared & Analyzed: 03/03/2015								
Nitrate/Nitrite as N	ND	0.100	0.150	0.200	mg/L							U
LCS				Prepared & Analyzed: 03/03/2015								
Nitrate/Nitrite as N	2.180	0.100	0.150	0.200	mg/L	2.156		101	90-110			
Matrix Spike	**Source: 1503004-03**			Prepared & Analyzed: 03/03/2015								
Nitrate/Nitrite as N	1.083	0.100	0.150	0.200	mg/L	1.000	ND	108	90-110			
Matrix Spike Dup	**Source: 1503004-03**			Prepared & Analyzed: 03/03/2015								
Nitrate/Nitrite as N	1.060	0.100	0.150	0.200	mg/L	1.000	ND	106	90-110	2.17	20	

Anions by IC - Quality Control

Analyte	Result	DL	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C03004												
Blank				Prepared & Analyzed: 03/03/2015								
Bromide	ND	0.0420	0.125	0.250	mg/L							U
Chloride	ND	0.170	0.330	0.500	mg/L							U
Sulfate as SO4	ND	0.330	1.00	2.50	mg/L							U
LCS				Prepared & Analyzed: 03/03/2015								
Bromide	13.54	0.0420	0.125	0.250	mg/L	14.00		96.7	90-110			
Chloride	4.513	0.170	0.330	0.500	mg/L	4.200		107	90-110			
Sulfate as SO4	21.99	0.330	1.00	2.50	mg/L	21.00		105	90-110			

Metals in Water by ICP-AES - Quality Control

Analyte	Result	DL	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C03012												
Blank				Prepared & Analyzed: 03/03/2015								
Aluminum	ND	12.5	25.0	50.0	ug/L							U
Antimony	ND	1.25	2.00	2.50	ug/L							U
Arsenic	ND	0.750	1.50	2.50	ug/L							U
Barium	ND	1.25	2.50	10.0	ug/L							U
Beryllium	ND	0.250	0.500	1.25	ug/L							UX
Cadmium	ND	0.250	0.500	1.25	ug/L							U
Calcium	ND	250	500	1250	ug/L							UX
Chromium	ND	0.500	1.00	2.50	ug/L							U
Cobalt	ND	1.25	2.50	3.12	ug/L							U
Copper	ND	1.00	2.00	2.50	ug/L							U
Iron	ND	7.50	15.0	25.0	ug/L							U
Lead	ND	0.375	0.750	1.25	ug/L							U
Magnesium	ND	250	750	1250	ug/L							U
Manganese	ND	0.750	1.50	3.75	ug/L							U
Molybdenum	ND	1.25	2.50	5.00	ug/L							U
Nickel	ND	0.750	1.50	2.50	ug/L							U
Potassium	ND	250	750	1250	ug/L							UX
Selenium	ND	0.750	1.25	2.50	ug/L							U
Silver	ND	0.250	0.500	2.50	ug/L							UX
Sodium	ND	250	750	1250	ug/L							UX
Thallium	ND	0.750	1.00	2.00	ug/L							U
Vanadium	ND	1.25	2.50	3.12	ug/L							U
Zinc	ND	1.25	2.50	5.00	ug/L							U
Blank				Prepared & Analyzed: 03/03/2015								
Aluminum	ND	12.5	25.0	50.0	ug/L							U
Antimony	ND	1.25	2.00	2.50	ug/L							U
Arsenic	ND	0.750	1.50	2.50	ug/L							U
Barium	ND	1.25	2.50	10.0	ug/L							U
Beryllium	ND	0.250	0.500	1.25	ug/L							UX
Cadmium	ND	0.250	0.500	1.25	ug/L							U
Calcium	ND	250	500	1250	ug/L							UX
Chromium	ND	0.500	1.00	2.50	ug/L							U
Cobalt	ND	1.25	2.50	3.12	ug/L							U
Copper	ND	1.00	2.00	2.50	ug/L							U
Iron	ND	7.50	15.0	25.0	ug/L							U
Lead	ND	0.375	0.750	1.25	ug/L							U
Magnesium	ND	250	750	1250	ug/L							U
Manganese	ND	0.750	1.50	3.75	ug/L							U
Molybdenum	ND	1.25	2.50	5.00	ug/L							U
Nickel	ND	0.750	1.50	2.50	ug/L							U
Potassium	ND	250	750	1250	ug/L							UX
Selenium	ND	0.750	1.25	2.50	ug/L							U
Silver	ND	0.250	0.500	2.50	ug/L							UX
Sodium	ND	250	750	1250	ug/L							UX
Thallium	ND	0.750	1.00	2.00	ug/L							U
Vanadium	ND	1.25	2.50	3.12	ug/L							U
Zinc	1.36	1.25	2.50	5.00	ug/L							J

Metals in Water by ICP-AES - Quality Control

Analyte	Result	DL	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C03012												
LCS					Prepared & Analyzed: 03/03/2015							
Aluminum	38.74	12.5	25.0	50.0	ug/L	40.00		96.8	80-120			J
Antimony	4.277	1.25	2.00	2.50	ug/L	5.000		85.5	80-120			
Arsenic	4.568	0.750	1.50	2.50	ug/L	5.000		91.4	80-120			
Barium	35.17	1.25	2.50	10.0	ug/L	40.00		87.9	80-120			
Beryllium	0.9596	0.250	0.500	1.25	ug/L	1.000		96.0	80-120			JX
Cadmium	2.329	0.250	0.500	1.25	ug/L	2.500		93.2	80-120			
Calcium	588.2	250	500	1250	ug/L	600.0		98.0	80-120			JX
Chromium	3.742	0.500	1.00	2.50	ug/L	4.000		93.6	80-120			
Cobalt	8.540	1.25	2.50	3.12	ug/L	10.00		85.4	80-120			
Copper	4.871	1.00	2.00	2.50	ug/L	5.000		97.4	80-120			
Iron	19.40	7.50	15.0	25.0	ug/L	20.00		97.0	80-120			J
Lead	4.460	0.375	0.750	1.25	ug/L	5.000		89.2	80-120			
Magnesium	549.2	250	750	1250	ug/L	600.0		91.5	80-120			J
Manganese	10.08	0.750	1.50	3.75	ug/L	10.00		101	80-120			
Molybdenum	17.00	1.25	2.50	5.00	ug/L	20.00		85.0	80-120			
Nickel	8.544	0.750	1.50	2.50	ug/L	10.00		85.4	80-120			
Potassium	554.3	250	750	1250	ug/L	600.0		92.4	80-120			JX
Selenium	4.243	0.750	1.25	2.50	ug/L	5.000		84.9	80-120			
Silver	5.412	0.250	0.500	2.50	ug/L	5.000		108	80-120			X
Sodium	577.0	250	750	1250	ug/L	600.0		96.2	80-120			JX
Thallium	4.507	0.750	1.00	2.00	ug/L	5.000		90.1	80-120			
Vanadium	9.514	1.25	2.50	3.12	ug/L	10.00		95.1	80-120			
Zinc	9.083	1.25	2.50	5.00	ug/L	10.00		90.8	80-120			
LCS Dup					Prepared & Analyzed: 03/03/2015							
Aluminum	39.34	12.5	25.0	50.0	ug/L	40.00		98.3	80-120	1.54	20	J
Antimony	4.172	1.25	2.00	2.50	ug/L	5.000		83.4	80-120	2.49	20	
Arsenic	4.918	0.750	1.50	2.50	ug/L	5.000		98.4	80-120	7.37	20	
Barium	36.05	1.25	2.50	10.0	ug/L	40.00		90.1	80-120	2.47	20	
Beryllium	1.079	0.250	0.500	1.25	ug/L	1.000		108	80-120	11.7	20	JX
Cadmium	2.326	0.250	0.500	1.25	ug/L	2.500		93.0	80-120	0.145	20	
Calcium	639.2	250	500	1250	ug/L	600.0		107	80-120	8.32	20	JX
Chromium	3.602	0.500	1.00	2.50	ug/L	4.000		90.1	80-120	3.80	20	
Cobalt	8.596	1.25	2.50	3.12	ug/L	10.00		86.0	80-120	0.648	20	
Copper	4.718	1.00	2.00	2.50	ug/L	5.000		94.4	80-120	3.20	20	
Iron	17.58	7.50	15.0	25.0	ug/L	20.00		87.9	80-120	9.87	20	J
Lead	4.417	0.375	0.750	1.25	ug/L	5.000		88.3	80-120	0.980	20	
Magnesium	584.4	250	750	1250	ug/L	600.0		97.4	80-120	6.20	20	J
Manganese	10.00	0.750	1.50	3.75	ug/L	10.00		100	80-120	0.774	20	
Molybdenum	17.23	1.25	2.50	5.00	ug/L	20.00		86.1	80-120	1.34	20	
Nickel	8.597	0.750	1.50	2.50	ug/L	10.00		86.0	80-120	0.615	20	
Potassium	625.3	250	750	1250	ug/L	600.0		104	80-120	12.0	20	JX
Selenium	4.452	0.750	1.25	2.50	ug/L	5.000		89.0	80-120	4.82	20	
Silver	5.632	0.250	0.500	2.50	ug/L	5.000		113	80-120	3.99	20	X
Sodium	658.2	250	750	1250	ug/L	600.0		110	80-120	13.1	20	JX
Thallium	4.428	0.750	1.00	2.00	ug/L	5.000		88.6	80-120	1.77	20	
Vanadium	9.635	1.25	2.50	3.12	ug/L	10.00		96.4	80-120	1.27	20	
Zinc	9.571	1.25	2.50	5.00	ug/L	10.00		95.7	80-120	5.23	20	

Mercury by CVAA - Quality Control

Analyte	Result	DL	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C03009												
Blank					Prepared: 03/03/2015 Analyzed: 03/04/2015							
Mercury	ND	0.0800	0.160	0.200	ug/L							U
LCS					Prepared: 03/03/2015 Analyzed: 03/04/2015							
Mercury	2.018	0.0800	0.160	0.200	ug/L	2.000		101	80-120			

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	DL	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C03001												
Blank				Prepared & Analyzed: 03/03/2015								
Acetone	ND	2.50	5.00	10.0	ug/L							U
Benzene	ND	0.250	0.500	1.00	ug/L							U
Bromobenzene	ND	0.250	0.500	1.00	ug/L							U
Bromochloromethane	ND	0.250	0.500	1.00	ug/L							U
Bromodichloromethane	ND	0.250	0.500	1.00	ug/L							U
Bromoform	ND	0.250	0.500	1.00	ug/L							U
Bromomethane	ND	0.500	1.00	2.00	ug/L							U
n-Butylbenzene	ND	0.250	0.500	1.00	ug/L							U
2-Butanone	ND	2.50	5.00	10.0	ug/L							U
sec-Butylbenzene	ND	0.250	0.500	1.00	ug/L							U
tert-Butylbenzene	ND	0.250	0.500	1.00	ug/L							U
Carbon disulfide	ND	0.250	0.500	1.00	ug/L							U
Carbon tetrachloride	ND	0.250	0.500	1.00	ug/L							U
Chlorobenzene	ND	0.250	0.500	1.00	ug/L							U
Chloroethane	ND	0.500	1.00	2.00	ug/L							U
Chloroform	ND	0.250	0.500	1.00	ug/L							U
Chloromethane	ND	0.250	0.500	1.00	ug/L							U
2-Chlorotoluene	ND	0.250	0.500	1.00	ug/L							U
4-Chlorotoluene	ND	0.250	0.500	1.00	ug/L							U
Dibromochloromethane	ND	0.250	0.500	1.00	ug/L							U
1,2-Dibromo-3-chloropropane	ND	0.500	1.00	2.00	ug/L							U
1,2-Dibromoethane (EDB)	ND	0.250	0.500	1.00	ug/L							U
Dibromomethane	ND	0.250	0.500	1.00	ug/L							U
1,2-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L							U
1,3-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L							U
1,4-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L							U
Dichlorodifluoromethane	ND	0.500	1.00	2.00	ug/L							U
1,1-Dichloroethane	ND	0.250	0.500	1.00	ug/L							U
1,2-Dichloroethane	ND	0.250	0.500	1.00	ug/L							U
1,1-Dichloroethene	ND	0.250	0.500	1.00	ug/L							U
cis-1,2-Dichloroethene	ND	0.250	0.500	1.00	ug/L							U
trans-1,2-Dichloroethene	ND	0.250	0.500	1.00	ug/L							U
1,2-Dichloropropane	ND	0.250	0.500	1.00	ug/L							U
1,3-Dichloropropane	ND	0.250	0.500	1.00	ug/L							U
2,2-Dichloropropane	ND	0.250	0.500	1.00	ug/L							U
1,1-Dichloropropene	ND	0.250	0.500	1.00	ug/L							U
cis-1,3-Dichloropropene	ND	0.250	0.500	1.00	ug/L							U
trans-1,3-Dichloropropene	ND	0.250	0.500	1.00	ug/L							U
Ethylbenzene	ND	0.250	0.500	1.00	ug/L							U
Hexachlorobutadiene	ND	0.250	0.500	2.00	ug/L							U
2-Hexanone	ND	1.25	2.50	5.00	ug/L							U
Isopropylbenzene	ND	0.250	0.500	1.00	ug/L							U
p-Isopropyltoluene	ND	0.250	0.500	1.00	ug/L							U
Methylene chloride	ND	0.500	1.00	2.00	ug/L							U
Naphthalene	ND	0.250	0.500	2.00	ug/L							U
4-Methyl-2-pentanone	ND	1.25	2.50	5.00	ug/L							U
Methyl t-Butyl Ether	ND	0.250	0.500	1.00	ug/L							U
n-Propylbenzene	ND	0.250	0.500	1.00	ug/L							U
Styrene	ND	0.250	0.500	1.00	ug/L							U
1,1,2,2-Tetrachloroethane	ND	0.250	0.500	1.00	ug/L							U

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	DL	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C03001												
Blank				Prepared & Analyzed: 03/03/2015								
1,1,1,2-Tetrachloroethane	ND	0.250	0.500	1.00	ug/L							U
Tetrachloroethene	ND	0.250	0.500	1.00	ug/L							U
Toluene	ND	0.250	0.500	1.00	ug/L							U
1,2,3-Trichlorobenzene	ND	0.250	0.500	2.00	ug/L							U
1,2,4-Trichlorobenzene	ND	0.250	0.500	2.00	ug/L							U
1,1,2-Trichloroethane	ND	0.250	0.500	1.00	ug/L							U
1,1,1-Trichloroethane	ND	0.250	0.500	1.00	ug/L							U
Trichloroethene	ND	0.250	0.500	1.00	ug/L							U
Trichlorofluoromethane	ND	0.500	1.00	2.00	ug/L							U
1,2,3-Trichloropropane	ND	0.500	1.00	2.00	ug/L							U
1,3,5-Trimethylbenzene	ND	0.250	0.500	1.00	ug/L							U
1,2,4-Trimethylbenzene	ND	0.250	0.500	1.00	ug/L							U
Vinyl chloride	ND	0.250	0.500	1.00	ug/L							U
Xylenes (total)	ND	0.750	1.50	3.00	ug/L							U
Surrogate: Bromofluorobenzene	*29.75*				*ug/L*	*30.00*		*99.2*	*75-120*			
Surrogate: Dibromofluoromethane	*29.75*				*ug/L*	*30.00*		*99.2*	*85-115*			
Surrogate: 1,2-Dichloroethane-d4	*28.19*				*ug/L*	*30.00*		*94.0*	*70-120*			
Surrogate: Toluene-d8	*28.15*				*ug/L*	*30.00*		*93.8*	*85-120*			
LCS				Prepared & Analyzed: 03/03/2015								
Acetone	107	2.50	5.00	10.0	ug/L	100.0		107	40-140			
Benzene	51.2	0.250	0.500	1.00	ug/L	50.00		102	80-120			
Bromobenzene	50.9	0.250	0.500	1.00	ug/L	50.00		102	75-125			
Bromochloromethane	49.5	0.250	0.500	1.00	ug/L	50.00		99.1	65-130			
Bromodichloromethane	53.2	0.250	0.500	1.00	ug/L	50.00		106	75-120			
Bromoform	50.4	0.250	0.500	1.00	ug/L	50.00		101	70-130			
Bromomethane	50.5	0.500	1.00	2.00	ug/L	50.00		101	30-145			
n-Butylbenzene	53.3	0.250	0.500	1.00	ug/L	50.00		107	70-135			
2-Butanone	108	2.50	5.00	10.0	ug/L	100.0		108	30-150			
sec-Butylbenzene	54.6	0.250	0.500	1.00	ug/L	50.00		109	70-125			
tert-Butylbenzene	53.2	0.250	0.500	1.00	ug/L	50.00		106	70-130			
Carbon disulfide	51.3	0.250	0.500	1.00	ug/L	50.00		103	35-160			
Carbon tetrachloride	51.7	0.250	0.500	1.00	ug/L	50.00		103	65-140			
Chlorobenzene	49.9	0.250	0.500	1.00	ug/L	50.00		99.8	80-120			
Chloroethane	46.1	0.500	1.00	2.00	ug/L	50.00		92.2	60-135			
Chloroform	48.6	0.250	0.500	1.00	ug/L	50.00		97.1	65-135			
Chloromethane	54.9	0.250	0.500	1.00	ug/L	50.00		110	40-125			
2-Chlorotoluene	51.9	0.250	0.500	1.00	ug/L	50.00		104	75-125			
4-Chlorotoluene	52.3	0.250	0.500	1.00	ug/L	50.00		105	75-130			
Dibromochloromethane	52.9	0.250	0.500	1.00	ug/L	50.00		106	60-135			
1,2-Dibromo-3-chloropropane	53.6	0.500	1.00	2.00	ug/L	50.00		107	50-130			
1,2-Dibromoethane (EDB)	52.1	0.250	0.500	1.00	ug/L	50.00		104	80-120			
Dibromomethane	50.6	0.250	0.500	1.00	ug/L	50.00		101	75-125			
1,2-Dichlorobenzene	49.4	0.250	0.500	1.00	ug/L	50.00		98.8	70-120			
1,3-Dichlorobenzene	49.0	0.250	0.500	1.00	ug/L	50.00		98.0	75-125			
1,4-Dichlorobenzene	49.2	0.250	0.500	1.00	ug/L	50.00		98.5	75-125			
Dichlorodifluoromethane	56.6	0.500	1.00	2.00	ug/L	50.00		113	30-155			
1,1-Dichloroethane	52.8	0.250	0.500	1.00	ug/L	50.00		106	70-135			
1,2-Dichloroethane	51.1	0.250	0.500	1.00	ug/L	50.00		102	70-130			

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	DL	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C03001												
LCS				Prepared & Analyzed: 03/03/2015								
1,1-Dichloroethene	49.6	0.250	0.500	1.00	ug/L	50.00		99.2	70-130			
cis-1,2-Dichloroethene	47.7	0.250	0.500	1.00	ug/L	50.00		95.4	70-125			
trans-1,2-Dichloroethene	50.5	0.250	0.500	1.00	ug/L	50.00		101	60-140			
1,2-Dichloropropane	54.0	0.250	0.500	1.00	ug/L	50.00		108	75-125			
1,3-Dichloropropane	54.0	0.250	0.500	1.00	ug/L	50.00		108	75-125			
2,2-Dichloropropane	49.4	0.250	0.500	1.00	ug/L	50.00		98.8	70-135			
1,1-Dichloropropene	51.4	0.250	0.500	1.00	ug/L	50.00		103	75-130			
cis-1,3-Dichloropropene	50.1	0.250	0.500	1.00	ug/L	50.00		100	70-130			
trans-1,3-Dichloropropene	48.5	0.250	0.500	1.00	ug/L	50.00		97.0	55-140			
Ethylbenzene	50.8	0.250	0.500	1.00	ug/L	50.00		102	75-125			
Hexachlorobutadiene	44.7	0.250	0.500	2.00	ug/L	50.00		89.5	50-140			
2-Hexanone	101	1.25	2.50	5.00	ug/L	100.0		101	55-130			
Isopropylbenzene	50.5	0.250	0.500	1.00	ug/L	50.00		101	75-125			
p-Isopropyltoluene	51.2	0.250	0.500	1.00	ug/L	50.00		102	75-130			
Methylene chloride	47.9	0.500	1.00	2.00	ug/L	50.00		95.7	55-140			
Naphthalene	52.5	0.250	0.500	2.00	ug/L	50.00		105	55-140			
4-Methyl-2-pentanone	98.2	1.25	2.50	5.00	ug/L	100.0		98.2	60-135			
Methyl t-Butyl Ether	49.4	0.250	0.500	1.00	ug/L	50.00		98.8	65-125			
n-Propylbenzene	54.2	0.250	0.500	1.00	ug/L	50.00		108	70-130			
Styrene	50.8	0.250	0.500	1.00	ug/L	50.00		102	65-135			
1,1,2,2-Tetrachloroethane	53.1	0.250	0.500	1.00	ug/L	50.00		106	65-130			
1,1,1,2-Tetrachloroethane	49.9	0.250	0.500	1.00	ug/L	50.00		99.8	80-130			
Tetrachloroethene	50.6	0.250	0.500	1.00	ug/L	50.00		101	45-150			
Toluene	53.4	0.250	0.500	1.00	ug/L	50.00		107	75-120			
1,2,3-Trichlorobenzene	54.0	0.250	0.500	2.00	ug/L	50.00		108	55-140			
1,2,4-Trichlorobenzene	51.5	0.250	0.500	2.00	ug/L	50.00		103	65-135			
1,1,2-Trichloroethane	53.1	0.250	0.500	1.00	ug/L	50.00		106	75-125			
1,1,1-Trichloroethane	50.3	0.250	0.500	1.00	ug/L	50.00		101	65-130			
Trichloroethene	52.2	0.250	0.500	1.00	ug/L	50.00		104	70-125			
Trichlorofluoromethane	51.7	0.500	1.00	2.00	ug/L	50.00		103	60-145			
1,2,3-Trichloropropane	49.6	0.500	1.00	2.00	ug/L	50.00		99.1	75-125			
1,3,5-Trimethylbenzene	56.0	0.250	0.500	1.00	ug/L	50.00		112	75-130			
1,2,4-Trimethylbenzene	54.5	0.250	0.500	1.00	ug/L	50.00		109	75-130			
Vinyl chloride	56.8	0.250	0.500	1.00	ug/L	50.00		114	50-145			
Xylenes (total)	156	0.750	1.50	3.00	ug/L	150.0		104	75-130			
Surrogate: Bromofluorobenzene	*30.49*				*ug/L*	*30.00*		*102*	*75-120*			
Surrogate: Dibromofluoromethane	*28.95*				*ug/L*	*30.00*		*96.5*	*85-115*			
Surrogate: 1,2-Dichloroethane-d4	*28.01*				*ug/L*	*30.00*		*93.4*	*70-120*			
Surrogate: Toluene-d8	*30.28*				*ug/L*	*30.00*		*101*	*85-120*			

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	DL	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C03001												
LCS Dup					Prepared & Analyzed: 03/03/2015							
Acetone	104	2.50	5.00	10.0	ug/L	100.0		104	40-140	2.31	30	
Benzene	50.3	0.250	0.500	1.00	ug/L	50.00		101	80-120	1.72	30	
Bromobenzene	48.3	0.250	0.500	1.00	ug/L	50.00		96.6	75-125	5.28	30	
Bromochloromethane	49.2	0.250	0.500	1.00	ug/L	50.00		98.4	65-130	0.686	30	
Bromodichloromethane	51.7	0.250	0.500	1.00	ug/L	50.00		103	75-120	2.89	30	
Bromoform	49.2	0.250	0.500	1.00	ug/L	50.00		98.5	70-130	2.40	30	
Bromomethane	49.3	0.500	1.00	2.00	ug/L	50.00		98.7	30-145	2.40	30	
n-Butylbenzene	51.8	0.250	0.500	1.00	ug/L	50.00		104	70-135	2.89	30	
2-Butanone	107	2.50	5.00	10.0	ug/L	100.0		107	30-150	1.39	30	
sec-Butylbenzene	50.6	0.250	0.500	1.00	ug/L	50.00		101	70-125	7.66	30	
tert-Butylbenzene	50.2	0.250	0.500	1.00	ug/L	50.00		100	70-130	5.79	30	
Carbon disulfide	50.1	0.250	0.500	1.00	ug/L	50.00		100	35-160	2.25	30	
Carbon tetrachloride	49.2	0.250	0.500	1.00	ug/L	50.00		98.5	65-140	4.96	30	
Chlorobenzene	47.4	0.250	0.500	1.00	ug/L	50.00		94.8	80-120	5.17	30	
Chloroethane	41.2	0.500	1.00	2.00	ug/L	50.00		82.4	60-135	11.2	30	
Chloroform	47.2	0.250	0.500	1.00	ug/L	50.00		94.5	65-135	2.75	30	
Chloromethane	50.8	0.250	0.500	1.00	ug/L	50.00		102	40-125	7.71	30	
2-Chlorotoluene	49.6	0.250	0.500	1.00	ug/L	50.00		99.2	75-125	4.52	30	
4-Chlorotoluene	49.4	0.250	0.500	1.00	ug/L	50.00		98.8	75-130	5.69	30	
Dibromochloromethane	51.1	0.250	0.500	1.00	ug/L	50.00		102	60-135	3.33	30	
1,2-Dibromo-3-chloropropane	47.2	0.500	1.00	2.00	ug/L	50.00		94.3	50-130	12.8	30	
1,2-Dibromoethane (EDB)	50.7	0.250	0.500	1.00	ug/L	50.00		101	80-120	2.66	30	
Dibromomethane	50.4	0.250	0.500	1.00	ug/L	50.00		101	75-125	0.296	30	
1,2-Dichlorobenzene	47.7	0.250	0.500	1.00	ug/L	50.00		95.3	70-120	3.58	30	
1,3-Dichlorobenzene	47.4	0.250	0.500	1.00	ug/L	50.00		94.9	75-125	3.20	30	
1,4-Dichlorobenzene	48.2	0.250	0.500	1.00	ug/L	50.00		96.5	75-125	2.06	30	
Dichlorodifluoromethane	54.9	0.500	1.00	2.00	ug/L	50.00		110	30-155	2.99	30	
1,1-Dichloroethane	50.9	0.250	0.500	1.00	ug/L	50.00		102	70-135	3.53	30	
1,2-Dichloroethane	49.1	0.250	0.500	1.00	ug/L	50.00		98.2	70-130	3.90	30	
1,1-Dichloroethene	47.4	0.250	0.500	1.00	ug/L	50.00		94.8	70-130	4.56	30	
cis-1,2-Dichloroethene	47.1	0.250	0.500	1.00	ug/L	50.00		94.3	70-125	1.23	30	
trans-1,2-Dichloroethene	48.7	0.250	0.500	1.00	ug/L	50.00		97.5	60-140	3.53	30	
1,2-Dichloropropane	52.8	0.250	0.500	1.00	ug/L	50.00		106	75-125	2.30	30	
1,3-Dichloropropane	51.3	0.250	0.500	1.00	ug/L	50.00		103	75-125	5.21	30	
2,2-Dichloropropane	47.2	0.250	0.500	1.00	ug/L	50.00		94.4	70-135	4.48	30	
1,1-Dichloropropene	47.9	0.250	0.500	1.00	ug/L	50.00		95.8	75-130	7.15	30	
cis-1,3-Dichloropropene	50.7	0.250	0.500	1.00	ug/L	50.00		101	70-130	1.22	30	
trans-1,3-Dichloropropene	46.8	0.250	0.500	1.00	ug/L	50.00		93.5	55-140	3.65	30	
Ethylbenzene	48.8	0.250	0.500	1.00	ug/L	50.00		97.7	75-125	4.05	30	
Hexachlorobutadiene	42.9	0.250	0.500	2.00	ug/L	50.00		85.9	50-140	4.08	30	
2-Hexanone	99.1	1.25	2.50	5.00	ug/L	100.0		99.1	55-130	2.28	30	
Isopropylbenzene	48.3	0.250	0.500	1.00	ug/L	50.00		96.6	75-125	4.37	30	
p-Isopropyltoluene	49.2	0.250	0.500	1.00	ug/L	50.00		98.5	75-130	3.94	30	
Methylene chloride	48.2	0.500	1.00	2.00	ug/L	50.00		96.5	55-140	0.777	30	
Naphthalene	51.3	0.250	0.500	2.00	ug/L	50.00		103	55-140	2.27	30	
4-Methyl-2-pentanone	102	1.25	2.50	5.00	ug/L	100.0		102	60-135	3.77	30	
Methyl t-Butyl Ether	49.0	0.250	0.500	1.00	ug/L	50.00		98.0	65-125	0.803	30	
n-Propylbenzene	49.6	0.250	0.500	1.00	ug/L	50.00		99.1	70-130	8.87	30	
Styrene	47.8	0.250	0.500	1.00	ug/L	50.00		95.6	65-135	6.16	30	
1,1,2,2-Tetrachloroethane	51.1	0.250	0.500	1.00	ug/L	50.00		102	65-130	3.75	30	

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	DL	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C03001												
LCS Dup				Prepared & Analyzed: 03/03/2015								
1,1,1,2-Tetrachloroethane	47.9	0.250	0.500	1.00	ug/L	50.00		95.7	80-130	4.13	30	
Tetrachloroethene	46.2	0.250	0.500	1.00	ug/L	50.00		92.5	45-150	8.96	30	
Toluene	50.6	0.250	0.500	1.00	ug/L	50.00		101	75-120	5.32	30	
1,2,3-Trichlorobenzene	51.3	0.250	0.500	2.00	ug/L	50.00		103	55-140	5.02	30	
1,2,4-Trichlorobenzene	49.4	0.250	0.500	2.00	ug/L	50.00		98.8	65-135	4.10	30	
1,1,2-Trichloroethane	51.8	0.250	0.500	1.00	ug/L	50.00		104	75-125	2.45	30	
1,1,1-Trichloroethane	50.3	0.250	0.500	1.00	ug/L	50.00		101	65-130	0.00497	30	
Trichloroethene	50.8	0.250	0.500	1.00	ug/L	50.00		102	70-125	2.74	30	
Trichlorofluoromethane	48.6	0.500	1.00	2.00	ug/L	50.00		97.2	60-145	6.14	30	
1,2,3-Trichloropropane	49.5	0.500	1.00	2.00	ug/L	50.00		99.1	75-125	0.0490	30	
1,3,5-Trimethylbenzene	52.5	0.250	0.500	1.00	ug/L	50.00		105	75-130	6.42	30	
1,2,4-Trimethylbenzene	50.2	0.250	0.500	1.00	ug/L	50.00		100	75-130	8.08	30	
Vinyl chloride	54.3	0.250	0.500	1.00	ug/L	50.00		109	50-145	4.60	30	
Xylenes (total)	148	0.750	1.50	3.00	ug/L	150.0		98.8	75-130	5.15	30	
Surrogate: Bromofluorobenzene	*30.16*				*ug/L*	*30.00*		*101*	*75-120*			
Surrogate: Dibromofluoromethane	*29.64*				*ug/L*	*30.00*		*98.8*	*85-115*			
Surrogate: 1,2-Dichloroethane-d4	*29.48*				*ug/L*	*30.00*		*98.3*	*70-120*			
Surrogate: Toluene-d8	*29.86*				*ug/L*	*30.00*		*99.5*	*85-120*			

EDB and DBCP by GC - Quality Control

Analyte	Result	DL	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C03006												
Blank					Prepared & Analyzed: 03/03/2015							
1,2-Dibromoethane	ND	0.0100	0.0200	0.0300	ug/L							U
1,2-Dibromoethane [2C]	ND	0.0100	0.0200	0.0300	ug/L							U
Surrogate: 1,3-Dibromopropane	*2.082*				*ug/L*	*1.989*		*105*	*55-160*			
Surrogate: 1,3-Dibromopropane [2C]	*2.227*				*ug/L*	*1.989*		*112*	*55-160*			
LCS					Prepared & Analyzed: 03/03/2015							
1,2-Dibromoethane	0.5247	0.0100	0.0200	0.0300	ug/L	0.5000		105	70-130		20	
1,2-Dibromoethane [2C]	0.4878	0.0100	0.0200	0.0300	ug/L	0.5000		97.6	70-130		20	
Surrogate: 1,3-Dibromopropane	*2.036*				*ug/L*	*1.989*		*102*	*55-160*			
Surrogate: 1,3-Dibromopropane [2C]	*2.197*				*ug/L*	*1.989*		*110*	*55-160*			
LCS Dup					Prepared & Analyzed: 03/03/2015							
1,2-Dibromoethane	0.5144	0.0100	0.0200	0.0300	ug/L	0.5000		103	70-130	1.98	20	
1,2-Dibromoethane [2C]	0.4886	0.0100	0.0200	0.0300	ug/L	0.5000		97.7	70-130	0.164	20	
Surrogate: 1,3-Dibromopropane	*2.022*				*ug/L*	*1.989*		*102*	*55-160*			
Surrogate: 1,3-Dibromopropane [2C]	*2.205*				*ug/L*	*1.989*		*111*	*55-160*			

1503004

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ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Reference Document No: 140705-GW8423

Page 1 of 2

Project Number: 140705
Project Name: Kirtland AFB
Sample Coordinator: Tim Noger
Turnaround Time:

Samples Shipment Date: 02 MAR 2015
Lab Destination: Empirical Laboratories, Inc.
Lab Contact: Jennifer Chandler
Project Contact: Susan Huang
Carrier/Waybill No.: Fed Ex/565119375134

Bill To: Shaw Environmental, Inc. - Accounts P
PO Box 98519
Baton Rouge LA 70884

Report To: Susan Huang
4005 Port Chicago Highway
Concord CA 94520-1120

Special Instructions:

Possible Hazard Identification: Radiological ☐
Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐

Sample Disposal:
Return to Client ☐ Disposal by Lab ☒ Archive (mos.)

1. Relinquished By (Signature/Affiliation)	Date: 3/2/15 Time: 1630	1. Received By (Signature/Affiliation)	Date: Time:
2. Relinquished By (Signature/Affiliation)	Date: Time:	2. Received By (Signature/Affiliation)	Date: Time:
3. Relinquished By (Signature/Affiliation)	Date: Time:	3. Received By (Signature/Affiliation)	Date: 3/3/15 Time: 0855

Comments:

Sample No	Sample Name	Sample Date	Sample Time	Container	Ctr Qty	Preservative	Requested Testing Program	Sample Vol	Units	Fil	CID	Condition On Receipt
01 EVT1-106212-1	KAFB-106212-GW-EVT1-106212-1-REG	02 MAR 2015	14:43	40 mL VOA VIAL	3	HCl<pH 2	VOCs by SW846 8260B			N		
EVT1-106212-1	KAFB-106212-GW-EVT1-106212-1-REG	02 MAR 2015	14:43	40 mL VOA VIAL	3	None except cool to 4 C	EDB by SW846 8011			N		
EVT1-106212-1	KAFB-106212-GW-EVT1-106212-1-REG	02 MAR 2015	14:43	250 mL HDPE	1	None except cool to 4 C	Bromide,Chloride and Sulfate by EPA 300			N		
EVT1-106212-1	KAFB-106212-GW-EVT1-106212-1-REG	02 MAR 2015	14:43	250 mL HDPE	1	HNO3<pH 2	TAL Metals by SW846 6010C/7470A			N		
~~EVT1-106212-1~~	~~KAFB-106212-GW-EVT1-106212-1-REG~~	~~02 MAR 2015~~	~~14:43~~	~~250 mL HDPE~~	~~1~~	~~H2SO4<pH 2~~	~~Nitrate plus Nitrite by EPA 353.2~~			~~N~~		
02 EVT1-106212-2	KAFB-106212-GW-EVT1-106212-2-REG	02 MAR 2015	14:43	40 mL VOA VIAL	3	HCl<pH 2	VOCs by SW846 8260B			N		
EVT1-106212-2	KAFB-106212-GW-EVT1-106212-2-REG	02 MAR 2015	14:43	40 mL VOA VIAL	3	None except cool to 4 C	EDB by SW846 8011			N		
EVT1-106212-2	KAFB-106212-GW-EVT1-106212-2-REG	02 MAR 2015	14:43	250 mL HDPE	1	H2SO4<pH 2	Nitrate plus Nitrite by EPA 353.2			N		

15Ø3ØØ4

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Shaw E & I, Inc.

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Reference Document No: 140705-GW8423

	Sample No	Sample Name	Sample Date	Sample Time	Container		Preservative	Requested Testing Program	Sample Vol	Units	Fil	CID	Condition On Receipt
Ø2	EVT1-106212-2	KAFB-106212-GW-EVT1-106212-2-REG	02 MAR 2015	14:43	250 mL HDPE	1	HNO3<pH 2	TAL Metals by SW846 6010C/7470A			N		
	EVT1-106212-2	KAFB-106212-GW-EVT1-106212-2-REG	02 MAR 2015	14:43	250 mL HDPE	1	None except cool to 4 C	Bromide,Chloride and Sulfate by EPA 300			N		
Ø3	EVT1-106212-3	KAFB-106212-GW-EVT1-106212-3-REG	02 MAR 2015	14:43	250 mL HDPE	1	None except cool to 4 C	Bromide,Chloride and Sulfate by EPA 300			N		
	EVT1-106212-3	KAFB-106212-GW-EVT1-106212-3-REG	02 MAR 2015	14:43	250 mL HDPE	1	H2SO4<pH 2	Nitrate plus Nitrite by EPA 353.2			N		
	EVT1-106212-3	KAFB-106212-GW-EVT1-106212-3-REG	02 MAR 2015	14:43	40 mL VOA VIAL	3	HCl<pH 2	VOCs by SW846 8260B			N		
	EVT1-106212-3	KAFB-106212-GW-EVT1-106212-3-REG	02 MAR 2015	14:43	250 mL HDPE	1	HNO3<pH 2	TAL Metals by SW846 6010C/7470A			N		
	EVT1-106212-3	KAFB-106212-GW-EVT1-106212-3-REG	02 MAR 2015	14:43	40 mL VOA VIAL	3	None except cool to 4 C	EDB by SW846 8011			N		
Ø4	GW8423-TB	FIELDQC-BW-GW8423-TB-TB	02 MAR 2015	08:00	40 mL VOA VIAL	2	HCl<pH 2	VOCs by SW846 8260B			N		

II. EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

Cooler Received/Opened On: 03/03/15 @ 0855 Work Order: 15Ø3ØØ4

1. Tracking # 5134 (last 4 digits, FedEx)

   Courier: FedEx

2. Temperature of rep. sample or temp blank when opened: Ø.5 °C + correction factor(-0.0) = Ø.5 °C

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA

4. Were custody seals on outside of cooler? YES...NO...NA

   If yes, how many and where: 2. Front & back

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

   I certify that I opened the cooler and answered questions 1-6 (initial/date) JTG 3/3/15

7. Were custody seals on containers: YES NO and intact YES...NO...NA

   Were these signed and dated correctly? YES...NO...NA

8. Packing material used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13. a. Were VOA vials received? YES...NO...NA

    b. Was there observable headspace present in any VOA vial (>5mm-6mm)? YES...NO...NA

14. Was there a Trip Blank in this cooler (custody seals present/intact)? YES...NO...NA...Comments_____
    If multiple coolers, sequence # —

    I certify that I unloaded the cooler and answered questions 7-14 (initial/date) JTG 3/3/15

15. a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

    b. Did the bottle labels indicate that the correct preservatives were used? YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

    I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial/date) JTG 3/3/15

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA If not, PM notified? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA If not, PM notified? YES...NO...NA

21. Were there Non-Conformance issues at login? YES...NO...NCR#_____

I certify that I entered this project into LIMS and answered questions 17-21 (initial/date) JTG 3/3/15

I certify that I attached a label with the unique LIMS number to each container (initial/date) JTG 3/3/15

I certify that I notified the laboratory of any short holding time or RUSH parameters (initial/date) JTG 3/3/15

II. EMPIRICAL LABORATORIES
COOLER RECEIPT FORM (Continued)

LIMS Data Entry Second Check Workorder# 1503004

22. Cooler Receipt Form Issues reviewed and communicated to PM? YES...NO...NA

23. Client and Project verified to match the COC/CRF in LIMS Project Screen? YES...NO...NA

24. Following items verified to items verified to match the COC/CRF in LIMS Receipt Screen:

    a. Received Date/Received By YES...NO...NA

    b. TAT (COC specified different?) YES...NO...NA

    c. Shipping Container Temperatures (corrected temps) YES...NO ...NA

    d. Condition Items (seals, intact, labels, preservation, ROI) YES...NO...NA

25. Following LIMS Sample Information verified against COC for each sample:

    a. Name YES...NO...NA

    b. QC Source YES...NO...NA

    c. Matrix YES...NO...NA

    d. Sample Type YES...NO...NA

    e. Sampled Date/Time (Correct Time Zone) YES...NO...NA

    f. Work Analyses/Versions (if applicable) YES...NO...NA

    g. Sample Issues included in comments (limited volume, concentration warnings, etc.)? YES...NO...NA

    h. Unpreserved VOA holding time set to 7 days? YES...NO...NA

26. Containers consistent with tests requested? YES...NO...NA

27. Field data entered and matching COC? YES...NO...NA

I certify that I have verified the LIMS data entry and answered questions 23-27 above (initial/date): _____.

Additional Details:

☆ Following sample vials have pea-size headspace present:

- 'EVT1-106212-1' (3/2/15 @ 1443) - three HCl pres. vials for VOC; one unpres. vial for EDB
- 'EVT1-106212-2' (3/2/15 @ 1443) - two HCl pres. vials for VOC
- 'EVT1-106212-3' (3/2/15 @ 1443) - two HCl pres. vials for VOC, two unpres. vials for EDB

DoD ELAP QSM5.0, Certificate Number L2226
- Aqueous
- Non-aqueous
- Expires: 11/30/2015

State of Florida, Department of Health – NELAP, Lab ID: E87646
- Clean Water Act
- RCRA/CERCLA
- Expires: 06/30/2015

State of Georgia, Environmental Protection Agency – NELAP, Self Certification
- Expires: 06/30/2015

State of Illinois, Environmental Protection Agency – NELAP, Certificate Number: 003464
- Groundwater
- Solid and Hazardous Waste
- Expires: 09/13/2015

Commonwealth of Kentucky, Energy and Environment Cabinet – WWLCP, Laboratory Number: 98017
- Wastewater
- Expires: 12/31/2015

Commonwealth of Kentucky, Department of Environmental Protection – UST, Certificate Number: 77
- Aqueous
- Non-aqueous
- Expires: 06/30/2015

State of New Jersey, Department of Environmental Protection – NELAP Primary, Lab ID: TN473
- Water Pollution
- Solid and Hazardous Waste
- Expires: 06/30/2015

State of North Carolina, Department of Environment and Natural Resources - Certificate Number: 643
- Aqueous
- Non-aqueous
- Expires: 12/31/2015

State of North Dakota, Department of Health – NELAP, Certificate No.: R-204
- Aqueous
- Non-aqueous
- Expires: 06/30/2015

Commonwealth of Pennsylvania, Department of Environmental Protection – NELAP, Lab ID: 68-05374
- Aqueous
- Non-aqueous
- Expires: 10/31/2015

State of Texas, Commission on Environmental Quality – NELAP, Certificate Number: T104704307-15-11
- Aqueous
- Non-aqueous
- Expires: 12/31/2015

State of Utah, Department of Health – NELAP, Certificate Number: TN0042014-6
- Aqueous
- Non-aqueous
- Expires: 07/31/2015

Commonwealth of Virginia, Department of General Services – NELAP, Certificate Number: 7596, Lab ID: 460243
- Aqueous
- Non-aqueous
- Expires: 12/14/2015

State of Washington, Department of Ecology – NELAP, Lab ID: C934-15
- Groundwater
- Solid and Hazardous Waste
- Expires: 03/18/2016

Empirical Laboratories, LLC

621 Mainstream Drive, Suite 270
Nashville, TN 37228
615.345.1115 Phone
866.417.0548 Fax

06 March 2015

Susan Huang
CB&I
4005 Port Chicago Highway
Concord, CA 94520

RE: Kirtland AFB 2011 (Laboratory WorkOrder # 1503016)

Enclosed are the results of analyses for samples received by the laboratory on 03/04/2015 08:50. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

DRAFT REPORT
DATA SUBJECT TO CHANGE

Data Qualifiers

As applicable and where required, the following general qualifiers are associated with the sample results. Additional qualifiers will be specified within the reporting sections of the data package or within the body of the Case Narrative.

Analytical Report Terms and Qualifiers

DL: The detection limit (DL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The DL is supported by the method detection limit (MDL) which is determined from analysis of a sample containing the analyte in a given matrix.

LOD: The Limit of Detection is an estimate of the minimum amount of a substance that an analytical process can reliably detect. An LOD is analyte- and matrix-specific and may be laboratory-dependent. This definition is further clarified in the DoD QSM as the smallest amount or concentration of a substance that must be present in a sample in order to be detected at a high level of confidence (99%). At the LOD, the false negative rate (Type II error) is 1%.

LOQ: The Limit of Quantitation is the minimum level, concentration, or quantity of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. This term is further clarified within the DoD QSM as the lowest concentration that produces a quantitative result within specified limits of precision and bias.

***:** Exceeding quality control criteria are associated with the reported result.

B: The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.

D: When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".

E: The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound. For Metals, the qualifier indicates that the serial dilution was outside of the control limits and the compound should be considered estimated due to the presence of interference.

H1: The result was analyzed outside of the EPA recommended holding time.

H2: The result was extracted outside of the EPA recommended holding time

H3: The sample for this analyte was received outside of the EPA recommended holding time.

J: The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The mass spectral data pass the identification criteria showing that the compound is present, but the calculated result is less than the LOQ. One should feel confident that the result is greater than zero and less than the LOQ.

M: Indicates that the sample matrix interfered with the quantitation of the analyte. In dual column analysis the result is reported from the column with the lower concentration. In inorganics, it indicates that the parameters DL/LOD/LOQ have been raised.

N: The MS/MSD accuracy and/or precision are outside criteria. The predigested spike recovery is not within control limits for the associated parameter.

P: The associated numerical value is an estimated quantity. There is greater than a 40% difference between the two GC columns for the detected concentrations. The higher of the two values is reported unless matrix interference is obvious or for HPLC analysis where the primary column is reported.

Q: The relative percent difference (RPD) and/or percent recovery exceeded limits in the associated Blank Spike and/or Blank Spike Duplicate.

S: The associated internal standard exceeded criteria.

U: The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the DL.

X: The parameter shows a potential positive bias on a reported concentration due to an ICV or CCV exceeding the upper control limit on the high side.

Y: The parameter shows a potential negative bias on a reported concentration due to an ICV or CCV exceeding the lower control limit on the low side.

Z: The parameter shows lack of confirmation/detection, which may be due to a negative bias in the ICV or CCV which exceeds the lower control limit.

Laboratory Analytical Results Report

Client Sample ID: EVT2-106212-1 **Sample Collection Date/Time: 03/03/2015 11:22**

Lab Sample ID: 1503016-01 **Sample Received Date/Time: 03/04/2015 08:50**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Classical Chemistry Parameters										
Nitrate/Nitrite as N	ND	0.100	0.150	0.200	mg/L	1	03/04/15 11:54	E353.2	5C04011	U
Anions by IC										
Bromide	ND	0.0420	0.125	0.250	mg/L	1	03/04/15 11:18	E300.0	5C04007	U
Chloride	**9.52**	0.170	0.330	0.500	mg/L	1	03/04/15 11:18	E300.0	5C04007	
Sulfate as SO4	**34.8**	0.330	1.00	2.50	mg/L	1	03/04/15 11:18	E300.0	5C04007	
Metals in Water by ICP-AES										
Aluminum	**15.9**	12.5	25.0	50.0	ug/L	1	03/06/15 12:27	SW6010C	5C04013	J
Antimony	ND	1.25	2.00	2.50	ug/L	1	03/06/15 12:27	SW6010C	5C04013	YU
Arsenic	ND	0.750	1.50	2.50	ug/L	1	03/06/15 12:27	SW6010C	5C04013	U
Barium	**102**	1.25	2.50	10.0	ug/L	1	03/06/15 12:27	SW6010C	5C04013	
Beryllium	ND	0.250	0.500	1.25	ug/L	1	03/06/15 12:27	SW6010C	5C04013	U
Cadmium	ND	0.250	0.500	1.25	ug/L	1	03/06/15 12:27	SW6010C	5C04013	U
Calcium	**33400**	250	500	1250	ug/L	1	03/06/15 12:27	SW6010C	5C04013	
Chromium	**2.29**	0.500	1.00	2.50	ug/L	1	03/06/15 12:27	SW6010C	5C04013	J
Cobalt	ND	1.25	2.50	3.12	ug/L	1	03/06/15 12:27	SW6010C	5C04013	U
Copper	**6.48**	1.00	2.00	2.50	ug/L	1	03/06/15 12:27	SW6010C	5C04013	
Iron	**37.6**	7.50	15.0	25.0	ug/L	1	03/06/15 12:27	SW6010C	5C04013	
Lead	ND	0.375	0.750	1.25	ug/L	1	03/06/15 12:27	SW6010C	5C04013	U
Magnesium	**4490**	250	750	1250	ug/L	1	03/06/15 12:27	SW6010C	5C04013	
Manganese	**31.1**	0.750	1.50	3.75	ug/L	1	03/06/15 12:27	SW6010C	5C04013	
Molybdenum	**7.86**	1.25	2.50	5.00	ug/L	1	03/06/15 12:27	SW6010C	5C04013	
Nickel	ND	0.750	1.50	2.50	ug/L	1	03/06/15 12:27	SW6010C	5C04013	U
Potassium	**2190**	250	750	1250	ug/L	1	03/06/15 12:27	SW6010C	5C04013	
Selenium	**0.814**	0.750	1.25	2.50	ug/L	1	03/06/15 12:27	SW6010C	5C04013	J
Silver	ND	0.250	0.500	2.50	ug/L	1	03/06/15 12:27	SW6010C	5C04013	U
Sodium	**23700**	250	750	1250	ug/L	1	03/06/15 12:27	SW6010C	5C04013	
Thallium	ND	0.750	1.00	2.00	ug/L	1	03/06/15 12:27	SW6010C	5C04013	U
Vanadium	**2.70**	1.25	2.50	3.12	ug/L	1	03/06/15 12:27	SW6010C	5C04013	J
Zinc	**29.8**	1.25	2.50	5.00	ug/L	1	03/06/15 12:27	SW6010C	5C04013	

Laboratory Analytical Results Report

Client Sample ID: EVT2-106212-1 **Sample Collection Date/Time: 03/03/2015 11:22**

Lab Sample ID: 1503016-01 **Sample Received Date/Time: 03/04/2015 08:50**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Mercury by CVAA										
Mercury	ND	0.0800	0.160	0.200	ug/L	1	03/06/15 10:48	SW7470A	5C04016	U
Volatile Organic Compounds by GC/MS										
Acetone	**5.62**	2.50	5.00	10.0	ug/L	1	03/04/15 13:13	SW8260B	5C04014	XJ
Benzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
Bromobenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
Bromochloromethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
Bromodichloromethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
Bromoform	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
Bromomethane	ND	0.500	1.00	2.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
n-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
2-Butanone	ND	2.50	5.00	10.0	ug/L	1	03/04/15 13:13	SW8260B	5C04014	XU
sec-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
tert-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
Carbon disulfide	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
Carbon tetrachloride	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
Chlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
Chloroethane	ND	0.500	1.00	2.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
Chloroform	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
Chloromethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
2-Chlorotoluene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
4-Chlorotoluene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
Dibromochloromethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
1,2-Dibromo-3-chloropropane	ND	0.500	1.00	2.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
1,2-Dibromoethane (EDB)	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
Dibromomethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
1,2-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
1,3-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
1,4-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
Dichlorodifluoromethane	ND	0.500	1.00	2.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	XU
1,1-Dichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
1,2-Dichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
1,1-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
cis-1,2-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
trans-1,2-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
1,2-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
1,3-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
2,2-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
1,1-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
cis-1,3-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
trans-1,3-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
Ethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
Hexachlorobutadiene	ND	0.250	0.500	2.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
2-Hexanone	ND	1.25	2.50	5.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	XU

Laboratory Analytical Results Report

Client Sample ID: EVT2-106212-1 **Sample Collection Date/Time: 03/03/2015 11:22**

Lab Sample ID: 1503016-01 **Sample Received Date/Time: 03/04/2015 08:50**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Volatile Organic Compounds by GC/MS										
Isopropylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
p-Isopropyltoluene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
Methylene chloride	ND	0.500	1.00	2.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
Naphthalene	ND	0.250	0.500	2.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
4-Methyl-2-pentanone	ND	1.25	2.50	5.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	XU
Methyl t-Butyl Ether	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
n-Propylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
Styrene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
1,1,2,2-Tetrachloroethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
1,1,1,2-Tetrachloroethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
Tetrachloroethene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
Toluene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
1,2,3-Trichlorobenzene	ND	0.250	0.500	2.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
1,2,4-Trichlorobenzene	ND	0.250	0.500	2.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
1,1,2-Trichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
1,1,1-Trichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
Trichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
Trichlorofluoromethane	ND	0.500	1.00	2.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
1,2,3-Trichloropropane	ND	0.500	1.00	2.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
1,3,5-Trimethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
1,2,4-Trimethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
Vinyl chloride	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	XU
Xylenes (total)	ND	0.750	1.50	3.00	ug/L	1	03/04/15 13:13	SW8260B	5C04014	U
Surrogate: Bromofluorobenzene				*96.6 %*	*75-120*		*03/04/15 13:13*	*SW8260B*	*5C04014*	
Surrogate: Dibromofluoromethane				*101 %*	*85-115*		*03/04/15 13:13*	*SW8260B*	*5C04014*	
Surrogate: 1.2-Dichloroethane-d4				*97.6 %*	*70-120*		*03/04/15 13:13*	*SW8260B*	*5C04014*	
Surrogate: Toluene-d8				*90.5 %*	*85-120*		*03/04/15 13:13*	*SW8260B*	*5C04014*	

Laboratory Analytical Results Report

Client Sample ID: EVT2-106212-1

Sample Collection Date/Time: 03/03/2015 11:22

Lab Sample ID: 1503016-01

Sample Received Date/Time: 03/04/2015 08:50

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
EDB and DBCP by GC										
1,2-Dibromoethane	ND	0.00933	0.0187	0.0280	ug/L	1	03/04/15 12:24	SW8011	5C04009	XQU
Surrogate: 1,3-Dibromopropane				*174 %*	*55-160*		*03/04/15 12:24*	*SW8011*	*5C04009*	X
Surrogate: 1,3-Dibromopropane [2C]				*211 %*	*55-160*		*03/04/15 12:24*	*SW8011*	*5C04009*	X

Laboratory Analytical Results Report

Client Sample ID: EVT2-106212-2 **Sample Collection Date/Time: 03/03/2015 11:22**

Lab Sample ID: 1503016-02 **Sample Received Date/Time: 03/04/2015 08:50**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Classical Chemistry Parameters										
Nitrate/Nitrite as N	ND	0.100	0.150	0.200	mg/L	1	03/04/15 11:56	E353.2	5C04011	U
Anions by IC										
Bromide	ND	0.0420	0.125	0.250	mg/L	1	03/04/15 11:36	E300.0	5C04007	U
Chloride	**9.54**	0.170	0.330	0.500	mg/L	1	03/04/15 11:36	E300.0	5C04007	
Sulfate as SO4	**34.8**	0.330	1.00	2.50	mg/L	1	03/04/15 11:36	E300.0	5C04007	
Metals in Water by ICP-AES										
Aluminum	**20.7**	12.5	25.0	50.0	ug/L	1	03/06/15 12:32	SW6010C	5C04013	J
Antimony	ND	1.25	2.00	2.50	ug/L	1	03/06/15 12:32	SW6010C	5C04013	YU
Arsenic	ND	0.750	1.50	2.50	ug/L	1	03/06/15 12:32	SW6010C	5C04013	U
Barium	**101**	1.25	2.50	10.0	ug/L	1	03/06/15 12:32	SW6010C	5C04013	
Beryllium	ND	0.250	0.500	1.25	ug/L	1	03/06/15 12:32	SW6010C	5C04013	U
Cadmium	ND	0.250	0.500	1.25	ug/L	1	03/06/15 12:32	SW6010C	5C04013	U
Calcium	**33900**	250	500	1250	ug/L	1	03/06/15 12:32	SW6010C	5C04013	
Chromium	**2.29**	0.500	1.00	2.50	ug/L	1	03/06/15 12:32	SW6010C	5C04013	J
Cobalt	ND	1.25	2.50	3.12	ug/L	1	03/06/15 12:32	SW6010C	5C04013	U
Copper	**6.49**	1.00	2.00	2.50	ug/L	1	03/06/15 12:32	SW6010C	5C04013	
Iron	**38.7**	7.50	15.0	25.0	ug/L	1	03/06/15 12:32	SW6010C	5C04013	
Lead	ND	0.375	0.750	1.25	ug/L	1	03/06/15 12:32	SW6010C	5C04013	U
Magnesium	**4520**	250	750	1250	ug/L	1	03/06/15 12:32	SW6010C	5C04013	
Manganese	**31.2**	0.750	1.50	3.75	ug/L	1	03/06/15 12:32	SW6010C	5C04013	
Molybdenum	**7.79**	1.25	2.50	5.00	ug/L	1	03/06/15 12:32	SW6010C	5C04013	
Nickel	ND	0.750	1.50	2.50	ug/L	1	03/06/15 12:32	SW6010C	5C04013	U
Potassium	**2190**	250	750	1250	ug/L	1	03/06/15 12:32	SW6010C	5C04013	
Selenium	ND	0.750	1.25	2.50	ug/L	1	03/06/15 12:32	SW6010C	5C04013	U
Silver	ND	0.250	0.500	2.50	ug/L	1	03/06/15 12:32	SW6010C	5C04013	U
Sodium	**23600**	250	750	1250	ug/L	1	03/06/15 12:32	SW6010C	5C04013	
Thallium	ND	0.750	1.00	2.00	ug/L	1	03/06/15 12:32	SW6010C	5C04013	U
Vanadium	**2.76**	1.25	2.50	3.12	ug/L	1	03/06/15 12:32	SW6010C	5C04013	J
Zinc	**29.6**	1.25	2.50	5.00	ug/L	1	03/06/15 12:32	SW6010C	5C04013	

Laboratory Analytical Results Report

Client Sample ID: EVT2-106212-2 **Sample Collection Date/Time: 03/03/2015 11:22**

Lab Sample ID: 1503016-02 **Sample Received Date/Time: 03/04/2015 08:50**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Mercury by CVAA										
Mercury	ND	0.0800	0.160	0.200	ug/L	1	03/06/15 10:49	SW7470A	5C04016	U
Volatile Organic Compounds by GC/MS										
Acetone	**5.30**	2.50	5.00	10.0	ug/L	1	03/04/15 13:42	SW8260B	5C04014	XJ
Benzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
Bromobenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
Bromochloromethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
Bromodichloromethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
Bromoform	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
Bromomethane	ND	0.500	1.00	2.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
n-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
2-Butanone	ND	2.50	5.00	10.0	ug/L	1	03/04/15 13:42	SW8260B	5C04014	XU
sec-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
tert-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
Carbon disulfide	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
Carbon tetrachloride	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
Chlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
Chloroethane	ND	0.500	1.00	2.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
Chloroform	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
Chloromethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
2-Chlorotoluene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
4-Chlorotoluene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
Dibromochloromethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
1,2-Dibromo-3-chloropropane	ND	0.500	1.00	2.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
1,2-Dibromoethane (EDB)	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
Dibromomethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
1,2-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
1,3-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
1,4-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
Dichlorodifluoromethane	ND	0.500	1.00	2.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	XU
1,1-Dichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
1,2-Dichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
1,1-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
cis-1,2-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
trans-1,2-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
1,2-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
1,3-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
2,2-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
1,1-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
cis-1,3-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
trans-1,3-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
Ethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
Hexachlorobutadiene	ND	0.250	0.500	2.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
2-Hexanone	ND	1.25	2.50	5.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	XU

Laboratory Analytical Results Report

Client Sample ID: EVT2-106212-2 **Sample Collection Date/Time: 03/03/2015 11:22**

Lab Sample ID: 1503016-02 **Sample Received Date/Time: 03/04/2015 08:50**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Volatile Organic Compounds by GC/MS										
Isopropylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
p-Isopropyltoluene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
Methylene chloride	ND	0.500	1.00	2.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
Naphthalene	ND	0.250	0.500	2.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
4-Methyl-2-pentanone	ND	1.25	2.50	5.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	XU
Methyl t-Butyl Ether	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
n-Propylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
Styrene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
1,1,2,2-Tetrachloroethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
1,1,1,2-Tetrachloroethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
Tetrachloroethene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
Toluene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
1,2,3-Trichlorobenzene	ND	0.250	0.500	2.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
1,2,4-Trichlorobenzene	ND	0.250	0.500	2.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
1,1,2-Trichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
1,1,1-Trichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
Trichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
Trichlorofluoromethane	ND	0.500	1.00	2.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
1,2,3-Trichloropropane	ND	0.500	1.00	2.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
1,3,5-Trimethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
1,2,4-Trimethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
Vinyl chloride	ND	0.250	0.500	1.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	XU
Xylenes (total)	ND	0.750	1.50	3.00	ug/L	1	03/04/15 13:42	SW8260B	5C04014	U
Surrogate: Bromofluorobenzene				*96.4 %*	*75-120*		*03/04/15 13:42*	*SW8260B*	*5C04014*	
Surrogate: Dibromofluoromethane				*101 %*	*85-115*		*03/04/15 13:42*	*SW8260B*	*5C04014*	
Surrogate: 1.2-Dichloroethane-d4				*96.0 %*	*70-120*		*03/04/15 13:42*	*SW8260B*	*5C04014*	
Surrogate: Toluene-d8				*93.4 %*	*85-120*		*03/04/15 13:42*	*SW8260B*	*5C04014*	

Laboratory Analytical Results Report

Client Sample ID: EVT2-106212-2 **Sample Collection Date/Time: 03/03/2015 11:22**

Lab Sample ID: 1503016-02 **Sample Received Date/Time: 03/04/2015 08:50**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
EDB and DBCP by GC										
1,2-Dibromoethane	ND	0.00922	0.0184	0.0277	ug/L	1	03/04/15 12:36	SW8011	5C04009	XQU
Surrogate: 1,3-Dibromopropane				*165 %*	*55-160*		*03/04/15 12:36*	*SW8011*	*5C04009*	X
Surrogate: 1,3-Dibromopropane [2C]				*198 %*	*55-160*		*03/04/15 12:36*	*SW8011*	*5C04009*	X

Laboratory Analytical Results Report

Client Sample ID: EVT2-106212-4 **Sample Collection Date/Time: 03/03/2015 11:22**

Lab Sample ID: 1503016-03 **Sample Received Date/Time: 03/04/2015 08:50**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Classical Chemistry Parameters										
Nitrate/Nitrite as N	ND	0.100	0.150	0.200	mg/L	1	03/04/15 11:57	E353.2	5C04011	U
Anions by IC										
Bromide	ND	0.0420	0.125	0.250	mg/L	1	03/04/15 11:54	E300.0	5C04007	U
Chloride	**9.55**	0.170	0.330	0.500	mg/L	1	03/04/15 11:54	E300.0	5C04007	
Sulfate as SO4	**34.8**	0.330	1.00	2.50	mg/L	1	03/04/15 11:54	E300.0	5C04007	
Metals in Water by ICP-AES										
Aluminum	**19.5**	12.5	25.0	50.0	ug/L	1	03/06/15 12:36	SW6010C	5C04013	J
Antimony	ND	1.25	2.00	2.50	ug/L	1	03/06/15 12:36	SW6010C	5C04013	YU
Arsenic	ND	0.750	1.50	2.50	ug/L	1	03/06/15 12:36	SW6010C	5C04013	U
Barium	**102**	1.25	2.50	10.0	ug/L	1	03/06/15 12:36	SW6010C	5C04013	
Beryllium	ND	0.250	0.500	1.25	ug/L	1	03/06/15 12:36	SW6010C	5C04013	U
Cadmium	ND	0.250	0.500	1.25	ug/L	1	03/06/15 12:36	SW6010C	5C04013	U
Calcium	**33200**	250	500	1250	ug/L	1	03/06/15 12:36	SW6010C	5C04013	
Chromium	**2.32**	0.500	1.00	2.50	ug/L	1	03/06/15 12:36	SW6010C	5C04013	J
Cobalt	ND	1.25	2.50	3.12	ug/L	1	03/06/15 12:36	SW6010C	5C04013	U
Copper	**6.27**	1.00	2.00	2.50	ug/L	1	03/06/15 12:36	SW6010C	5C04013	
Iron	**38.4**	7.50	15.0	25.0	ug/L	1	03/06/15 12:36	SW6010C	5C04013	
Lead	ND	0.375	0.750	1.25	ug/L	1	03/06/15 12:36	SW6010C	5C04013	U
Magnesium	**4440**	250	750	1250	ug/L	1	03/06/15 12:36	SW6010C	5C04013	
Manganese	**30.9**	0.750	1.50	3.75	ug/L	1	03/06/15 12:36	SW6010C	5C04013	
Molybdenum	**7.91**	1.25	2.50	5.00	ug/L	1	03/06/15 12:36	SW6010C	5C04013	
Nickel	ND	0.750	1.50	2.50	ug/L	1	03/06/15 12:36	SW6010C	5C04013	U
Potassium	**2200**	250	750	1250	ug/L	1	03/06/15 12:36	SW6010C	5C04013	
Selenium	ND	0.750	1.25	2.50	ug/L	1	03/06/15 12:36	SW6010C	5C04013	U
Silver	ND	0.250	0.500	2.50	ug/L	1	03/06/15 12:36	SW6010C	5C04013	U
Sodium	**24000**	250	750	1250	ug/L	1	03/06/15 12:36	SW6010C	5C04013	
Thallium	ND	0.750	1.00	2.00	ug/L	1	03/06/15 12:36	SW6010C	5C04013	U
Vanadium	**2.69**	1.25	2.50	3.12	ug/L	1	03/06/15 12:36	SW6010C	5C04013	J
Zinc	**30.0**	1.25	2.50	5.00	ug/L	1	03/06/15 12:36	SW6010C	5C04013	

Laboratory Analytical Results Report

Client Sample ID: EVT2-106212-4 **Sample Collection Date/Time: 03/03/2015 11:22**

Lab Sample ID: 1503016-03 **Sample Received Date/Time: 03/04/2015 08:50**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Mercury by CVAA										
Mercury	ND	0.0800	0.160	0.200	ug/L	1	03/06/15 10:50	SW7470A	5C04016	U
Volatile Organic Compounds by GC/MS										
Acetone	**5.95**	2.50	5.00	10.0	ug/L	1	03/04/15 14:11	SW8260B	5C04014	XJ
Benzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
Bromobenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
Bromochloromethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
Bromodichloromethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
Bromoform	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
Bromomethane	ND	0.500	1.00	2.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
n-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
2-Butanone	ND	2.50	5.00	10.0	ug/L	1	03/04/15 14:11	SW8260B	5C04014	XU
sec-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
tert-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
Carbon disulfide	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
Carbon tetrachloride	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
Chlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
Chloroethane	ND	0.500	1.00	2.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
Chloroform	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
Chloromethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
2-Chlorotoluene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
4-Chlorotoluene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
Dibromochloromethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
1,2-Dibromo-3-chloropropane	ND	0.500	1.00	2.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
1,2-Dibromoethane (EDB)	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
Dibromomethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
1,2-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
1,3-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
1,4-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
Dichlorodifluoromethane	ND	0.500	1.00	2.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	XU
1,1-Dichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
1,2-Dichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
1,1-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
cis-1,2-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
trans-1,2-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
1,2-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
1,3-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
2,2-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
1,1-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
cis-1,3-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
trans-1,3-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
Ethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
Hexachlorobutadiene	ND	0.250	0.500	2.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
2-Hexanone	ND	1.25	2.50	5.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	XU

Laboratory Analytical Results Report

Client Sample ID: EVT2-106212-4 **Sample Collection Date/Time: 03/03/2015 11:22**

Lab Sample ID: 1503016-03 **Sample Received Date/Time: 03/04/2015 08:50**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Volatile Organic Compounds by GC/MS										
Isopropylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
p-Isopropyltoluene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
Methylene chloride	ND	0.500	1.00	2.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
Naphthalene	ND	0.250	0.500	2.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
4-Methyl-2-pentanone	ND	1.25	2.50	5.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	XU
Methyl t-Butyl Ether	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
n-Propylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
Styrene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
1,1,2,2-Tetrachloroethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
1,1,1,2-Tetrachloroethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
Tetrachloroethene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
Toluene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
1,2,3-Trichlorobenzene	ND	0.250	0.500	2.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
1,2,4-Trichlorobenzene	ND	0.250	0.500	2.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
1,1,2-Trichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
1,1,1-Trichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
Trichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
Trichlorofluoromethane	ND	0.500	1.00	2.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
1,2,3-Trichloropropane	ND	0.500	1.00	2.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
1,3,5-Trimethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
1,2,4-Trimethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
Vinyl chloride	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	XU
Xylenes (total)	ND	0.750	1.50	3.00	ug/L	1	03/04/15 14:11	SW8260B	5C04014	U
Surrogate: Bromofluorobenzene				*97.8 %*	*75-120*		*03/04/15 14:11*	*SW8260B*	*5C04014*	
Surrogate: Dibromofluoromethane				*103 %*	*85-115*		*03/04/15 14:11*	*SW8260B*	*5C04014*	
Surrogate: 1.2-Dichloroethane-d4				*95.7 %*	*70-120*		*03/04/15 14:11*	*SW8260B*	*5C04014*	
Surrogate: Toluene-d8				*90.5 %*	*85-120*		*03/04/15 14:11*	*SW8260B*	*5C04014*	

Laboratory Analytical Results Report

Client Sample ID: EVT2-106212-4

Sample Collection Date/Time: 03/03/2015 11:22

Lab Sample ID: 1503016-03

Sample Received Date/Time: 03/04/2015 08:50

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
EDB and DBCP by GC										
1,2-Dibromoethane	ND	0.00944	0.0189	0.0283	ug/L	1	03/04/15 12:47	SW8011	5C04009	XQU
Surrogate: 1,3-Dibromopropane				*159 %*	*55-160*		*03/04/15 12:47*	*SW8011*	*5C04009*	X
Surrogate: 1,3-Dibromopropane [2C]				*190 %*	*55-160*		*03/04/15 12:47*	*SW8011*	*5C04009*	X

Laboratory Analytical Results Report

Client Sample ID: GW8424-TB **Sample Collection Date/Time: 03/03/2015 08:00**

Lab Sample ID: 1503016-04 **Sample Received Date/Time: 03/04/2015 08:50**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Volatile Organic Compounds by GC/MS										
Acetone	ND	2.50	5.00	10.0	ug/L	1	03/04/15 14:40	SW8260B	5C04014	XU
Benzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
Bromobenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
Bromochloromethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
Bromodichloromethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
Bromoform	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
Bromomethane	ND	0.500	1.00	2.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
n-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
2-Butanone	ND	2.50	5.00	10.0	ug/L	1	03/04/15 14:40	SW8260B	5C04014	XU
sec-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
tert-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
Carbon disulfide	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
Carbon tetrachloride	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
Chlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
Chloroethane	ND	0.500	1.00	2.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
Chloroform	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
Chloromethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
2-Chlorotoluene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
4-Chlorotoluene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
Dibromochloromethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
1,2-Dibromo-3-chloropropane	ND	0.500	1.00	2.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
1,2-Dibromoethane (EDB)	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
Dibromomethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
1,2-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
1,3-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
1,4-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
Dichlorodifluoromethane	ND	0.500	1.00	2.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	XU
1,1-Dichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
1,2-Dichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
1,1-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
cis-1,2-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
trans-1,2-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
1,2-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
1,3-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
2,2-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
1,1-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
cis-1,3-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
trans-1,3-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
Ethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
Hexachlorobutadiene	ND	0.250	0.500	2.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
2-Hexanone	ND	1.25	2.50	5.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	XU
Isopropylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
p-Isopropyltoluene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U

Laboratory Analytical Results Report

Client Sample ID: GW8424-TB **Sample Collection Date/Time: 03/03/2015 08:00**

Lab Sample ID: 1503016-04 **Sample Received Date/Time: 03/04/2015 08:50**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Volatile Organic Compounds by GC/MS										
Methylene chloride	ND	0.500	1.00	2.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
Naphthalene	ND	0.250	0.500	2.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
4-Methyl-2-pentanone	ND	1.25	2.50	5.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	XU
Methyl t-Butyl Ether	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
n-Propylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
Styrene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
1,1,2,2-Tetrachloroethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
1,1,1,2-Tetrachloroethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
Tetrachloroethene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
Toluene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
1,2,3-Trichlorobenzene	ND	0.250	0.500	2.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
1,2,4-Trichlorobenzene	ND	0.250	0.500	2.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
1,1,2-Trichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
1,1,1-Trichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
Trichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
Trichlorofluoromethane	ND	0.500	1.00	2.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
1,2,3-Trichloropropane	ND	0.500	1.00	2.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
1,3,5-Trimethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
1,2,4-Trimethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
Vinyl chloride	ND	0.250	0.500	1.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	XU
Xylenes (total)	ND	0.750	1.50	3.00	ug/L	1	03/04/15 14:40	SW8260B	5C04014	U
Surrogate: Bromofluorobenzene				*98.5 %*	*75-120*		*03/04/15 14:40*	*SW8260B*	*5C04014*	
Surrogate: Dibromofluoromethane				*103 %*	*85-115*		*03/04/15 14:40*	*SW8260B*	*5C04014*	
Surrogate: 1.2-Dichloroethane-d4				*96.6 %*	*70-120*		*03/04/15 14:40*	*SW8260B*	*5C04014*	
Surrogate: Toluene-d8				*94.4 %*	*85-120*		*03/04/15 14:40*	*SW8260B*	*5C04014*	

Classical Chemistry Parameters - Quality Control

Analyte	Result	DL	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C04011												
Blank					Prepared & Analyzed: 03/04/2015							
Nitrate/Nitrite as N	ND	0.100	0.150	0.200	mg/L							U
LCS					Prepared & Analyzed: 03/04/2015							
Nitrate/Nitrite as N	2.198	0.100	0.150	0.200	mg/L	2.156		102	90-110			

Anions by IC - Quality Control

Analyte	Result	DL	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C04007												
Blank				Prepared & Analyzed: 03/04/2015								
Bromide	ND	0.0420	0.125	0.250	mg/L							U
Chloride	ND	0.170	0.330	0.500	mg/L							U
Sulfate as SO4	ND	0.330	1.00	2.50	mg/L							U
LCS				Prepared & Analyzed: 03/04/2015								
Bromide	13.48	0.0420	0.125	0.250	mg/L	14.00		96.3	90-110			
Chloride	4.492	0.170	0.330	0.500	mg/L	4.200		107	90-110			
Sulfate as SO4	21.87	0.330	1.00	2.50	mg/L	21.00		104	90-110			

Metals in Water by ICP-AES - Quality Control

Analyte	Result	DL	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C04013												
Blank					Prepared: 03/04/2015 Analyzed: 03/06/2015							
Aluminum	ND	12.5	25.0	50.0	ug/L							U
Antimony	ND	1.25	2.00	2.50	ug/L							UY
Arsenic	ND	0.750	1.50	2.50	ug/L							U
Barium	ND	1.25	2.50	10.0	ug/L							U
Beryllium	ND	0.250	0.500	1.25	ug/L							U
Cadmium	ND	0.250	0.500	1.25	ug/L							U
Calcium	ND	250	500	1250	ug/L							U
Chromium	ND	0.500	1.00	2.50	ug/L							U
Cobalt	ND	1.25	2.50	3.12	ug/L							U
Copper	ND	1.00	2.00	2.50	ug/L							U
Iron	ND	7.50	15.0	25.0	ug/L							U
Lead	ND	0.375	0.750	1.25	ug/L							U
Magnesium	ND	250	750	1250	ug/L							U
Manganese	ND	0.750	1.50	3.75	ug/L							U
Molybdenum	ND	1.25	2.50	5.00	ug/L							U
Nickel	ND	0.750	1.50	2.50	ug/L							U
Potassium	ND	250	750	1250	ug/L							U
Selenium	ND	0.750	1.25	2.50	ug/L							U
Silver	ND	0.250	0.500	2.50	ug/L							U
Sodium	ND	250	750	1250	ug/L							U
Thallium	ND	0.750	1.00	2.00	ug/L							U
Vanadium	ND	1.25	2.50	3.12	ug/L							U
Zinc	ND	1.25	2.50	5.00	ug/L							U
LCS					Prepared: 03/04/2015 Analyzed: 03/06/2015							
Aluminum	37.59	12.5	25.0	50.0	ug/L	40.00		94.0	80-120			J
Antimony	4.298	1.25	2.00	2.50	ug/L	5.000		86.0	80-120			Y
Arsenic	4.201	0.750	1.50	2.50	ug/L	5.000		84.0	80-120			
Barium	33.66	1.25	2.50	10.0	ug/L	40.00		84.1	80-120			
Beryllium	0.8969	0.250	0.500	1.25	ug/L	1.000		89.7	80-120			J
Cadmium	2.224	0.250	0.500	1.25	ug/L	2.500		88.9	80-120			
Calcium	561.9	250	500	1250	ug/L	600.0		93.6	80-120			J
Chromium	3.842	0.500	1.00	2.50	ug/L	4.000		96.0	80-120			
Cobalt	8.394	1.25	2.50	3.12	ug/L	10.00		83.9	80-120			
Copper	5.157	1.00	2.00	2.50	ug/L	5.000		103	80-120			
Iron	20.53	7.50	15.0	25.0	ug/L	20.00		103	80-120			J
Lead	4.292	0.375	0.750	1.25	ug/L	5.000		85.8	80-120			
Magnesium	539.4	250	750	1250	ug/L	600.0		89.9	80-120			J
Manganese	9.304	0.750	1.50	3.75	ug/L	10.00		93.0	80-120			
Molybdenum	16.39	1.25	2.50	5.00	ug/L	20.00		82.0	80-120			
Nickel	8.341	0.750	1.50	2.50	ug/L	10.00		83.4	80-120			
Potassium	513.1	250	750	1250	ug/L	600.0		85.5	80-120			J
Selenium	4.370	0.750	1.25	2.50	ug/L	5.000		87.4	80-120			
Silver	4.629	0.250	0.500	2.50	ug/L	5.000		92.6	80-120			
Sodium	533.0	250	750	1250	ug/L	600.0		88.8	80-120			J
Thallium	4.457	0.750	1.00	2.00	ug/L	5.000		89.1	80-120			
Vanadium	8.932	1.25	2.50	3.12	ug/L	10.00		89.3	80-120			
Zinc	8.762	1.25	2.50	5.00	ug/L	10.00		87.6	80-120			

Mercury by CVAA - Quality Control

Analyte	Result	DL	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C04016												
Blank					Prepared: 03/04/2015 Analyzed: 03/06/2015							
Mercury	ND	0.0800	0.160	0.200	ug/L							U
LCS					Prepared: 03/04/2015 Analyzed: 03/06/2015							
Mercury	2.054	0.0800	0.160	0.200	ug/L	2.000		103	80-120			

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	DL	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C04014												
Blank				Prepared & Analyzed: 03/04/2015								
Acetone	ND	2.50	5.00	10.0	ug/L							UX
Benzene	ND	0.250	0.500	1.00	ug/L							U
Bromobenzene	ND	0.250	0.500	1.00	ug/L							U
Bromochloromethane	ND	0.250	0.500	1.00	ug/L							U
Bromodichloromethane	ND	0.250	0.500	1.00	ug/L							U
Bromoform	ND	0.250	0.500	1.00	ug/L							U
Bromomethane	ND	0.500	1.00	2.00	ug/L							U
n-Butylbenzene	ND	0.250	0.500	1.00	ug/L							U
2-Butanone	ND	2.50	5.00	10.0	ug/L							UX
sec-Butylbenzene	ND	0.250	0.500	1.00	ug/L							U
tert-Butylbenzene	ND	0.250	0.500	1.00	ug/L							U
Carbon disulfide	ND	0.250	0.500	1.00	ug/L							U
Carbon tetrachloride	ND	0.250	0.500	1.00	ug/L							U
Chlorobenzene	ND	0.250	0.500	1.00	ug/L							U
Chloroethane	ND	0.500	1.00	2.00	ug/L							U
Chloroform	ND	0.250	0.500	1.00	ug/L							U
Chloromethane	ND	0.250	0.500	1.00	ug/L							U
2-Chlorotoluene	ND	0.250	0.500	1.00	ug/L							U
4-Chlorotoluene	ND	0.250	0.500	1.00	ug/L							U
Dibromochloromethane	ND	0.250	0.500	1.00	ug/L							U
1,2-Dibromo-3-chloropropane	ND	0.500	1.00	2.00	ug/L							U
1,2-Dibromoethane (EDB)	ND	0.250	0.500	1.00	ug/L							U
Dibromomethane	ND	0.250	0.500	1.00	ug/L							U
1,2-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L							U
1,3-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L							U
1,4-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L							U
Dichlorodifluoromethane	ND	0.500	1.00	2.00	ug/L							UX
1,1-Dichloroethane	ND	0.250	0.500	1.00	ug/L							U
1,2-Dichloroethane	ND	0.250	0.500	1.00	ug/L							U
1,1-Dichloroethene	ND	0.250	0.500	1.00	ug/L							U
cis-1,2-Dichloroethene	ND	0.250	0.500	1.00	ug/L							U
trans-1,2-Dichloroethene	ND	0.250	0.500	1.00	ug/L							U
1,2-Dichloropropane	ND	0.250	0.500	1.00	ug/L							U
1,3-Dichloropropane	ND	0.250	0.500	1.00	ug/L							U
2,2-Dichloropropane	ND	0.250	0.500	1.00	ug/L							U
1,1-Dichloropropene	ND	0.250	0.500	1.00	ug/L							U
cis-1,3-Dichloropropene	ND	0.250	0.500	1.00	ug/L							U
trans-1,3-Dichloropropene	ND	0.250	0.500	1.00	ug/L							U
Ethylbenzene	ND	0.250	0.500	1.00	ug/L							U
Hexachlorobutadiene	ND	0.250	0.500	2.00	ug/L							U
2-Hexanone	ND	1.25	2.50	5.00	ug/L							UX
Isopropylbenzene	ND	0.250	0.500	1.00	ug/L							U
p-Isopropyltoluene	ND	0.250	0.500	1.00	ug/L							U
Methylene chloride	ND	0.500	1.00	2.00	ug/L							U
Naphthalene	ND	0.250	0.500	2.00	ug/L							U
4-Methyl-2-pentanone	ND	1.25	2.50	5.00	ug/L							UX
Methyl t-Butyl Ether	ND	0.250	0.500	1.00	ug/L							U
n-Propylbenzene	ND	0.250	0.500	1.00	ug/L							U
Styrene	ND	0.250	0.500	1.00	ug/L							U
1,1,2,2-Tetrachloroethane	ND	0.250	0.500	1.00	ug/L							U

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	DL	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C04014												
Blank				Prepared & Analyzed: 03/04/2015								
1,1,1,2-Tetrachloroethane	ND	0.250	0.500	1.00	ug/L							U
Tetrachloroethene	ND	0.250	0.500	1.00	ug/L							U
Toluene	ND	0.250	0.500	1.00	ug/L							U
1,2,3-Trichlorobenzene	ND	0.250	0.500	2.00	ug/L							U
1,2,4-Trichlorobenzene	ND	0.250	0.500	2.00	ug/L							U
1,1,2-Trichloroethane	ND	0.250	0.500	1.00	ug/L							U
1,1,1-Trichloroethane	ND	0.250	0.500	1.00	ug/L							U
Trichloroethene	ND	0.250	0.500	1.00	ug/L							U
Trichlorofluoromethane	ND	0.500	1.00	2.00	ug/L							U
1,2,3-Trichloropropane	ND	0.500	1.00	2.00	ug/L							U
1,3,5-Trimethylbenzene	ND	0.250	0.500	1.00	ug/L							U
1,2,4-Trimethylbenzene	ND	0.250	0.500	1.00	ug/L							U
Vinyl chloride	ND	0.250	0.500	1.00	ug/L							UX
Xylenes (total)	ND	0.750	1.50	3.00	ug/L							U
Surrogate: Bromofluorobenzene	*28.89*				*ug/L*	*30.00*		*96.3*	*75-120*			
Surrogate: Dibromofluoromethane	*30.14*				*ug/L*	*30.00*		*100*	*85-115*			
Surrogate: 1,2-Dichloroethane-d4	*28.68*				*ug/L*	*30.00*		*95.6*	*70-120*			
Surrogate: Toluene-d8	*27.87*				*ug/L*	*30.00*		*92.9*	*85-120*			
LCS				Prepared & Analyzed: 03/04/2015								
Acetone	133	2.50	5.00	10.0	ug/L	100.0		133	40-140			X
Benzene	53.5	0.250	0.500	1.00	ug/L	50.00		107	80-120			
Bromobenzene	49.8	0.250	0.500	1.00	ug/L	50.00		99.5	75-125			
Bromochloromethane	51.6	0.250	0.500	1.00	ug/L	50.00		103	65-130			
Bromodichloromethane	56.1	0.250	0.500	1.00	ug/L	50.00		112	75-120			
Bromoform	49.5	0.250	0.500	1.00	ug/L	50.00		98.9	70-130			
Bromomethane	50.0	0.500	1.00	2.00	ug/L	50.00		100	30-145			
n-Butylbenzene	54.3	0.250	0.500	1.00	ug/L	50.00		109	70-135			
2-Butanone	133	2.50	5.00	10.0	ug/L	100.0		133	30-150			X
sec-Butylbenzene	54.2	0.250	0.500	1.00	ug/L	50.00		108	70-125			
tert-Butylbenzene	53.5	0.250	0.500	1.00	ug/L	50.00		107	70-130			
Carbon disulfide	53.5	0.250	0.500	1.00	ug/L	50.00		107	35-160			
Carbon tetrachloride	54.3	0.250	0.500	1.00	ug/L	50.00		109	65-140			
Chlorobenzene	48.5	0.250	0.500	1.00	ug/L	50.00		97.0	80-120			
Chloroethane	52.5	0.500	1.00	2.00	ug/L	50.00		105	60-135			
Chloroform	51.9	0.250	0.500	1.00	ug/L	50.00		104	65-135			
Chloromethane	56.2	0.250	0.500	1.00	ug/L	50.00		112	40-125			
2-Chlorotoluene	53.7	0.250	0.500	1.00	ug/L	50.00		107	75-125			
4-Chlorotoluene	55.1	0.250	0.500	1.00	ug/L	50.00		110	75-130			
Dibromochloromethane	52.5	0.250	0.500	1.00	ug/L	50.00		105	60-135			
1,2-Dibromo-3-chloropropane	57.1	0.500	1.00	2.00	ug/L	50.00		114	50-130			
1,2-Dibromoethane (EDB)	51.9	0.250	0.500	1.00	ug/L	50.00		104	80-120			
Dibromomethane	55.6	0.250	0.500	1.00	ug/L	50.00		111	75-125			
1,2-Dichlorobenzene	48.6	0.250	0.500	1.00	ug/L	50.00		97.3	70-120			
1,3-Dichlorobenzene	49.0	0.250	0.500	1.00	ug/L	50.00		97.9	75-125			
1,4-Dichlorobenzene	49.8	0.250	0.500	1.00	ug/L	50.00		99.7	75-125			
Dichlorodifluoromethane	59.4	0.500	1.00	2.00	ug/L	50.00		119	30-155			X
1,1-Dichloroethane	56.5	0.250	0.500	1.00	ug/L	50.00		113	70-135			
1,2-Dichloroethane	56.5	0.250	0.500	1.00	ug/L	50.00		113	70-130			

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	DL	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C04014												
LCS					Prepared & Analyzed: 03/04/2015							
1,1-Dichloroethene	49.6	0.250	0.500	1.00	ug/L	50.00		99.1	70-130			
cis-1,2-Dichloroethene	50.1	0.250	0.500	1.00	ug/L	50.00		100	70-125			
trans-1,2-Dichloroethene	52.2	0.250	0.500	1.00	ug/L	50.00		104	60-140			
1,2-Dichloropropane	58.0	0.250	0.500	1.00	ug/L	50.00		116	75-125			
1,3-Dichloropropane	56.0	0.250	0.500	1.00	ug/L	50.00		112	75-125			
2,2-Dichloropropane	55.9	0.250	0.500	1.00	ug/L	50.00		112	70-135			
1,1-Dichloropropene	53.7	0.250	0.500	1.00	ug/L	50.00		107	75-130			
cis-1,3-Dichloropropene	55.7	0.250	0.500	1.00	ug/L	50.00		111	70-130			
trans-1,3-Dichloropropene	50.2	0.250	0.500	1.00	ug/L	50.00		100	55-140			
Ethylbenzene	49.3	0.250	0.500	1.00	ug/L	50.00		98.6	75-125			
Hexachlorobutadiene	43.2	0.250	0.500	2.00	ug/L	50.00		86.4	50-140			
2-Hexanone	125	1.25	2.50	5.00	ug/L	100.0		125	55-130			X
Isopropylbenzene	48.9	0.250	0.500	1.00	ug/L	50.00		97.8	75-125			
p-Isopropyltoluene	53.3	0.250	0.500	1.00	ug/L	50.00		107	75-130			
Methylene chloride	50.2	0.500	1.00	2.00	ug/L	50.00		100	55-140			
Naphthalene	52.2	0.250	0.500	2.00	ug/L	50.00		104	55-140			
4-Methyl-2-pentanone	116	1.25	2.50	5.00	ug/L	100.0		116	60-135			X
Methyl t-Butyl Ether	55.6	0.250	0.500	1.00	ug/L	50.00		111	65-125			
n-Propylbenzene	54.3	0.250	0.500	1.00	ug/L	50.00		109	70-130			
Styrene	51.3	0.250	0.500	1.00	ug/L	50.00		103	65-135			
1,1,2,2-Tetrachloroethane	54.0	0.250	0.500	1.00	ug/L	50.00		108	65-130			
1,1,1,2-Tetrachloroethane	49.3	0.250	0.500	1.00	ug/L	50.00		98.6	80-130			
Tetrachloroethene	44.6	0.250	0.500	1.00	ug/L	50.00		89.3	45-150			
Toluene	50.7	0.250	0.500	1.00	ug/L	50.00		101	75-120			
1,2,3-Trichlorobenzene	51.6	0.250	0.500	2.00	ug/L	50.00		103	55-140			
1,2,4-Trichlorobenzene	50.1	0.250	0.500	2.00	ug/L	50.00		100	65-135			
1,1,2-Trichloroethane	53.5	0.250	0.500	1.00	ug/L	50.00		107	75-125			
1,1,1-Trichloroethane	54.4	0.250	0.500	1.00	ug/L	50.00		109	65-130			
Trichloroethene	53.2	0.250	0.500	1.00	ug/L	50.00		106	70-125			
Trichlorofluoromethane	54.4	0.500	1.00	2.00	ug/L	50.00		109	60-145			
1,2,3-Trichloropropane	52.4	0.500	1.00	2.00	ug/L	50.00		105	75-125			
1,3,5-Trimethylbenzene	56.5	0.250	0.500	1.00	ug/L	50.00		113	75-130			
1,2,4-Trimethylbenzene	53.6	0.250	0.500	1.00	ug/L	50.00		107	75-130			
Vinyl chloride	60.7	0.250	0.500	1.00	ug/L	50.00		121	50-145			X
Xylenes (total)	159	0.750	1.50	3.00	ug/L	150.0		106	75-130			
Surrogate: Bromofluorobenzene	*29.86*				*ug/L*	*30.00*		*99.5*	*75-120*			
Surrogate: Dibromofluoromethane	*30.22*				*ug/L*	*30.00*		*101*	*85-115*			
Surrogate: 1,2-Dichloroethane-d4	*29.56*				*ug/L*	*30.00*		*98.5*	*70-120*			
Surrogate: Toluene-d8	*29.54*				*ug/L*	*30.00*		*98.5*	*85-120*			

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	DL	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C04014												
LCS Dup					Prepared & Analyzed: 03/04/2015							
Acetone	123	2.50	5.00	10.0	ug/L	100.0		123	40-140	7.82	30	X
Benzene	49.6	0.250	0.500	1.00	ug/L	50.00		99.1	80-120	7.65	30	
Bromobenzene	48.0	0.250	0.500	1.00	ug/L	50.00		96.0	75-125	3.60	30	
Bromochloromethane	51.0	0.250	0.500	1.00	ug/L	50.00		102	65-130	1.13	30	
Bromodichloromethane	53.4	0.250	0.500	1.00	ug/L	50.00		107	75-120	4.94	30	
Bromoform	48.1	0.250	0.500	1.00	ug/L	50.00		96.2	70-130	2.77	30	
Bromomethane	47.8	0.500	1.00	2.00	ug/L	50.00		95.6	30-145	4.61	30	
n-Butylbenzene	52.0	0.250	0.500	1.00	ug/L	50.00		104	70-135	4.28	30	
2-Butanone	133	2.50	5.00	10.0	ug/L	100.0		133	30-150	0.101	30	X
sec-Butylbenzene	48.6	0.250	0.500	1.00	ug/L	50.00		97.2	70-125	10.9	30	
tert-Butylbenzene	50.3	0.250	0.500	1.00	ug/L	50.00		101	70-130	6.24	30	
Carbon disulfide	48.4	0.250	0.500	1.00	ug/L	50.00		96.9	35-160	9.92	30	
Carbon tetrachloride	49.1	0.250	0.500	1.00	ug/L	50.00		98.1	65-140	10.2	30	
Chlorobenzene	46.0	0.250	0.500	1.00	ug/L	50.00		92.0	80-120	5.25	30	
Chloroethane	44.6	0.500	1.00	2.00	ug/L	50.00		89.2	60-135	16.2	30	
Chloroform	49.5	0.250	0.500	1.00	ug/L	50.00		99.0	65-135	4.82	30	
Chloromethane	51.9	0.250	0.500	1.00	ug/L	50.00		104	40-125	7.98	30	
2-Chlorotoluene	47.0	0.250	0.500	1.00	ug/L	50.00		93.9	75-125	13.5	30	
4-Chlorotoluene	50.5	0.250	0.500	1.00	ug/L	50.00		101	75-130	8.75	30	
Dibromochloromethane	49.8	0.250	0.500	1.00	ug/L	50.00		99.7	60-135	5.11	30	
1,2-Dibromo-3-chloropropane	54.9	0.500	1.00	2.00	ug/L	50.00		110	50-130	4.00	30	
1,2-Dibromoethane (EDB)	49.9	0.250	0.500	1.00	ug/L	50.00		99.8	80-120	3.86	30	
Dibromomethane	53.0	0.250	0.500	1.00	ug/L	50.00		106	75-125	4.74	30	
1,2-Dichlorobenzene	46.9	0.250	0.500	1.00	ug/L	50.00		93.8	70-120	3.66	30	
1,3-Dichlorobenzene	46.2	0.250	0.500	1.00	ug/L	50.00		92.4	75-125	5.82	30	
1,4-Dichlorobenzene	47.6	0.250	0.500	1.00	ug/L	50.00		95.2	75-125	4.64	30	
Dichlorodifluoromethane	52.3	0.500	1.00	2.00	ug/L	50.00		105	30-155	12.7	30	X
1,1-Dichloroethane	53.0	0.250	0.500	1.00	ug/L	50.00		106	70-135	6.46	30	
1,2-Dichloroethane	55.1	0.250	0.500	1.00	ug/L	50.00		110	70-130	2.56	30	
1,1-Dichloroethene	45.6	0.250	0.500	1.00	ug/L	50.00		91.3	70-130	8.24	30	
cis-1,2-Dichloroethene	46.6	0.250	0.500	1.00	ug/L	50.00		93.3	70-125	7.21	30	
trans-1,2-Dichloroethene	47.4	0.250	0.500	1.00	ug/L	50.00		94.8	60-140	9.72	30	
1,2-Dichloropropane	55.8	0.250	0.500	1.00	ug/L	50.00		112	75-125	3.84	30	
1,3-Dichloropropane	51.5	0.250	0.500	1.00	ug/L	50.00		103	75-125	8.42	30	
2,2-Dichloropropane	50.6	0.250	0.500	1.00	ug/L	50.00		101	70-135	9.89	30	
1,1-Dichloropropene	49.9	0.250	0.500	1.00	ug/L	50.00		99.9	75-130	7.21	30	
cis-1,3-Dichloropropene	50.5	0.250	0.500	1.00	ug/L	50.00		101	70-130	9.86	30	
trans-1,3-Dichloropropene	47.3	0.250	0.500	1.00	ug/L	50.00		94.6	55-140	6.00	30	
Ethylbenzene	47.7	0.250	0.500	1.00	ug/L	50.00		95.3	75-125	3.40	30	
Hexachlorobutadiene	41.6	0.250	0.500	2.00	ug/L	50.00		83.2	50-140	3.80	30	
2-Hexanone	117	1.25	2.50	5.00	ug/L	100.0		117	55-130	5.93	30	X
Isopropylbenzene	44.8	0.250	0.500	1.00	ug/L	50.00		89.7	75-125	8.70	30	
p-Isopropyltoluene	49.6	0.250	0.500	1.00	ug/L	50.00		99.1	75-130	7.35	30	
Methylene chloride	46.5	0.500	1.00	2.00	ug/L	50.00		93.0	55-140	7.72	30	
Naphthalene	51.2	0.250	0.500	2.00	ug/L	50.00		102	55-140	2.12	30	
4-Methyl-2-pentanone	117	1.25	2.50	5.00	ug/L	100.0		117	60-135	0.663	30	X
Methyl t-Butyl Ether	52.3	0.250	0.500	1.00	ug/L	50.00		105	65-125	6.26	30	
n-Propylbenzene	50.5	0.250	0.500	1.00	ug/L	50.00		101	70-130	7.12	30	
Styrene	47.2	0.250	0.500	1.00	ug/L	50.00		94.5	65-135	8.33	30	
1,1,2,2-Tetrachloroethane	54.7	0.250	0.500	1.00	ug/L	50.00		109	65-130	1.27	30	

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	DL	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C04014												
LCS Dup				Prepared & Analyzed: 03/04/2015								
1,1,1,2-Tetrachloroethane	46.1	0.250	0.500	1.00	ug/L	50.00		92.2	80-130	6.68	30	
Tetrachloroethene	42.4	0.250	0.500	1.00	ug/L	50.00		84.8	45-150	5.16	30	
Toluene	48.1	0.250	0.500	1.00	ug/L	50.00		96.2	75-120	5.32	30	
1,2,3-Trichlorobenzene	50.7	0.250	0.500	2.00	ug/L	50.00		101	55-140	1.80	30	
1,2,4-Trichlorobenzene	49.2	0.250	0.500	2.00	ug/L	50.00		98.5	65-135	1.75	30	
1,1,2-Trichloroethane	50.1	0.250	0.500	1.00	ug/L	50.00		100	75-125	6.64	30	
1,1,1-Trichloroethane	49.4	0.250	0.500	1.00	ug/L	50.00		98.9	65-130	9.57	30	
Trichloroethene	48.8	0.250	0.500	1.00	ug/L	50.00		97.6	70-125	8.61	30	
Trichlorofluoromethane	46.6	0.500	1.00	2.00	ug/L	50.00		93.2	60-145	15.5	30	
1,2,3-Trichloropropane	51.3	0.500	1.00	2.00	ug/L	50.00		103	75-125	2.20	30	
1,3,5-Trimethylbenzene	52.4	0.250	0.500	1.00	ug/L	50.00		105	75-130	7.55	30	
1,2,4-Trimethylbenzene	50.7	0.250	0.500	1.00	ug/L	50.00		101	75-130	5.56	30	
Vinyl chloride	57.2	0.250	0.500	1.00	ug/L	50.00		114	50-145	5.88	30	X
Xylenes (total)	144	0.750	1.50	3.00	ug/L	150.0		95.8	75-130	10.1	30	
Surrogate: Bromofluorobenzene	*29.78*				*ug/L*	*30.00*		*99.3*	*75-120*			
Surrogate: Dibromofluoromethane	*29.89*				*ug/L*	*30.00*		*99.6*	*85-115*			
Surrogate: 1,2-Dichloroethane-d4	*30.31*				*ug/L*	*30.00*		*101*	*70-120*			
Surrogate: Toluene-d8	*28.86*				*ug/L*	*30.00*		*96.2*	*85-120*			

EDB and DBCP by GC - Quality Control

Analyte	Result	DL	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C04009												
Blank					Prepared & Analyzed: 03/04/2015							
1,2-Dibromoethane	ND	0.0100	0.0200	0.0300	ug/L							QUX
1,2-Dibromoethane [2C]	ND	0.0100	0.0200	0.0300	ug/L							QUX
Surrogate: 1,3-Dibromopropane	*2.573*				*ug/L*	*1.989*		*129*	*55-160*			*X*
Surrogate: 1,3-Dibromopropane [2C]	*3.036*				*ug/L*	*1.989*		*153*	*55-160*			*X*
LCS					Prepared & Analyzed: 03/04/2015							
1,2-Dibromoethane	0.6577	0.0100	0.0200	0.0300	ug/L	0.5000		132	70-130		20	X
1,2-Dibromoethane [2C]	0.7294	0.0100	0.0200	0.0300	ug/L	0.5000		146	70-130		20	X
Surrogate: 1,3-Dibromopropane	*2.554*				*ug/L*	*1.989*		*128*	*55-160*			*X*
Surrogate: 1,3-Dibromopropane [2C]	*3.049*				*ug/L*	*1.989*		*153*	*55-160*			*X*
LCS Dup					Prepared & Analyzed: 03/04/2015							
1,2-Dibromoethane	0.6504	0.0100	0.0200	0.0300	ug/L	0.5000		130	70-130	1.12	20	X
1,2-Dibromoethane [2C]	0.7151	0.0100	0.0200	0.0300	ug/L	0.5000		143	70-130	1.98	20	X
Surrogate: 1,3-Dibromopropane	*2.511*				*ug/L*	*1.989*		*126*	*55-160*			*X*
Surrogate: 1,3-Dibromopropane [2C]	*2.985*				*ug/L*	*1.989*		*150*	*55-160*			*X*

1503001C TK 3/4/15
1503016

106212 Triplicate Sampling

Shaw™
Shaw E & I, Inc.

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Reference Document No: 140705-GW8424
Page 1 of 2

Project Number: 140705
Project Name: Kirtland AFB
Sample Coordinator: Tim Noger
Turnaround Time:

Samples Shipment Date: 03 MAR 2015
Lab Destination: Empirical Laboratories, Inc.
Lab Contact: Jennifer Chandler
Project Contact: Susan Huang
Carrier/Waybill No.: Fed Ex/565119375145

Bill To: Shaw Environmental, Inc. - Accounts P
PO Box 98519
Baton Rouge LA 70884

Report To: Susan Huang
4005 Port Chicago Highway
Concord CA 94520-1120

Special Instructions:

Possible Hazard Identification: Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Radiological ☐ Unknown ☐

Sample Disposal: Return to Client ☐ Disposal by Lab ☒ Archive (mos.)

1. Relinquished By (Signature/Affiliation)	Date: 3/3/15 Time: 1630	1. Received By (Signature/Affiliation)	Date: Time:
2. Relinquished By (Signature/Affiliation)	Date: Time:	2. Received By (Signature/Affiliation)	Date: Time:
3. Relinquished By (Signature/Affiliation)	Date: Time:	3. Received By (Signature/Affiliation)	Date: 3/4/15 Time: 650

Comments:

	Sample No	Sample Name	Sample Date	Sample Time	Container	Ctr Qty	Preservative	Requested Testing Program	Sample Vol	Units	Fil	CID	Condition On Receipt
01	EVT2-106212-1	KAFB-106212-GW-EVT2-106212-1-REG	03 MAR 2015	11:22	40 mL VOA VIAL	3	HCl<pH 2	VOCs by SW846 8260B			N		
	EVT2-106212-1	KAFB-106212-GW-EVT2-106212-1-REG	03 MAR 2015	11:22	40 mL VOA VIAL	3	None except cool to 4 C	EDB by SW846 8011			N		
	EVT2-106212-1	KAFB-106212-GW-EVT2-106212-1-REG	03 MAR 2015	11:22	250 mL HDPE	1	None except cool to 4 C	Bromide,Chloride and Sulfate by EPA 300			N		
	EVT2-106212-1	KAFB-106212-GW-EVT2-106212-1-REG	03 MAR 2015	11:22	250 mL HDPE	1	HNO3<pH 2	TAL Metals by SW846 6010C/7470A			N		
	~~EVT2-106212-1~~	~~KAFB-106212-GW-EVT2-106212-1-REG~~	~~03 MAR 2015~~	~~11:22~~	~~250 mL HDPE~~	~~1~~	~~H2SO4<pH 2~~	~~Nitrate plus Nitrite by EPA 353.2~~			N		
02	EVT2-106212-2	KAFB-106212-GW-EVT2-106212-2-REG	03 MAR 2015	11:22	40 mL VOA VIAL	3	HCl<pH 2	VOCs by SW846 8260B			N		
	EVT2-106212-2	KAFB-106212-GW-EVT2-106212-2-REG	03 MAR 2015	11:22	40 mL VOA VIAL	3	None except cool to 4 C	EDB by SW846 8011			N		
	EVT2-106212-2	KAFB-106212-GW-EVT2-106212-2-REG	03 MAR 2015	11:22	250 mL HDPE	1	H2SO4<pH 2	Nitrate plus Nitrite by EPA 353.2			N		

Shaw™
Shaw E & I, Inc.

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Reference Document No: 140705-GW8424

Page 2 of 2

Sample No	Sample Name	Sample Date	Sample Time	Container		Preservative	Requested Testing Program	Sample Vol	Units	Fil	CID	Condition On Receipt
02 EVT2-106212-2	KAFB-106212-GW-EVT2-106212-2-REG	03 MAR 2015	11:22	250 mL HDPE	1	HNO3<pH 2	TAL Metals by SW846 6010C/7470A			N		
16 EVT2-106212-2	KAFB-106212-GW-EVT2-106212-2-REG	03 MAR 2015	11:22	250 mL HDPE	1	None except cool to 4 C	Bromide,Chloride and Sulfate by EPA 300			N		
03 EVT2-106212-4	KAFB-106212-GW-EVT2-106212-4-REG	03 MAR 2015	11:22	40 mL VOA VIAL	3	None except cool to 4 C	EDB by SW846 8011			N		
EVT2-106212-4	KAFB-106212-GW-EVT2-106212-4-REG	03 MAR 2015	11:22	250 mL HDPE	1	None except cool to 4 C	Bromide,Chloride and Sulfate by EPA 300			N		
EVT2-106212-4	KAFB-106212-GW-EVT2-106212-4-REG	03 MAR 2015	11:22	40 mL VOA VIAL	3	HCl<pH 2	VOCs by SW846 8260B			N		
EVT2-106212-4	KAFB-106212-GW-EVT2-106212-4-REG	03 MAR 2015	11:22	250 mL HDPE	1	H2SO4<pH 2	Nitrate plus Nitrite by EPA 353.2			N		
04 GW8424-TB	FIELDQC-BW-GW8424-TB-TB	03 MAR 2015	08:00	40 mL VOA VIAL	2	HCl<pH 2	TAL Metals by SW846 6010C/7470A			N		
							VOCs by SW846 8260B			N		

Possible Hazard Identification

Date 1. Relinquished By/Received By

Date 2. Relinquished By/Received By

II. EMPIRICAL LABORATORIES COOLER RECEIPT FORM

Cooler Received/Opened On: 03/04/15 @ 850

Work Order: 1503006

1. Tracking # 5145 (last 4 digits, FedEx)

   Courier: FedEx

2. Temperature of rep. sample or temp blank when opened: 1.0 °C + correction factor(-0.0) = 1.0 C

3. If item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO NA

4. Were custody seals on outside of cooler? YES...NO...NA

   If yes, how many and where: 2 front + Back

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

   I certify that I opened the cooler and answered questions 1-6 (initial/date) TH 3/4/15

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

   Were these signed and dated correctly? YES...NO...NA

8. Packing material used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13. a. Were VOA vials received? YES...NO...NA

    b. Was there observable headspace present in any VOA vial (>5mm-6mm)? YES...NO...NA

14. Was there a Trip Blank in this cooler (custody seals present/intact)? YES...NO...NA...Comments_____
    If multiple coolers, sequence #_____

    I certify that I unloaded the cooler and answered questions 7-14 (initial/date) TH 3/4/15

15. a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

    b. Did the bottle labels indicate that the correct preservatives were used? YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

    I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial/date) TH 3/4/15

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA If not, PM notified? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA If not, PM notified? YES...NO...NA

21. Were there Non-Conformance issues at login? YES...NO...NCR#_____

I certify that I entered this project into LIMS and answered questions 17-21 (initial/date) TH 3/4/15
I certify that I attached a label with the unique LIMS number to each container (initial/date) TH 3/4/15
I certify that I notified the laboratory of any short holding time or RUSH parameters (initial/date) TH 3/4/15

II. EMPIRICAL LABORATORIES
COOLER RECEIPT FORM (Continued)

LIMS Data Entry Second Check

Workorder# 1503066

22. Cooler Receipt Form Issues reviewed and communicated to PM? YES...NO...NA
23. Client and Project verified to match the COC/CRF in LIMS Project Screen? YES...NO...NA
24. Following items verified to items verified to match the COC/CRF in LIMS Receipt Screen:
    a. Received Date/Received By YES...NO...NA
    b. TAT (COC specified different?) YES...NO...NA
    c. Shipping Container Temperatures (corrected temps) YES...NO ...NA
    d. Condition Items (seals, intact, labels, preservation, ROI) YES...NO...NA
25. Following LIMS Sample Information verified against COC for each sample:
    a. Name YES...NO...NA
    b. QC Source YES...NO...NA
    c. Matrix YES...NO...NA
    d. Sample Type YES...NO...NA
    e. Sampled Date/Time (Correct Time Zone) YES...NO...NA
    f. Work Analyses/Versions (if applicable) YES...NO...NA
    g. Sample Issues included in comments (limited volume, concentration warnings, etc.)? YES...NO...NA
    h. Unpreserved VOA holding time set to 7 days? YES...NO...NA
26. Containers consistent with tests requested? YES...NO...NA
27. Field data entered and matching COC? YES...NO...NA

I certify that I have verified the LIMS data entry and answered questions 23-27 above (initial/date): _____.

Additional Details:

III. EMPIRICAL LABORATORIES, LLC
DATA ENTRY VERIFICATION FORM – PROJECT MANAGEMENT

Work Order#: 1503016

	Verification Item	Yes	No	NA
1.	**Cooler Receipt Form Issues reviewed and communicated to client**			X
2.	**Element/ Project Screen/items verified to match the COC/CRF:**			
a.	**Client/Project**	X		
b.	Comments requiring laboratory reminder?	X		
c.	Client and/or Project Memo requiring laboratory reminder?			X
3.	**Receipt Screen items verified to match the COC/CRF:**			
a.	Received Date/Received By	X		
b.	Workorder Due Date	X		
c.	Package Due Date	X		
d.	TAT	X		
e.	SDG Identifier Populated	X		
4.	**Sample Information verified against COC for each sample:**			
a.	Name	X		
b.	QC Source			X
c.	Matrix	X		
d.	Sample Type	X		
e.	Sampled Date/Time (Correct Time Zone)	X		
f.	Work Analyses/Versions	X		
g.	Sample Issues included in comments			X
h.	Unpreserved VOA holding time set to 7 days			X
5.	**Containers consistent with tests requested**	X		
6.	**Field data entered and matching COC, if applicable**			X
	I certify that I have performed a second check of the LIMS information against the COC to confirm accuracy (initial/date):	MJW 03/04/15		

DoD ELAP QSM5.0, Certificate Number L2226
- Aqueous
- Non-aqueous
- Expires: 11/30/2015

State of Florida, Department of Health – NELAP, Lab ID: E87646
- Clean Water Act
- RCRA/CERCLA
- Expires: 06/30/2015

State of Georgia, Environmental Protection Agency – NELAP, Self Certification
- Expires: 06/30/2015

State of Illinois, Environmental Protection Agency – NELAP, Certificate Number: 003464
- Groundwater
- Solid and Hazardous Waste
- Expires: 09/13/2015

Commonwealth of Kentucky, Energy and Environment Cabinet – WWLCP, Laboratory Number: 98017
- Wastewater
- Expires: 12/31/2015

Commonwealth of Kentucky, Department of Environmental Protection – UST, Certificate Number: 77
- Aqueous
- Non-aqueous
- Expires: 06/30/2015

State of New Jersey, Department of Environmental Protection – NELAP Primary, Lab ID: TN473
- Water Pollution
- Solid and Hazardous Waste
- Expires: 06/30/2015

State of North Carolina, Department of Environment and Natural Resources - Certificate Number: 643
- Aqueous
- Non-aqueous
- Expires: 12/31/2015

State of North Dakota, Department of Health – NELAP, Certificate No.: R-204
- Aqueous
- Non-aqueous
- Expires: 06/30/2015

Commonwealth of Pennsylvania, Department of Environmental Protection – NELAP, Lab ID: 68-05374
- Aqueous
- Non-aqueous
- Expires: 10/31/2015

State of Texas, Commission on Environmental Quality – NELAP, Certificate Number: T104704307-15-11
- Aqueous
- Non-aqueous
- Expires: 12/31/2015

State of Utah, Department of Health – NELAP, Certificate Number: TN0042014-6
- Aqueous
- Non-aqueous
- Expires: 07/31/2015

Commonwealth of Virginia, Department of General Services – NELAP, Certificate Number: 7596, Lab ID: 460243
- Aqueous
- Non-aqueous
- Expires: 12/14/2015

State of Washington, Department of Ecology – NELAP, Lab ID: C934-15
- Groundwater
- Solid and Hazardous Waste
- Expires: 03/18/2016

Empirical Laboratories, LLC

621 Mainstream Drive, Suite 270
Nashville, TN 37228
615.345.1115 Phone
866.417.0548 Fax

10 March 2015

Susan Huang
CB&I
4005 Port Chicago Highway
Concord, CA 94520

RE: Kirtland AFB 2011 (Laboratory WorkOrder # 1503039)

Enclosed are the results of analyses for samples received by the laboratory on 03/07/2015 10:15. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

DRAFT REPORT
DATA SUBJECT TO CHANGE

Data Qualifiers

As applicable and where required, the following general qualifiers are associated with the sample results. Additional qualifiers will be specified within the reporting sections of the data package or within the body of the Case Narrative.

Analytical Report Terms and Qualifiers

DL: The detection limit (DL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The DL is supported by the method detection limit (MDL) which is determined from analysis of a sample containing the analyte in a given matrix.

LOD: The Limit of Detection is an estimate of the minimum amount of a substance that an analytical process can reliably detect. An LOD is analyte- and matrix-specific and may be laboratory-dependent. This definition is further clarified in the DoD QSM as the smallest amount or concentration of a substance that must be present in a sample in order to be detected at a high level of confidence (99%). At the LOD, the false negative rate (Type II error) is 1%.

LOQ: The Limit of Quantitation is the minimum level, concentration, or quantity of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. This term is further clarified within the DoD QSM as the lowest concentration that produces a quantitative result within specified limits of precision and bias.

***:** Exceeding quality control criteria are associated with the reported result.

B: The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.

D: When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".

E: The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound. For Metals, the qualifier indicates that the serial dilution was outside of the control limits and the compound should be considered estimated due to the presence of interference.

H1: The result was analyzed outside of the EPA recommended holding time.

H2: The result was extracted outside of the EPA recommended holding time

H3: The sample for this analyte was received outside of the EPA recommended holding time.

J: The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The mass spectral data pass the identification criteria showing that the compound is present, but the calculated result is less than the LOQ. One should feel confident that the result is greater than zero and less than the LOQ.

M: Indicates that the sample matrix interfered with the quantitation of the analyte. In dual column analysis the result is reported from the column with the lower concentration. In inorganics, it indicates that the parameters DL/LOD/LOQ have been raised.

N: The MS/MSD accuracy and/or precision are outside criteria. The predigested spike recovery is not within control limits for the associated parameter.

P: The associated numerical value is an estimated quantity. There is greater than a 40% difference between the two GC columns for the detected concentrations. The higher of the two values is reported unless matrix interference is obvious or for HPLC analysis where the primary column is reported.

Q: The relative percent difference (RPD) and/or percent recovery exceeded limits in the associated Blank Spike and/or Blank Spike Duplicate.

S: The associated internal standard exceeded criteria.

U: The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the DL.

X: The parameter shows a potential positive bias on a reported concentration due to an ICV or CCV exceeding the upper control limit on the high side.

Y: The parameter shows a potential negative bias on a reported concentration due to an ICV or CCV exceeding the lower control limit on the low side.

Z: The parameter shows lack of confirmation/detection, which may be due to a negative bias in the ICV or CCV which exceeds the lower control limit.

Laboratory Analytical Results Report

Client Sample ID: EVT3-106212-1 **Sample Collection Date/Time: 03/04/2015 11:20**

Lab Sample ID: 1503039-01 **Sample Received Date/Time: 03/07/2015 10:15**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Classical Chemistry Parameters										
Nitrate/Nitrite as N	ND	0.100	0.150	0.200	mg/L	1	03/09/15 12:20	E353.2	5C09012	U
Metals in Water by ICP-AES										
Aluminum	**63.7**	12.5	25.0	50.0	ug/L	1	03/09/15 17:34	SW6010C	5C09016	
Antimony	ND	1.25	2.00	2.50	ug/L	1	03/09/15 17:34	SW6010C	5C09016	U
Arsenic	ND	0.750	1.50	2.50	ug/L	1	03/09/15 17:34	SW6010C	5C09016	U
Barium	**101**	1.25	2.50	10.0	ug/L	1	03/09/15 17:34	SW6010C	5C09016	
Beryllium	ND	0.250	0.500	1.25	ug/L	1	03/09/15 17:34	SW6010C	5C09016	U
Cadmium	ND	0.250	0.500	1.25	ug/L	1	03/09/15 17:34	SW6010C	5C09016	U
Calcium	**35000**	250	500	1250	ug/L	1	03/09/15 17:34	SW6010C	5C09016	
Chromium	**2.26**	0.500	1.00	2.50	ug/L	1	03/09/15 17:34	SW6010C	5C09016	J
Cobalt	ND	1.25	2.50	3.12	ug/L	1	03/09/15 17:34	SW6010C	5C09016	U
Copper	**3.15**	1.00	2.00	2.50	ug/L	1	03/09/15 17:34	SW6010C	5C09016	
Iron	**31.8**	7.50	15.0	25.0	ug/L	1	03/09/15 17:34	SW6010C	5C09016	
Lead	**0.660**	0.375	0.750	1.25	ug/L	1	03/09/15 17:34	SW6010C	5C09016	J
Magnesium	**4440**	250	750	1250	ug/L	1	03/09/15 17:34	SW6010C	5C09016	
Manganese	**24.8**	0.750	1.50	3.75	ug/L	1	03/09/15 17:34	SW6010C	5C09016	
Molybdenum	**6.87**	1.25	2.50	5.00	ug/L	1	03/09/15 17:34	SW6010C	5C09016	
Nickel	ND	0.750	1.50	2.50	ug/L	1	03/09/15 17:34	SW6010C	5C09016	U
Potassium	**2220**	250	750	1250	ug/L	1	03/09/15 17:34	SW6010C	5C09016	
Selenium	ND	0.750	1.25	2.50	ug/L	1	03/09/15 17:34	SW6010C	5C09016	U
Silver	ND	0.250	0.500	2.50	ug/L	1	03/09/15 17:34	SW6010C	5C09016	U
Sodium	**23300**	250	750	1250	ug/L	1	03/09/15 17:34	SW6010C	5C09016	
Thallium	ND	0.750	1.00	2.00	ug/L	1	03/09/15 17:34	SW6010C	5C09016	U
Vanadium	**2.70**	1.25	2.50	3.12	ug/L	1	03/09/15 17:34	SW6010C	5C09016	J
Zinc	**17.8**	1.25	2.50	5.00	ug/L	1	03/09/15 17:34	SW6010C	5C09016	

Laboratory Analytical Results Report

Client Sample ID: EVT3-106212-1 **Sample Collection Date/Time: 03/04/2015 11:20**

Lab Sample ID: 1503039-01 **Sample Received Date/Time: 03/07/2015 10:15**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Mercury by CVAA										
Mercury	ND	0.0800	0.160	0.200	ug/L	1	03/09/15 15:00	SW7470A	5C09008	U
Volatile Organic Compounds by GC/MS										
Acetone	**3.03**	2.50	5.00	10.0	ug/L	1	03/09/15 09:35	SW8260B	5C09001	J
Benzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
Bromobenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
Bromochloromethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
Bromodichloromethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
Bromoform	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
Bromomethane	ND	0.500	1.00	2.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
n-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
2-Butanone	ND	2.50	5.00	10.0	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
sec-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
tert-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
Carbon disulfide	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
Carbon tetrachloride	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
Chlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
Chloroethane	ND	0.500	1.00	2.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
Chloroform	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
Chloromethane	**0.297**	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	J
2-Chlorotoluene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
4-Chlorotoluene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
Dibromochloromethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
1,2-Dibromo-3-chloropropane	ND	0.500	1.00	2.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
1,2-Dibromoethane (EDB)	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
Dibromomethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
1,2-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
1,3-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
1,4-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
Dichlorodifluoromethane	ND	0.500	1.00	2.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
1,1-Dichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
1,2-Dichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
1,1-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
cis-1,2-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
trans-1,2-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
1,2-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
1,3-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
2,2-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
1,1-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
cis-1,3-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
trans-1,3-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
Ethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
Hexachlorobutadiene	ND	0.250	0.500	2.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
2-Hexanone	ND	1.25	2.50	5.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U

Laboratory Analytical Results Report

Client Sample ID: EVT3-106212-1 **Sample Collection Date/Time: 03/04/2015 11:20**

Lab Sample ID: 1503039-01 **Sample Received Date/Time: 03/07/2015 10:15**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Volatile Organic Compounds by GC/MS										
Isopropylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
p-Isopropyltoluene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
Methylene chloride	ND	0.500	1.00	2.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
Naphthalene	ND	0.250	0.500	2.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
4-Methyl-2-pentanone	ND	1.25	2.50	5.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
Methyl t-Butyl Ether	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
n-Propylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
Styrene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
1,1,2,2-Tetrachloroethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
1,1,1,2-Tetrachloroethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
Tetrachloroethene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
Toluene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
1,2,3-Trichlorobenzene	ND	0.250	0.500	2.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
1,2,4-Trichlorobenzene	ND	0.250	0.500	2.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
1,1,2-Trichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
1,1,1-Trichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
Trichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
Trichlorofluoromethane	ND	0.500	1.00	2.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
1,2,3-Trichloropropane	ND	0.500	1.00	2.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
1,3,5-Trimethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
1,2,4-Trimethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
Vinyl chloride	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
Xylenes (total)	ND	0.750	1.50	3.00	ug/L	1	03/09/15 09:35	SW8260B	5C09001	U
Surrogate: Bromofluorobenzene				*98.5 %*	*75-120*		*03/09/15 09:35*	*SW8260B*	*5C09001*	
Surrogate: Dibromofluoromethane				*98.8 %*	*85-115*		*03/09/15 09:35*	*SW8260B*	*5C09001*	
Surrogate: 1.2-Dichloroethane-d4				*95.3 %*	*70-120*		*03/09/15 09:35*	*SW8260B*	*5C09001*	
Surrogate: Toluene-d8				*96.5 %*	*85-120*		*03/09/15 09:35*	*SW8260B*	*5C09001*	

Laboratory Analytical Results Report

Client Sample ID: EVT3-106212-1 **Sample Collection Date/Time: 03/04/2015 11:20**

Lab Sample ID: 1503039-01 **Sample Received Date/Time: 03/07/2015 10:15**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
EDB and DBCP by GC										
1,2-Dibromoethane	ND	0.00954	0.0191	0.0286	ug/L	1	03/07/15 12:04	SW8011	5C07002	U
Surrogate: 1,3-Dibromopropane				*115 %*	*55-160*		*03/07/15 12:04*	*SW8011*	*5C07002*	
Surrogate: 1,3-Dibromopropane [2C]				*111 %*	*55-160*		*03/07/15 12:04*	*SW8011*	*5C07002*	X

Laboratory Analytical Results Report

Client Sample ID: EVT3-106212-1

Sample Collection Date/Time: 03/04/2015 11:20

Lab Sample ID: 1503039-01RE1

Sample Received Date/Time: 03/07/2015 10:15

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Anions by IC										
Bromide	ND	0.0420	0.125	0.250	mg/L	1	03/09/15 11:08	E300.0	5C09007	U
Chloride	**9.00**	0.170	0.330	0.500	mg/L	1	03/09/15 11:08	E300.0	5C09007	
Sulfate as SO4	**33.3**	0.330	1.00	2.50	mg/L	1	03/09/15 11:08	E300.0	5C09007	

Laboratory Analytical Results Report

Client Sample ID: EVT3-106212-2 **Sample Collection Date/Time: 03/04/2015 11:20**

Lab Sample ID: 1503039-02 **Sample Received Date/Time: 03/07/2015 10:15**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Classical Chemistry Parameters										
Nitrate/Nitrite as N	ND	0.100	0.150	0.200	mg/L	1	03/09/15 12:21	E353.2	5C09012	U
Metals in Water by ICP-AES										
Aluminum	**58.8**	12.5	25.0	50.0	ug/L	1	03/09/15 17:39	SW6010C	5C09016	
Antimony	ND	1.25	2.00	2.50	ug/L	1	03/09/15 17:39	SW6010C	5C09016	U
Arsenic	ND	0.750	1.50	2.50	ug/L	1	03/09/15 17:39	SW6010C	5C09016	U
Barium	**95.6**	1.25	2.50	10.0	ug/L	1	03/09/15 17:39	SW6010C	5C09016	
Beryllium	ND	0.250	0.500	1.25	ug/L	1	03/09/15 17:39	SW6010C	5C09016	U
Cadmium	ND	0.250	0.500	1.25	ug/L	1	03/09/15 17:39	SW6010C	5C09016	U
Calcium	**33900**	250	500	1250	ug/L	1	03/09/15 17:39	SW6010C	5C09016	
Chromium	**2.28**	0.500	1.00	2.50	ug/L	1	03/09/15 17:39	SW6010C	5C09016	J
Cobalt	ND	1.25	2.50	3.12	ug/L	1	03/09/15 17:39	SW6010C	5C09016	U
Copper	**3.34**	1.00	2.00	2.50	ug/L	1	03/09/15 17:39	SW6010C	5C09016	
Iron	**27.4**	7.50	15.0	25.0	ug/L	1	03/09/15 17:39	SW6010C	5C09016	
Lead	**0.440**	0.375	0.750	1.25	ug/L	1	03/09/15 17:39	SW6010C	5C09016	J
Magnesium	**4320**	250	750	1250	ug/L	1	03/09/15 17:39	SW6010C	5C09016	
Manganese	**24.5**	0.750	1.50	3.75	ug/L	1	03/09/15 17:39	SW6010C	5C09016	
Molybdenum	**6.67**	1.25	2.50	5.00	ug/L	1	03/09/15 17:39	SW6010C	5C09016	
Nickel	ND	0.750	1.50	2.50	ug/L	1	03/09/15 17:39	SW6010C	5C09016	U
Potassium	**2130**	250	750	1250	ug/L	1	03/09/15 17:39	SW6010C	5C09016	
Selenium	ND	0.750	1.25	2.50	ug/L	1	03/09/15 17:39	SW6010C	5C09016	U
Silver	ND	0.250	0.500	2.50	ug/L	1	03/09/15 17:39	SW6010C	5C09016	U
Sodium	**22800**	250	750	1250	ug/L	1	03/09/15 17:39	SW6010C	5C09016	
Thallium	ND	0.750	1.00	2.00	ug/L	1	03/09/15 17:39	SW6010C	5C09016	U
Vanadium	**2.69**	1.25	2.50	3.12	ug/L	1	03/09/15 17:39	SW6010C	5C09016	J
Zinc	**17.0**	1.25	2.50	5.00	ug/L	1	03/09/15 17:39	SW6010C	5C09016	

Laboratory Analytical Results Report

Client Sample ID: EVT3-106212-2 **Sample Collection Date/Time: 03/04/2015 11:20**

Lab Sample ID: 1503039-02 **Sample Received Date/Time: 03/07/2015 10:15**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Mercury by CVAA										
Mercury	ND	0.0800	0.160	0.200	ug/L	1	03/09/15 15:01	SW7470A	5C09008	U
Volatile Organic Compounds by GC/MS										
Acetone	**3.77**	2.50	5.00	10.0	ug/L	1	03/09/15 10:00	SW8260B	5C09001	J
Benzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
Bromobenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
Bromochloromethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
Bromodichloromethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
Bromoform	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
Bromomethane	ND	0.500	1.00	2.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
n-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
2-Butanone	ND	2.50	5.00	10.0	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
sec-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
tert-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
Carbon disulfide	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
Carbon tetrachloride	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
Chlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
Chloroethane	ND	0.500	1.00	2.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
Chloroform	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
Chloromethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
2-Chlorotoluene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
4-Chlorotoluene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
Dibromochloromethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
1,2-Dibromo-3-chloropropane	ND	0.500	1.00	2.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
1,2-Dibromoethane (EDB)	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
Dibromomethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
1,2-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
1,3-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
1,4-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
Dichlorodifluoromethane	ND	0.500	1.00	2.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
1,1-Dichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
1,2-Dichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
1,1-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
cis-1,2-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
trans-1,2-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
1,2-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
1,3-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
2,2-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
1,1-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
cis-1,3-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
trans-1,3-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
Ethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
Hexachlorobutadiene	ND	0.250	0.500	2.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
2-Hexanone	ND	1.25	2.50	5.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U

Laboratory Analytical Results Report

Client Sample ID: EVT3-106212-2 **Sample Collection Date/Time: 03/04/2015 11:20**

Lab Sample ID: 1503039-02 **Sample Received Date/Time: 03/07/2015 10:15**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Volatile Organic Compounds by GC/MS										
Isopropylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
p-Isopropyltoluene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
Methylene chloride	ND	0.500	1.00	2.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
Naphthalene	ND	0.250	0.500	2.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
4-Methyl-2-pentanone	ND	1.25	2.50	5.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
Methyl t-Butyl Ether	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
n-Propylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
Styrene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
1,1,2,2-Tetrachloroethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
1,1,1,2-Tetrachloroethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
Tetrachloroethene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
Toluene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
1,2,3-Trichlorobenzene	ND	0.250	0.500	2.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
1,2,4-Trichlorobenzene	ND	0.250	0.500	2.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
1,1,2-Trichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
1,1,1-Trichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
Trichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
Trichlorofluoromethane	ND	0.500	1.00	2.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
1,2,3-Trichloropropane	ND	0.500	1.00	2.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
1,3,5-Trimethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
1,2,4-Trimethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
Vinyl chloride	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
Xylenes (total)	ND	0.750	1.50	3.00	ug/L	1	03/09/15 10:00	SW8260B	5C09001	U
Surrogate: Bromofluorobenzene				*95.5 %*	*75-120*		*03/09/15 10:00*	*SW8260B*	*5C09001*	
Surrogate: Dibromofluoromethane				*98.2 %*	*85-115*		*03/09/15 10:00*	*SW8260B*	*5C09001*	
Surrogate: 1.2-Dichloroethane-d4				*92.5 %*	*70-120*		*03/09/15 10:00*	*SW8260B*	*5C09001*	
Surrogate: Toluene-d8				*98.1 %*	*85-120*		*03/09/15 10:00*	*SW8260B*	*5C09001*	

Laboratory Analytical Results Report

Client Sample ID: EVT3-106212-2 **Sample Collection Date/Time: 03/04/2015 11:20**

Lab Sample ID: 1503039-02 **Sample Received Date/Time: 03/07/2015 10:15**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
EDB and DBCP by GC										
1,2-Dibromoethane	ND	0.00920	0.0184	0.0276	ug/L	1	03/07/15 13:58	SW8011	5C07002	U
Surrogate: 1,3-Dibromopropane				*85.6 %*	*55-160*		*03/07/15 13:58*	*SW8011*	*5C07002*	
Surrogate: 1,3-Dibromopropane [2C]				*97.3 %*	*55-160*		*03/07/15 13:58*	*SW8011*	*5C07002*	X

Laboratory Analytical Results Report

Client Sample ID: EVT3-106212-2

Sample Collection Date/Time: 03/04/2015 11:20

Lab Sample ID: 1503039-02RE1

Sample Received Date/Time: 03/07/2015 10:15

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Anions by IC										
Bromide	ND	0.0420	0.125	0.250	mg/L	1	03/09/15 11:26	E300.0	5C09007	U
Chloride	**8.93**	0.170	0.330	0.500	mg/L	1	03/09/15 11:26	E300.0	5C09007	
Sulfate as SO4	**33.2**	0.330	1.00	2.50	mg/L	1	03/09/15 11:26	E300.0	5C09007	

Laboratory Analytical Results Report

Client Sample ID: EVT3-106212-3 **Sample Collection Date/Time: 03/04/2015 11:20**

Lab Sample ID: 1503039-03 **Sample Received Date/Time: 03/07/2015 10:15**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Classical Chemistry Parameters										
Nitrate/Nitrite as N	ND	0.100	0.150	0.200	mg/L	1	03/09/15 12:23	E353.2	5C09012	NU
Metals in Water by ICP-AES										
Aluminum	**58.1**	12.5	25.0	50.0	ug/L	1	03/09/15 17:44	SW6010C	5C09016	
Antimony	ND	1.25	2.00	2.50	ug/L	1	03/09/15 17:44	SW6010C	5C09016	U
Arsenic	ND	0.750	1.50	2.50	ug/L	1	03/09/15 17:44	SW6010C	5C09016	U
Barium	**98.6**	1.25	2.50	10.0	ug/L	1	03/09/15 17:44	SW6010C	5C09016	
Beryllium	ND	0.250	0.500	1.25	ug/L	1	03/09/15 17:44	SW6010C	5C09016	U
Cadmium	ND	0.250	0.500	1.25	ug/L	1	03/09/15 17:44	SW6010C	5C09016	U
Calcium	**34600**	250	500	1250	ug/L	1	03/09/15 17:44	SW6010C	5C09016	
Chromium	**2.30**	0.500	1.00	2.50	ug/L	1	03/09/15 17:44	SW6010C	5C09016	J
Cobalt	ND	1.25	2.50	3.12	ug/L	1	03/09/15 17:44	SW6010C	5C09016	U
Copper	**4.67**	1.00	2.00	2.50	ug/L	1	03/09/15 17:44	SW6010C	5C09016	
Iron	**27.3**	7.50	15.0	25.0	ug/L	1	03/09/15 17:44	SW6010C	5C09016	
Lead	**0.653**	0.375	0.750	1.25	ug/L	1	03/09/15 17:44	SW6010C	5C09016	J
Magnesium	**4450**	250	750	1250	ug/L	1	03/09/15 17:44	SW6010C	5C09016	
Manganese	**25.3**	0.750	1.50	3.75	ug/L	1	03/09/15 17:44	SW6010C	5C09016	
Molybdenum	**6.86**	1.25	2.50	5.00	ug/L	1	03/09/15 17:44	SW6010C	5C09016	
Nickel	ND	0.750	1.50	2.50	ug/L	1	03/09/15 17:44	SW6010C	5C09016	U
Potassium	**2180**	250	750	1250	ug/L	1	03/09/15 17:44	SW6010C	5C09016	
Selenium	ND	0.750	1.25	2.50	ug/L	1	03/09/15 17:44	SW6010C	5C09016	U
Silver	ND	0.250	0.500	2.50	ug/L	1	03/09/15 17:44	SW6010C	5C09016	U
Sodium	**23400**	250	750	1250	ug/L	1	03/09/15 17:44	SW6010C	5C09016	
Thallium	ND	0.750	1.00	2.00	ug/L	1	03/09/15 17:44	SW6010C	5C09016	U
Vanadium	**2.77**	1.25	2.50	3.12	ug/L	1	03/09/15 17:44	SW6010C	5C09016	J
Zinc	**18.5**	1.25	2.50	5.00	ug/L	1	03/09/15 17:44	SW6010C	5C09016	

Laboratory Analytical Results Report

Client Sample ID: EVT3-106212-3 **Sample Collection Date/Time: 03/04/2015 11:20**

Lab Sample ID: 1503039-03 **Sample Received Date/Time: 03/07/2015 10:15**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Mercury by CVAA										
Mercury	ND	0.0800	0.160	0.200	ug/L	1	03/09/15 15:02	SW7470A	5C09008	U
Volatile Organic Compounds by GC/MS										
Acetone	**3.21**	2.50	5.00	10.0	ug/L	1	03/09/15 10:25	SW8260B	5C09001	J
Benzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
Bromobenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
Bromochloromethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
Bromodichloromethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
Bromoform	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
Bromomethane	ND	0.500	1.00	2.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
n-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
2-Butanone	ND	2.50	5.00	10.0	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
sec-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
tert-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
Carbon disulfide	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
Carbon tetrachloride	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
Chlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
Chloroethane	ND	0.500	1.00	2.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
Chloroform	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
Chloromethane	**0.318**	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	J
2-Chlorotoluene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
4-Chlorotoluene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
Dibromochloromethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
1,2-Dibromo-3-chloropropane	ND	0.500	1.00	2.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
1,2-Dibromoethane (EDB)	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
Dibromomethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
1,2-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
1,3-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
1,4-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
Dichlorodifluoromethane	ND	0.500	1.00	2.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
1,1-Dichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
1,2-Dichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
1,1-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
cis-1,2-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
trans-1,2-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
1,2-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
1,3-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
2,2-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
1,1-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
cis-1,3-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
trans-1,3-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
Ethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
Hexachlorobutadiene	ND	0.250	0.500	2.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
2-Hexanone	ND	1.25	2.50	5.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U

Laboratory Analytical Results Report

Client Sample ID: EVT3-106212-3 **Sample Collection Date/Time: 03/04/2015 11:20**

Lab Sample ID: 1503039-03 **Sample Received Date/Time: 03/07/2015 10:15**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Volatile Organic Compounds by GC/MS										
Isopropylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
p-Isopropyltoluene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
Methylene chloride	ND	0.500	1.00	2.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
Naphthalene	ND	0.250	0.500	2.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
4-Methyl-2-pentanone	ND	1.25	2.50	5.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
Methyl t-Butyl Ether	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
n-Propylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
Styrene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
1,1,2,2-Tetrachloroethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
1,1,1,2-Tetrachloroethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
Tetrachloroethene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
Toluene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
1,2,3-Trichlorobenzene	ND	0.250	0.500	2.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
1,2,4-Trichlorobenzene	ND	0.250	0.500	2.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
1,1,2-Trichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
1,1,1-Trichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
Trichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
Trichlorofluoromethane	ND	0.500	1.00	2.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
1,2,3-Trichloropropane	ND	0.500	1.00	2.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
1,3,5-Trimethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
1,2,4-Trimethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
Vinyl chloride	ND	0.250	0.500	1.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
Xylenes (total)	ND	0.750	1.50	3.00	ug/L	1	03/09/15 10:25	SW8260B	5C09001	U
Surrogate: Bromofluorobenzene				*96.6 %*	*75-120*		*03/09/15 10:25*	*SW8260B*	*5C09001*	
Surrogate: Dibromofluoromethane				*96.2 %*	*85-115*		*03/09/15 10:25*	*SW8260B*	*5C09001*	
Surrogate: 1.2-Dichloroethane-d4				*94.9 %*	*70-120*		*03/09/15 10:25*	*SW8260B*	*5C09001*	
Surrogate: Toluene-d8				*98.8 %*	*85-120*		*03/09/15 10:25*	*SW8260B*	*5C09001*	

Laboratory Analytical Results Report

Client Sample ID: EVT3-106212-3 **Sample Collection Date/Time: 03/04/2015 11:20**

Lab Sample ID: 1503039-03 **Sample Received Date/Time: 03/07/2015 10:15**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
EDB and DBCP by GC										
1,2-Dibromoethane	ND	0.00965	0.0193	0.0290	ug/L	1	03/07/15 14:09	SW8011	5C07002	U
Surrogate: 1,3-Dibromopropane				*107 %*	*55-160*		*03/07/15 14:09*	*SW8011*	*5C07002*	
Surrogate: 1,3-Dibromopropane [2C]				*122 %*	*55-160*		*03/07/15 14:09*	*SW8011*	*5C07002*	X

Laboratory Analytical Results Report

Client Sample ID: EVT3-106212-3

Sample Collection Date/Time: 03/04/2015 11:20

Lab Sample ID: 1503039-03RE1

Sample Received Date/Time: 03/07/2015 10:15

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Anions by IC										
Bromide	ND	0.0420	0.125	0.250	mg/L	1	03/09/15 11:44	E300.0	5C09007	U
Chloride	**8.99**	0.170	0.330	0.500	mg/L	1	03/09/15 11:44	E300.0	5C09007	
Sulfate as SO4	**33.2**	0.330	1.00	2.50	mg/L	1	03/09/15 11:44	E300.0	5C09007	

Laboratory Analytical Results Report

Client Sample ID: EVT3-106212-TB **Sample Collection Date/Time: 03/04/2015 08:00**

Lab Sample ID: 1503039-04 **Sample Received Date/Time: 03/07/2015 10:15**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Volatile Organic Compounds by GC/MS										
Acetone	ND	2.50	5.00	10.0	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
Benzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
Bromobenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
Bromochloromethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
Bromodichloromethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
Bromoform	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
Bromomethane	ND	0.500	1.00	2.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
n-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
2-Butanone	ND	2.50	5.00	10.0	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
sec-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
tert-Butylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
Carbon disulfide	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
Carbon tetrachloride	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
Chlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
Chloroethane	ND	0.500	1.00	2.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
Chloroform	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
Chloromethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
2-Chlorotoluene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
4-Chlorotoluene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
Dibromochloromethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
1,2-Dibromo-3-chloropropane	ND	0.500	1.00	2.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
1,2-Dibromoethane (EDB)	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
Dibromomethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
1,2-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
1,3-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
1,4-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
Dichlorodifluoromethane	ND	0.500	1.00	2.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
1,1-Dichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
1,2-Dichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
1,1-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
cis-1,2-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
trans-1,2-Dichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
1,2-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
1,3-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
2,2-Dichloropropane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
1,1-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
cis-1,3-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
trans-1,3-Dichloropropene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
Ethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
Hexachlorobutadiene	ND	0.250	0.500	2.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
2-Hexanone	ND	1.25	2.50	5.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
Isopropylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
p-Isopropyltoluene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U

Laboratory Analytical Results Report

Client Sample ID: EVT3-106212-TB **Sample Collection Date/Time: 03/04/2015 08:00**

Lab Sample ID: 1503039-04 **Sample Received Date/Time: 03/07/2015 10:15**

Sample Matrix: Water

Analyte	Result	DL	LOD	LOQ	Units	Dilution	Analyzed	Method	Batch	Notes
Volatile Organic Compounds by GC/MS										
Methylene chloride	ND	0.500	1.00	2.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
Naphthalene	ND	0.250	0.500	2.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
4-Methyl-2-pentanone	ND	1.25	2.50	5.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
Methyl t-Butyl Ether	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
n-Propylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
Styrene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
1,1,2,2-Tetrachloroethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
1,1,1,2-Tetrachloroethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
Tetrachloroethene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
Toluene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
1,2,3-Trichlorobenzene	ND	0.250	0.500	2.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
1,2,4-Trichlorobenzene	ND	0.250	0.500	2.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
1,1,2-Trichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
1,1,1-Trichloroethane	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
Trichloroethene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
Trichlorofluoromethane	ND	0.500	1.00	2.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
1,2,3-Trichloropropane	ND	0.500	1.00	2.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
1,3,5-Trimethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
1,2,4-Trimethylbenzene	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
Vinyl chloride	ND	0.250	0.500	1.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
Xylenes (total)	ND	0.750	1.50	3.00	ug/L	1	03/09/15 09:10	SW8260B	5C09001	U
Surrogate: Bromofluorobenzene				*95.4 %*	*75-120*		*03/09/15 09:10*	*SW8260B*	*5C09001*	
Surrogate: Dibromofluoromethane				*95.9 %*	*85-115*		*03/09/15 09:10*	*SW8260B*	*5C09001*	
Surrogate: 1,2-Dichloroethane-d4				*95.9 %*	*70-120*		*03/09/15 09:10*	*SW8260B*	*5C09001*	
Surrogate: Toluene-d8				*95.9 %*	*85-120*		*03/09/15 09:10*	*SW8260B*	*5C09001*	

Classical Chemistry Parameters - Quality Control

Analyte	Result	DL	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C09012												
Blank				Prepared & Analyzed: 03/09/2015								
Nitrate/Nitrite as N	ND	0.100	0.150	0.200	mg/L							U
LCS				Prepared & Analyzed: 03/09/2015								
Nitrate/Nitrite as N	2.146	0.100	0.150	0.200	mg/L	2.156		99.5	90-110			
Matrix Spike	**Source: 1503039-03**			Prepared & Analyzed: 03/09/2015								
Nitrate/Nitrite as N	1.288	0.100	0.150	0.200	mg/L	1.000	ND	129	90-110			
Matrix Spike Dup	**Source: 1503039-03**			Prepared & Analyzed: 03/09/2015								
Nitrate/Nitrite as N	1.244	0.100	0.150	0.200	mg/L	1.000	ND	124	90-110	3.48	20	

Anions by IC - Quality Control

Analyte	Result	DL	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C09007												
Blank				Prepared & Analyzed: 03/09/2015								
Bromide	ND	0.0420	0.125	0.250	mg/L							U
Chloride	ND	0.170	0.330	0.500	mg/L							U
Sulfate as SO4	ND	0.330	1.00	2.50	mg/L							U
LCS				Prepared & Analyzed: 03/09/2015								
Bromide	13.03	0.0420	0.125	0.250	mg/L	14.00		93.1	90-110			
Chloride	4.345	0.170	0.330	0.500	mg/L	4.200		103	90-110			
Sulfate as SO4	21.01	0.330	1.00	2.50	mg/L	21.00		100	90-110			
Duplicate	**Source: 1503039-03RE1**			Prepared & Analyzed: 03/09/2015								
Bromide	ND	0.0420	0.125	0.250	mg/L		ND				10	U
Chloride	8.943	0.170	0.330	0.500	mg/L		8.994			0.571	10	
Sulfate as SO4	32.99	0.330	1.00	2.50	mg/L		33.23			0.707	10	
Matrix Spike	**Source: 1503039-03RE1**			Prepared & Analyzed: 03/09/2015								
Bromide	6.247	0.0467	0.139	0.278	mg/L	7.000	ND	89.2	80-120			
Chloride	36.06	0.189	0.367	0.556	mg/L	27.78	8.994	97.5	80-120			
Sulfate as SO4	61.73	0.367	1.11	2.78	mg/L	27.78	33.23	103	80-120			
Matrix Spike Dup	**Source: 1503039-03RE1**			Prepared & Analyzed: 03/09/2015								
Bromide	6.293	0.0467	0.139	0.278	mg/L	7.000	ND	89.9	80-120	0.737	15	
Chloride	36.41	0.189	0.367	0.556	mg/L	27.78	8.994	98.7	80-120	0.944	15	
Sulfate as SO4	62.72	0.367	1.11	2.78	mg/L	27.78	33.23	106	80-120	1.60	15	

Metals in Water by ICP-AES - Quality Control

Analyte	Result	DL	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C09016												
Blank				Prepared & Analyzed: 03/09/2015								
Aluminum	ND	12.5	25.0	50.0	ug/L							U
Antimony	ND	1.25	2.00	2.50	ug/L							U
Arsenic	ND	0.750	1.50	2.50	ug/L							U
Barium	ND	1.25	2.50	10.0	ug/L							U
Beryllium	ND	0.250	0.500	1.25	ug/L							U
Cadmium	ND	0.250	0.500	1.25	ug/L							U
Calcium	ND	250	500	1250	ug/L							U
Chromium	ND	0.500	1.00	2.50	ug/L							U
Cobalt	ND	1.25	2.50	3.12	ug/L							U
Copper	ND	1.00	2.00	2.50	ug/L							U
Iron	ND	7.50	15.0	25.0	ug/L							U
Lead	ND	0.375	0.750	1.25	ug/L							U
Magnesium	ND	250	750	1250	ug/L							U
Manganese	ND	0.750	1.50	3.75	ug/L							U
Molybdenum	ND	1.25	2.50	5.00	ug/L							U
Nickel	ND	0.750	1.50	2.50	ug/L							U
Potassium	ND	250	750	1250	ug/L							U
Selenium	ND	0.750	1.25	2.50	ug/L							U
Silver	ND	0.250	0.500	2.50	ug/L							U
Sodium	ND	250	750	1250	ug/L							U
Thallium	ND	0.750	1.00	2.00	ug/L							U
Vanadium	ND	1.25	2.50	3.12	ug/L							U
Zinc	ND	1.25	2.50	5.00	ug/L							U
LCS				Prepared & Analyzed: 03/09/2015								
Aluminum	38.54	12.5	25.0	50.0	ug/L	40.00		96.4	80-120			J
Antimony	4.548	1.25	2.00	2.50	ug/L	5.000		91.0	80-120			
Arsenic	4.660	0.750	1.50	2.50	ug/L	5.000		93.2	80-120			
Barium	38.05	1.25	2.50	10.0	ug/L	40.00		95.1	80-120			
Beryllium	0.9602	0.250	0.500	1.25	ug/L	1.000		96.0	80-120			J
Cadmium	2.473	0.250	0.500	1.25	ug/L	2.500		98.9	80-120			
Calcium	629.6	250	500	1250	ug/L	600.0		105	80-120			J
Chromium	3.920	0.500	1.00	2.50	ug/L	4.000		98.0	80-120			
Cobalt	9.276	1.25	2.50	3.12	ug/L	10.00		92.8	80-120			
Copper	4.404	1.00	2.00	2.50	ug/L	5.000		88.1	80-120			
Iron	18.79	7.50	15.0	25.0	ug/L	20.00		94.0	80-120			J
Lead	4.896	0.375	0.750	1.25	ug/L	5.000		97.9	80-120			
Magnesium	568.3	250	750	1250	ug/L	600.0		94.7	80-120			J
Manganese	9.979	0.750	1.50	3.75	ug/L	10.00		99.8	80-120			
Molybdenum	18.56	1.25	2.50	5.00	ug/L	20.00		92.8	80-120			
Nickel	9.272	0.750	1.50	2.50	ug/L	10.00		92.7	80-120			
Potassium	568.8	250	750	1250	ug/L	600.0		94.8	80-120			J
Selenium	4.738	0.750	1.25	2.50	ug/L	5.000		94.8	80-120			
Silver	5.021	0.250	0.500	2.50	ug/L	5.000		100	80-120			
Sodium	594.5	250	750	1250	ug/L	600.0		99.1	80-120			J
Thallium	4.474	0.750	1.00	2.00	ug/L	5.000		89.5	80-120			
Vanadium	9.356	1.25	2.50	3.12	ug/L	10.00		93.6	80-120			
Zinc	9.798	1.25	2.50	5.00	ug/L	10.00		98.0	80-120			

Metals in Water by ICP-AES - Quality Control

Analyte	Result	DL	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C09016												
Duplicate	**Source: 1503039-03**		Prepared & Analyzed: 03/09/2015									
Aluminum	73.04	62.5	125	250	ug/L		58.10			22.8	20	DJ
Antimony	ND	6.25	10.0	12.5	ug/L		ND				20	U
Arsenic	ND	3.75	7.50	12.5	ug/L		ND				20	U
Barium	101.7	6.25	12.5	50.0	ug/L		98.55			3.13	20	D
Beryllium	ND	1.25	2.50	6.25	ug/L		ND				20	U
Cadmium	ND	1.25	2.50	6.25	ug/L		ND				20	U
Calcium	36620	1250	2500	6250	ug/L		34570			5.77	20	D
Chromium	2.653	2.50	5.00	12.5	ug/L		2.303			14.1	20	DJ
Cobalt	ND	6.25	12.5	15.6	ug/L		ND				20	U
Copper	ND	5.00	10.0	12.5	ug/L		4.673				20	U
Iron	ND	37.5	75.0	125	ug/L		27.29				20	U
Lead	ND	1.88	3.75	6.25	ug/L		0.6533				20	U
Magnesium	4539	1250	3750	6250	ug/L		4451			1.96	20	DJ
Manganese	26.33	3.75	7.50	18.8	ug/L		25.30			3.99	20	D
Molybdenum	7.487	6.25	12.5	25.0	ug/L		6.855			8.81	20	DJ
Nickel	ND	3.75	7.50	12.5	ug/L		ND				20	U
Potassium	2141	1250	3750	6250	ug/L		2182			1.87	20	DJ
Selenium	ND	3.75	6.25	12.5	ug/L		ND				20	U
Silver	ND	1.25	2.50	12.5	ug/L		ND				20	U
Sodium	23540	1250	3750	6250	ug/L		23380			0.691	20	D
Thallium	ND	3.75	5.00	10.0	ug/L		ND				20	U
Vanadium	ND	6.25	12.5	15.6	ug/L		2.773				20	U
Zinc	18.93	6.25	12.5	25.0	ug/L		18.45			2.58	20	DJ
Matrix Spike	**Source: 1503039-03**		Prepared & Analyzed: 03/09/2015									
Aluminum	518.8	12.5	25.0	50.0	ug/L	500.0	58.10	92.1	80-120			
Antimony	117.9	1.25	2.00	2.50	ug/L	125.0	ND	94.3	80-120			
Arsenic	122.3	0.750	1.50	2.50	ug/L	125.0	ND	97.8	80-120			
Barium	562.4	1.25	2.50	10.0	ug/L	500.0	98.55	92.8	80-120			
Beryllium	11.97	0.250	0.500	1.25	ug/L	12.50	ND	95.8	80-120			
Cadmium	61.75	0.250	0.500	1.25	ug/L	62.50	ND	98.8	80-120			
Calcium	35090	250	500	1250	ug/L	1250	34570	41.4	80-120			
Chromium	48.70	0.500	1.00	2.50	ug/L	50.00	2.303	92.8	80-120			
Cobalt	116.1	1.25	2.50	3.12	ug/L	125.0	ND	92.9	80-120			
Copper	65.87	1.00	2.00	2.50	ug/L	62.50	4.673	97.9	80-120			
Iron	269.4	7.50	15.0	25.0	ug/L	250.0	27.29	96.9	80-120			
Lead	117.4	0.375	0.750	1.25	ug/L	125.0	0.6533	93.4	80-120			
Magnesium	5496	250	750	1250	ug/L	1250	4451	83.6	80-120			
Manganese	147.5	0.750	1.50	3.75	ug/L	125.0	25.30	97.8	80-120			
Molybdenum	242.8	1.25	2.50	5.00	ug/L	250.0	6.855	94.4	80-120			
Nickel	114.8	0.750	1.50	2.50	ug/L	125.0	ND	91.8	80-120			
Potassium	3336	250	750	1250	ug/L	1250	2182	92.4	80-120			
Selenium	124.8	0.750	1.25	2.50	ug/L	125.0	ND	99.8	80-120			
Silver	62.74	0.250	0.500	2.50	ug/L	62.50	ND	100	80-120			
Sodium	24430	250	750	1250	ug/L	1250	23380	84.2	80-120			
Thallium	117.7	0.750	1.00	2.00	ug/L	125.0	ND	94.1	80-120			
Vanadium	119.5	1.25	2.50	3.12	ug/L	125.0	2.773	93.4	80-120			
Zinc	135.7	1.25	2.50	5.00	ug/L	125.0	18.45	93.8	80-120			

Metals in Water by ICP-AES - Quality Control

Analyte	Result	DL	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C09016												
Matrix Spike Dup	**Source: 1503039-03**		Prepared & Analyzed: 03/09/2015									
Aluminum	557.8	12.5	25.0	50.0	ug/L	500.0	58.10	99.9	80-120	7.26	20	
Antimony	115.5	1.25	2.00	2.50	ug/L	125.0	ND	92.4	80-120	2.06	20	
Arsenic	121.8	0.750	1.50	2.50	ug/L	125.0	ND	97.4	80-120	0.400	20	
Barium	557.3	1.25	2.50	10.0	ug/L	500.0	98.55	91.7	80-120	0.920	20	
Beryllium	12.08	0.250	0.500	1.25	ug/L	12.50	ND	96.6	80-120	0.890	20	
Cadmium	61.83	0.250	0.500	1.25	ug/L	62.50	ND	98.9	80-120	0.134	20	
Calcium	36800	250	500	1250	ug/L	1250	34570	179	80-120	4.78	20	
Chromium	49.07	0.500	1.00	2.50	ug/L	50.00	2.303	93.5	80-120	0.762	20	
Cobalt	113.9	1.25	2.50	3.12	ug/L	125.0	ND	91.1	80-120	1.93	20	
Copper	68.24	1.00	2.00	2.50	ug/L	62.50	4.673	102	80-120	3.53	20	
Iron	272.4	7.50	15.0	25.0	ug/L	250.0	27.29	98.0	80-120	1.08	20	
Lead	117.6	0.375	0.750	1.25	ug/L	125.0	0.6533	93.6	80-120	0.185	20	
Magnesium	5770	250	750	1250	ug/L	1250	4451	105	80-120	4.86	20	
Manganese	152.8	0.750	1.50	3.75	ug/L	125.0	25.30	102	80-120	3.50	20	
Molybdenum	244.1	1.25	2.50	5.00	ug/L	250.0	6.855	94.9	80-120	0.520	20	
Nickel	112.6	0.750	1.50	2.50	ug/L	125.0	ND	90.0	80-120	1.98	20	
Potassium	3381	250	750	1250	ug/L	1250	2182	95.9	80-120	1.32	20	
Selenium	122.0	0.750	1.25	2.50	ug/L	125.0	ND	97.6	80-120	2.29	20	
Silver	67.04	0.250	0.500	2.50	ug/L	62.50	ND	107	80-120	6.63	20	
Sodium	24460	250	750	1250	ug/L	1250	23380	87.0	80-120	0.142	20	
Thallium	116.8	0.750	1.00	2.00	ug/L	125.0	ND	93.4	80-120	0.746	20	
Vanadium	124.3	1.25	2.50	3.12	ug/L	125.0	2.773	97.2	80-120	3.89	20	
Zinc	135.1	1.25	2.50	5.00	ug/L	125.0	18.45	93.3	80-120	0.462	20	
Post Spike	**Source: 1503039-03**		Prepared & Analyzed: 03/09/2015									
Aluminum	2518				ug/L	2000	232.4	114	80-120			
Antimony	264.4				ug/L	250.0	-1.404	106	80-120			
Arsenic	259.0				ug/L	250.0	1.078	103	80-120			
Barium	2403				ug/L	2000	394.2	100	80-120			
Beryllium	51.57				ug/L	50.00	0.01081	103	80-120			
Cadmium	131.0				ug/L	125.0	-0.4831	105	80-120			
Calcium	154600				ug/L	5000	138300	327	80-120			
Chromium	209.0				ug/L	200.0	9.213	99.9	80-120			
Cobalt	488.0				ug/L	500.0	0.03711	97.6	80-120			
Copper	289.6				ug/L	250.0	18.69	108	80-120			
Iron	1146				ug/L	1000	109.2	104	80-120			
Lead	252.5				ug/L	250.0	2.613	99.9	80-120			
Magnesium	23940				ug/L	5000	17800	123	80-120			
Manganese	647.2				ug/L	500.0	101.2	109	80-120			
Molybdenum	1038				ug/L	1000	27.42	101	80-120			
Nickel	479.8				ug/L	500.0	1.786	95.6	80-120			
Potassium	13810				ug/L	5000	8726	102	80-120			
Selenium	266.0				ug/L	250.0	1.506	106	80-120			
Silver	299.2				ug/L	250.0	-0.6352	120	80-120			
Sodium	97280				ug/L	5000	93500	75.6	80-120			
Thallium	248.4				ug/L	250.0	-0.08503	99.3	80-120			
Vanadium	535.7				ug/L	500.0	11.09	105	80-120			
Zinc	566.1				ug/L	500.0	73.81	98.5	80-120			

Mercury by CVAA - Quality Control

Analyte	Result	DL	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C09008												
Blank				Prepared & Analyzed: 03/09/2015								
Mercury	ND	0.0800	0.160	0.200	ug/L							U
LCS				Prepared & Analyzed: 03/09/2015								
Mercury	1.781	0.0800	0.160	0.200	ug/L	2.000		89.0	80-120			
Matrix Spike	**Source: 1503039-03**			Prepared & Analyzed: 03/09/2015								
Mercury	1.750	0.0800	0.160	0.200	ug/L	2.000	ND	87.5	80-120			
Matrix Spike Dup	**Source: 1503039-03**			Prepared & Analyzed: 03/09/2015								
Mercury	1.794	0.0800	0.160	0.200	ug/L	2.000	ND	89.7	80-120	2.50	20	

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	DL	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C09001												
Blank				Prepared & Analyzed: 03/09/2015								
Acetone	ND	2.50	5.00	10.0	ug/L							U
Benzene	ND	0.250	0.500	1.00	ug/L							U
Bromobenzene	ND	0.250	0.500	1.00	ug/L							U
Bromochloromethane	ND	0.250	0.500	1.00	ug/L							U
Bromodichloromethane	ND	0.250	0.500	1.00	ug/L							U
Bromoform	ND	0.250	0.500	1.00	ug/L							U
Bromomethane	ND	0.500	1.00	2.00	ug/L							U
n-Butylbenzene	ND	0.250	0.500	1.00	ug/L							U
2-Butanone	ND	2.50	5.00	10.0	ug/L							U
sec-Butylbenzene	ND	0.250	0.500	1.00	ug/L							U
tert-Butylbenzene	ND	0.250	0.500	1.00	ug/L							U
Carbon disulfide	ND	0.250	0.500	1.00	ug/L							U
Carbon tetrachloride	ND	0.250	0.500	1.00	ug/L							U
Chlorobenzene	ND	0.250	0.500	1.00	ug/L							U
Chloroethane	ND	0.500	1.00	2.00	ug/L							U
Chloroform	ND	0.250	0.500	1.00	ug/L							U
Chloromethane	ND	0.250	0.500	1.00	ug/L							U
2-Chlorotoluene	ND	0.250	0.500	1.00	ug/L							U
4-Chlorotoluene	ND	0.250	0.500	1.00	ug/L							U
Dibromochloromethane	ND	0.250	0.500	1.00	ug/L							U
1,2-Dibromo-3-chloropropane	ND	0.500	1.00	2.00	ug/L							U
1,2-Dibromoethane (EDB)	ND	0.250	0.500	1.00	ug/L							U
Dibromomethane	ND	0.250	0.500	1.00	ug/L							U
1,2-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L							U
1,3-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L							U
1,4-Dichlorobenzene	ND	0.250	0.500	1.00	ug/L							U
Dichlorodifluoromethane	ND	0.500	1.00	2.00	ug/L							U
1,1-Dichloroethane	ND	0.250	0.500	1.00	ug/L							U
1,2-Dichloroethane	ND	0.250	0.500	1.00	ug/L							U
1,1-Dichloroethene	ND	0.250	0.500	1.00	ug/L							U
cis-1,2-Dichloroethene	ND	0.250	0.500	1.00	ug/L							U
trans-1,2-Dichloroethene	ND	0.250	0.500	1.00	ug/L							U
1,2-Dichloropropane	ND	0.250	0.500	1.00	ug/L							U
1,3-Dichloropropane	ND	0.250	0.500	1.00	ug/L							U
2,2-Dichloropropane	ND	0.250	0.500	1.00	ug/L							U
1,1-Dichloropropene	ND	0.250	0.500	1.00	ug/L							U
cis-1,3-Dichloropropene	ND	0.250	0.500	1.00	ug/L							U
trans-1,3-Dichloropropene	ND	0.250	0.500	1.00	ug/L							U
Ethylbenzene	ND	0.250	0.500	1.00	ug/L							U
Hexachlorobutadiene	ND	0.250	0.500	2.00	ug/L							U
2-Hexanone	ND	1.25	2.50	5.00	ug/L							U
Isopropylbenzene	ND	0.250	0.500	1.00	ug/L							U
p-Isopropyltoluene	ND	0.250	0.500	1.00	ug/L							U
Methylene chloride	ND	0.500	1.00	2.00	ug/L							U
Naphthalene	ND	0.250	0.500	2.00	ug/L							U
4-Methyl-2-pentanone	ND	1.25	2.50	5.00	ug/L							U
Methyl t-Butyl Ether	ND	0.250	0.500	1.00	ug/L							U
n-Propylbenzene	ND	0.250	0.500	1.00	ug/L							U
Styrene	ND	0.250	0.500	1.00	ug/L							U
1,1,2,2-Tetrachloroethane	ND	0.250	0.500	1.00	ug/L							U

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	DL	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C09001												
Blank				Prepared & Analyzed: 03/09/2015								
1,1,1,2-Tetrachloroethane	ND	0.250	0.500	1.00	ug/L							U
Tetrachloroethene	ND	0.250	0.500	1.00	ug/L							U
Toluene	ND	0.250	0.500	1.00	ug/L							U
1,2,3-Trichlorobenzene	ND	0.250	0.500	2.00	ug/L							U
1,2,4-Trichlorobenzene	ND	0.250	0.500	2.00	ug/L							U
1,1,2-Trichloroethane	ND	0.250	0.500	1.00	ug/L							U
1,1,1-Trichloroethane	ND	0.250	0.500	1.00	ug/L							U
Trichloroethene	ND	0.250	0.500	1.00	ug/L							U
Trichlorofluoromethane	ND	0.500	1.00	2.00	ug/L							U
1,2,3-Trichloropropane	ND	0.500	1.00	2.00	ug/L							U
1,3,5-Trimethylbenzene	ND	0.250	0.500	1.00	ug/L							U
1,2,4-Trimethylbenzene	ND	0.250	0.500	1.00	ug/L							U
Vinyl chloride	ND	0.250	0.500	1.00	ug/L							U
Xylenes (total)	ND	0.750	1.50	3.00	ug/L							U
Surrogate: Bromofluorobenzene	*28.79*				*ug/L*	*30.00*		*96.0*	*75-120*			
Surrogate: Dibromofluoromethane	*27.77*				*ug/L*	*30.00*		*92.6*	*85-115*			
Surrogate: 1,2-Dichloroethane-d4	*28.37*				*ug/L*	*30.00*		*94.6*	*70-120*			
Surrogate: Toluene-d8	*28.26*				*ug/L*	*30.00*		*94.2*	*85-120*			
LCS				Prepared & Analyzed: 03/09/2015								
Acetone	92.6	2.50	5.00	10.0	ug/L	100.0		92.6	40-140			
Benzene	48.6	0.250	0.500	1.00	ug/L	50.00		97.3	80-120			
Bromobenzene	48.0	0.250	0.500	1.00	ug/L	50.00		95.9	75-125			
Bromochloromethane	42.7	0.250	0.500	1.00	ug/L	50.00		85.4	65-130			
Bromodichloromethane	49.8	0.250	0.500	1.00	ug/L	50.00		99.5	75-120			
Bromoform	59.1	0.250	0.500	1.00	ug/L	50.00		118	70-130			
Bromomethane	45.5	0.500	1.00	2.00	ug/L	50.00		91.0	30-145			
n-Butylbenzene	48.5	0.250	0.500	1.00	ug/L	50.00		97.1	70-135			
2-Butanone	91.0	2.50	5.00	10.0	ug/L	100.0		91.0	30-150			
sec-Butylbenzene	55.9	0.250	0.500	1.00	ug/L	50.00		112	70-125			
tert-Butylbenzene	51.5	0.250	0.500	1.00	ug/L	50.00		103	70-130			
Carbon disulfide	47.3	0.250	0.500	1.00	ug/L	50.00		94.6	35-160			
Carbon tetrachloride	59.6	0.250	0.500	1.00	ug/L	50.00		119	65-140			
Chlorobenzene	45.6	0.250	0.500	1.00	ug/L	50.00		91.2	80-120			
Chloroethane	44.2	0.500	1.00	2.00	ug/L	50.00		88.4	60-135			
Chloroform	48.0	0.250	0.500	1.00	ug/L	50.00		96.0	65-135			
Chloromethane	44.9	0.250	0.500	1.00	ug/L	50.00		89.9	40-125			
2-Chlorotoluene	51.6	0.250	0.500	1.00	ug/L	50.00		103	75-125			
4-Chlorotoluene	56.7	0.250	0.500	1.00	ug/L	50.00		113	75-130			
Dibromochloromethane	48.2	0.250	0.500	1.00	ug/L	50.00		96.4	60-135			
1,2-Dibromo-3-chloropropane	51.7	0.500	1.00	2.00	ug/L	50.00		103	50-130			
1,2-Dibromoethane (EDB)	41.4	0.250	0.500	1.00	ug/L	50.00		82.8	80-120			
Dibromomethane	44.8	0.250	0.500	1.00	ug/L	50.00		89.5	75-125			
1,2-Dichlorobenzene	49.1	0.250	0.500	1.00	ug/L	50.00		98.1	70-120			
1,3-Dichlorobenzene	49.5	0.250	0.500	1.00	ug/L	50.00		99.1	75-125			
1,4-Dichlorobenzene	48.8	0.250	0.500	1.00	ug/L	50.00		97.5	75-125			
Dichlorodifluoromethane	56.1	0.500	1.00	2.00	ug/L	50.00		112	30-155			
1,1-Dichloroethane	48.4	0.250	0.500	1.00	ug/L	50.00		96.8	70-135			
1,2-Dichloroethane	51.6	0.250	0.500	1.00	ug/L	50.00		103	70-130			

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	DL	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C09001												
LCS				Prepared & Analyzed: 03/09/2015								
1,1-Dichloroethene	42.3	0.250	0.500	1.00	ug/L	50.00		84.5	70-130			
cis-1,2-Dichloroethene	46.0	0.250	0.500	1.00	ug/L	50.00		92.0	70-125			
trans-1,2-Dichloroethene	44.0	0.250	0.500	1.00	ug/L	50.00		88.0	60-140			
1,2-Dichloropropane	46.5	0.250	0.500	1.00	ug/L	50.00		93.0	75-125			
1,3-Dichloropropane	45.8	0.250	0.500	1.00	ug/L	50.00		91.6	75-125			
2,2-Dichloropropane	59.1	0.250	0.500	1.00	ug/L	50.00		118	70-135			
1,1-Dichloropropene	53.9	0.250	0.500	1.00	ug/L	50.00		108	75-130			
cis-1,3-Dichloropropene	57.9	0.250	0.500	1.00	ug/L	50.00		116	70-130			
trans-1,3-Dichloropropene	50.0	0.250	0.500	1.00	ug/L	50.00		99.9	55-140			
Ethylbenzene	51.6	0.250	0.500	1.00	ug/L	50.00		103	75-125			
Hexachlorobutadiene	48.4	0.250	0.500	2.00	ug/L	50.00		96.9	50-140			
2-Hexanone	92.2	1.25	2.50	5.00	ug/L	100.0		92.2	55-130			
Isopropylbenzene	55.1	0.250	0.500	1.00	ug/L	50.00		110	75-125			
p-Isopropyltoluene	53.9	0.250	0.500	1.00	ug/L	50.00		108	75-130			
Methylene chloride	46.5	0.500	1.00	2.00	ug/L	50.00		93.0	55-140			
Naphthalene	34.8	0.250	0.500	2.00	ug/L	50.00		69.5	55-140			
4-Methyl-2-pentanone	94.4	1.25	2.50	5.00	ug/L	100.0		94.4	60-135			
Methyl t-Butyl Ether	51.5	0.250	0.500	1.00	ug/L	50.00		103	65-125			
n-Propylbenzene	55.5	0.250	0.500	1.00	ug/L	50.00		111	70-130			
Styrene	54.0	0.250	0.500	1.00	ug/L	50.00		108	65-135			
1,1,2,2-Tetrachloroethane	46.4	0.250	0.500	1.00	ug/L	50.00		92.7	65-130			
1,1,1,2-Tetrachloroethane	48.3	0.250	0.500	1.00	ug/L	50.00		96.6	80-130			
Tetrachloroethene	49.1	0.250	0.500	1.00	ug/L	50.00		98.2	45-150			
Toluene	46.5	0.250	0.500	1.00	ug/L	50.00		93.0	75-120			
1,2,3-Trichlorobenzene	37.5	0.250	0.500	2.00	ug/L	50.00		75.0	55-140			
1,2,4-Trichlorobenzene	40.6	0.250	0.500	2.00	ug/L	50.00		81.1	65-135			
1,1,2-Trichloroethane	42.1	0.250	0.500	1.00	ug/L	50.00		84.2	75-125			
1,1,1-Trichloroethane	53.5	0.250	0.500	1.00	ug/L	50.00		107	65-130			
Trichloroethene	46.5	0.250	0.500	1.00	ug/L	50.00		93.0	70-125			
Trichlorofluoromethane	56.2	0.500	1.00	2.00	ug/L	50.00		112	60-145			
1,2,3-Trichloropropane	41.6	0.500	1.00	2.00	ug/L	50.00		83.2	75-125			
1,3,5-Trimethylbenzene	59.6	0.250	0.500	1.00	ug/L	50.00		119	75-130			
1,2,4-Trimethylbenzene	57.4	0.250	0.500	1.00	ug/L	50.00		115	75-130			
Vinyl chloride	49.1	0.250	0.500	1.00	ug/L	50.00		98.2	50-145			
Xylenes (total)	154	0.750	1.50	3.00	ug/L	150.0		103	75-130			
Surrogate: Bromofluorobenzene	*30.86*				*ug/L*	*30.00*		*103*	*75-120*			
Surrogate: Dibromofluoromethane	*28.50*				*ug/L*	*30.00*		*95.0*	*85-115*			
Surrogate: 1,2-Dichloroethane-d4	*29.16*				*ug/L*	*30.00*		*97.2*	*70-120*			
Surrogate: Toluene-d8	*28.43*				*ug/L*	*30.00*		*94.8*	*85-120*			

EDB and DBCP by GC - Quality Control

Analyte	Result	DL	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5C07002												
Blank				Prepared & Analyzed: 03/07/2015								
1,2-Dibromoethane	ND	0.0100	0.0200	0.0300	ug/L							U
1,2-Dibromoethane [2C]	ND	0.0100	0.0200	0.0300	ug/L							U
Surrogate: 1,3-Dibromopropane	*2.211*				*ug/L*	*1.989*		*111*	*55-160*			
Surrogate: 1,3-Dibromopropane [2C]	*2.362*				*ug/L*	*1.989*		*119*	*55-160*			*X*
LCS				Prepared & Analyzed: 03/07/2015								
1,2-Dibromoethane	0.5391	0.0100	0.0200	0.0300	ug/L	0.5000		108	70-130		20	
1,2-Dibromoethane [2C]	0.5191	0.0100	0.0200	0.0300	ug/L	0.5000		104	70-130		20	
Surrogate: 1,3-Dibromopropane	*2.121*				*ug/L*	*1.989*		*107*	*55-160*			
Surrogate: 1,3-Dibromopropane [2C]	*2.364*				*ug/L*	*1.989*		*119*	*55-160*			*X*
LCS Dup				Prepared & Analyzed: 03/07/2015								
1,2-Dibromoethane	0.5412	0.0100	0.0200	0.0300	ug/L	0.5000		108	70-130	0.383	20	
1,2-Dibromoethane [2C]	0.5166	0.0100	0.0200	0.0300	ug/L	0.5000		103	70-130	0.481	20	
Surrogate: 1,3-Dibromopropane	*2.221*				*ug/L*	*1.989*		*112*	*55-160*			
Surrogate: 1,3-Dibromopropane [2C]	*2.404*				*ug/L*	*1.989*		*121*	*55-160*			*X*
Matrix Spike	**Source: 1503039-03**			Prepared & Analyzed: 03/07/2015								
1,2-Dibromoethane	0.5080	0.00948	0.0190	0.0284	ug/L	0.4739	ND	107	70-130		20	
1,2-Dibromoethane [2C]	0.4916	0.00948	0.0190	0.0284	ug/L	0.4739	ND	104	70-130		20	
Surrogate: 1,3-Dibromopropane	*1.992*				*ug/L*	*1.885*		*106*	*55-160*			
Surrogate: 1,3-Dibromopropane [2C]	*2.255*				*ug/L*	*1.885*		*120*	*55-160*			*X*
Matrix Spike Dup	**Source: 1503039-03**			Prepared & Analyzed: 03/07/2015								
1,2-Dibromoethane	0.5004	0.00955	0.0191	0.0286	ug/L	0.4774	ND	105	70-130	1.50	20	
1,2-Dibromoethane [2C]	0.4895	0.00955	0.0191	0.0286	ug/L	0.4774	ND	103	70-130	0.441	20	
Surrogate: 1,3-Dibromopropane	*1.920*				*ug/L*	*1.899*		*101*	*55-160*			
Surrogate: 1,3-Dibromopropane [2C]	*2.178*				*ug/L*	*1.899*		*115*	*55-160*			*X*

1503039

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Shaw E & I, Inc.

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Reference Document No: 140705-EVT3-106212

Project Number: 140705
Project Name: Kirtland AFB
Sample Coordinator: Tim Noger
Turnaround Time:

Samples Shipment Date: 04 MAR 2015
Lab Destination: Empirical Laboratories, Inc.
Lab Contact: Jennifer Chandler
Project Contact: Susan Huang
Carrier/Waybill No.: Fed Ex/565119375237

Bill To: Shaw Environmental, Inc. - Accounts P
PO Box 98519
Baton Rouge LA 70884

Report To: Susan Huang
4005 Port Chicago Highway
Concord CA 94520-1120

Special Instructions:

Possible Hazard Identification: Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological ☐

Sample Disposal: Return to Client ☐ Disposal by Lab ☐ Archive (mos.)

1. Relinquished By (Signature/Affiliation) Date: 3/4/15 Time: 1600
1. Received By (Signature/Affiliation) Date: Time:
2. Relinquished By (Signature/Affiliation) Date: Time:
2. Received By (Signature/Affiliation) Date: Time:
3. Relinquished By (Signature/Affiliation) Date: Time:
3. Received By (Signature/Affiliation) Date: 3/7/15 Time: 1015

Comments:

Sample No	Sample Name	Sample Date	Sample Time	Container	Ctr Qty	Preservative	Requested Testing Program	Sample Vol	Units	Fil	CID	Condition On Receipt
EVT3-106212-1	KAFB-106212-GW-EVT3-106212-1-REG	04 MAR 2015	11:20	40 mL VOA VIAL	3	None except cool to 4 C	EDB by SW846 8011			N		
EVT3-106212-1	KAFB-106212-GW-EVT3-106212-1-REG	04 MAR 2015	11:20	250 mL HDPE	1	None except cool to 4 C	Bromide,Chloride and Sulfate by EPA 300			N		
EVT3-106212-1	KAFB-106212-GW-EVT3-106212-1-REG	04 MAR 2015	11:20	250 mL HDPE	1	H2SO4<pH 2	Nitrate plus Nitrite by EPA 353.2			N		
EVT3-106212-1	KAFB-106212-GW-EVT3-106212-1-REG	04 MAR 2015	11:20	250 mL HDPE	1	HNO3<pH 2	TAL Metals by SW846 6010C/7470A			N		
EVT3-106212-1	KAFB-106212-GW-EVT3-106212-1-REG	04 MAR 2015	11:20	40 mL VOA VIAL	3	HCl<pH 2	VOCs by SW846 8260B			N		
EVT3-106212-2	KAFB-106212-GW-EVT3-106212-2-REG	04 MAR 2015	11:20	40 mL VOA VIAL	3	HCl<pH 2	VOCs by SW846 8260B			N		
EVT3-106212-2	KAFB-106212-GW-EVT3-106212-2-REG	04 MAR 2015	11:20	40 mL VOA VIAL	3	None except cool to 4 C	EDB by SW846 8011			N		
EVT3-106212-2	KAFB-106212-GW-EVT3-106212-2-REG	04 MAR 2015	11:20	250 mL HDPE	1	None except cool to 4 C	Bromide,Chloride and Sulfate by EPA			N		

Ø1

Ø2

15Ø3Ø39

Shaw™
Shaw E & I, Inc.

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Reference Document No: 140705-EVT3-106212

Sample No	Sample Name	Sample Date	Sample Time	Container		Preservative	Requested Testing Program	Sample Vol	Units	Fil	CID	Condition On Receipt
							300					
Ø2 EVT3-106212-2	KAFB-106212-GW-EVT3-106212-2-REG	04 MAR 2015	11:20	250 mL HDPE	1	H2SO4<pH 2	Nitrate plus Nitrite by EPA 353.2			N		
EVT3-106212-2	KAFB-106212-GW-EVT3-106212-2-REG	04 MAR 2015	11:20	250 mL HDPE	1	HNO3<pH 2	TAL Metals by SW846 6010C/7470A			N		
EVT3-106212-3	KAFB-106212-GW-EVT3-106212-3-REG	04 MAR 2015	11:20	40 mL VOA VIAL	3	HCl<pH 2	VOCs by SW846 8260B			N		
Ø3 EVT3-106212-3	KAFB-106212-GW-EVT3-106212-3-REG	04 MAR 2015	11:20	250 mL HDPE	1	H2SO4<pH 2	Nitrate plus Nitrite by EPA 353.2			N		
EVT3-106212-3	KAFB-106212-GW-EVT3-106212-3-REG	04 MAR 2015	11:20	250 mL HDPE	1	None except cool to 4 C	Bromide,Chloride and Sulfate by EPA 300			N		
EVT3-106212-3	KAFB-106212-GW-EVT3-106212-3-REG	04 MAR 2015	11:20	40 mL VOA VIAL	3	None except cool to 4 C	EDB by SW846 8011			N		
EVT3-106212-3	KAFB-106212-GW-EVT3-106212-3-REG	04 MAR 2015	11:20	250 mL HDPE	1	HNO3<pH 2	TAL Metals by SW846 6010C/7470A			N		
EVT3-106212-3	KAFB-106212-GW-EVT3-106212-3-MS-N	04 MAR 2015	11:20	40 mL VOA VIAL	3	HCl<pH 2	VOCs by SW846 8260B			N		
EVT3-106212-3	KAFB-106212-GW-EVT3-106212-3-MS-N	04 MAR 2015	11:20	250 mL HDPE	1	H2SO4<pH 2	Nitrate plus Nitrite by EPA 353.2			N		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1	None except cool to 4 C	Bromide,Chloride and Sulfate by EPA 300			N		
EVT3-106212-3	KAFB-106212-GW-EVT3-106212-3-MS-N	04 MAR 2015	11:20	250 mL HDPE	1	HNO3<pH 2	TAL Metals by SW846 6010C/7470A			N		
EVT3-106212-3	KAFB-106212-GW-EVT3-106212-3-MS-N	04 MAR 2015	11:20	40 mL VOA VIAL	3	None except cool to 4 C	EDB by SW846 8011			N		
EVT3-106212-3	KAFB-106212-GW-EVT3-106212-3-MSD	04 MAR 2015	11:20	250 mL HDPE	1	None except cool to 4 C	Bromide,Chloride and Sulfate by EPA 300			N		
EVT3-106212-3	KAFB-106212-GW-EVT3-106212-3-MSD	04 MAR 2015	11:20	40 mL VOA VIAL	3	None except cool to 4 C	EDB by SW846 8011			N		
EVT3-106212-3	KAFB-106212-GW-EVT3-106212-3-MSD	04 MAR 2015	11:20	40 mL VOA VIAL	3	HCl<pH 2	VOCs by SW846 8260B			N		
EVT3-106212-3	KAFB-106212-GW-EVT3-106212-3-MSD	04 MAR 2015	11:20	250 mL HDPE	1	H2SO4<pH 2	Nitrate plus Nitrite by EPA 353.2			N		
EVT3-106212-3	KAFB-106212-GW-EVT3-106212-3-MSD	04 MAR 2015	11:20	250 mL HDPE	1	HNO3<pH 2	TAL Metals by SW846 6010C/7470A			N		
Ø4 EVT3-106212-TB	KAFB-106212-GW-EVT3-106212-TB-TB	04 MAR 2015	08:00	40 mL VOA VIAL	2	HCl<pH 2	VOCs by SW846 8260B			N		

II. EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

Cooler Received/Opened On: 03/07/15 @ 1015 Workorder# 1503039

1. Tracking # 5237 (last 4 digits, FedEx)

   Courier: FedEx

2. Temperature of rep. sample or temp blank when opened: 0.3 °C + correction factor(-0.0) = 0.3 °C
3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA
4. Were custody seals on outside of cooler? YES...NO...NA

   If yes, how many and where: 2. Front + back

5. Were the seals intact, signed, and dated correctly? YES...NO...NA
6. Were custody papers inside cooler? YES...NO...NA

   I certify that I opened the cooler and answered questions 1-6 (initial/date) JTG 3/7/15

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

   Were these signed and dated correctly? YES...NO...NA

8. Packing material used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None
9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None
10. Did all containers arrive in good condition (unbroken)? YES...NO...NA
11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA
12. Did all container labels and tags agree with custody papers? YES...NO...NA
13. a. Were VOA vials received? YES...NO...NA

    b. Was there observable headspace present in any VOA vial (>5mm-6mm)? YES...NO...NA

14. Was there a Trip Blank in this cooler (custody seals present/intact)? YES...NO...NA...Comments headspace present
    If multiple coolers, sequence # 1

    I certify that I unloaded the cooler and answered questions 7-14 (initial/date) JTG 3/7/15

15. a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

    b. Did the bottle labels indicate that the correct preservatives were used? YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

    I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial/date) JTG 3/7/15

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA
18. Did you sign the custody papers in the appropriate place? YES...NO...NA
19. Were correct containers used for the analysis requested? YES...NO...NA If not, PM notified? YES...NO...NA
20. Was sufficient amount of sample sent in each container? YES...NO...NA If not, PM notified? YES...NO...NA
21. Were there Non-Conformance issues at login? YES...NO...NCR#_____

I certify that I entered this project into LIMS and answered questions 17-21 (initial/date) JTG 3/7/15

I certify that I attached a label with the unique LIMS number to each container (initial/date) JTG 3/7/15

I certify that I notified the laboratory of any short holding time or RUSH parameters (initial/date) JTG 3/7/15

C:\Users\jgross\Desktop\Cooler Receipt Updated 2014.doc

II. EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

Cooler Received/Opened On: 03/07/15 @ 1015 Workorder# 1503039

1. Tracking # 5248 (last 4 digits, FedEx)

   Courier: FedEx

2. Temperature of rep. sample or temp blank when opened: -0.2 °C + correction factor(-0.0) = -0.2 °C

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES (NO)..NA

4. Were custody seals on outside of cooler? (YES)..NO...NA

   If yes, how many and where: 2 front + back

5. Were the seals intact, signed, and dated correctly? (YES)..NO...NA

6. Were custody papers inside cooler? (YES)..NO...NA

   I certify that I opened the cooler and answered questions 1-6 (initial/date) JTG 3/7/15

7. Were custody seals on containers: YES (NO) and Intact YES...NO...(NA)

   Were these signed and dated correctly? YES...NO...(NA)

8. Packing material used? (Bubblewrap) (Plastic bag) Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice (Ice-pack) Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? (YES)..NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? (YES)..NO...NA

12. Did all container labels and tags agree with custody papers? (YES)..NO...NA

13. a. Were VOA vials received? YES...(NO)..NA

    b. Was there observable headspace present in any VOA vial (>5mm-6mm)? YES...NO...(NA)

14. Was there a Trip Blank in this cooler (custody seals present/intact)? YES...(NO)..NA...Comments_____
    If multiple coolers, sequence # 2

    I certify that I unloaded the cooler and answered questions 7-14 (initial/date) JTG 3/7/15

15. a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? (YES)..NO...NA

    b. Did the bottle labels indicate that the correct preservatives were used? (YES)..NO...NA

16. Was residual chlorine present? YES...NO...(NA)

    I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial/date) JTG 3/7/15

17. Were custody papers properly filled out (ink, signed, etc)? (YES)..NO...NA

18. Did you sign the custody papers in the appropriate place? (YES)..NO...NA

19. Were correct containers used for the analysis requested? (YES)..NO...NA If not, PM notified? YES...NO...(NA)

20. Was sufficient amount of sample sent in each container? (YES)..NO...NA If not, PM notified? YES...NO...(NA)

21. Were there Non-Conformance issues at login? YES...(NO)..NCR#_____

I certify that I entered this project into LIMS and answered questions 17-21 (initial/date) JTG 3/7/15

I certify that I attached a label with the unique LIMS number to each container (initial/date) JTG 3/7/15

I certify that I notified the laboratory of any short holding time or RUSH parameters (initial/date) JTG 3/7/15

C:\Users\jgross\Desktop\Cooler Receipt Updated 2014.doc

II. EMPIRICAL LABORATORIES
COOLER RECEIPT FORM (Continued)

Workorder# 1503039

LIMS Data Entry Second Check

22. Cooler Receipt Form Issues reviewed and communicated to PM? YES...NO...NA

23. Client and Project verified to match the COC/CRF in LIMS Project Screen? YES...NO...NA

24. Following items verified to items verified to match the COC/CRF in LIMS Receipt Screen:

    a. Received Date/Received By YES...NO...NA

    b. TAT (COC specified different?) YES...NO...NA

    c. Shipping Container Temperatures (corrected temps) YES...NO ...NA

    d. Condition Items (seals, intact, labels, preservation, ROI) YES...NO...NA

25. Following LIMS Sample Information verified against COC for each sample:

    a. Name YES...NO...NA

    b. QC Source YES...NO...NA

    c. Matrix YES...NO...NA

    d. Sample Type YES...NO...NA

    e. Sampled Date/Time (Correct Time Zone) YES...NO...NA

    f. Work Analyses/Versions (if applicable) YES...NO...NA

    g. Sample Issues included in comments (limited volume, concentration warnings, etc.)? YES...NO...NA

    h. Unpreserved VOA holding time set to 7 days? YES...NO...NA

26. Containere consistent with tests requested? YES...NO...NA

27. Field data entered and matching COC? YES...NO...NA

I certify that I have verified the LIMS data entry and answered questions 23-27 above (initial/date): _____

Additional Details: ☆ Following sample vials have pea-size or larger headspace present:

- EVT3-106212-1 (3/4/15@1120) - 3 HCl pres. vials for VOC, 3 unpres. vials for EDB
- EVT3-106212-2 (3/4/15@1120) - 3 HCl pres. vials for VOC, 2 unpres. vials for EDB
- EVT3-106212-2 (3/4/15@1120) - 9 HCl pres. vials for VOC, 9 unpres. vials for EDB
- EVT3-106212-TB (3/4/15@0800) - 2 HCl pres. vial for VOC

II. EMPIRICAL LABORATORIES
COOLER RECEIPT FORM (Continued)

LIMS Data Entry Second Check Workorder# 15Ø3Ø39

22. Cooler Receipt Form Issues reviewed and communicated to PM? YES...NO...NA

23. Client and Project verified to match the COC/CRF in LIMS Project Screen? YES...NO...NA

24. Following items verified to items verified to match the COC/CRF in LIMS Receipt Screen:

    a. Received Date/Received By YES...NO...NA

    b. TAT (COC specified different?) YES...NO...NA

    c. Shipping Container Temperatures (corrected temps) YES...NO ...NA

    d. Condition Items (seals, intact, labels, preservation, ROI) YES...NO...NA

25. Following LIMS Sample Information verified against COC for each sample:

    a. Name YES...NO...NA

    b. QC Source YES...NO...NA

    c. Matrix YES...NO...NA

    d. Sample Type YES...NO...NA

    e. Sampled Date/Time (Correct Time Zone) YES...NO...NA

    f. Work Analyses/Versions (if applicable) YES...NO...NA

    g. Sample Issues included in comments (limited volume, concentration warnings, etc.)? YES...NO...NA

    h. Unpreserved VOA holding time set to 7 days? YES...NO...NA

26. Containers consistent with tests requested? YES...NO...NA

27. Field data entered and matching COC? YES...NO...NA

I certify that I have verified the LIMS data entry and answered questions 23-27 above (initial/date): TH 3/9/15

Additional Details:

☆ Following sample vials have pea-size or larger headspace present:

- EVT3-1Ø6212-1 (3/4/15@112Ø) - 3 HCl pres. vials for VOC, 3 unpres. vials for EDB
- EVT3-1Ø6212-2 (3/4/15@112Ø) - 3 HCl pres. vials for VOC, 2 unpres. vials for EDB
- EVT3-1Ø6212-2 (3/4/15@112Ø) - 9 HCl pres. vials for VOC, 9 unpres. vials for EDB
- EVT3-1Ø6212-TB (3/4/15@Ø8ØØ) - 2 HCl pres. vial for VOC

DoD ELAP QSM5.0, Certificate Number L2226
- Aqueous
- Non-aqueous
- Expires: 11/30/2015

State of Florida, Department of Health – NELAP, Lab ID: E87646
- Clean Water Act
- RCRA/CERCLA
- Expires: 06/30/2015

State of Georgia, Environmental Protection Agency – NELAP, Self Certification
- Expires: 06/30/2015

State of Illinois, Environmental Protection Agency – NELAP, Certificate Number: 003464
- Groundwater
- Solid and Hazardous Waste
- Expires: 09/13/2015

Commonwealth of Kentucky, Energy and Environment Cabinet – WWLCP, Laboratory Number: 98017
- Wastewater
- Expires: 12/31/2015

Commonwealth of Kentucky, Department of Environmental Protection – UST, Certificate Number: 77
- Aqueous
- Non-aqueous
- Expires: 06/30/2015

State of New Jersey, Department of Environmental Protection – NELAP Primary, Lab ID: TN473
- Water Pollution
- Solid and Hazardous Waste
- Expires: 06/30/2015

State of North Carolina, Department of Environment and Natural Resources - Certificate Number: 643
- Aqueous
- Non-aqueous
- Expires: 12/31/2015

State of North Dakota, Department of Health – NELAP, Certificate No.: R-204
- Aqueous
- Non-aqueous
- Expires: 06/30/2015

Commonwealth of Pennsylvania, Department of Environmental Protection – NELAP, Lab ID: 68-05374
- Aqueous
- Non-aqueous
- Expires: 10/31/2015

State of Texas, Commission on Environmental Quality – NELAP, Certificate Number: T104704307-15-11
- Aqueous
- Non-aqueous
- Expires: 12/31/2015

State of Utah, Department of Health – NELAP, Certificate Number: TN0042014-6
- Aqueous
- Non-aqueous
- Expires: 07/31/2015

Commonwealth of Virginia, Department of General Services – NELAP, Certificate Number: 7596, Lab ID: 460243
- Aqueous
- Non-aqueous
- Expires: 12/14/2015

State of Washington, Department of Ecology – NELAP, Lab ID: C934-15
- Groundwater
- Solid and Hazardous Waste
- Expires: 03/18/2016

APPENDIX C

KAFB-106212 Geotechnical Results

February 26, 2015

CB&I Federal Services, LLC
2440 Louisiana Blvd NE Ste. 300
Albuquerque, NM 87110

Amecfw Job # 14-519-00612

Attn: Todd Hiltunen

Project: KAFB-FFOR Excavation

Re: Hall Environmental Analysis Laboratory Test Results.

Abe Sandoval
Project Manager

AMEC Earth Environmental, Inc.
8519 Jefferson NE
Albuquerque, NM 87113
Tel (505) 821-1801
Fax (505) 821-7371

HALL
ENVIRONMENTAL
ANALYSIS
LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

February 25, 2015

Jason Olivar
AMEC
8519 Jefferson Street, NE
Albuquerque, NM 87113
TEL: (505) 821-1807
FAX (505) 821-7371

RE: 140705-106212-GEO

OrderNo.: 1502313

Dear Jason Olivar:

Hall Environmental Analysis Laboratory received 5 sample(s) on 2/6/2015 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: AMEC
Project: 140705-106212-GEO
Lab Order: 1502313

Lab ID: 1502313-001 **Collection Date:** 2/2/2015 4:20:00 PM
Client Sample ID: KAFB-106212-GEO-1 **Matrix:** SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
WALKLEY BLACK TOC/FOC/OM						Analyst: **SRM**	
FOC	ND	0.095		% C	1	2/9/2015 12:23:00 PM	17625
TOC	ND	0.12		% C	1	2/9/2015 12:23:00 PM	17625

Lab ID: 1502313-002 **Collection Date:** 2/4/2015 3:28:00 PM
Client Sample ID: KAFB-106212-GEO-2 **Matrix:** SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
WALKLEY BLACK TOC/FOC/OM						Analyst: **SRM**	
FOC	ND	0.095		% C	1	2/13/2015 12:32:00 PM	17744
TOC	ND	0.12		% C	1	2/13/2015 12:32:00 PM	17744

Lab ID: 1502313-003 **Collection Date:** 2/5/2015 1:00:00 PM
Client Sample ID: KAFB-106212-GEO-3 **Matrix:** SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
WALKLEY BLACK TOC/FOC/OM						Analyst: **SRM**	
FOC	ND	0.096		% C	1	2/13/2015 12:32:00 PM	17744
TOC	ND	0.12		% C	1	2/13/2015 12:32:00 PM	17744

Lab ID: 1502313-004 **Collection Date:** 2/4/2015 12:59:00 PM
Client Sample ID: KAFB-106212-GEO-5 **Matrix:** SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
WALKLEY BLACK TOC/FOC/OM						Analyst: **SRM**	
FOC	ND	0.099		% C	1	2/13/2015 12:32:00 PM	17744
TOC	ND	0.13		% C	1	2/13/2015 12:32:00 PM	17744

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Laboratory Report for Hall Environmental Analysis Laboratory

(1502313)

February 25, 2015

Daniel B. Stephens & Associates, Inc.

4400 Alameda Blvd. NE, Suite C • Albuquerque, New Mexico 87113

February 25, 2015

Andy Freeman
Hall Environmental Analysis Laboratory
4901 Hawkins NE, Suite D
Albuquerque, NM 87109
(505) 345-3975

Re: DBS&A Laboratory Report for the Hall Environmental Analysis Laboratory Project # 1502313 Samples

Dear Mr. Freeman:

Enclosed is the report for the Hall Environmental Analysis Laboratory Project # 1502313 samples. Please review this report and provide any comments as samples will be held for a maximum of 30 days. After 30 days samples will be returned or disposed of in an appropriate manner.

All testing results were evaluated subjectively for consistency and reasonableness, and the results appear to be reasonably representative of the material tested. However, DBS&A does not assume any responsibility for interpretations or analyses based on the data enclosed, nor can we guarantee that these data are fully representative of the undisturbed materials at the field site. We recommend that careful evaluation of these laboratory results be made for your particular application.

The testing utilized to generate the enclosed report employs methods that are standard for the industry. The results do not constitute a professional opinion by DBS&A, nor can the results affect any professional or expert opinions rendered with respect thereto by DBS&A. You have acknowledged that all the testing undertaken by us, and the report provided, constitutes mere test results using standardized methods, and cannot be used to disqualify DBS&A from rendering any professional or expert opinion, having waived any claim of conflict of interest by DBS&A.

We are pleased to provide this service to Hall Environmental Analysis Laboratory and look forward to future laboratory testing on other projects. If you have any questions about the enclosed data, please do not hesitate to call.

Sincerely,

DANIEL B. STEPHENS & ASSOCIATES, INC.
SOIL TESTING & RESEARCH LABORATORY

Joleen Hines

Joleen Hines
Laboratory Supervising Manager

Enclosure

Daniel B. Stephens & Associates, Inc.
Soil Testing & Research Laboratory
4400 Alameda Blvd. NE, Suite C 505-889-7752
Albuquerque, NM 871 FAX 505-889-0258

Summaries

Summary of Tests Performed

Laboratory Sample Number	Initial Soil Properties[1]			Saturated Hydraulic Conductivity[2]			Moisture Characteristics[3]								Particle Size[4]			Specific Gravity[5]		Air Perm-eability	Atterberg Limits	Proctor Compaction
	G	VM	VD	CH	FH	FW	HC	PP	FP	DPP	RH	EP	WHC	K_{unsat}	DS	WS	H	F	C			
1502313-001B																X	X					
1502313-001B (128 pcf)	X	X		X								X										
1502313-002B																X	X					
1502313-002B (109 pcf)	X	X		X								X										
1502313-003B																X	X					
1502313-003B (118 pcf)	X	X		X								X										
1502313-005A																X	X					
1502313-005A (115 pcf)	X	X		X								X										

[1] G = Gravimetric Moisture Content, VM = Volume Measurement Method, VD = Volume Displacement Method
[2] CH = Constant Head Rigid Wall, FH = Falling Head Rigid Wall, FW = Falling Head Rising Tail Flexible Wall
[3] HC = Hanging Column, PP = Pressure Plate, FP = Filter Paper, DPP = Dew Point Potentiometer, RH = Relative Humidity Box, EP = Effective Porosity, WHC = Water Holding Capacity, Kunsat = Calculated Unsaturated Hydraulic Conductivity
[4] DS = Dry Sieve, WS = Wet Sieve, H = Hydrometer
[5] F = Fine (<4.75mm), C = Coarse (>4.75mm)

Notes

Sample Receipt:
Four samples were hand delivered on February 10, 2015. Each sample was received as loose material in a 4" x 24" pvc sleeve, cut in half lengthwise, and wrapped with cellophane.

Sample Preparation and Testing Notes:
A portion of each sample was remolded to target a 'very dense' state. The actual dry density achieved (in pcf) was added to each sub-sample ID. These remolded sub-samples were subjected to initial properties testing and saturated hydraulic conductivity testing. Remaining sample material was used to perform the particle size analysis and dewpoint potentiometer portion of the effective porosity testing.

For consistency, the saturated hydraulic conductivity testing was performed using a rigid-wall method (ASTM D2434M) for all samples, since three of the samples were not cohesive enough to perform the requested flexible-wall method (ASTM D5084).

Material larger than 3/8" was removed from the bulk material prior to remolding the sub-samples. Oversize correction calculations are provided if the removed fraction was larger than 5% of the bulk sample mass.

Porosity calculations, and the particle diameter calculations in the hydrometer portion of the particle size analysis testing, are based on the use of an assumed specific gravity value of 2.65.

Summary of Sample Preparation/Volume Changes

	Target Remold Parameters[1]			Actual Remold Data				Volume Change Post Saturation[2]			
Sample Number	Moisture Content (%, g/g)	Dry Bulk Density (g/cm^3)	Dry Bulk Density (pcf)	Moisture Content (%, g/g)	Dry Bulk Density (g/cm^3)	Dry Bulk Density (pcf)	% of Target Density (%)	Dry Bulk Density (g/cm^3)	Dry Bulk Density (pcf)	% Volume Change (%)	% of Initial Density (%)
1502313-001B (128 pcf)	10.0	'Very Dense'	'Very Dense'	9.5	2.06	128	NA	2.06	128	---	100%
1502313-002B (109 pcf)	5.0	'Very Dense'	'Very Dense'	4.9	1.75	109	NA	1.75	109	---	100%
1502313-003B (118 pcf)	5.0	'Very Dense'	'Very Dense'	4.9	1.89	118	NA	1.89	118	---	100%
1502313-005A (115 pcf)	5.0	'Very Dense'	'Very Dense'	5.0	1.85	115	NA	1.85	115	---	100%

[1]Target Remold Parameters: Provided by the client. Each sample was hand compacted into a testing ring using a 'Very Dense' compactive effort, in an effort to mimic 'Very Dense' field density. The density of the sample effects the total and effective porosity determinations (provided later in this report).

[2]Volume Change Post Saturation: Volume change measurements were obtained after saturated hydraulic conductivity testing.

Notes:

"+" indicates sample swelling, "-" indicates sample settling, and "---" indicates no volume change occurred.

Summary of Initial Moisture Content, Dry Bulk Density Wet Bulk Density and Calculated Porosity

Sample Number	Moisture Content: As Received Gravimetric (%, g/g)	Moisture Content: As Received Volumetric (%, cm^3/cm^3)	Moisture Content: Remolded Gravimetric (%, g/g)	Moisture Content: Remolded Volumetric (%, cm^3/cm^3)	Dry Bulk Density (g/cm^3)	Wet Bulk Density (g/cm^3)	Calculated Porosity (%)
1502313-001B (128 pcf)	NA	NA	9.5	19.5	2.06	2.25	22.4
1502313-002B (109 pcf)	NA	NA	4.9	8.6	1.75	1.83	34.0
1502313-003B (118 pcf)	NA	NA	4.9	9.3	1.89	1.98	28.8
1502313-005A (115 pcf)	NA	NA	5.0	9.2	1.85	1.94	30.2

NA = Not analyzed

--- = This sample was not remolded

Summary of Saturated Hydraulic Conductivity Tests

Sample Number	K_{sat} (cm/sec)	Oversize Corrected K_{sat} (cm/sec)	Method of Analysis	
			Constant Head	Falling Head
1502313-001B (128 pcf)	2.4E-03	---	X	
1502313-002B (109 pcf)	2.6E-02	2.4E-02	X	
1502313-003B (118 pcf)	1.3E-02	1.0E-02	X	
1502313-005A (115 pcf)	2.3E-02	1.9E-02	X	

— = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NR = Not requested
NA = Not applicable

Summary of Moisture Retention (Effective Porosity)

Sample Number	Calculated Total Porosity (%, cm^3/cm^3)	-15 Bar Point Volumetric Water Content[1] (%, cm^3/cm^3)	Effective Porosity (%, cm^3/cm^3)	Oversize Corrected: Calculated Total Porosity (%, cm^3/cm^3)	Oversize Corrected: -15 Bar Point Volumetric Water Content (%, cm^3/cm^3)	Oversize Corrected: Effective Porosity (%, cm^3/cm^3)
1502313-001B (128 pcf)	22.4	5.9	16.5	---	---	---
1502313-002B (109 pcf)	34.0	3.5	30.5	32.2	3.3	28.9
1502313-003B (118 pcf)	28.8	3.1	25.7	24.6	2.7	22.0
1502313-005A (115 pcf)	30.2	3.6	26.6	25.7	3.1	22.7

1 = Volume adjusted, if applicable

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

NA = Not applicable

NR = Not requested

Summary of Particle Size Characteristics

Sample Number	d_{10} (mm)	d_{50} (mm)	d_{60} (mm)	C_u	C_c	Method	ASTM Classification	USDA Classification
1502313-001B	0.0040	0.19	0.27	68	4.4	WS/H	Classification by ASTM 2487 requires Atterberg test	Sandy Loam
1502313-002B	0.18	0.55	0.65	3.6	1.2	WS/H	Poorly-graded sand (SP)	Sand †
1502313-003B	0.17	2.0	3.5	21	0.53	WS/H	Poorly-graded sand with gravel (SP)g	Sand †
1502313-005A	0.27	1.4	2.1	7.8	0.79	WS/H	Classification by ASTM 2487 requires Atterberg test	Sand †

d_{50} = Median particle diameter

Est = Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

$$C_u = \frac{d_{60}}{d_{10}}$$

$$C_c = \frac{(d_{30})^2}{(d_{10})(d_{60})}$$

DS = Dry sieve

H = Hydrometer

WS = Wet sieve

† Greater than 10% of sample is coarse material

Percent Gravel, Sand, Silt and Clay*

Sample Number	% Gravel (>4.75mm)	% Sand (<4.75mm, >0.075mm)	% Silt (<0.075mm, >0.002mm)	% Clay (<0.002mm)
1502313-001B	0.7	67.8	24.5	7.0
1502313-002B	10.7	84.9	2.1	2.3
1502313-003B	34.1	61.0	3.7	1.3
1502313-005A	29.2	65.0	4.0	1.8

*USCS classification does not classify clay fraction based on particle size. USDA definition of clay (<0.002mm) used in this table.

Initial Properties

Summary of Initial Moisture Content, Dry Bulk Density Wet Bulk Density and Calculated Porosity

Sample Number	Moisture Content				Dry Bulk Density (g/cm^3)	Wet Bulk Density (g/cm^3)	Calculated Porosity (%)
	As Received		Remolded				
	Gravimetric (%, g/g)	Volumetric (%, cm^3/cm^3)	Gravimetric (%, g/g)	Volumetric (%, cm^3/cm^3)			
1502313-001B (128 pcf)	NA	NA	9.5	19.5	2.06	2.25	22.4
1502313-002B (109 pcf)	NA	NA	4.9	8.6	1.75	1.83	34.0
1502313-003B (118 pcf)	NA	NA	4.9	9.3	1.89	1.98	28.8
1502313-005A (115 pcf)	NA	NA	5.0	9.2	1.85	1.94	30.2

NA = Not analyzed

--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Hall Environmental Analysis Labortory
Job Number: NM15.0026.00
Sample Number: 1502313-001B (128 pcf)
Project: Kirtland
Client Sample ID: KAFB106212-GEO-001

	As Received	Remolded
Test Date:	NA	17-Feb-15
Field weight of sample* (g):		936.33
Tare weight, ring (g):		214.81
Tare weight, pan/plate (g):		0.00
Tare weight, other (g):		0.00
Dry weight of sample (g):		659.01
Sample volume (cm^3):		320.65
Assumed particle density (g/cm^3):		2.65
Gravimetric Moisture Content (% g/g):		9.5
Volumetric Moisture Content (% vol):		19.5
Dry bulk density (g/cm^3):		2.06
Wet bulk density (g/cm^3):		2.25
Calculated Porosity (% vol):		22.4
Percent Saturation:		86.9

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Hall Environmental Analysis Labortory
Job Number: NM15.0026.00
Sample Number: 1502313-002B (109 pcf)
Project: Kirtland
Client Sample ID: KAFB106212-GEO-002

	As Received	Remolded
Test Date:	NA	17-Feb-15
Field weight of sample* (g):		805.11
Tare weight, ring (g):		215.67
Tare weight, pan/plate (g):		0.00
Tare weight, other (g):		0.00
Dry weight of sample (g):		561.80
Sample volume (cm^3):		321.29
Assumed particle density (g/cm^3):		2.65
Gravimetric Moisture Content (% g/g):		4.9
Volumetric Moisture Content (% vol):		8.6
Dry bulk density (g/cm^3):		1.75
Wet bulk density (g/cm^3):		1.83
Calculated Porosity (% vol):		34.0
Percent Saturation:		25.3

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Hall Environmental Analysis Labortory
Job Number: NM15.0026.00
Sample Number: 1502313-003B (118 pcf)
Project: Kirtland
Client Sample ID: KAFB106212-GEO-003

	As Received	Remolded
Test Date:	NA	17-Feb-15
Field weight of sample* (g):		813.82
Tare weight, ring (g):		164.51
Tare weight, pan/plate (g):		0.00
Tare weight, other (g):		0.00
Dry weight of sample (g):		618.88
Sample volume (cm^3):		328.14
Assumed particle density (g/cm^3):		2.65
Gravimetric Moisture Content (% g/g):		4.9
Volumetric Moisture Content (% vol):		9.3
Dry bulk density (g/cm^3):		1.89
Wet bulk density (g/cm^3):		1.98
Calculated Porosity (% vol):		28.8
Percent Saturation:		32.2

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Hall Environmental Analysis Labortory
Job Number: NM15.0026.00
Sample Number: 1502313-005A (115 pcf)
Project: Kirtland
Client Sample ID: KAFB106212-GEO-004

	As Received	Remolded
Test Date:	NA	17-Feb-15
Field weight of sample* (g):		835.84
Tare weight, ring (g):		215.63
Tare weight, pan/plate (g):		0.00
Tare weight, other (g):		0.00
Dry weight of sample (g):		590.89
Sample volume (cm^3):		319.57
Assumed particle density (g/cm^3):		2.65
Gravimetric Moisture Content (% g/g):		5.0
Volumetric Moisture Content (% vol):		9.2
Dry bulk density (g/cm^3):		1.85
Wet bulk density (g/cm^3):		1.94
Calculated Porosity (% vol):		30.2
Percent Saturation:		30.4

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Saturated Hydraulic Conductivity

Summary of Saturated Hydraulic Conductivity Tests

Sample Number	K_{sat} (cm/sec)	Oversize Corrected K_{sat} (cm/sec)	Method of Analysis	
			Constant Head	Falling Head
1502313-001B (128 pcf)	2.4E-03	---	X	
1502313-002B (109 pcf)	2.6E-02	2.4E-02	X	
1502313-003B (118 pcf)	1.3E-02	1.0E-02	X	
1502313-005A (115 pcf)	2.3E-02	1.9E-02	X	

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NR = Not requested
NA = Not applicable

Saturated Hydraulic Conductivity
Constant Head Method

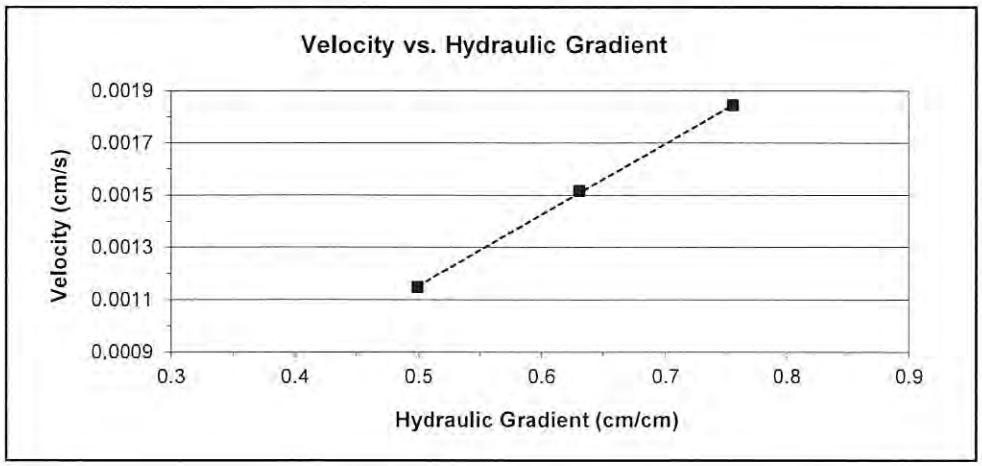
Job Name: Hall Environmental Analysis Labortory
Job Number: NM15.0026.00
Sample Number: 1502313-001B (128 pcf)
Project: Kirtland
Client Sample ID: KAFB106212-GEO-001

Type of water used: TAP
Collection vessel tare (g)*:* 10.97
Sample length (cm)*:* 7.61
Sample diameter (cm)*:* 7.33
Sample x-sectional area (cm^2)*:* 42.14

Date	Time	Temp (°C)	Head (cm)	Q + Tare (g)	Q (cm^3)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:								
20-Feb-15	10:22:00	19.0	5.75	15.63	4.7	60	2.4E-03	2.5E-03
20-Feb-15	10:23:00							
Test # 2:								
20-Feb-15	10:39:30	19.0	4.8	14.80	3.8	60	2.4E-03	2.5E-03
20-Feb-15	10:40:30							
Test # 3:								
20-Feb-15	10:56:00	19.0	3.8	13.87	2.9	60	2.3E-03	2.4E-03
20-Feb-15	10:57:00							

Average Ksat* (cm/sec)*: **2.4E-03**
Oversize Corrected Ksat* (cm/sec)*: **---**

Comments:
— = Oversize correction is unnecessary since coarse fraction < 5% of composite mass



Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Saturated Hydraulic Conductivity
Constant Head Method

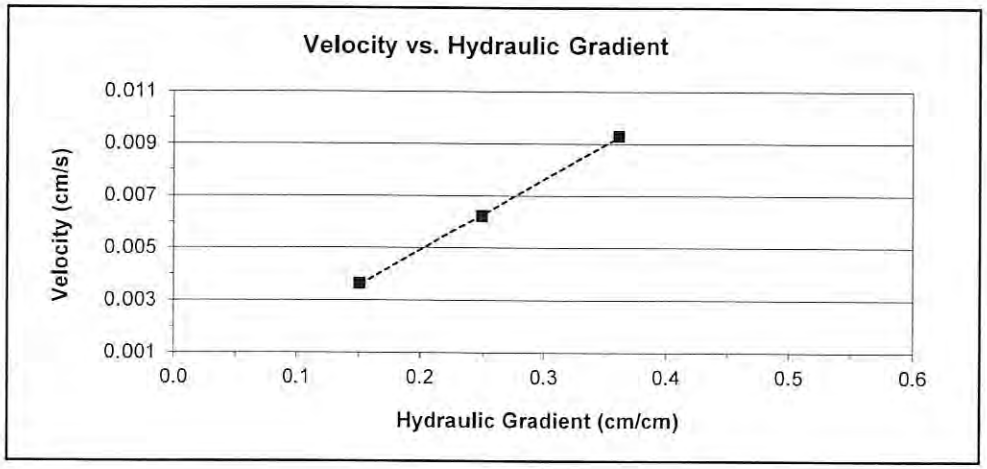
Job Name: Hall Environmental Analysis Labortory
Job Number: NM15.0026.00
Sample Number: 1502313-002B (109 pcf)
Project: Kirtland
Client Sample ID: KAFB106212-GEO-002

Type of water used: TAP
Collection vessel tare (g): 10.89
Sample length (cm): 7.62
Sample diameter (cm): 7.33
Sample x-sectional area (cm^2): 42.18

Date	Time	Temp (°C)	Head (cm)	Q + Tare (g)	Q (cm^3)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:								
20-Feb-15	10:20:00	19.0	2.75	34.38	23.5	60	2.6E-02	2.6E-02
20-Feb-15	10:21:00							
Test # 2:								
20-Feb-15	10:37:30	19.0	1.9	26.62	15.7	60	2.5E-02	2.6E-02
20-Feb-15	10:38:30							
Test # 3:								
20-Feb-15	10:54:00	19.0	1.15	20.05	9.2	60	2.4E-02	2.5E-02
20-Feb-15	10:55:00							

***Average Ksat* (cm/sec):** **2.6E-02**
***Oversize Corrected Ksat* (cm/sec):** **2.4E-02**

Comments:
— = Oversize correction is unnecessary since coarse fraction < 5% of composite mass



Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Oversize Correction Data Sheet

Job Name: Hall Environmental Analysis Labortory
Job Number: NM15.0026.00
Sample Number: 1502313-002B (109 pcf)
Project: Kirtland
Client Sample ID: KAFB106212-GEO-002

Split (3/4", 3/8", #4): 3/8
Calculated Porosity of Fines (% vol): 34.0

	Coarse Fraction*	Fines Fraction	Composite
Subsample Mass (g):	32.59	379.74	412.33
Bulk Density (g/cm^3):	2.65	1.75	1.80
Volume of Solids (cm^3):	12.30	143.30	155.60
Volume of Voids (cm^3):	0.00	73.88	73.88
Total Volume (cm^3):	12.30	217.17	229.47
Volumetric Fraction (%):	5.36	94.64	100.00
Mass Fraction (%):	7.90	92.10	100.00
Ksat (cm/sec):	NM	2.6E-02	2.4E-02

* = Porosity and moisture content of coarse fraction assumed to be zero.
— = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NM = Not measured

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Saturated Hydraulic Conductivity
Constant Head Method

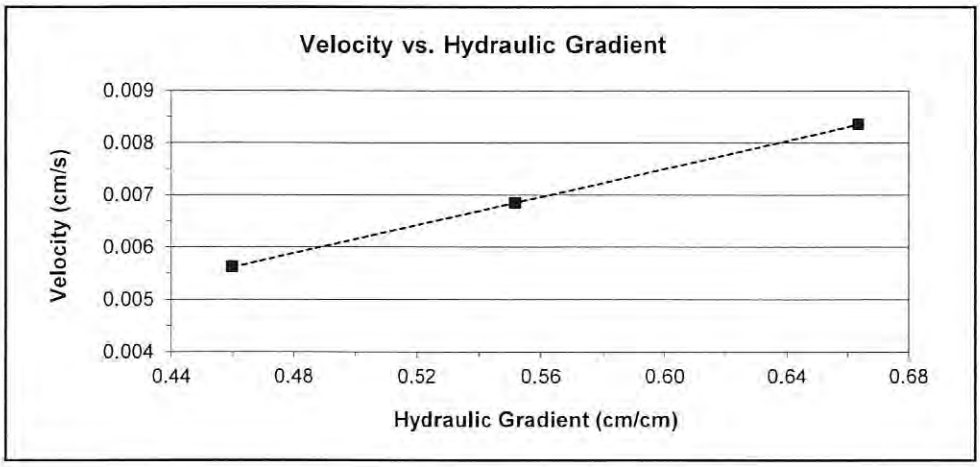
Job Name: Hall Environmental Analysis Labortory
Job Number: NM15.0026.00
Sample Number: 1502313-003B (118 pcf)
Project: Kirtland
Client Sample ID: KAFB106212-GEO-003

Type of water used: TAP
Collection vessel tare (g): 11.00
Sample length (cm): 7.61
Sample diameter (cm): 7.41
Sample x-sectional area (cm^2): 43.12

Date	Time	Temp (°C)	Head (cm)	Q + Tare (g)	Q (cm^3)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:								
20-Feb-15	10:20:30	19.0	5.05	32.61	21.6	60	1.3E-02	1.3E-02
20-Feb-15	10:21:30							
Test # 2:								
20-Feb-15	10:38:00	19.0	4.2	28.71	17.7	60	1.2E-02	1.3E-02
20-Feb-15	10:39:00							
Test # 3:								
20-Feb-15	10:54:30	19.0	3.5	25.53	14.5	60	1.2E-02	1.3E-02
20-Feb-15	10:55:30							

***Average Ksat* (cm/sec):** **1.3E-02**
***Oversize Corrected Ksat* (cm/sec):** **1.0E-02**

Comments:
— = Oversize correction is unnecessary since coarse fraction < 5% of composite mass



Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Oversize Correction Data Sheet

Job Name: Hall Environmental Analysis Labortory
Job Number: NM15.0026.00
Sample Number: 1502313-003B (118 pcf)
Project: Kirtland
Client Sample ID: KAFB106212-GEO-003

Split (3/4", 3/8", #4): 3/8
Calculated Porosity of Fines (% vol): 28.8

	Coarse Fraction*	Fines Fraction	Composite
Subsample Mass (g):	186.48	781.07	967.55
Bulk Density (g/cm^3):	2.65	1.89	2.00
Volume of Solids (cm^3):	70.37	294.74	365.11
Volume of Voids (cm^3):	0.00	119.39	119.39
Total Volume (cm^3):	70.37	414.13	484.50
Volumetric Fraction (%):	14.52	85.48	100.00
Mass Fraction (%):	19.27	80.73	100.00
Ksat (cm/sec):	NM	1.3E-02	1.0E-02

* = Porosity and moisture content of coarse fraction assumed to be zero.
— = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NM = Not measured

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Constant Head Method

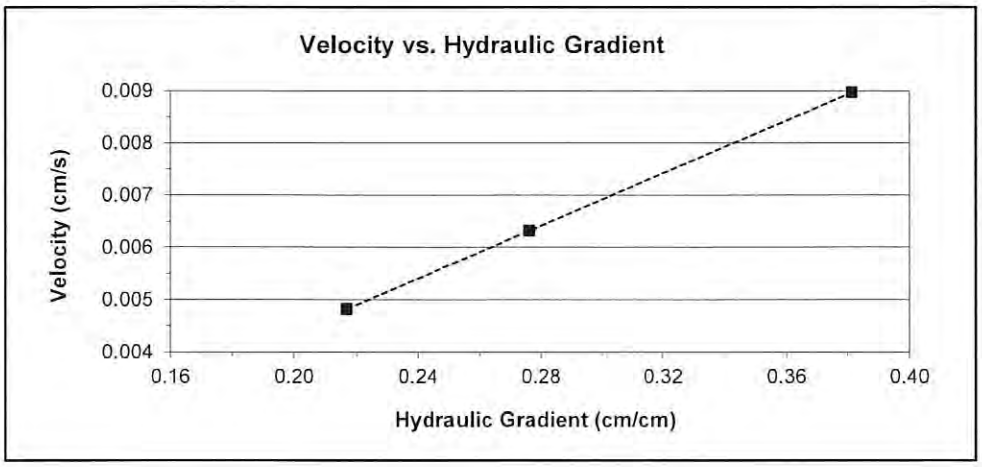
Job Name: Hall Environmental Analysis Labortory
Job Number: NM15.0026.00
Sample Number: 1502313-005A (115 pcf)
Project: Kirtland
Client Sample ID: KAFB106212-GEO-004

Type of water used: TAP
Collection vessel tare (g): 10.94
Sample length (cm): 7.60
Sample diameter (cm): 7.32
Sample x-sectional area (cm^2): 42.05

Date	Time	Temp (°C)	Head (cm)	Q + Tare (g)	Q (cm^3)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:								
20-Feb-15	10:22:30	19.0	2.9	33.56	22.6	60	2.3E-02	2.4E-02
20-Feb-15	10:23:30							
Test # 2:								
20-Feb-15	10:40:00	19.0	2.1	26.86	15.9	60	2.3E-02	2.3E-02
20-Feb-15	10:41:00							
Test # 3:								
20-Feb-15	10:56:30	19.0	1.65	23.09	12.2	60	2.2E-02	2.3E-02
20-Feb-15	10:57:30							

***Average Ksat* (cm/sec):** **2.3E-02**
***Oversize Corrected Ksat* (cm/sec):** **1.9E-02**

Comments:
— = Oversize correction is unnecessary since coarse fraction < 5% of composite mass



Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Oversize Correction Data Sheet

Job Name: Hall Environmental Analysis Labortory
Job Number: NM15.0026.00
Sample Number: 1502313-005A (115 pcf)
Project: Kirtland
Client Sample ID: KAFB106212-GEO-004

Split (3/4", 3/8", #4): 3/8
Calculated Porosity of Fines (% vol)*:* 30.2

	Coarse Fraction*	Fines Fraction	Composite
Subsample Mass (g)*:*	250.28	999.94	1250.22
Bulk Density (g/cm^3)*:*	2.65	1.85	1.97
Volume of Solids (cm^3)*:*	94.45	377.34	471.78
Volume of Voids (cm^3)*:*	0.00	163.46	163.46
Total Volume (cm^3)*:*	94.45	540.80	635.25
Volumetric Fraction (%)*:*	14.87	85.13	100.00
Mass Fraction (%)*:*	20.02	79.98	100.00
Ksat (cm/sec)*:*	NM	2.3E-02	1.9E-02

* = Porosity and moisture content of coarse fraction assumed to be zero.
— = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NM = Not measured

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Effective Porosity

Summary of Moisture Retention (Effective Porosity)

Sample Number	Calculated Total Porosity (%, cm^3/cm^3)	-15 Bar Point Volumetric Water Content[1] (%, cm^3/cm^3)	Effective Porosity (%, cm^3/cm^3)	Oversize Corrected: Calculated Total Porosity (%, cm^3/cm^3)	Oversize Corrected: -15 Bar Point Volumetric Water Content (%, cm^3/cm^3)	Oversize Corrected: Effective Porosity (%, cm^3/cm^3)
1502313-001B (128 pcf)	22.4	5.9	16.5	---	---	---
1502313-002B (109 pcf)	34.0	3.5	30.5	32.2	3.3	28.9
1502313-003B (118 pcf)	28.8	3.1	25.7	24.6	2.7	22.0
1502313-005A (115 pcf)	30.2	3.6	26.6	25.7	3.1	22.7

1 = Volume adjusted, if applicable

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

NA = Not applicable

NR = Not requested

Moisture Retention Data

Dew Point Potentiometer

(Effective Porosity)

Job Name: Hall Environmental Analysis Labortory
Job Number: NM15.0026.00
Sample Number: 1502313-001B (128 pcf)
Project: Kirtland
Client Sample ID: KAFB106212-GEO-001

Initial sample calculated total porosity (cm^3): 22.44
Assumed particle density (g/cm^3): 2.65

Initial sample bulk density (g/cm^3): 2.06
Fraction of bulk sample used (<2.00mm fraction) (%): 94.74

Dry weight of dew point potentiometer sample* (g): 171.04
Tare weight, jar (g): 113.14

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content† (% vol)
Dew point potentiometer:	19-Feb-15	14:05	172.85	13971	6.09
	19-Feb-15	15:40	172.71	17643	5.62

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	13971	---	---	---	---
	17643	---	---	---	---

Moisture content at -15 bars (% cm^3/cm^3): 5.9

***Effective Porosity* (% cm^3/cm^3):** **16.5**
***Oversize Corrected Effective Porosity* (% cm^3/cm^3):** **NA**

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the saturation point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '—' denotes no volume change occurred.

* Weight including tares

† Adjusted for >2.00mm (#10 sieve) material not used in DPP testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

NA Not Applicable

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Dew Point Potentiometer

(Effective Porosity)

Job Name: Hall Environmental Analysis Labortory
Job Number: NM15.0026.00
Sample Number: 1502313-002B (109 pcf)
Project: Kirtland
Client Sample ID: KAFB106212-GEO-002

Initial sample calculated total porosity (cm^3): 34.02
Assumed particle density (g/cm^3): 2.65

Initial sample bulk density (g/cm^3): 1.75
Fraction of bulk sample used (<2.00mm fraction) (%): 93.74

Dry weight of dew point potentiometer sample* (g): 190.67
Tare weight, jar (g): 110.57

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content† (% vol)
Dew point potentiometer:	19-Feb-15	15:48	192.44	12849	3.62
	19-Feb-15	15:30	192.34	17031	3.42

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	12849	---	---	---	---
	17031	---	---	---	---

Moisture content at -15 bars (% cm^3/cm^3): 3.5

***Effective Porosity* (% cm^3/cm^3):** **30.5**

***Oversize Corrected Effective Porosity* (% cm^3/cm^3):** **28.9**

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the saturation point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Adjusted for >2.00mm (#10 sieve) material not used in DPP testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

NA Not Applicable

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Oversize Correction Data Sheet

Job Name:	Hall Environmental Analysis Labortory
Job Number:	NM15.0026.00
Sample Number:	1502313-002B (109 pcf)
Project:	Kirtland
Client Sample ID:	KAFB106212-GEO-002
Split (3/4", 3/8", #4):	3/8"

	Coarse Fraction*	Fines Fraction**	Composite
Subsample Mass (g):	32.59	379.74	412.33
Mass Fraction (%):	7.90	92.10	100.00
Initial Sample			
Bulk Density (g/cm^3):	2.65	1.75	1.80
Calculated Porosity (% vol):	0.00	34.02	32.19
Volume of Solids (cm^3):	12.30	143.30	155.60
Volume of Voids (cm^3):	0.00	73.88	73.88
Total Volume (cm^3):	12.30	217.17	229.47
Volumetric Fraction (%):	5.36	94.64	100.00
Initial Moisture Content (% vol):	0.00	8.60	8.14
Sample at -15 Bar			
Bulk Density (g/cm^3):	2.65	1.75	1.80
Calculated Porosity (% vol):	0.00	34.02	32.19
Volume of Solids (cm^3):	12.30	143.30	155.60
Volume of Voids (cm^3):	0.00	73.88	73.88
Total Volume (cm^3):	12.30	217.17	229.47
Volumetric Fraction (%):	5.36	94.64	100.00
Moisture Content (% vol):	0.00	3.50	3.31
Ksat (cm/sec):	NA	2.6E-02	2.4E-02

NA = Not analyzed

* = Porosity and moisture content of coarse fraction assumed to be zero, and coarse fraction bulk density assumed to be equal to particle density.

** = Volume adjusted, if applicable.

Laboratory analysis by:	D. O'Dowd
Data entered by:	C. Krous
Checked by:	J. Hines

Moisture Retention Data

Dew Point Potentiometer

(Effective Porosity)

Job Name: Hall Environmental Analysis Labortory
Job Number: NM15.0026.00
Sample Number: 1502313-003B (118 pcf)
Project: Kirtland
Client Sample ID: KAFB106212-GEO-003

Initial sample calculated total porosity (cm^3): 28.83
Assumed particle density (g/cm^3): 2.65

Initial sample bulk density (g/cm^3): 1.89
Fraction of bulk sample used (<2.00mm fraction) (%): 61.74

Dry weight of dew point potentiometer sample* (g): 197.25
Tare weight, jar (g): 116.59

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content† (% vol)
Dew point potentiometer:	19-Feb-15	15:45	199.41	15195	3.12
	19-Feb-15	14:55	199.26	20090	2.90

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	15195	---	---	---	---
	20090	---	---	---	---

Moisture content at -15 bars (% cm^3/cm^3): 3.1

***Effective Porosity* (% cm^3/cm^3):** **25.7**

***Oversize Corrected Effective Porosity* (% cm^3/cm^3):** **22.0**

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the saturation point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Adjusted for >2.00mm (#10 sieve) material not used in DPP testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

NA Not Applicable

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Oversize Correction Data Sheet

Job Name:	Hall Environmental Analysis Labortory
Job Number:	NM15.0026.00
Sample Number:	1502313-003B (118 pcf)
Project:	Kirtland
Client Sample ID:	KAFB106212-GEO-003
Split (3/4", 3/8", #4):	3/8"

	Coarse Fraction*	Fines Fraction**	Composite
Subsample Mass (g):	186.48	781.07	967.55
Mass Fraction (%):	19.27	80.73	100.00
Initial Sample			
Bulk Density (g/cm^3):	2.65	1.89	2.00
Calculated Porosity (% vol):	0.00	28.83	24.64
Volume of Solids (cm^3):	70.37	294.74	365.11
Volume of Voids (cm^3):	0.00	119.39	119.39
Total Volume (cm^3):	70.37	414.13	484.50
Volumetric Fraction (%):	14.52	85.48	100.00
Initial Moisture Content (% vol):	0.00	9.27	7.93
Sample at -15 Bar			
Bulk Density (g/cm^3):	2.65	1.89	2.00
Calculated Porosity (% vol):	0.00	28.83	24.64
Volume of Solids (cm^3):	70.37	294.74	365.11
Volume of Voids (cm^3):	0.00	119.39	119.39
Total Volume (cm^3):	70.37	414.13	484.50
Volumetric Fraction (%):	14.52	85.48	100.00
Moisture Content (% vol):	0.00	3.11	2.66
Ksat (cm/sec):	NA	1.3E-02	1.0E-02

NA = Not analyzed

* = Porosity and moisture content of coarse fraction assumed to be zero, and coarse fraction bulk density assumed to be equal to particle density.

** = Volume adjusted, if applicable.

Laboratory analysis by:	D. O'Dowd
Data entered by:	C. Krous
Checked by:	J. Hines

Moisture Retention Data

Dew Point Potentiometer

(Effective Porosity)

Job Name: Hall Environmental Analysis Labortory
Job Number: NM15.0026.00
Sample Number: 1502313-005A (115 pcf)
Project: Kirtland
Client Sample ID: KAFB106212-GEO-004

Initial sample calculated total porosity (cm^3): 30.23
Assumed particle density (g/cm^3): 2.65

Initial sample bulk density (g/cm^3): 1.85
Fraction of bulk sample used (<2.00mm fraction) (%): 73.85

Dry weight of dew point potentiometer sample* (g): 177.45
Tare weight, jar (g): 116.15

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content† (% vol)
Dew point potentiometer:	19-Feb-15	15:05	179.07	15297	3.61

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	15297	---	---	---	---

Moisture content at -15 bars (% cm^3/cm^3): 3.6

***Effective Porosity* (% cm^3/cm^3):** **26.6**
***Oversize Corrected Effective Porosity* (% cm^3/cm^3):** **22.7**

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the pressure plate point. "---" indicates no volume changes occurred.

[2] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the saturation point. "---" indicates no volume changes occurred.

* Weight including tares

† Adjusted for >2.00mm (#10 sieve) material not used in DPP testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

NA Not Applicable

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Oversize Correction Data Sheet

Job Name:	Hall Environmental Analysis Labortory
Job Number:	NM15.0026.00
Sample Number:	1502313-005A (115 pcf)
Project:	Kirtland
Client Sample ID:	KAFB106212-GEO-004
Split (3/4", 3/8", #4):	3/8"

	Coarse Fraction*	Fines Fraction**	Composite
Subsample Mass (g):	250.28	999.94	1250.22
Mass Fraction (%):	20.02	79.98	100.00
Initial Sample			
Bulk Density (g/cm^3):	2.65	1.85	1.97
Calculated Porosity (% vol):	0.00	30.23	25.73
Volume of Solids (cm^3):	94.45	377.34	471.78
Volume of Voids (cm^3):	0.00	163.46	163.46
Total Volume (cm^3):	94.45	540.80	635.25
Volumetric Fraction (%):	14.87	85.13	100.00
Initial Moisture Content (% vol):	0.00	9.17	7.81
Sample at -15 Bar			
Bulk Density (g/cm^3):	2.65	1.85	1.97
Calculated Porosity (% vol):	0.00	30.23	25.73
Volume of Solids (cm^3):	94.45	377.34	471.78
Volume of Voids (cm^3):	0.00	163.46	163.46
Total Volume (cm^3):	94.45	540.80	635.25
Volumetric Fraction (%):	14.87	85.13	100.00
Moisture Content (% vol):	0.00	3.61	3.07
Ksat (cm/sec):	NA	2.3E-02	1.9E-02

NA = Not analyzed

* = Porosity and moisture content of coarse fraction assumed to be zero, and coarse fraction bulk density assumed to be equal to particle density.

** = Volume adjusted, if applicable.

Laboratory analysis by:	D. O'Dowd
Data entered by:	C. Krous
Checked by:	J. Hines

Particle Size Analysis

Summary of Particle Size Characteristics

Sample Number	d_{10} (mm)	d_{50} (mm)	d_{60} (mm)	C_u	C_c	Method	ASTM Classification	USDA Classification
1502313-001B	0.0040	0.19	0.27	68	4.4	WS/H	Classification by ASTM 2487 requires Atterberg test	Sandy Loam
1502313-002B	0.18	0.55	0.65	3.6	1.2	WS/H	Poorly-graded sand (SP)	Sand †
1502313-003B	0.17	2.0	3.5	21	0.53	WS/H	Poorly-graded sand with gravel (SP)g	Sand †
1502313-005A	0.27	1.4	2.1	7.8	0.79	WS/H	Classification by ASTM 2487 requires Atterberg test	Sand †

d_{50} = Median particle diameter

Est = Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

$$C_u = \frac{d_{60}}{d_{10}}$$

$$C_c = \frac{(d_{30})^2}{(d_{10})(d_{60})}$$

DS = Dry sieve

H = Hydrometer

WS = Wet sieve

† Greater than 10% of sample is coarse material

Percent Gravel, Sand, Silt and Clay*

Sample Number	% Gravel (>4.75mm)	% Sand (<4.75mm, >0.075mm)	% Silt (<0.075mm, >0.002mm)	% Clay (<0.002mm)
1502313-001B	0.7	67.8	24.5	7.0
1502313-002B	10.7	84.9	2.1	2.3
1502313-003B	34.1	61.0	3.7	1.3
1502313-005A	29.2	65.0	4.0	1.8

*USCS classification does not classify clay fraction based on particle size. USDA definition of clay (<0.002mm) used in this table.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Hall Environmental Analysis Labortory
Job Number: NM15.0026.00
Sample Number: 1502313-001B
Project: Kirtland
Client Sample ID: KAFB106212-GEO-001
Test Date: 23-Feb-15

Initial Dry Weight of Sample (g): 423.15
Weight Passing #10 (g): 400.91
Weight Retained #10 (g): 22.24
Weight of Hydrometer Sample (g): 71.51
Calculated Weight of Sieve Sample (g): 75.48

Shape: Rounded
Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	423.15	100.00
	2"	50	0.00	0.00	423.15	100.00
	1.5"	38.1	0.00	0.00	423.15	100.00
	1"	25	0.00	0.00	423.15	100.00
	3/4"	19.0	0.00	0.00	423.15	100.00
	3/8"	9.5	0.00	0.00	423.15	100.00
	4	4.75	2.99	2.99	420.16	99.29
	10	2.00	19.25	22.24	400.91	94.74
-10			(Based on calculated sieve wt.)			
	20	0.85	6.10	10.07	65.41	86.66
	40	0.425	9.80	19.87	55.61	73.68
	60	0.250	12.12	31.99	43.49	57.62
	140	0.106	16.99	48.98	26.50	35.11
	200	0.075	2.70	51.68	23.80	31.53
	dry pan		0.39	52.07	23.41	
	wet pan			23.41	0.00	

d_{10} (mm): 0.0040 d_{50} (mm): 0.19
d_{16} (mm): 0.011 d_{60} (mm): 0.27
d_{30} (mm): 0.069 d_{84} (mm): 0.74

Median Particle Diameter--d_{50} (mm): 0.19
Uniformity Coefficient, Cu--$[d_{60}/d_{10}]$ (mm): 68
Coefficient of Curvature, Cc--$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 4.4
Mean Particle Diameter--$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.31

ASTM Soil Classification: Classification by ASTM 2487 requires Atterberg test
USDA Soil Classification: Sandy Loam

Laboratory analysis by: E. Bastien
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Hall Environmental Analysis Labortory
Job Number: NM15.0026.00
Sample Number: 1502313-001B
Project: Kirtland
Client Sample ID: KAFB106212-GEO-001

Test Date: 19-Feb-15
Start Time: 9:00

Type of Water Used: DISTILLED
Reaction with H_2O_2: NAq
Dispersant:* $(NaPO_3)_6$
Assumed particle density: 2.65

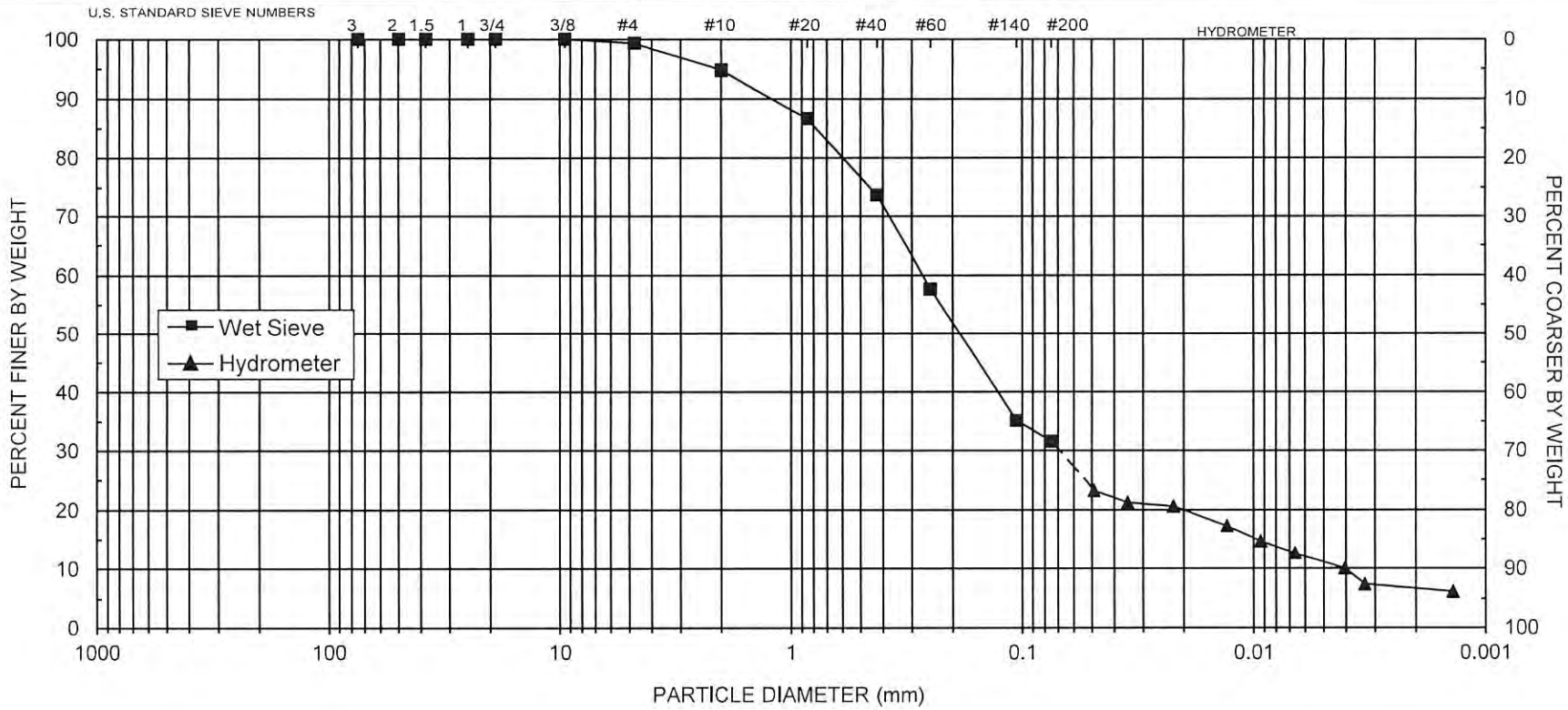
Initial Wt. (g): 71.51
Total Sample Wt. (g): 423.15
Wt. Passing #10 (g): 400.91

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
19-Feb-15	1	18.4	24.0	6.5	17.5	12.4	0.04891	24.5	23.2
	2	18.4	22.5	6.5	16.0	12.6	0.03493	22.4	21.2
	5	18.4	22.0	6.5	15.5	12.7	0.02216	21.7	20.5
	15	18.4	19.5	6.5	13.0	13.1	0.01300	18.2	17.2
	30	18.4	17.5	6.5	11.0	13.4	0.00931	15.4	14.6
	60	18.5	16.0	6.5	9.5	13.7	0.00663	13.3	12.6
	165	18.6	14.0	6.5	7.6	14.0	0.00404	10.6	10.0
	250	18.7	12.0	6.4	5.6	14.3	0.00332	7.8	7.4
20-Feb-15	1444	19.0	11.0	6.4	4.6	14.5	0.00138	6.4	6.1

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: N. Candelaria
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY	
		Coarse	Fine	Coarse	Medium	Fine		
USDA	COBBLES	GRAVEL		SAND			SILT	CLAY
				Very coarse	Coarse	Medium	Fine	Very fine

d_{10} = **0.0040**	d_{30} = **0.069**	d_{50} = **0.19**	d_{60} = **0.27**	C_u = **68**	C_c = **4.4**

SAMPLE NUMBER	CLIENT SAMPLE ID	ASTM CLASSIFICATION	USDA CLASSIFICATION
1502313-001B	**KAFB106212-GEO-001**	**Classification by ASTM 2487 requires Atterberg test**	**Sandy Loam**

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Hall Environmental Analysis Labortory
Job Number: NM15.0026.00
Sample Number: 1502313-002B
Project: Kirtland
Client Sample ID: KAFB106212-GEO-002
Test Date: 23-Feb-15

Initial Dry Weight of Sample (g): 412.33
Weight Passing #10 (g): 355.95
Weight Retained #10 (g): 56.38
Weight of Hydrometer Sample (g): 83.09
Calculated Weight of Sieve Sample (g): 96.25

Shape: Angular
Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	412.33	100.00
	2"	50	0.00	0.00	412.33	100.00
	1.5"	38.1	0.00	0.00	412.33	100.00
	1"	25	0.00	0.00	412.33	100.00
	3/4"	19.0	22.93	22.93	389.40	94.44
	3/8"	9.5	9.66	32.59	379.74	92.10
	4	4.75	11.70	44.29	368.04	89.26
	10	2.00	12.09	56.38	355.95	86.33
-10			(Based on calculated sieve wt.)			
	20	0.85	10.17	23.33	72.92	75.76
	40	0.425	39.47	62.80	33.45	34.75
	60	0.250	20.87	83.67	12.58	13.07
	140	0.106	7.70	91.37	4.88	5.07
	200	0.075	0.69	92.06	4.19	4.35
	dry pan		0.01	92.07	4.18	
	wet pan			4.18	0.00	

d_{10} (mm): 0.18 d_{50} (mm): 0.55
d_{16} (mm): 0.27 d_{60} (mm): 0.65
d_{30} (mm): 0.38 d_{84} (mm): 1.7

Median Particle Diameter--d_{50} (mm): 0.55
Uniformity Coefficient, Cu--$[d_{60}/d_{10}]$ (mm): 3.6
Coefficient of Curvature, Cc--$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 1.2
Mean Particle Diameter--$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.84

ASTM Soil Classification: Poorly-graded sand (SP)
USDA Soil Classification: Sand †

† Greater than 10% of sample is coarse material

Laboratory analysis by: E. Bastien
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Hall Environmental Analysis Labortory
Job Number: NM15.0026.00
Sample Number: 1502313-002B
Project: Kirtland
Client Sample ID: KAFB106212-GEO-002

Test Date: 19-Feb-15
Start Time: 9:06

Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Assumed particle density: 2.65

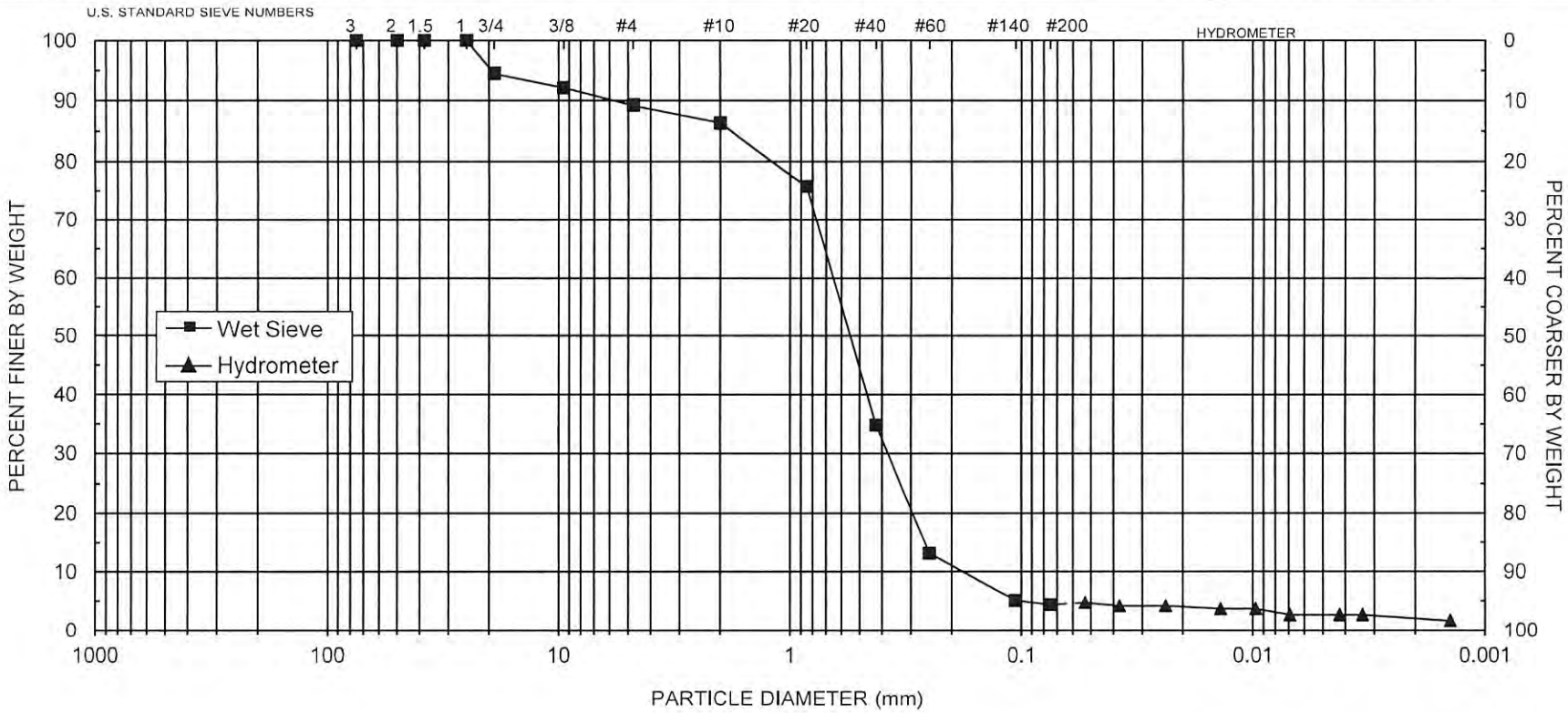
Initial Wt. (g)*:* 83.09
Total Sample Wt. (g)*:* 412.33
Wt. Passing #10 (g): 355.95

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
19-Feb-15	1	18.4	11.0**	6.5	4.5	14.5	0.05296	5.4	4.7
	2	18.4	10.5	6.5	4.0	14.6	0.03755	4.8	4.2
	5	18.4	10.5	6.5	4.0	14.6	0.02375	4.8	4.2
	15	18.4	10.0	6.5	3.5	14.7	0.01375	4.2	3.6
	30	18.5	10.0	6.5	3.5	14.7	0.00972	4.2	3.6
	60	18.5	9.0	6.5	2.5	14.8	0.00690	3.0	2.6
	160	18.6	9.0	6.5	2.5	14.8	0.00422	3.0	2.6
	250	18.8	9.0	6.5	2.5	14.8	0.00337	3.0	2.6
20-Feb-15	1439	19.0	8.0	6.4	1.6	15.0	0.00141	1.9	1.7

Comments:

* Dispersion device: mechanically operated stirring device
** Discontinuity in initial data points due to sample characteristics.

Laboratory analysis by: N. Candelaria
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL: Coarse, Fine	SAND: Coarse, Medium, Fine	SILT OR CLAY	
USDA	COBBLES	GRAVEL	SAND: Very coarse, Coarse, Medium, Fine, Very fine	SILT	CLAY

d_{10} = **0.18**	d_{30} = **0.38**	d_{50} = **0.55**	d_{60} = **0.65**	C_u = **3.6**	C_c = **1.2**

SAMPLE NUMBER	CLIENT SAMPLE ID	ASTM CLASSIFICATION	USDA CLASSIFICATION
1502313-002B	**KAFB106212-GEO-002**	**Poorly-graded sand (SP)**	**Sand †**

† Greater than 10% of sample is coarse material

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Hall Environmental Analysis Labortory
Job Number: NM15.0026.00
Sample Number: 1502313-003B
Project: Kirtland
Client Sample ID: KAFB106212-GEO-003
Test Date: 23-Feb-15

Initial Dry Weight of Sample (g): 967.55
Weight Passing #10 (g): 482.23
Weight Retained #10 (g): 485.32
Weight of Hydrometer Sample (g): 95.17
Calculated Weight of Sieve Sample (g): 190.95
Shape: Angular
Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	967.55	100.00
	2"	50	0.00	0.00	967.55	100.00
	1.5"	38.1	0.00	0.00	967.55	100.00
	1"	25	63.81	63.81	903.74	93.40
	3/4"	19.0	27.43	91.24	876.31	90.57
	3/8"	9.5	95.24	186.48	781.07	80.73
	4	4.75	143.10	329.58	637.97	65.94
	10	2.00	155.74	485.32	482.23	49.84
-10			(Based on calculated sieve wt.)			
	20	0.85	21.00	116.78	74.17	38.84
	40	0.425	27.70	144.48	46.47	24.34
	60	0.250	21.29	165.77	25.18	13.19
	140	0.106	13.48	179.25	11.70	6.13
	200	0.075	2.25	181.50	9.45	4.95
	dry pan		0.47	181.97	8.98	
	wet pan			8.98	0.00	

d_{10} (mm): 0.17 d_{50} (mm): 2.0
d_{16} (mm): 0.29 d_{60} (mm): 3.5
d_{30} (mm): 0.56 d_{84} (mm): 12

Median Particle Diameter--d_{50} (mm): 2.0
Uniformity Coefficient, Cu--$[d_{60}/d_{10}]$ (mm): 21
Coefficient of Curvature, Cc--$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 0.53
Mean Particle Diameter--$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 4.8

ASTM Soil Classification: Poorly-graded sand with gravel (SP)g
USDA Soil Classification: Sand †

† Greater than 10% of sample is coarse material

Laboratory analysis by: E. Bastien
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Hall Environmental Analysis Labortory
Job Number: NM15.0026.00
Sample Number: 1502313-003B
Project: Kirtland
Client Sample ID: KAFB106212-GEO-003

Test Date: 19-Feb-15
Start Time: 9:12

Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Assumed particle density: 2.65

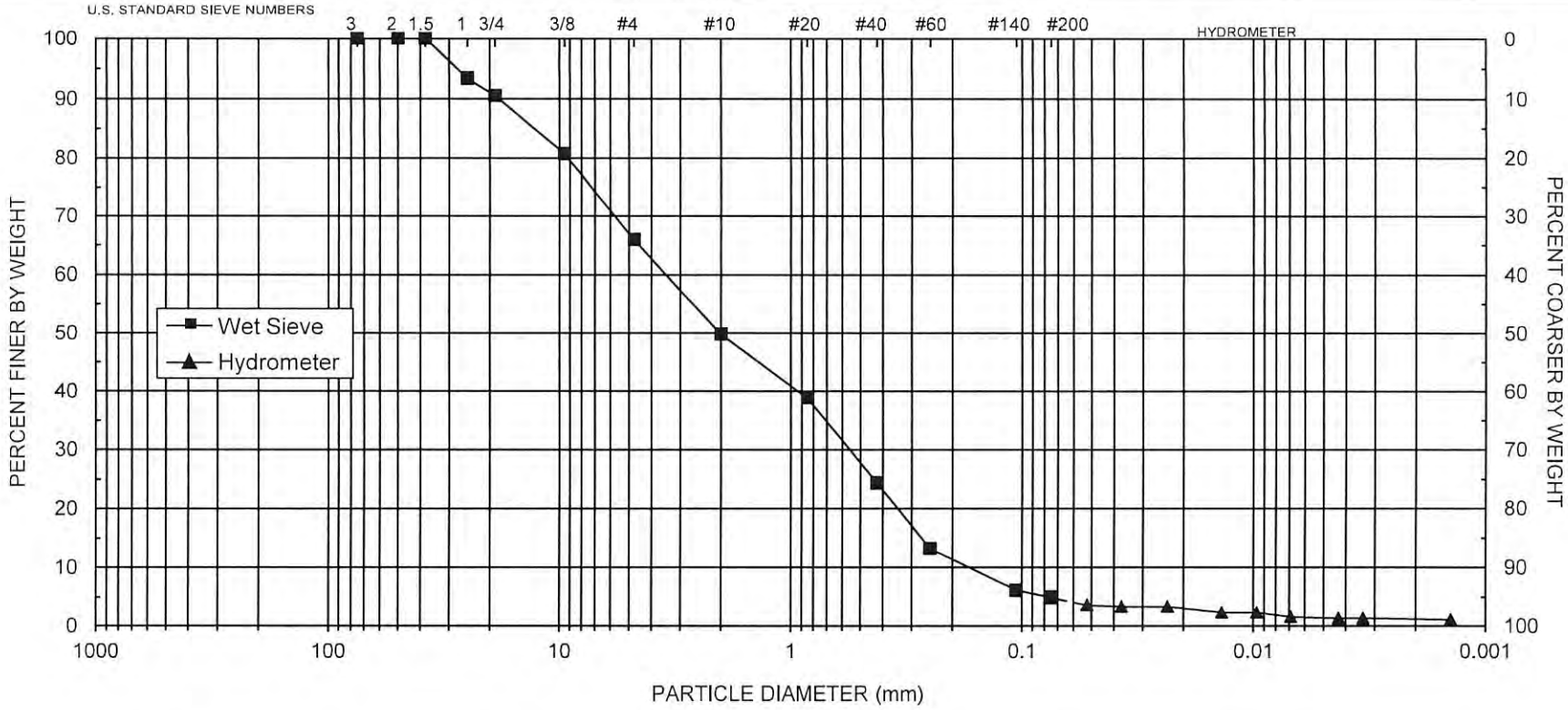
Initial Wt. (g)*:* 95.17
Total Sample Wt. (g)*:* 967.55
Wt. Passing #10 (g): 482.23

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
19-Feb-15	1	18.4	13.5	6.5	7.0	14.1	0.05220	7.4	3.7
	2	18.4	13.0	6.5	6.5	14.2	0.03702	6.8	3.4
	5	18.4	13.0	6.5	6.5	14.2	0.02341	6.8	3.4
	15	18.4	11.0	6.5	4.5	14.5	0.01367	4.7	2.4
	30	18.5	11.0	6.5	4.5	14.5	0.00966	4.7	2.4
	60	18.5	9.5	6.5	3.0	14.7	0.00689	3.2	1.6
	155	18.6	9.0	6.5	2.6	14.8	0.00429	2.7	1.3
	250	18.8	9.0	6.5	2.6	14.8	0.00337	2.7	1.3
20-Feb-15	1434	19.0	8.5	6.4	2.1	14.9	0.00141	2.2	1.1

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: N. Candelaria
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY	
		Coarse	Fine	Coarse	Medium	Fine		
USDA	COBBLES	GRAVEL		SAND			SILT	CLAY
				Very coarse	Coarse	Medium	Fine	Very fine

d_{10} = **0.17**	d_{30} = **0.56**	d_{50} = **2.0**	d_{60} = **3.5**	C_u = **21**	C_c = **0.53**

SAMPLE NUMBER	CLIENT SAMPLE ID	ASTM CLASSIFICATION	USDA CLASSIFICATION
1502313-003B	**KAFB106212-GEO-003**	**Poorly-graded sand with gravel (SP)g**	**Sand †**

† Greater than 10% of sample is coarse material

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Hall Environmental Analysis Labortory
Job Number: NM15.0026.00
Sample Number: 1502313-005A
Project: Kirtland
Client Sample ID: KAFB106212-GEO-004
Test Date: 23-Feb-15

Initial Dry Weight of Sample (g): 1250.22
Weight Passing #10 (g): 738.45
Weight Retained #10 (g): 511.77
Weight of Hydrometer Sample (g): 91.45
Calculated Weight of Sieve Sample (g): 154.83

Shape: Angular
Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	1250.22	100.00
	2"	50	0.00	0.00	1250.22	100.00
	1.5"	38.1	0.00	0.00	1250.22	100.00
	1"	25	70.08	70.08	1180.14	94.39
	3/4"	19.0	39.49	109.57	1140.65	91.24
	3/8"	9.5	140.71	250.28	999.94	79.98
	4	4.75	114.31	364.59	885.63	70.84
	10	2.00	147.18	511.77	738.45	59.07
-10			(Based on calculated sieve wt.)			
	20	0.85	32.75	96.13	58.70	37.91
	40	0.425	36.33	132.46	22.37	14.45
	60	0.250	7.74	140.20	14.63	9.45
	140	0.106	4.55	144.75	10.08	6.51
	200	0.075	1.07	145.82	9.01	5.82
	dry pan		0.25	146.07	8.76	
	wet pan			8.76	0.00	

d_{10} (mm): 0.27 d_{50} (mm): 1.4
d_{16} (mm): 0.44 d_{60} (mm): 2.1
d_{30} (mm): 0.67 d_{84} (mm): 12

Median Particle Diameter--d_{50} (mm): 1.4
Uniformity Coefficient, Cu--$[d_{60}/d_{10}]$ (mm): 7.8
Coefficient of Curvature, Cc--$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 0.79
Mean Particle Diameter--$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 4.6

ASTM Soil Classification: Classification by ASTM 2487 requires Atterberg test
USDA Soil Classification: Sand †

† Greater than 10% of sample is coarse material

Laboratory analysis by: E. Bastien
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Hall Environmental Analysis Labortory
Job Number: NM15.0026.00
Sample Number: 1502313-005A
Project: Kirtland
Client Sample ID: KAFB106212-GEO-004

Test Date: 19-Feb-15
Start Time: 9:18

Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Assumed particle density: 2.65

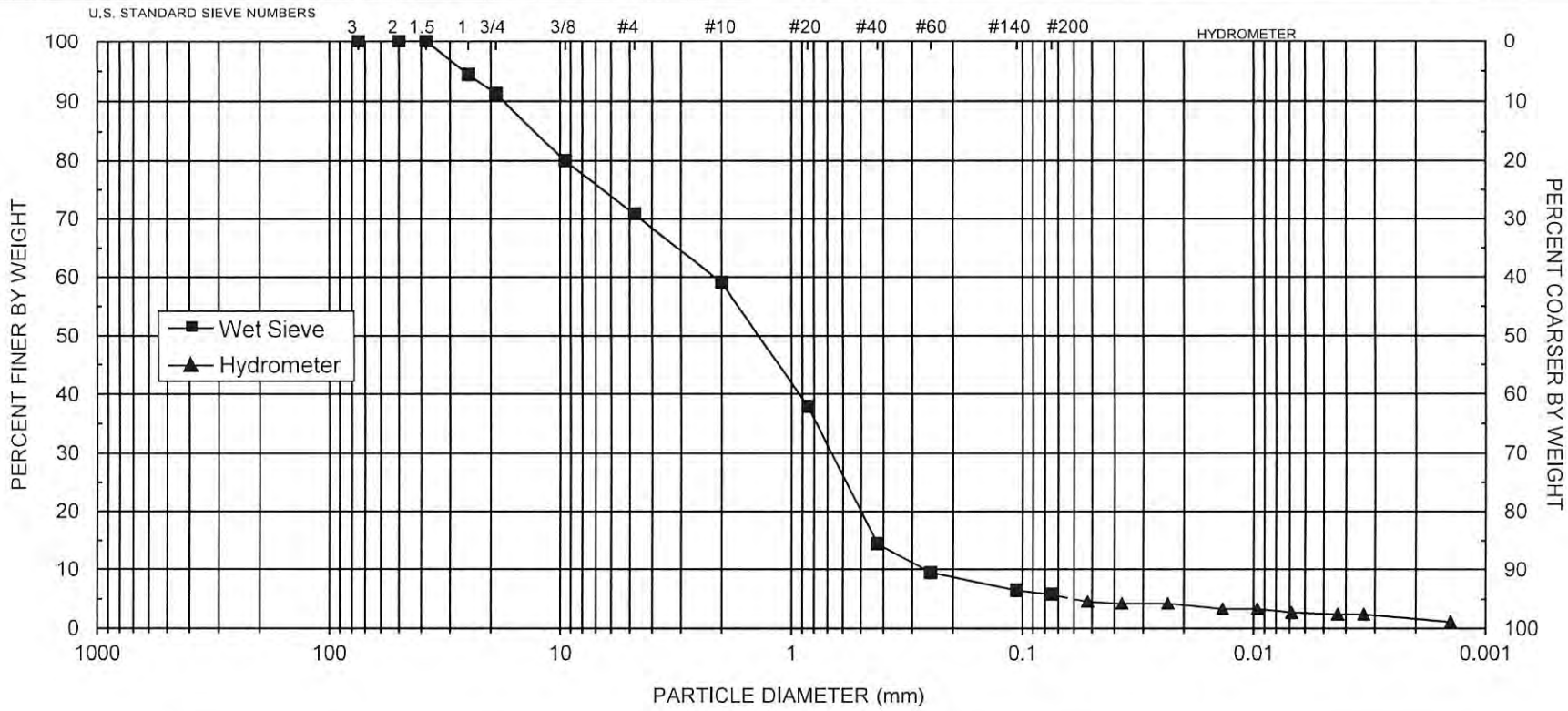
Initial Wt. (g)*:* 91.45
Total Sample Wt. (g)*:* 1250.22
Wt. Passing #10 (g): 738.45

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
19-Feb-15	1	18.4	13.5	6.5	7.0	14.1	0.05220	7.7	4.5
	2	18.4	13.0	6.5	6.5	14.2	0.03702	7.1	4.2
	5	18.4	13.0	6.5	6.5	14.2	0.02341	7.1	4.2
	15	18.5	11.5	6.5	5.0	14.4	0.01363	5.5	3.2
	30	18.5	11.5	6.5	5.0	14.4	0.00963	5.5	3.2
	60	18.5	10.5	6.5	4.0	14.6	0.00685	4.4	2.6
	150	18.6	10.0	6.5	3.6	14.7	0.00434	3.9	2.3
	250	18.8	10.0	6.5	3.6	14.7	0.00335	3.9	2.3
20-Feb-15	1429	19.0	8.0	6.4	1.6	15.0	0.00141	1.8	1.0

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: N. Candelaria
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.27**	d_{30} = **0.67**	d_{50} = **1.4**	d_{60} = **2.1**	C_u = **7.8**	C_c = **0.79**

SAMPLE NUMBER	CLIENT SAMPLE ID	ASTM CLASSIFICATION	USDA CLASSIFICATION
1502313-005A	**KAFB106212-GEO-004**	**Classification by ASTM 2487 requires Atterberg test**	**Sand †**

† Greater than 10% of sample is coarse material

Daniel B. Stephens & Associates, Inc.

Laboratory Tests and Methods

Tests and Methods

Dry Bulk Density:	ASTM D7263
Moisture Content:	ASTM D7263
Calculated Porosity:	ASTM D7263
Saturated Hydraulic Conductivity: Constant Head: (Rigid Wall)	ASTM D 2434 (modified apparatus)
Water Potential (Dewpoint Potentiometer) Method:	ASTM D6836
Particle Size Analysis:	ASTM D422
USCS (ASTM) Classification:	ASTM D422, ASTM D2487
USDA Classification:	ASTM D422, USDA Soil Textural Triangle
Coarse Fraction (Gravel) Correction (calc):	ASTM D4718; Bouwer, H. and Rice, R.C. 1984. Hydraulic Properties of Stony Vadose Zones. Groundwater Vol. 22, No. 6
Effective Porosity:	ASTM D6836; Stephens, D.B.,1997, Hydrology Journal (1998) 6:6156-165, A Comparison of Estimated and Calculated Effective Porosity

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1502313**

25-Feb-15

Client: AMEC

Project: 140705-106212-GEO

Sample ID **MB-17625** SampType: **MBLK** TestCode: **Walkley Black TOC/FOC/OM**
Client ID: **PBS** Batch ID: **17625** RunNo: **24181**
Prep Date: **2/9/2015** Analysis Date: **2/9/2015** SeqNo: **712872** Units: **% C**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
FOC	ND	0.10								

Sample ID **LCS-17625** SampType: **LCS** TestCode: **Walkley Black TOC/FOC/OM**
Client ID: **LCSS** Batch ID: **17625** RunNo: **24181**
Prep Date: **2/9/2015** Analysis Date: **2/9/2015** SeqNo: **712873** Units: **% C**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
FOC	2.1	0.10	2.100	0	101	80	120			

Sample ID **1502313-001AMS** SampType: **MS** TestCode: **Walkley Black TOC/FOC/OM**
Client ID: **KAFB-106212-GEO-** Batch ID: **17625** RunNo: **24181**
Prep Date: **2/9/2015** Analysis Date: **2/9/2015** SeqNo: **712875** Units: **% C**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
FOC	2.1	0.095	2.000	0	103	75	125			

Sample ID **1502313-001AMSD** SampType: **MSD** TestCode: **Walkley Black TOC/FOC/OM**
Client ID: **KAFB-106212-GEO-** Batch ID: **17625** RunNo: **24181**
Prep Date: **2/9/2015** Analysis Date: **2/9/2015** SeqNo: **712876** Units: **% C**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
FOC	2.1	0.099	2.079	0	102	75	125	2.87	20	

Sample ID **MB-17744** SampType: **MBLK** TestCode: **Walkley Black TOC/FOC/OM**
Client ID: **PBS** Batch ID: **17744** RunNo: **24293**
Prep Date: **2/13/2015** Analysis Date: **2/13/2015** SeqNo: **715986** Units: **% C**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
FOC	ND	0.10								

Sample ID **LCS-17744** SampType: **LCS** TestCode: **Walkley Black TOC/FOC/OM**
Client ID: **LCSS** Batch ID: **17744** RunNo: **24293**
Prep Date: **2/13/2015** Analysis Date: **2/13/2015** SeqNo: **715987** Units: **% C**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
FOC	2.2	0.10	2.100	0	104	80	120			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH Not In Range
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1502313**

25-Feb-15

Client: AMEC

Project: 140705-106212-GEO

Sample ID **1502313-002AMS** SampType: **MS** TestCode: **Walkley Black TOC/FOC/OM**

Client ID: **KAFB-106212-GEO-** Batch ID: **17744** RunNo: **24293**

Prep Date: **2/13/2015** Analysis Date: **2/13/2015** SeqNo: **715989** Units: **% C**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
FOC	2.2	0.10	2.100	0	103	75	125			

Sample ID **1502313-002AMSD** SampType: **MSD** TestCode: **Walkley Black TOC/FOC/OM**

Client ID: **KAFB-106212-GEO-** Batch ID: **17744** RunNo: **24293**

Prep Date: **2/13/2015** Analysis Date: **2/13/2015** SeqNo: **715990** Units: **% C**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
FOC	2.1	0.10	2.121	0	101	75	125	1.39	20	

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH Not In Range
- RL Reporting Detection Limit

CHAIN OF CUSTODY

Shaw Environmental and Infrastructure Inc., a CB&I Co.

Reference Document # 140705-106212-GED

Project Number: 140705

Geotechnical Sampling

Project Manager: Tom Cooper
Send Report To: Susan Huang
Phone Number: 925-288-2099
Address: 4005 Port Chicago Hwy
City: Concord, CA 94520
susan.huang@cbifederalservices.com

Purchase Order #:

Shipment Date: 2/6/2015

FedEx Number:

Lab Destination: AMEC Earth & Environmental
8519 Jefferson Street
Northeast, Albuquerque, NM
87113

Lab Contact Name: Jason Olivar
Phone #: 505.821.1801

Sampler's Name(s):

Sample ID Number	Location	Date	Time	Method	Matrix	# of containers	Preservative	Grain size analysis-(ASTM D422)	Water Permeability/Hydraulic Conductivity (API RP40 and EPA 9100)		Effective porosity-(modified ASTM 425)	Total Organic Carbon (TOC) and Fraction Organic Carbon (FOC)-(Walkley Black)			
							Preservative	none	none		none	Ice	none	none	none
							Container	PVC	PVC		PVC	16 OZ JAR			
							TAT Requirements	Normal							
Temperature Blank															
KAFB-106212-GEO-1	449.6-451.7	2/2/15	1620	G	So.	2		✓	✓		✓	✓			
KAFB-106212-GEO-2	502.7-504.2	2/4/15	1528	G	SO.	2		✓	✓		✓	✓			
KAFB-106212-GEO-3	532-533.8	2/5/15	13:00	G	SO.	2		✓	✓		✓	✓			
KAFB-106212-GEO-4	541.6-542.9	2/5/15	14:30	G	SO.	1		✓	✓		✓				
KAFB-106212-GEO-5	480.6-482.2	2/9/15	1259	G	SO	1						✓			

Draft

Turnaround Time: Standard 21 Day ☐ 24-hr ☐ 48-hr ☐ 3-day ☐ 5-day

Level Of QC Required: I II (III) IV Project Specific: unless IV requested

Relinquished By: Rachel Hollis Date: 2-6-15 Time: 1550

Received By: Rosin Romero Date: 2-6-15 Time: 15:50

Relinquished By: Date: Time:

Received By: Date: Time:

Method Codes
G = Grab

Date ~~2/6/2015~~ RGH 2/2/15
Time 1620
Project No. 140705
Page 1 of 5

Sample Collection Log

Project Name KAFB BFF
Sample No. KAFB-106212-GE01
Sample Location 449.6-491.7
Sample Type Soil
Composite: Y / N
Sample Matrix ~~Silty Sand~~ Poorly Graded Sand w/ Clay
Weather Sunny
Sample Team RGH, RW COC#

Sample:

Analyte	Preservative	Container	TAT	Initials
Grain size analysis-(ASTM D422)	NONE	PVC	St.	RGH
Water Permeability/Hydraulic Conductivity (API RP40 and EPA 9100)	NONE	PVC	St.	RGH
Effective porosity-(modified ASTM 425)	NONE	PVC	St.	RGH
Total Organic Carbon (TOC) and Fraction Organic Carbon (FOC)-(Walkley Black)	NONE	16 oz Jar	St	RGH

Comments: St
~~Cover~~ Run 1 Box 2
sample interval requested by G. Berger

Logged By: R. Hobbs Reviewed By:

Date 2/4/15
Time 1828
Project No. 140705
Page 2 of ~~4~~ 5

Sample Collection Log

Project Name KAFB BFF
Sample No. KAFB-106212-GEO2
Sample Location 502.7-504.2
Sample Type Soil - Well Graded Sand
Composite: Y (N)
Sample Matrix Well Graded Sand
Weather Sunny
Sample Team RGH, RW COC#

Sample:

Analyte	Preservative	Container	TAT	Initials
Grain size analysis-(ASTM D422)	NONE	PVC	St.	RW
Water Permeability/Hydraulic Conductivity (API RP40 and EPA 9100)	NONE	PVC	St.	RW
Effective porosity-(modified ASTM 425)	NONE	PVC	St.	RW
Total Organic Carbon (TOC) and Fraction Organic Carbon (FOC)-(Walkley Black)	NONE	16 oz Jar	St.	RW

Comments: ~~Run~~ Run 6 Box 5 G. Burger requested representative sample between 492.0 - 515.0

Logged By: Ryan Wortman Reviewed By:

Date 2/5/2015
Time 1300
Project No. 140705
Page 3 of ~~4~~ 5

Sample Collection Log

Project Name KAFB-BFF
Sample No. KAFB1106212-GEO-3
Sample Location 532-533.8
Sample Type Soil
Composite: Y / N
Sample Matrix W.G. Sand.
Weather Sunny
Sample Team RGH, RW COC#

Sample:

Analyte	Preservative	Container	TAT	Initials
Grain size analysis-(ASTM D422)	NONE	PVC	St.	RW
Water Permeability/Hydraulic Conductivity (API RP40 and EPA 9100)	NONE	PVC	St.	RW
Effective porosity-(modified ASTM 425)	NONE	PVC	St.	RW
Total Organic Carbon (TOC) and Fraction Organic Carbon (FOC)-(Walkley Black)	NONE	16 oz Jar	St.	RW

Comments: Run 10 Box 4 G. Burger requested representative sample between 522-533

Logged By: Ryan Wortman Reviewed By:

Date 2/5/15
Time 1430
Project No. 140709
Page 4 of ~~4~~ 5

Sample Collection Log

Project Name
Sample No. KAFB100212-GE04
Sample Location 541.6-~~543.3~~ 542.9
Sample Type soil
Composite: Y/N
Sample Matrix W.G. Sand.
Weather Sunny
Sample Team RGH, RW COC#

Sample:

Analyte	Preservative	Container	TAT	Initials
Grain size analysis-(ASTM D422)	NONE	PVC	St.	RW
Water Permeability/Hydraulic Conductivity (API RP40 and EPA 9100)	NONE	PVC	St.	RW
Effective porosity-(modified ASTM 425)	NONE	PVC	St.	RW
Total Organic Carbon (TOC) and Fraction Organic Carbon (FOC)-(Walkley Black)	NONE	~~Glass 16oz Jar~~	~~St.~~	~~RW~~ RGH

Comments: Run 11 Box 5 G. Burger requested a representative sample between 535-547

Logged By: Ryan Wortman Reviewed By:

Date 02/04/15
Time 12:59
Project No. 140705
Page 5 of 5

Sample Collection Log

Project Name
Sample No. KAFB-106212-GE05
Sample Location ~~S 460.8-462.5~~ 480.6-482.2
Sample Type Soil
Composite: Y / (N)
Sample Matrix Clayey Sand
Weather Sunny
Sample Team RGH, RW COC#

Sample:

Analyte	Preservative	Container	TAT	Initials
~~Grain size analysis (ASTM D422)~~	NONE			RGH
~~Water Permeability/Hydraulic Conductivity (API RP40 and EPA 9100)~~	NONE			
~~Effective porosity (modified ASTM 425)~~	NONE			
Total Organic Carbon (TOC) and Fraction Organic Carbon (FOC)-(Walkley Black)	NONE	Glass 16oz. Jar	57.	RW

Comments: Run 4 Box 4 G. Burger requested a TOC/VOC sample to repersentate interbedded Clayes

Logged By: Ryan Wortman Reviewed By:

APPENDIX D

Example Field Forms

PROJECT NUMBER:	PROJECT NAME:	
BORING NUMBER:	COORDINATES:	DATE:
ELEVATION:	GWL: Depth Date/Time	DATE STARTED:
ENGINEER/GEOLOGIST:	Depth Date/Time	DATE COMPLETED:
DRILLING METHODS:		PAGE: OF

DEPTH ( )	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER ( )	RECOVERY ( )	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS

NOTES:

Drilling Contractor: _____

Drilling Equipment: _____

Driller: _____

_____

1651-9-02

PROJECT NUMBER:_____
PROJECT NAME:_____
_____
APPROX. ELEV:_____
DRILLING METHOD:_____
_____
COORDINATES:_____
_____

FIELD GEOLOGIST:_____
_____
CORING/SAMPLING METHOD:_____
_____
CORE SIZE/DIA:_____
DRILLER:_____
_____

PAGE:_____OF:_____
BORING NO.:_____
DATE:_____
DATE STARTED:_____
DATE COMPLETED:_____

RUN NUMBER	DEPTH ( )	RECOVERY ( )	% RECOVERY	% RQD	DESCRIPTION	JOINT SPACING			REMARKS
						MAXIMUM	MINIMUM	AVERAGE	

Groundwater Extraction Well Development

Project Name: _____ **Well No.:** _____
Location: _____ **Date Installed:** _____
Personnel: _____ **Casing Diameter (I.D.):** _____
Start Date: _____ **Total Depth (ft. BGS):** _____
End Date: _____

Method of Development:

☐ Surging ☐ Bailing ☐ Pumping ☐ Jetting

☐ Original Development ☐ Redevelopment ☐ Other

Depth to Water Before Developing Well (ft. BGS): _____
Screened Interval (ft. BGS): _____
Weather: _____

Equipment Numbers: **pH:** _____ **Conductivity:** _____
Turbidity: _____

Equipment Decontaminated Prior to Development? ☐ Yes ☐ No
Describe: _____

Collected Sample of Water Added to Well? ☐ Yes ☐ No
Describe: _____

Comments: _____

Summary of development procedure, including key decision-points, calculations, and observations (described in detail in the following pages):

Groundwater Extraction Well Development

Bailing

Date	Time	Total Volume Bailed (gallons)	Imhoff Cone Measurement (mL sediment per L water)	Comments

Groundwater Extraction Well Development

Page_____ of ______

Surging

Interval (ft bgs)	Date	Start Time	End Time	Comments

Groundwater Extraction Well Development

Page_____ of ______

Pumping

Date	Time	Rate (gpm)	Depth to Water (ft BGS)	Volume Removed (gallons)	Temp (°C)	pH	EC (mS/cm)	Turbidity (NTU)	Specific Capacity (gpm/ft)	Comments

Groundwater Extraction Well Development

Page_____ of ______

Jetting

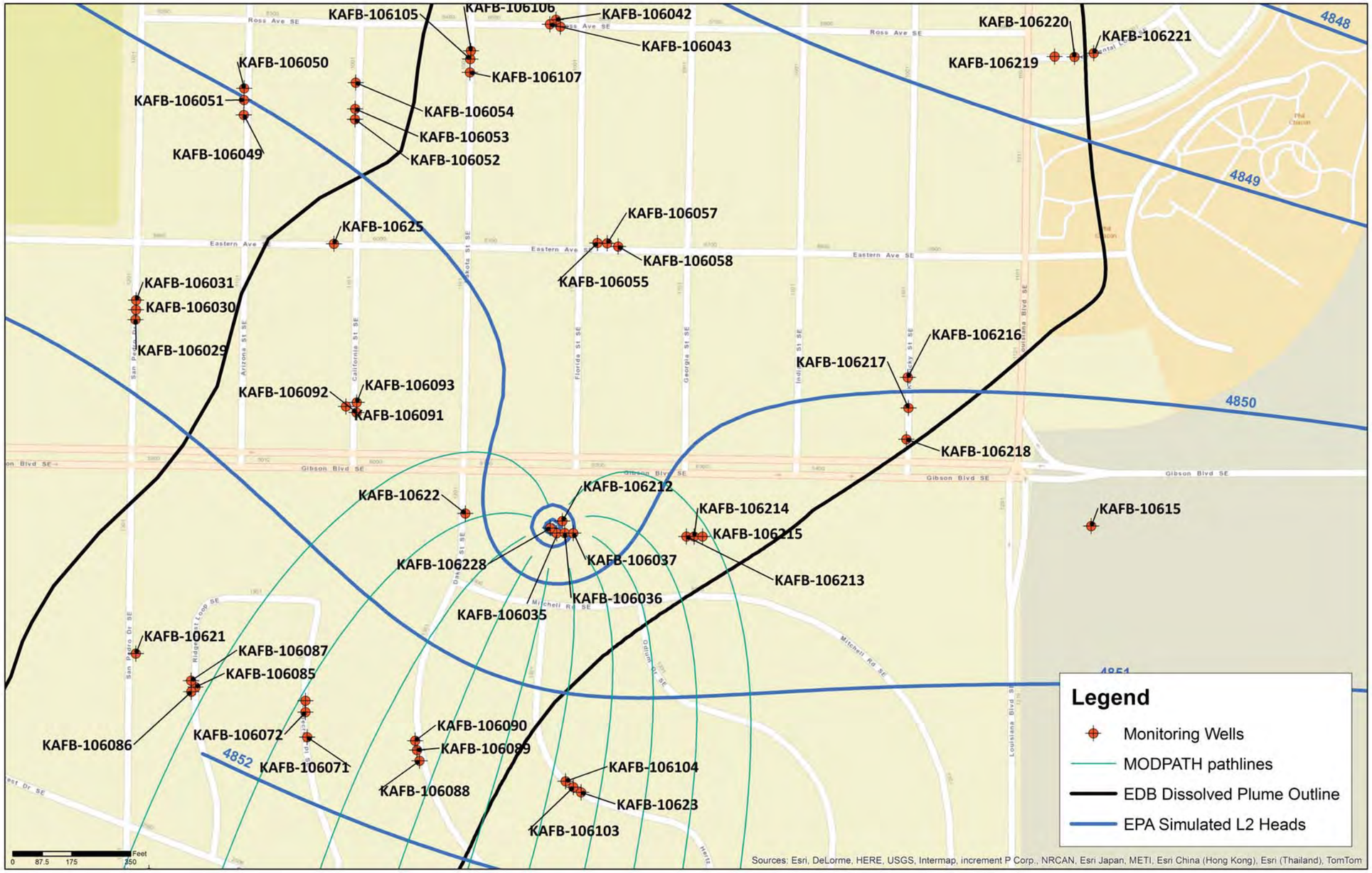
Date	Time	Depth (ft bgs)	Jetting Rate (gpm)	Pumping Rate (gpm)	Imhoff Cone Measurement (mL sediment per L water)	Comments

APPENDIX E

Preliminary Modeling

Table E-1. EPA/CBI Model Layer Specifications

Model Layers	Top Elevation	Bottom Elevation	Max Thickness (ft)	Main Purpose
1	5000	4978–4854	146	Contains water table
2	4978–4854	4854–4827	27–124	Water table; 450 fine grained unit; EDB source and EDB plume shallow
3	4854–4827	4827–4762	27–65	EDB plume shallow and intermediate
4	4827–4762	4762–4742	20–65	EDB plume intermediate and deep
5	4762–4742	4742–4725	17–20	EDB plume deep
6	4742–4725	4725–4494	17–231	Production well screens
7	4725–4494	4494–4304	190–231	A2 Zone; production well screens
8	4494–4304	4304–4229	75–190	Production well screens
9	4304–4229	4229–4001	75–228	A1 Zone; production well screens
10	4229–4001	3800	201–429	Production well screens



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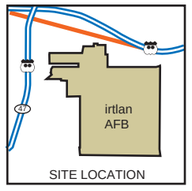


Revision Date: 3/12/15

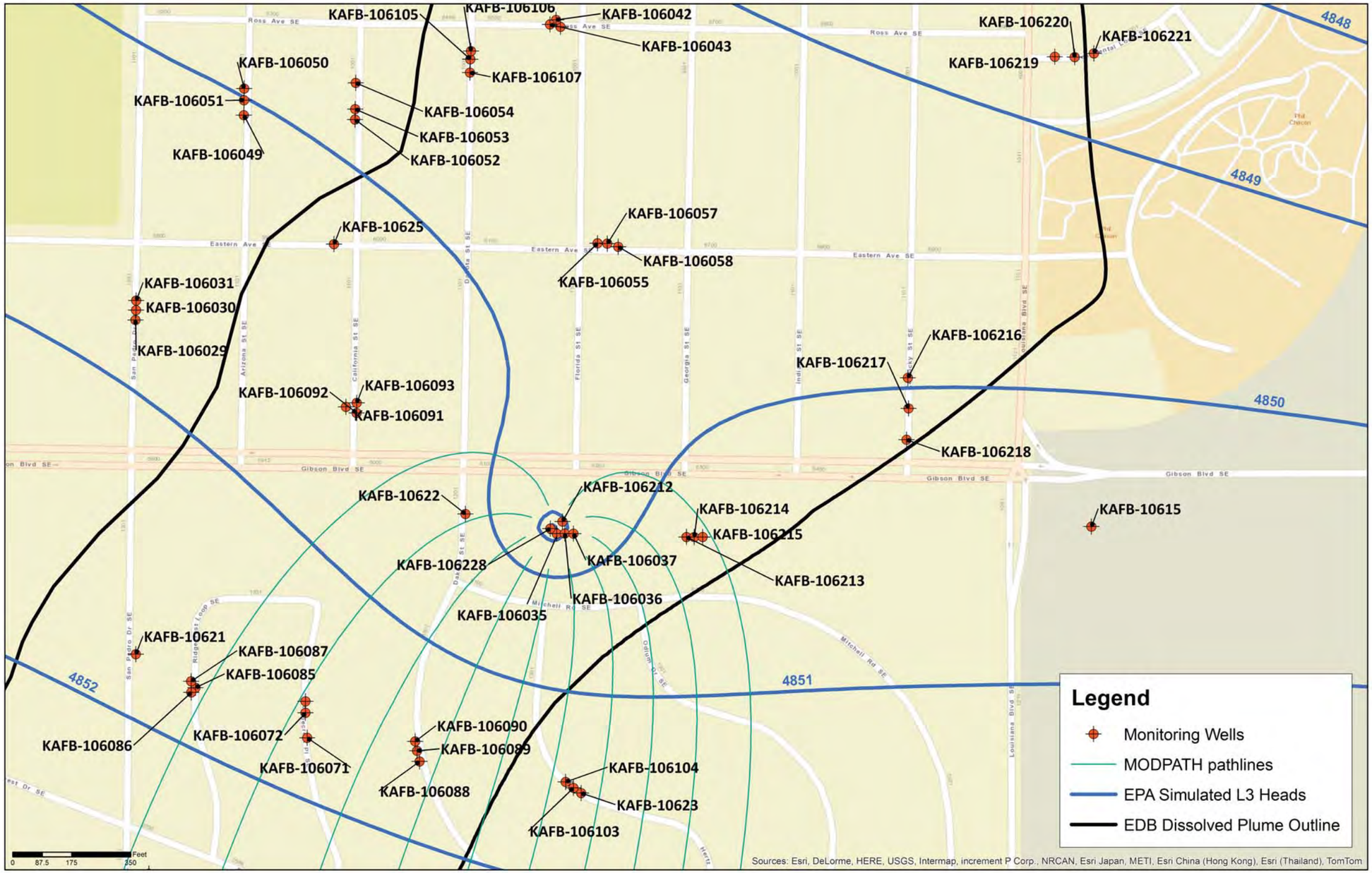
N

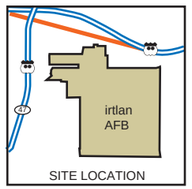
GROUNDWATER EXTRACTION
PILOT IMPLEMENTATION AND ADDITIONAL PLUME
CHARACTERIZATION LETTER WORK PLAN ADDENDUM #3
BULK FUELS FACILITY
KIRTLAND AIR FORCE BASE, NEW MEXICO

FIGURE E-1

MODEL SIMULATED HEADS
AND CAPTURE ZONE LAYER 2

140705.FB010010_B3





Revision Date: 3/12/15

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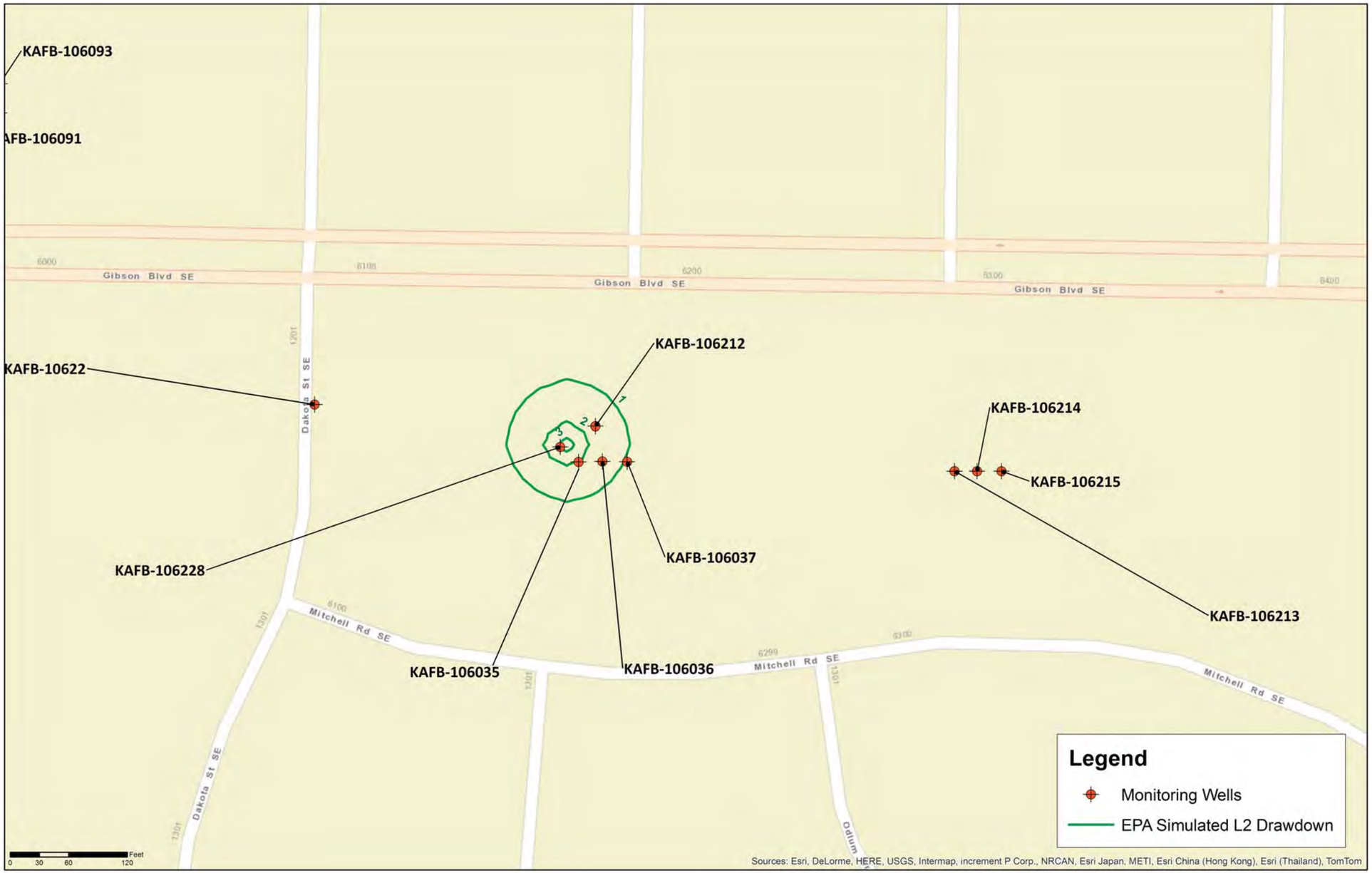
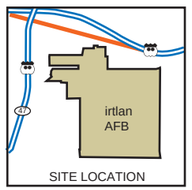
GROUNDWATER EXTRACTION
PILOT IMPLEMENTATION AND ADDITIONAL PLUME
CHARACTERIZATION LETTER WORK PLAN ADDENDUM #3
BULK FUELS FACILITY
KIRTLAND AIR FORCE BASE, NEW MEXICO

FIGURE E-2

MODEL SIMULATED HEADS
AND CAPTURE ZONE LAYER 3

140705.FB010010_B1





Revision Date: 3/12/15

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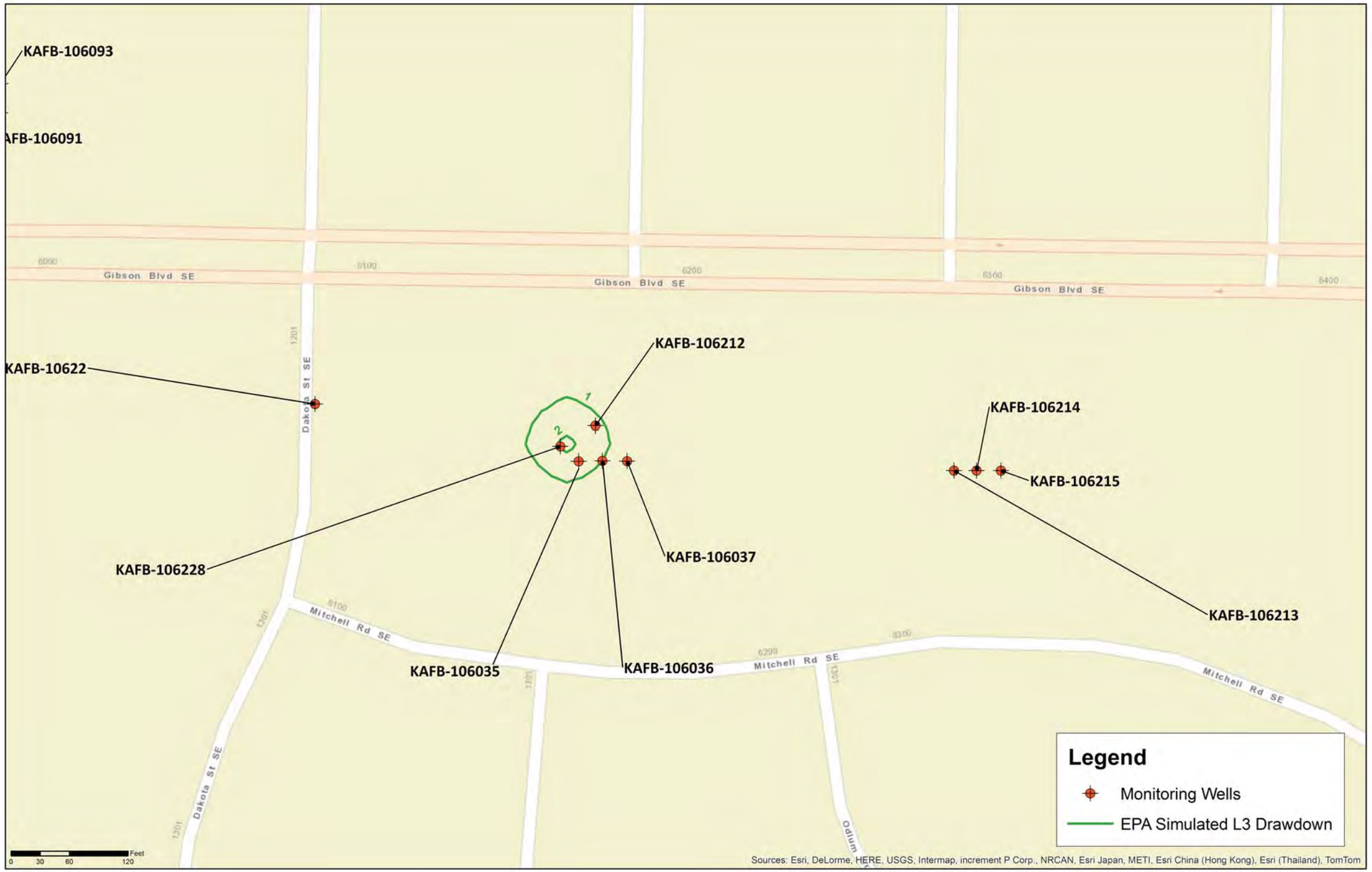
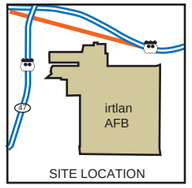
GROUNDWATER EXTRACTION
PILOT IMPLEMENTATION AND ADDITIONAL PLUME
CHARACTERIZATION LETTER WORK PLAN ADDENDUM #3
BULK FUELS FACILITY
KIRTLAND AIR FORCE BASE, NEW MEXICO

FIGURE E-3

MODEL SIMULATED DRAWDOWN LAYER 2

140705.FB010010_B2





Revision Date: 3/12/15

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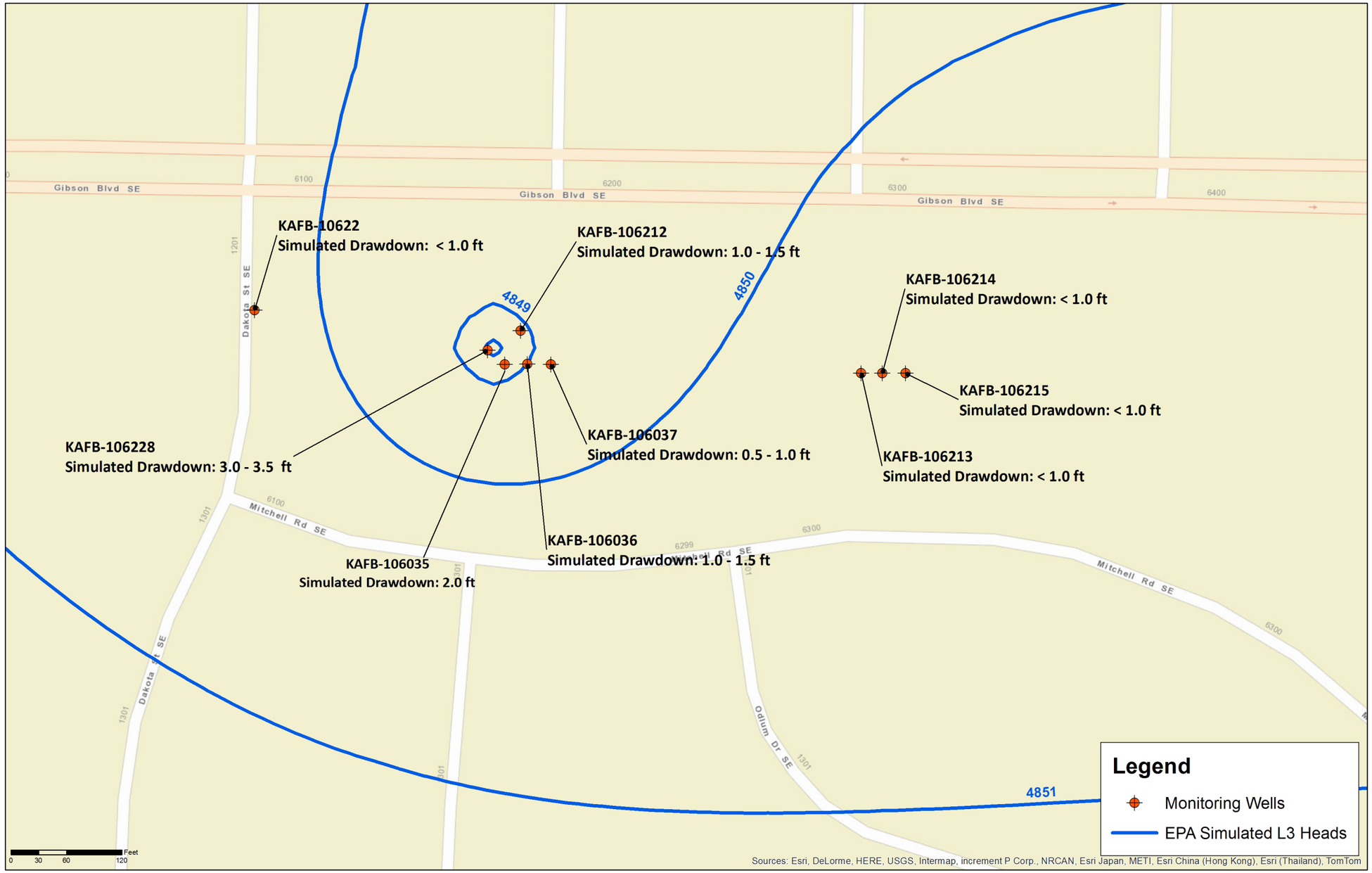
GROUNDWATER EXTRACTION
PILOT IMPLEMENTATION AND ADDITIONAL PLUME
CHARACTERIZATION LETTER WORK PLAN ADDENDUM #3
BULK FUELS FACILITY
KIRTLAND AIR FORCE BASE, NEW MEXICO

FIGURE E-4

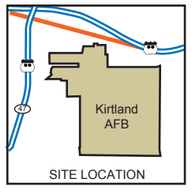
MODEL SIMULATED DRAWDOWN LAYER 3

140705.FB010010_B4



Legend

Note:
The model simulated drawdown values are based on a pumping rate of 100 gallons per minute at extraction well KAFB-106228.



Revision Date: 3/10/15

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GROUNDWATER EXTRACTION
PILOT IMPLEMENTATION AND ADDITIONAL PLUME
CHARACTERIZATION LETTER WORK PLAN ADDENDUM #3
BULK FUELS FACILITY
KIRTLAND AIR FORCE BASE, NEW MEXICO

FIGURE E-5

SIMULATED DRAWDOWN FOR WELLS SCREENED IN MODEL LAYERS 2 AND 3

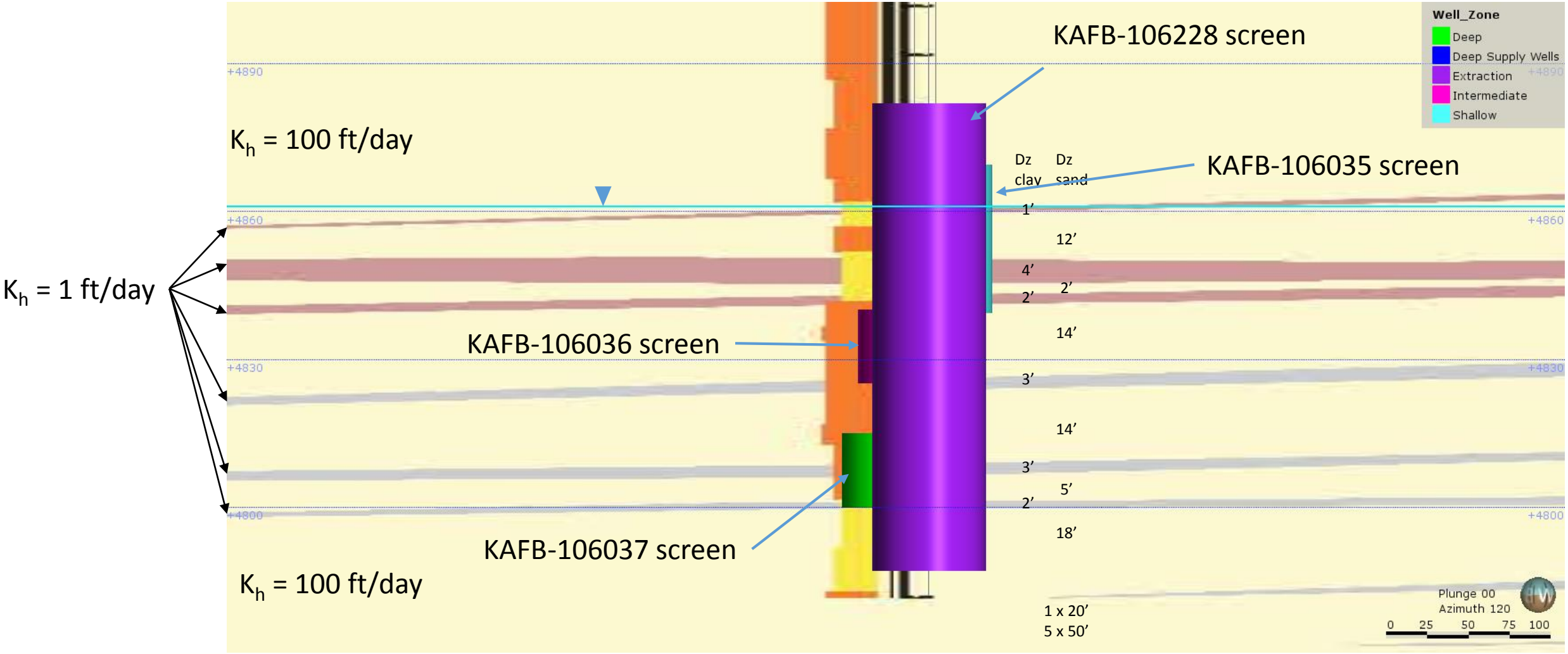
140705.FB010010_B5

Analytical Element Method

- Superposition of analytical solutions ('elements') that represent components of the flow system
  - Pumping wells, regional gradient, boundaries, etc.
- Use Tim^{ML}, an open-source steady flow code from Delft University
- Inputs:
  - Total extraction rate
  - Regional groundwater flow rate, q, based on K_h and hydraulic gradient
  - Regional flow direction: N47.5E˚ ± 5˚
  - Extraction well location, rate, screen interval
  - Monitor well locations, screen intervals
  - Layering and hydraulic conductivity of sand and clay units
- Results:
  - Steady-state drawdown at extraction well and nearby monitoring wells

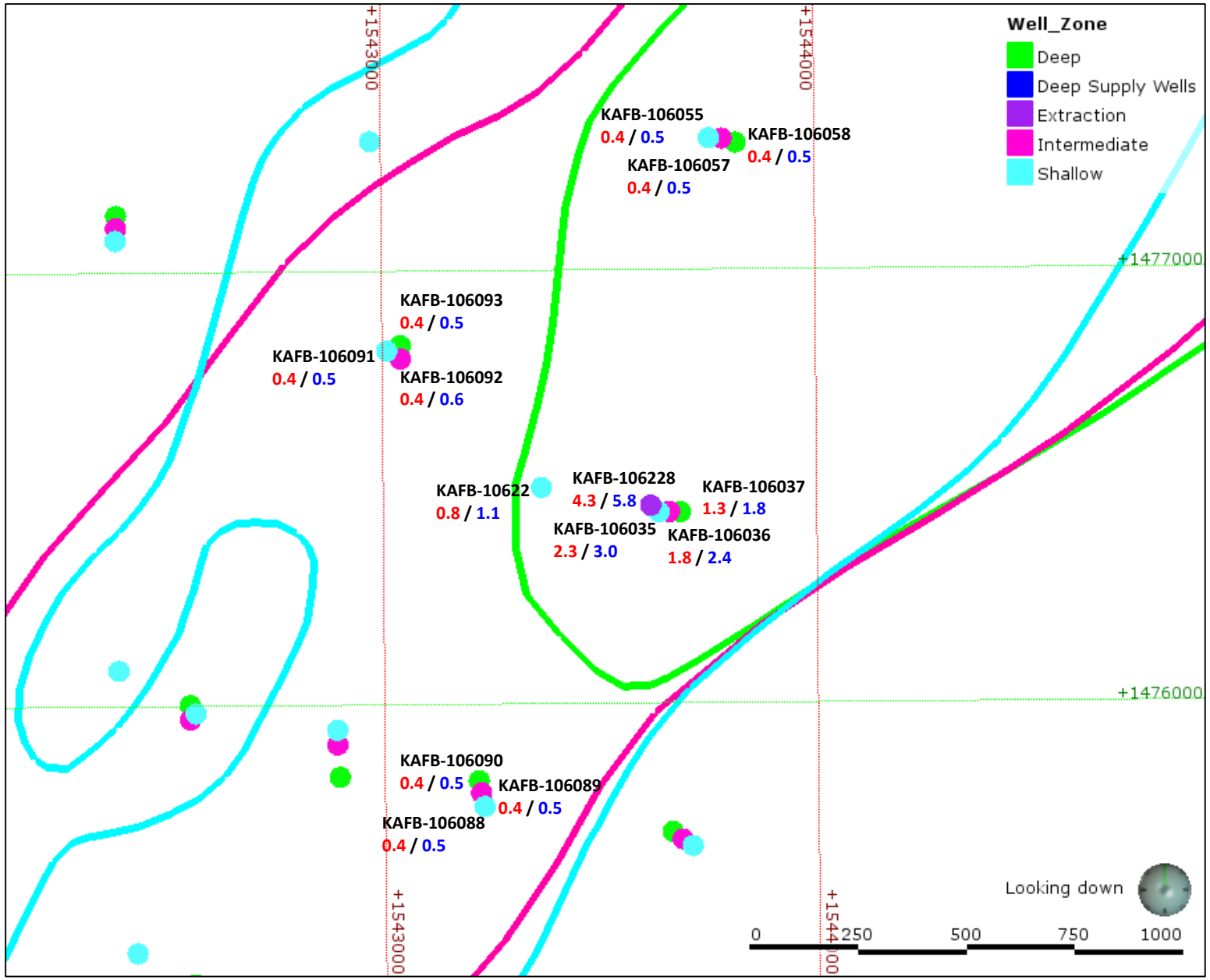
Model Parameters

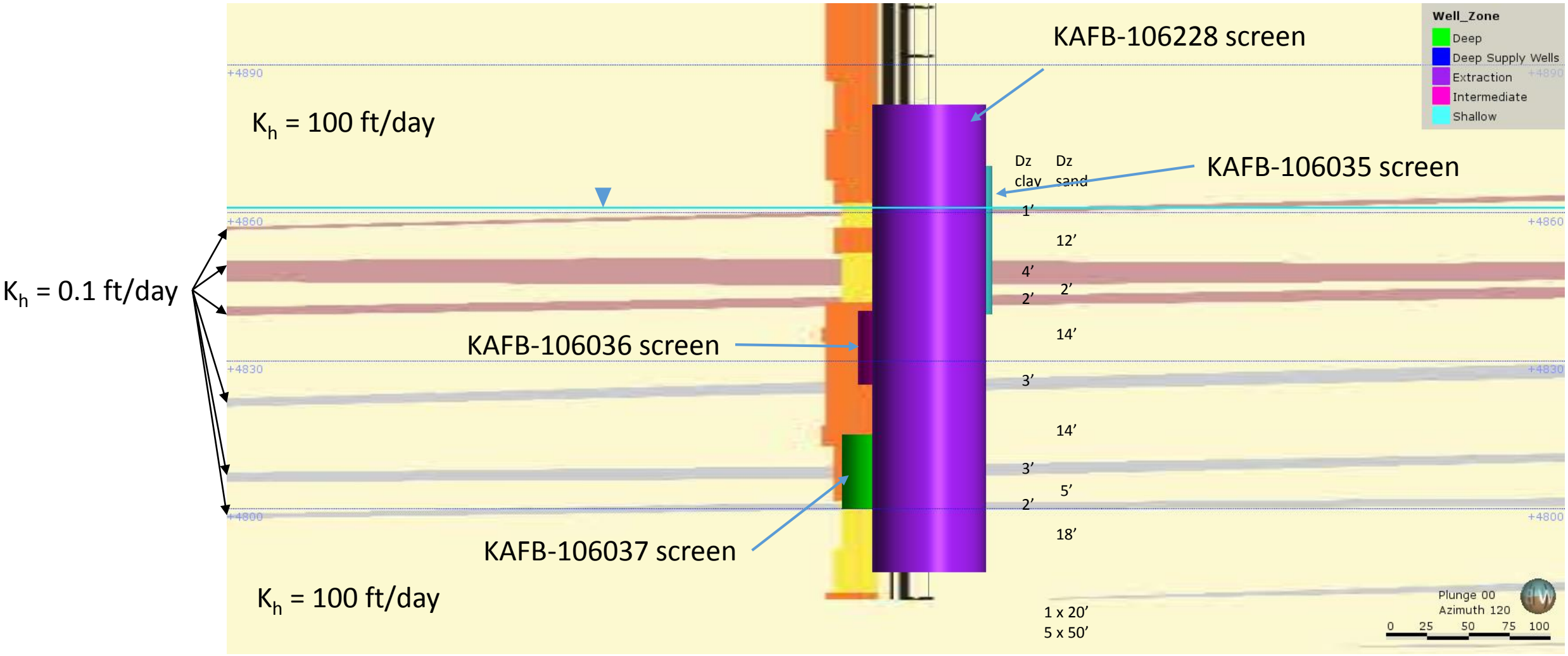
- Layering defined by AECOM cross-section: sand or clay
- Hydraulic conductivity (4 combinations)
  - K_{sand} = 100 or 150 ft/day
  - K_{clay} = 0.1 or 1.0 ft/day
- Pumping rate
  - 100 or 150 gpm
- Total of 8 parameter combinations
- 18 layers
  - Alternating sand and clay within extraction well-screen interval (80 ft, 12 layers)
  - Sand below extraction well (270 ft, 6 layers)


KAFB-106228 screen
Well_Zone
Deep
Deep Supply Wells
Extraction
Intermediate
Shallow
+4890
K_h = 100 ft/day
Dz clay
Dz sand
KAFB-106035 screen
+4860
1'
12'
4'
2'
2'
K_h = 1 ft/day
KAFB-106036 screen
14'
+4830
3'
14'
3'
5'
2'
+4800
18'
KAFB-106037 screen
K_h = 100 ft/day
1 x 20'
5 x 50'
Plunge 00
Azimuth 120
0 25 50 75 100

K_{sand} = 100 ft/day
K_{clay} = 1 ft/day

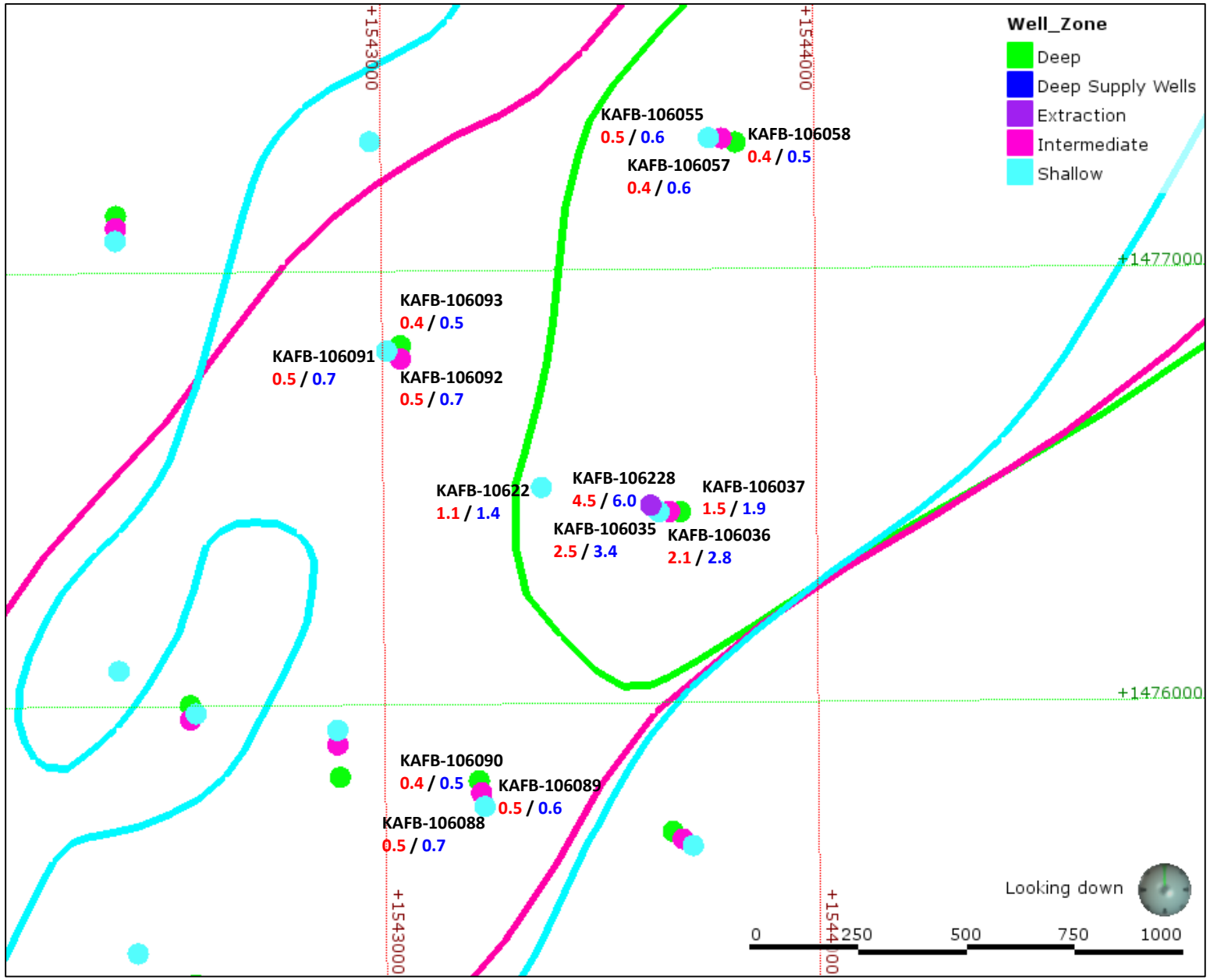
Well ID
150 gpm / 200 gpm

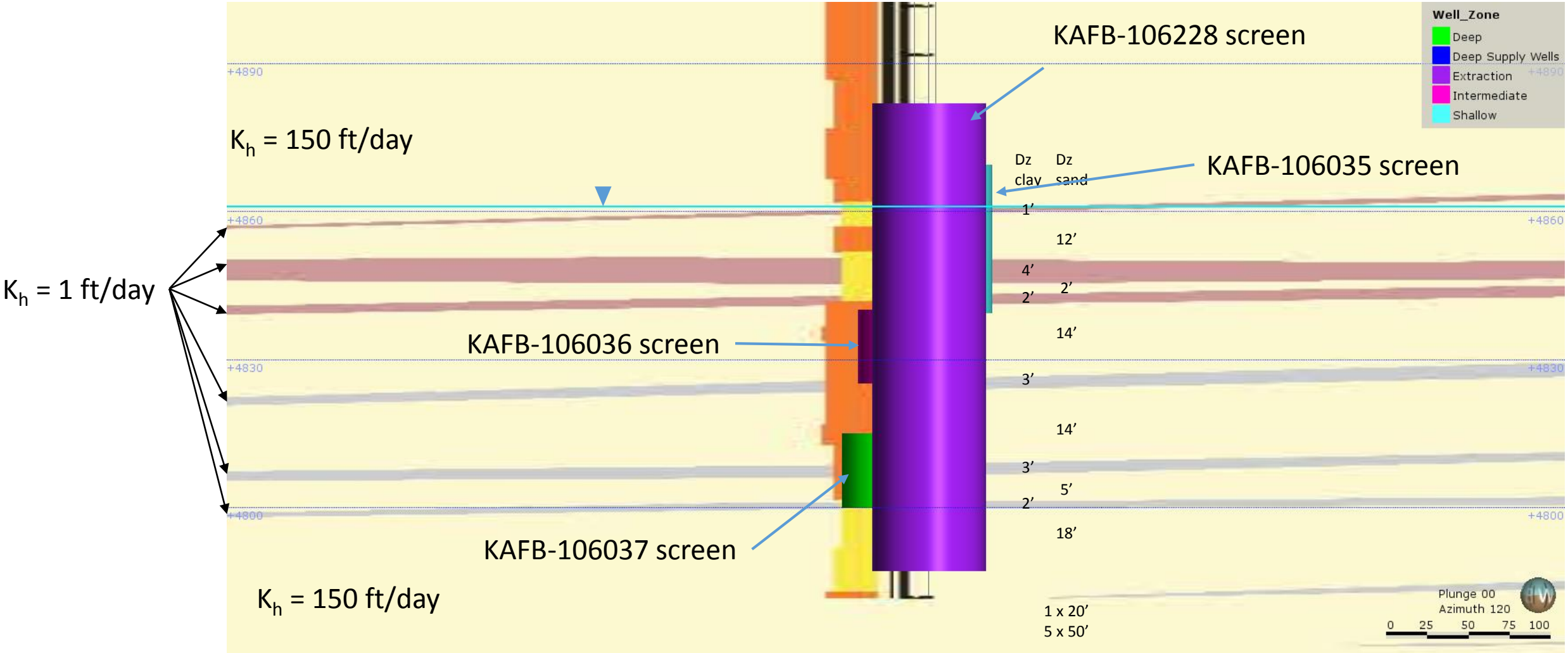



KAFB-106228 screen
Well_Zone
Deep
Deep Supply Wells
Extraction
Intermediate
Shallow
+4890
K_h = 100 ft/day
Dz clay
Dz sand
KAFB-106035 screen
+4860
1'
12'
4'
2'
2'
K_h = 0.1 ft/day
KAFB-106036 screen
14'
+4830
3'
14'
3'
5'
2'
+4800
18'
KAFB-106037 screen
K_h = 100 ft/day
1 x 20'
5 x 50'
Plunge 00
Azimuth 120
0 25 50 75 100

K_{sand} = 100 ft/day
K_{clay} = 0.1 ft/day

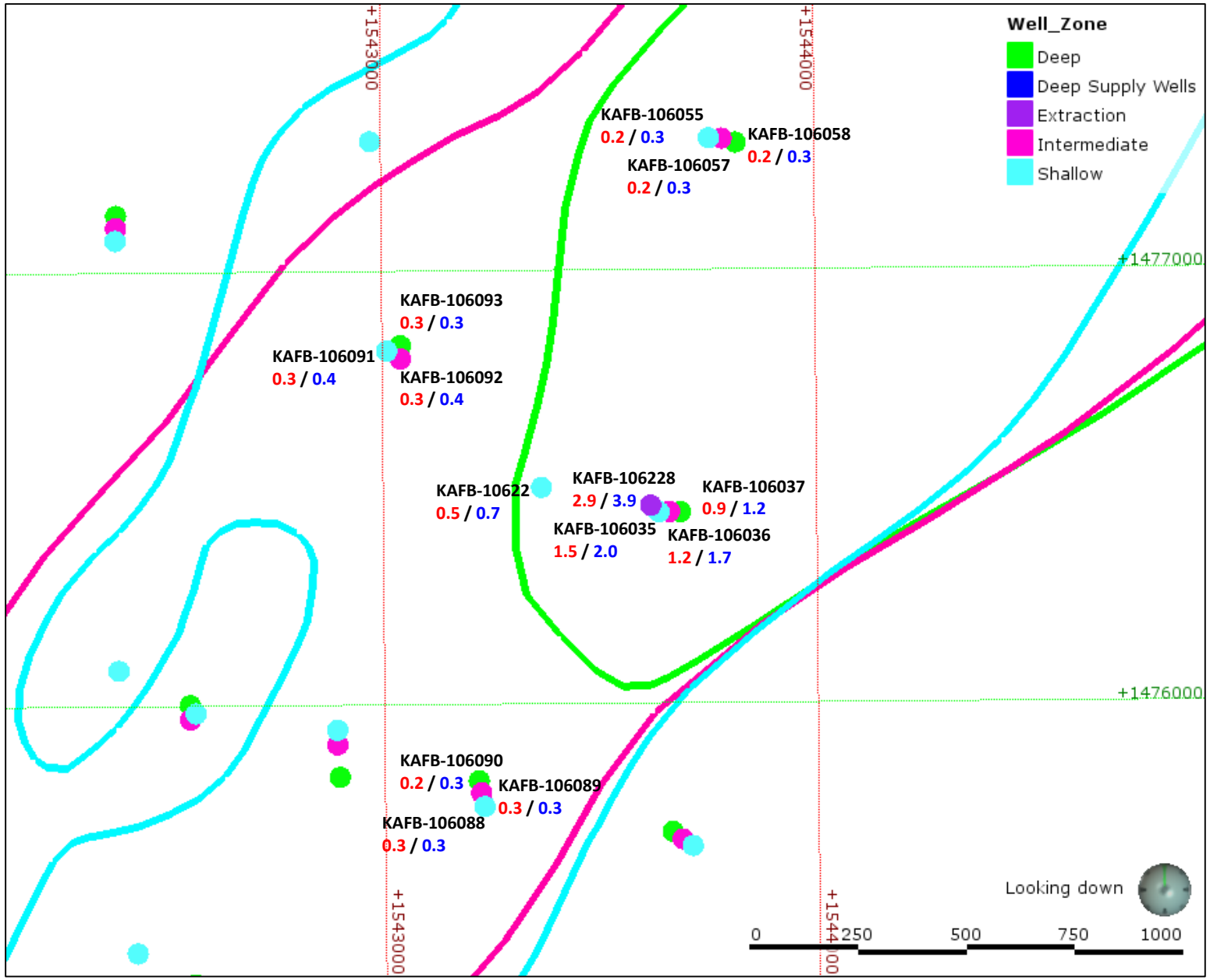
Well ID
150 gpm / 200 gpm

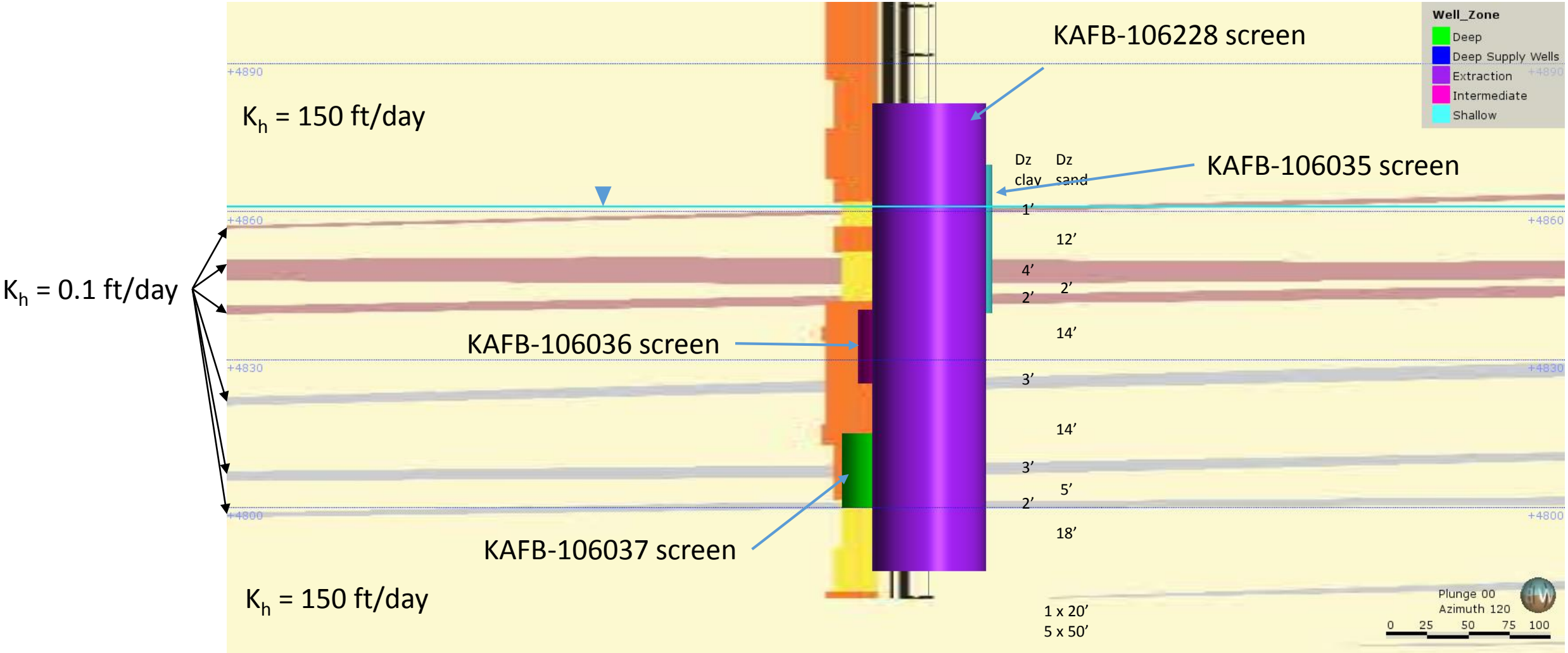



KAFB-106228 screen
Well_Zone
Deep
Deep Supply Wells
Extraction
Intermediate
Shallow
+4890
K_h = 150 ft/day
Dz clay
Dz sand
KAFB-106035 screen
+4860
1'
12'
4'
2'
2'
K_h = 1 ft/day
KAFB-106036 screen
14'
+4830
3'
14'
3'
5'
2'
+4800
18'
KAFB-106037 screen
K_h = 150 ft/day
1 x 20'
5 x 50'
Plunge 00
Azimuth 120
0 25 50 75 100

K_{sand} = 150 ft/day
K_{clay} = 1 ft/day

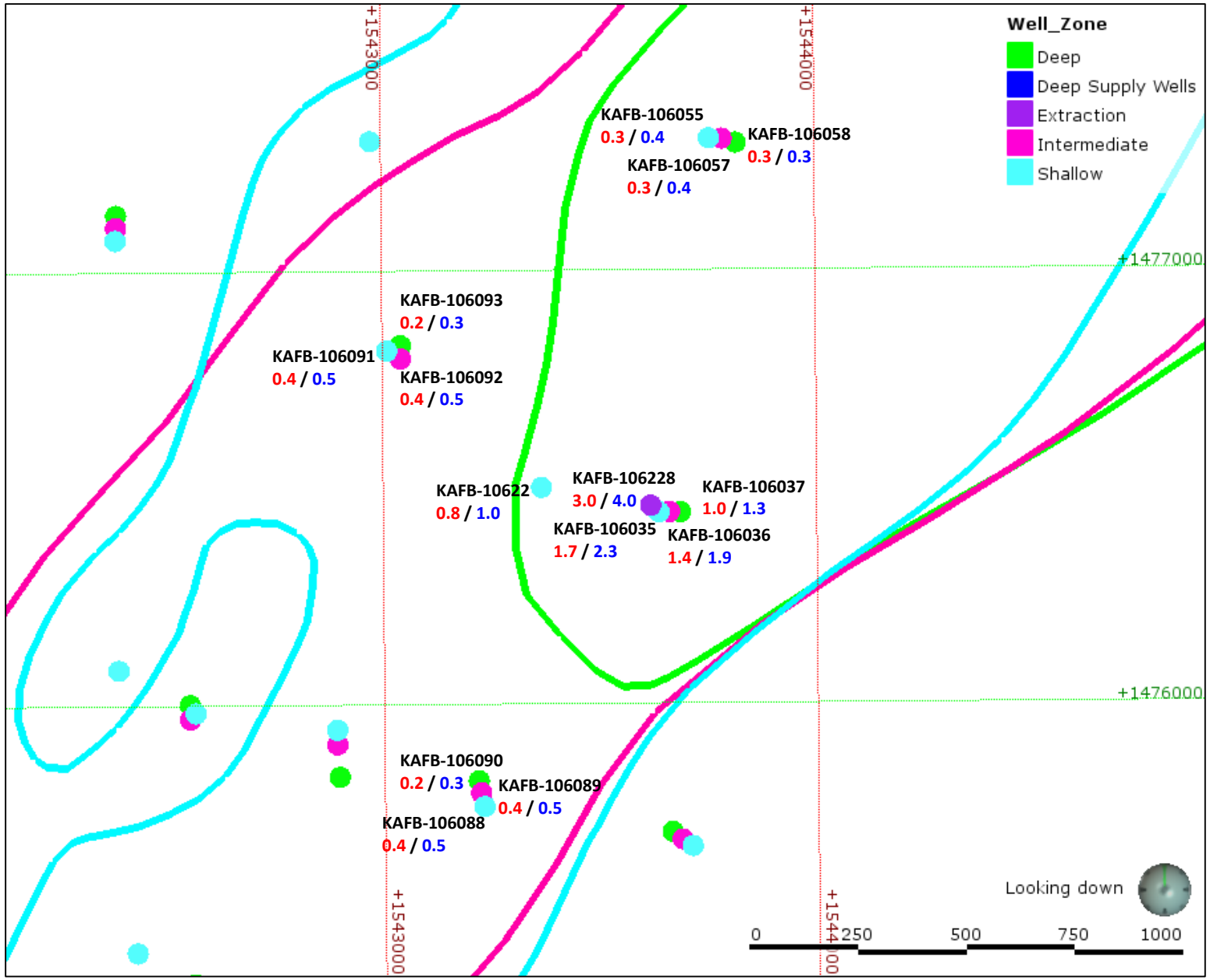
Well ID
150 gpm / 200 gpm




KAFB-106228 screen
Well_Zone
Deep
Deep Supply Wells
Extraction
Intermediate
Shallow
+4890
K_h = 150 ft/day
Dz clay
Dz sand
KAFB-106035 screen
+4860
1'
12'
4'
2'
2'
K_h = 0.1 ft/day
KAFB-106036 screen
14'
+4830
3'
14'
3'
5'
2'
+4800
18'
KAFB-106037 screen
K_h = 150 ft/day
1 x 20'
5 x 50'
Plunge 00
Azimuth 120
0 25 50 75 100

K_{sand} = 150 ft/day
K_{clay} = 0.1 ft/day

Well ID
150 gpm / 200 gpm



Summary of Drawdown Results

Well ID	Easting (feet)	Northing (feet)	Depth to TOS (feet btoc)	Depth to BOS (feet btoc)	Drawdown (feet)							
					Ks 100 Kc 1		Ks 100 Kc 0.1		Ks 150 Kc 1		Ks 150 Kc 0.1	
					150 gpm	200 gpm	150 gpm	200 gpm	150 gpm	200 gpm	150 gpm	200 gpm
KAFB-106228	1543617	1476456	435	530	4.3	5.8	4.5	6.0	2.9	3.9	3.0	4.0
KAFB-106035	1543636	1476441	452	482	2.3	3.0	2.5	3.4	1.5	2.0	1.7	2.3
KAFB-106036	1543660	1476441	481.8	496.8	1.8	2.4	2.1	2.8	1.2	1.7	1.4	1.9
KAFB-106037	1543686	1476441	507	522	1.3	1.8	1.5	1.9	0.9	1.2	1.0	1.3
KAFB-106055	1543757	1477302	465.8	485.8	0.4	0.5	0.5	0.6	0.2	0.3	0.3	0.4
KAFB-106057	1543786	1477301	484.9	499.9	0.4	0.5	0.4	0.6	0.2	0.3	0.3	0.4
KAFB-106058	1543818	1477292	511.8	56.8	0.4	0.5	0.4	0.5	0.2	0.3	0.3	0.3
KAFB-106088	1543229	1475764	460	480	0.4	0.5	0.5	0.7	0.3	0.3	0.4	0.5
KAFB-106089	1543222	1475796	481.5	496.5	0.4	0.5	0.5	0.6	0.3	0.3	0.4	0.5
KAFB-106090	1543216	1475824	555	570	0.4	0.5	0.4	0.5	0.2	0.3	0.2	0.3
KAFB-106091	1543011	1476816	454	474	0.4	0.5	0.5	0.7	0.3	0.4	0.4	0.5
KAFB-106092	1543042	1476798	474	489	0.4	0.6	0.5	0.7	0.3	0.4	0.4	0.5
KAFB-106093	1543042	1476828	544	559	0.4	0.5	0.4	0.5	0.3	0.3	0.2	0.3
KAFB-10622	1543365	1476499	462	487	0.8	1.1	1.1	1.4	0.5	0.7	0.8	1.0

Results Summary

- For the pumping rates and hydraulic conductivity values examined
  - Drawdown at KAFB-106228 will be moderate: 2.9 to 6 ft
  - Drawdown at nearest well cluster (KAFB-106035, 36, & 37) will be small: 0.9 to 3 ft
  - Drawdown at next nearest well (KAFB-10622) will be small: 0.5 to 1.1 ft
  - Drawdown at other well clusters is very small: 0.2 to 0.7 ft