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August 15, 2013

Penny Reddy
Groundwater Remediation Project Manager
Superfund Division SFD-7-3
EPA Region IX
75 Hawthorne Street
San Francisco, CA 94105

Subject: **Draft Pilot Study Design and Implementation Work Plan**
Evandale Avenue Sources
Mountain View, California

Dear Ms. Reddy:

Enclosed with this letter is a work plan for an *in situ* chemical oxidation (ISCO) pilot study at two locations along Evandale Avenue in Mountain View, California. The work plan is submitted on behalf of the Middlefield-Ellis-Whisman (MEW) Regional Groundwater Remediation Program (RGRP).

As indicated in the 27 March 2013 report to EPA entitled *Grab-Groundwater Assessment and Proposed Well Installations*, ("March 2013 Report") two previously unidentified areas of elevated concentrations of trichloroethylene ("TCE") were identified along Evandale Avenue in Mountain View during a cone penetration testing and grab groundwater sampling program implemented in late 2012. At a meeting with EPA on 22 January 2013, the MEW Companies agreed to address the elevated concentrations along Evandale Avenue despite the understanding of the MEW Companies that they are not responsible for the previously unidentified sources. The MEW Companies agreed to proceed with that remedy with the understanding that EPA would use all available tools under CERCLA to identify responsible parties for the elevated concentrations along Evandale Avenue.

The enclosed work plan presents a proposed ISCO pilot study for reducing the elevated concentrations of TCE at two locations along Evandale Avenue.

If you have any questions about the enclosed work plan, please feel free to contact me.

Very truly yours,



V. COCIANNI

Virgilio Cocianni
Remediation Manager

Attachment

CC: MEW Distribution List

Prepared for

Schlumberger Technology Corporation
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Sugar Land, Texas 77478

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**PILOT STUDY DESIGN AND
IMPLEMENTATION WORK PLAN
EVANDALE AVENUE SOURCES**

**MIDDLEFIELD-ELLIS-WHISMAN
REGIONAL GROUNDWATER REMEDIATION PROGRAM
MOUNTAIN VIEW, CALIFORNIA**

Prepared by

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Project Number WR1128A

15 August 2013

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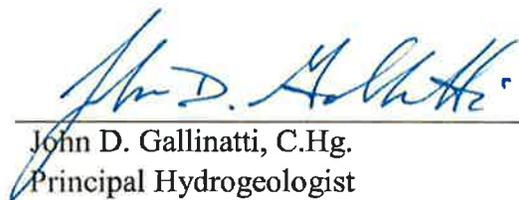
**Pilot Study Design and
Implementation Work Plan
Evandale Avenue Sources
Middlefield-Ellis-Whisman
Regional Groundwater Remediation Program
Mountain View, California**

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1. INTRODUCTION

This Pilot Study Design and Implementation Work Plan (Work Plan) presents a scope of work for conducting an *in situ* chemical oxidation (ISCO) pilot study in two areas containing elevated concentrations of chlorinated volatile organic compounds (cVOCs) that have been identified along Evandale Avenue, west of the Middlefield-Ellis-Whisman (MEW) study area located in Mountain View, California (Figure 1). Geosyntec Consultants, Inc. (Geosyntec) has prepared this Work Plan on behalf of Schlumberger Technology Corporation (Schlumberger), the MEW Regional Groundwater Remediation Program (RGRP) program coordinator.

1.1 Background

In response to a request from the United States Environmental Protection Agency (EPA), (EPA, 2012), a grab-groundwater sampling program was implemented by the RGRP between November 2012 and February 2013, and the results were presented in the Grab-Groundwater Assessment and Proposed Well Installations Report (Geosyntec, 2013a). During implementation of the grab-groundwater sampling program, two locations on Evandale Avenue were identified as containing elevated concentrations of cVOCs, in particular trichloroethene (TCE).

The locations are referred to as the “CPT-15 Area” and “CPT-21 Area” throughout the remainder of this report (Figure 2). Because the distribution of cVOCs indicate that the elevated cVOCs result from sources unrelated to cVOC releases at the former facilities of the MEW Companies, the CPT-15 and CPT-21 areas are collectively referred to as the Evandale Avenue Sources. It is the position of the RGRP that it is not responsible to remediate Evandale Avenue Sources. However, the RGRP has agreed to implement this Work Plan provided that the EPA actively investigates other potentially responsible parties.

1.2 Work Plan Organization

The remainder of this Work Plan is organized as follows:

- Section 2, *Conceptual Site Model*, presents a description of the local hydrogeology and cVOC distribution at the CPT-15 and CPT-21 areas;
- Section 3 *Pilot Study Objectives*, summarizes the specific project objectives for the pilot study;

- Section 4, *Design Basis for Pilot Study*, summarizes the results of Site-specific matrix oxidant demand testing, and presents a proposed approach and layout for the pilot study;
- Section 5, *Implementation Work Plan*, provides a work plan for implementing the pilot study scope of work;
- Section 6, *Reporting and Schedule*, summarizes the reports that will be submitted to document the pilot study results and presents a schedule for implementing the pilot study; and
- Section 7, *References*, provides the references cited in this Work Plan.

Tables, figures, and appendices are provided at the end of this Work Plan.

2. SITE CONCEPTUAL MODEL

This section of the Work Plan presents a description of the local hydrogeology and cVOC distribution at the CPT-15 and CPT-21 areas. Full descriptions of the MEW conceptual site model are presented elsewhere (e.g., Geosyntec, 2008; Geosyntec, 2013c), and are not repeated herein.

2.1 Hydrogeology

The CPT-15 and CPT-21 areas have been characterized through a series of cone penetration test (CPT) borings, direct-push borings, and grab-groundwater samples collected between November 2012 and April 2013. The locations of borings advanced in the vicinity of the CPT-15 and CPT-21 areas are shown in Figure 2.

Results from borings advanced between November 2012 and February 2013 were reported in the Grab-Groundwater Assessment and Proposed Well Installation Report (Geosyntec, 2013a). In April 2013, additional borings were advanced as described in the Final Work Plan for Remedy Design Data Collection (Geosyntec, 2013b). A summary of the activities related to the implementation of the Final Work Plan for Remedy Design Data Collection is included as Appendix A of this Work Plan and the sampling results are discussed below.

Approximately east-west and north-south trending cross-sections of the CPT-15 Area are presented in Figure 3 and Figure 4, respectively. An approximately east-west trending cross-section of the CPT-21 Area is presented in Figure 5. The cross-sections include a simplified interpretation of soil lithology based on soil behavior type (SBT) values from CPT logs along with geologic logs from direct-push boring locations. The soil lithology interpretations are generalized into coarser-grained units (i.e., sand and silty sand) and finer-grained units (i.e., silt and clay).

The current groundwater flow direction in the CPT-15 and CPT-21 areas is generally to the northeast towards the groundwater extraction wells located in the central core of the MEW study area. Potentiometric surface contour maps and groundwater hydraulic gradients are presented in the MEW RGRP Annual Progress Reports (e.g., Geosyntec, 2013c).

2.2 cVOC Distribution

cVOC analytical results for samples collected in the vicinity of the CPT-15 and CPT-21 areas are summarized in Table 1. TCE analytical results are posted on the cross-sections (Figure 3, Figure 4, and Figure 5) for grab-groundwater samples collected at the boring locations.

2.2.1 CPT-15 Area

The east-west trending cross-section A-A' (Figure 3) is approximately perpendicular to the regional hydraulic gradient and illustrates the lateral extent of TCE concentrations in the CPT-15 Area.

- The highest concentrations of TCE were detected at location CPT-15 at an approximate depth of 35 feet below ground surface (bgs).
- TCE concentrations decrease significantly to the immediate east and west of CPT-15.
 - To the west, TCE concentrations exceeding 1,000 micrograms per liter ($\mu\text{g/L}$) were not detected west of CPT-18.
 - To the east, TCE concentrations exceeding 1,000 $\mu\text{g/L}$ were not detected east of CPT-14.
- TCE concentrations decrease with depth, although concentrations of up to 15,000 $\mu\text{g/L}$ were detected at a depth of 56 to 60 feet bgs.

The north-south trending cross-section (Figure 4) illustrates the extent of TCE concentrations in the approximate direction of groundwater flow in the CPT-15 Area.

- Concentrations of TCE in groundwater at depths between approximately 25 and 35 feet bgs decrease downgradient of CPT-15, and concentrations of TCE exceeding 1,000 $\mu\text{g/L}$ were not detected beyond CPT-31, approximately 100 feet north (downgradient) of CPT-15, indicating that the area with elevated TCE concentrations is constrained.
- TCE concentrations of 64,000 $\mu\text{g/L}$ were detected at CPT-31 at a depth of 69 to 71 feet bgs. RGRP groundwater extraction well REG-3B(1) is located downgradient of CPT-31 and screened from 57 to 72 feet bgs. Analysis of groundwater capture zones indicates that TCE in groundwater downgradient of

CPT-15 at depths between 57 and 72 feet bgs has been and continues to be captured by this extraction well (e.g., Geosyntec, 2013c).

2.2.2 CPT-21 Area

The east-west trending cross-section C-C' (Figure 5) illustrates the lateral extent of TCE concentrations in the CPT-21 Area.

- TCE is either not present or only present at low concentrations (approximately 5 to 10 µg/L) in a thin coarse-grained unit present at approximately 15 feet bgs and representing first encountered groundwater.
- The highest concentrations of TCE were detected at CPT-21 at a depth of 19 to 23 feet bgs.
- TCE concentrations decrease significantly to the immediate east and west of CPT-21.
 - To the west, the TCE concentration at soil boring SB-5, located approximately 20 feet west of CPT-21 is 6.1 µg/L.
 - To the east, TCE was not detected at soil boring SB-6, located approximately 20 feet east of CPT-21.
- Samples collected from depth intervals beginning at approximately 40 feet bgs at boring locations CPT-09 and CPT-10 did not contain TCE at concentrations exceeding the Maximum Contaminant Level (MCL) of 5 µg/L.

3. PILOT STUDY OBJECTIVES

The ISCO pilot study will be conducted at the CPT-15 and CPT-21 areas located along Evandale Avenue. Location-specific pilot study objectives have been developed and are as follows:

- CPT-15 Area:
 - Evaluate whether ISCO can be practicably implemented to reduce cVOC mass and/or concentrations at the CPT-15 Area. The performance of the ISCO pilot study will be assessed based on the following:
 - The observed distribution and consumption of oxidant within the pilot study implementation area following three ISCO injection events.
 - The average groundwater cVOC concentration reductions measured in the pilot study implementation area following completion of three ISCO injection events.
- CPT-21 Area:
 - Evaluate whether ISCO can be practicably implemented as an alternative to groundwater extraction and treatment in the CPT-21 Area. The potential use of ISCO as an alternative to groundwater extraction and treatment will be evaluated based on the average groundwater cVOC concentration reductions measured in the pilot study implementation area following completion of up to three ISCO injection events.

It is important to recognize that, even when cVOC mass remains present in the subsurface, the observed cVOC concentrations may be low while permanganate is present in the subsurface. This temporary decrease in concentrations does not represent a sustainable cVOC concentration. Rather, a “rebound” in the cVOC concentrations may be observed following ISCO implementation as residual oxidant is depleted and geochemical conditions return to near baseline (ITRC, 2005). Therefore, evaluation of cVOC concentration reduction at the CPT-15 and CPT-21 areas will be based on observed cVOC concentrations once oxidant has been depleted from the system.

4. DESIGN BASIS FOR PILOT STUDY

The design basis for the ISCO pilot study was developed based on the hydrogeology and cVOC extent at the CPT-15 and CPT-21 areas (Section 2), bench-scale permanganate soil oxidant demand (PSOD) testing results (Appendix B), review of previous pilot studies conducted at MEW sites, and the professional experience of the design engineers.

4.1 Oxidant Selection

Potassium permanganate (KMnO₄) was selected as the chemical oxidant for the ISCO pilot study test based on the following:

- Potassium permanganate is a well-studied chemical oxidant that has been demonstrated to effectively degrade TCE and other chlorinated ethenes (e.g., ITRC, 2005).
- Potassium permanganate is a solid compound from which aqueous solutions can be prepared onsite using groundwater or tap water. Other permanganate formulations (e.g., sodium permanganate) are liquid, which makes handling more difficult.
- Unlike sodium permanganate, injection of potassium permanganate solution into aquifers does not risk causing an increase in sodium cations in groundwater that could degrade local water quality.

Hexavalent chromium can be generated or introduced during ISCO implementation using permanganate solutions. However, due to the naturally occurring reduced subsurface environment, hexavalent chromium generated during ISCO will attenuate over distance and time following implementation (Siegrist et al., 2011). During previous ISCO injections conducted at the MEW Study Area, concentrations of hexavalent chromium were reportedly below the analytical method detection limit (0.010 milligrams per liter [mg/L]) within 4.5 months following the ISCO injections (PES Environmental, 2001).

4.2 Permanganate Soil Oxidant Demand Testing

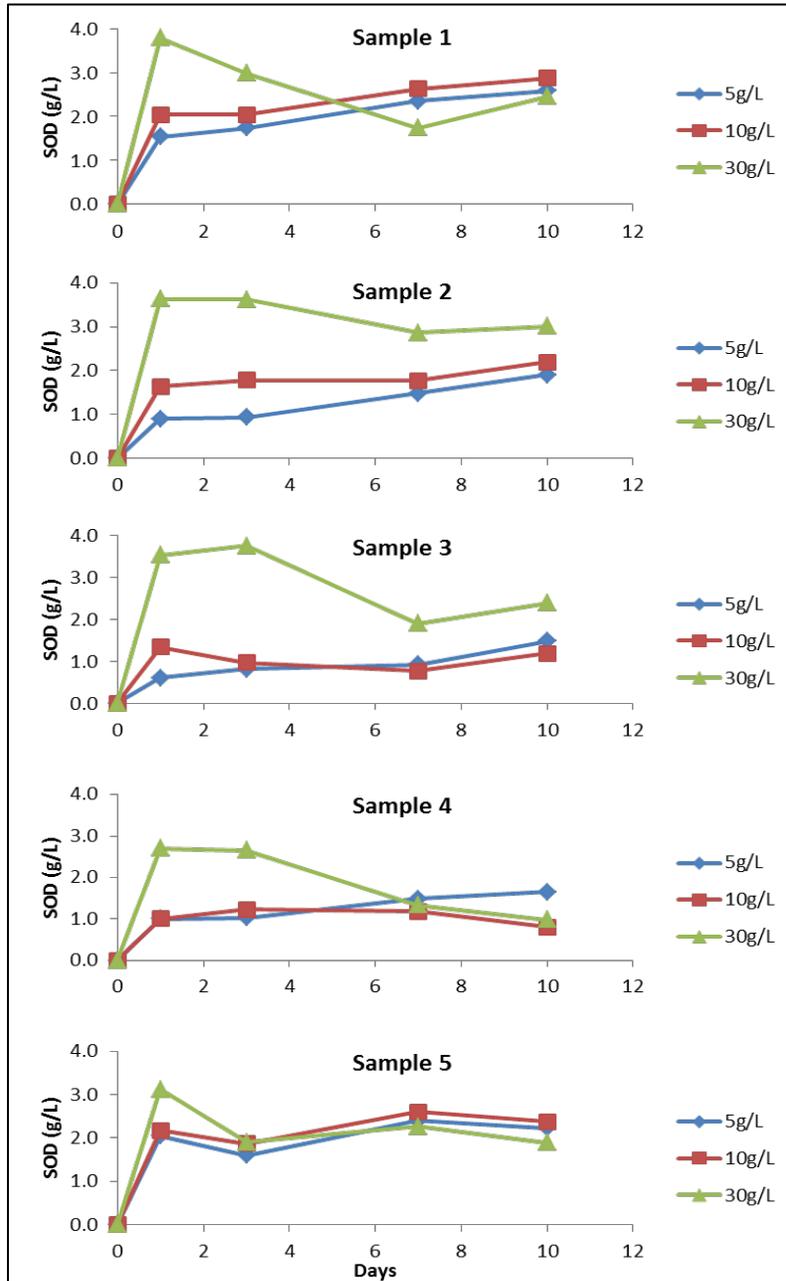
The oxidant dosing is designed to account for the natural soil demand (i.e., oxidant use by naturally occurring organic matter) and cVOC demand (i.e., oxidant use by cVOCs)

within the pilot study area. Of the two demands, natural soil demand typically drives the required oxidant dosing and is estimated based on the results of PSOD testing.

Bench-scale PSOD testing was performed in April and May 2013 to evaluate the rate and extent of oxidant consumption by soil and groundwater¹ when treated with permanganate. Soil samples for PSOD testing were collected during implementation of the Final Work Plan for Remedy Design Data Collection (Geosyntec, 2013b). A total of five soil samples were collected from borings SB-5, SB-6, and SB-9 (Figure 2). Four samples were collected from the borings at depth intervals containing coarse-grained soil (sand and silty sand). One soil sample was collected at SB-9 from a depth interval containing fine-grained soil (silt and clay). The PSOD Testing Results Report provided by the testing laboratory is provided in Appendix B and provides details of the PSOD testing methods.

The plots below provide a graph of the cumulative soil oxidant demand (SOD) in units of total grams of permanganate consumed divided by liters of groundwater in the test reactor (g/L) as a function of time in days. For each of the five soil samples that were tested, three graphs are presented, one for each of the initial permanganate doses that was tested (5 g/L, 10 g/L, and 30 g/L). The plots show that most permanganate consumption occurred within the first day of the PSOD tests, with observed permanganate consumption after one day ranging from approximately 1 to 4 g/L. Higher permanganate consumption was observed in the reactors that received highest initial permanganate dose of 30 g/L. The plots also show that permanganate consumption slowed after the first day of the PSOD test, with the cumulative permanganate consumption after 10 days similar to what was observed after one day.

¹ Soil and groundwater samples were collected from the CPT-15 and CPT-21 areas (Appendix B).



Reaction half-lives ($t_{1/2}$) for permanganate consumption over the first day and remainder of the PSOD testing, assuming first order reaction kinetics,² were calculated for each of the five soil samples and the mean results are summarized below.

Initial Permanganate Concentration (g/L)	Mean Half-Life, Day 0-1 (Days)	Mean Half-Life, Day 1-10 (Days)
5	2.0	19
10	3.1	60
30	4.6	NA ¹

¹ Half-life could not be calculated because an increase in permanganate concentrations was measured between day 1 and day 10.

The cumulative SOD measured during PSOD testing can also be presented on the basis of grams of permanganate consumed per kilograms of soil in the test reactor (g/kg). This provides an estimate of the natural soil oxidant demand (i.e., oxidant use by naturally occurring organic matter) that is used to develop the oxidant dosing design basis. PSOD test results measured on a g/kg basis after 10 days did not vary significantly as a function of the initial permanganate dosing and ranged between 1.8 and 4.3 grams permanganate per kilogram of soil, with a mean 10-day PSOD of 3.2 g/kg for the five soil samples. No correlation was evident between PSOD and the soil types tested, and PSOD of the finest-grained soil type evaluated (silty clay) was 3.4 g/kg, which was within the range of measured PSOD values. The mean 10-day PSOD of 3.2 g/kg is relatively low, with long-term permanganate natural oxidant demand values ranging from 0.8 g/kg to over 35 g/kg reported in the literature (e.g., Strategic Environmental Research and Development Program [SERDP], 2007).

The results of the PSOD testing indicate that ISCO using permanganate appears to be viable for the CPT-15 and CPT-21 areas, with limited short-term oxidant demand observed over the 10 day testing period, estimated long-term oxidant half-lives on the order of several weeks to several months, and a mean 10 day PSOD value that falls within the low range of values reported for other sites.

² The equation for estimating a reaction half-life assuming first order reaction kinetics is: $t_{1/2} = \frac{[t_1 - t_0] \ln 2}{\ln [C_1/C_0]}$, where C_1 is the concentration at time t_1 and C_0 is the concentration at time t_0 .

4.3 Oxidant Dosing

The target potassium permanganate dosing in the CPT-15 and CPT-21 areas for the pilot study is estimated based on the natural soil demand (i.e., oxidant use by naturally occurring organic matter) and cVOC demand (i.e., oxidant use by cVOCs).

Natural soil demand can be estimated based on the results of PSOD testing. As described in Section 4.2, PSOD test results indicated a natural soil permanganate demand of 1.8 to 4.3 g/kg, with a mean PSOD of 3.16 g/kg. However, bench-scale PSOD testing generally overestimates the amount of oxidant consumption during *in situ* applications due to differences in system configuration (i.e., batch laboratory tests versus plug-flow application in the field) (Mumford et al., 2005; Siegrist et al., 2011). As a result, a design range of PSOD values of 0.5 to 2.0 g/kg as permanganate (0.7 to 2.7 g/kg as potassium permanganate) was selected for the pilot study design.

Because cVOC potassium permanganate demand is typically small (on the order of 1%) compared to natural soil demand, the target potassium permanganate dose was selected to be equal to the estimated PSOD values (ranging from 0.7 to 2.7 g/kg) for the pilot study design basis. The volume and concentration of potassium permanganate solution injected as part of the pilot study is described in Section 4.6 and was designed to meet this target dosing.

4.4 Injection Rates

Injection rates, volumes, and pressures for the pilot study will be determined in the field based on the results of injection testing that will be conducted in the vicinity of CPT-15 (Section 5.2).

Preliminary pilot study injection rates for pilot study design were estimated based on a review of previously reported injection studies performed at MEW sites (e.g., PES Environmental, 2001; Shaw, 2011, 2012; Weiss, 2008). Previous studies suggest that injections of soluble materials dissolved in water performed using direct-push technology (similar to the planned application of potassium permanganate during the pilot study) have had achievable injection rates ranging from 2 to 12 gallons per minute (gpm).

Based on these studies, a nominal injection rate of 4 gpm at each injection location was selected for design of the CPT-15 and CPT-21 areas pilot study as a realistic injection rate that would result in a relatively low injection pressure.

If design injection rates and volumes cannot be reasonably achieved in the field based on the results of injection testing, the injection rates and oxidant dosing will be modified prior to ISCO injections. Modifications to the design injection rates or dosing, if necessary, would be determined in consultation with EPA. If the injection rate test results are consistent with the design basis, the ISCO injection program would proceed as designed.

4.5 Proposed Implementation Layout

The proposed injection point and performance monitoring network layouts for the pilot study are presented in the following section.

4.5.1 Proposed Injection Point Layouts

The proposed injection layouts for the CPT-15 and CPT-21 areas are described below.

CPT-15 Area

Figure 6 presents the proposed injection point layout for the CPT-15 Area.

ISCO injections will be performed along Evandale Avenue at five injection locations centered on CPT-15, where the highest TCE concentrations (up to 130,000 µg/L) were measured during grab-groundwater sampling. The proposed injection locations were selected based on constraints on the available work locations (i.e., presence of sidewalks, driveways, overhead trees and power lines, and subsurface utility corridors). The injection points spacing is approximately 15 feet on center (Figure 7), with some variation due to constraints on available work locations. The target radius of influence (ROI) for the injections is approximately 11 feet, which would result in a 33 percent overlap between the injection points. The vertical injection interval is 15 to 35 feet bgs based on the groundwater concentrations measured in the CPT-15 Area (Figure 7, Figure 8).

The injection locations may be adjusted based on conditions observed in the field during implementation.

CPT-21 Area

Figure 9 presents the proposed injection point layout for the CPT-21 Area.

ISCO injections will be performed along Evandale Avenue at two injection locations centered on CPT-21, where the highest TCE concentration (up to 4,000 µg/L) was measured during grab-groundwater sampling. The proposed injection locations were selected based on constraints on the available work locations (i.e., presence of sidewalks, driveways, overhead trees and power lines, and subsurface utility corridors). The injection point spacing is approximately 15 feet on center. The target ROI for the injections is 10 feet, which would result in a 33 percent overlap between the injection points. The vertical injection interval is 15 to 25 feet bgs and is based on the groundwater concentrations measured in the CPT-21 Area (Figure 10).

The injection locations may be adjusted based on conditions observed in the field during implementation.

4.5.2 Proposed Performance Monitoring Network Layouts

The proposed performance monitoring networks for the CPT-15 and CPT-21 areas are described below.

CPT-15 Area

The purpose of the performance monitoring is to assess the progress of the pilot study towards meeting the objectives described in Section 3. The proposed monitoring locations were selected in consideration of that purpose, as well as constraints on the available work locations (i.e., access, presence of overhead trees and power lines, and subsurface utility corridors). Figure 6 presents a plan view of the proposed monitoring network for the CPT-15 Area. Figure 8 presents a north-south trending cross-section showing the proposed monitoring well screen intervals along the approximate direction of groundwater flow.

One temporary piezometer will be installed between the proposed ISCO injection locations and the storm sewer, in order to monitor groundwater elevation during the injections to ensure that it remains below the storm sewer elevation. The piezometer will be drilled to first encountered groundwater (approximately 15 to 20 feet bgs).

A transect of temporary monitoring wells consisting of two well clusters will be installed approximately 20 feet downgradient of the injection points to monitor permanganate breakthrough, consumption, and changes in cVOC concentration. Based on the design injection ROI, permanganate is expected to reach the monitoring well transect after one or two injection events. Each well cluster will contain two wells with approximate screen intervals of 15 to 25 and 25 to 35 feet bgs to assess potential changes in pilot study performance as a function of injection depth.

Two additional monitoring well clusters will be installed further downgradient at distances approximately 35 and 60 feet north of the injection points. These well clusters will be used to monitor changes in cVOC concentration further downgradient of the injection locations (although outside the expected injection radius of influence, these wells will also be monitored for potential permanganate breakthrough). The well cluster located 35 feet downgradient of the injection points will contain three wells. Two wells will have approximate screen intervals of 15 to 25 and 25 to 35 feet bgs to assess potential changes in pilot study performance as a function of injection depth. The third well in the cluster will be installed with a deeper screen interval from 65 to 75 feet bgs to evaluate the potential for density-driven downward vertical transport of the injected permanganate solution. The well cluster located 60 feet downgradient of the injection points will contain two wells with approximate screen intervals of 15 to 25 feet bgs and 25 to 35 feet bgs.

Finally, existing MEW groundwater monitoring well 79A will be included in the monitoring well network as a far downgradient monitoring well. Well 79A is located adjacent to Fairchild Drive, approximately 320 feet downgradient the pilot study area near existing groundwater extraction well REG-3B(1). This well will provide long-term monitoring of the area as part of the on-going annual groundwater monitoring program.

CPT-21 Area

As with the CPT-15 Area, the purpose of performance monitoring at the CPT-21 Area is to assess the progress of the pilot study towards meeting the pilot study objectives described in Section 3. However, due to logistical constraints (i.e., access, presence of overhead trees and power lines, and subsurface utility corridors), performance monitoring at the CPT-21 Area will be conducted through collection of grab-groundwater samples.

One temporary piezometer will be installed in the CPT-21 Area between the proposed injection locations and the storm sewer, in order to monitor the groundwater elevation during injections to ensure that it remains below storm sewer elevation. The piezometer will be drilled to first encountered groundwater (approximately 15 to 20 feet bgs).

Approximately one month after each CPT-21 Area injection event, grab-groundwater samples will be collected from up to three boring locations in the vicinity of the injection locations in order to monitor permanganate consumption and changes in cVOC concentration during the pilot study. Grab-groundwater samples will be collected from each location at two depth intervals (approximately 15 to 20 feet bgs and 20 to 25 feet bgs) to assess potential changes in pilot study performance as a function of injection depth.

In addition, a downgradient performance monitoring well will be installed along Fairchild Drive (Figure 9) as part of the Grab-Groundwater Assessment and Proposed Well Installations Report (Geosyntec, 2013a) implementation.

4.6 Proposed Implementation Approach

The ISCO pilot study will consist of installing temporary performance monitoring wells, mixing and injection of potassium permanganate solution, performance monitoring, and data evaluation and reporting. Given the logistical constraints present in the CPT-15 and CPT-21 areas, and in order to allow flexibility between injection events, the ISCO injections will be performed using direct-push technology. The proposed injection approach for the CPT-15 and CPT-21 areas are described in this section of the Work Plan. Details of the proposed ISCO pilot study procedures are described in Section 5.

4.6.1 CPT-15 Area

Three potassium permanganate ISCO injection events will be conducted at the CPT-15 Area. The injection events will occur approximately every three months, with pilot study performance monitoring conducted between injections.

The volume of potassium permanganate solution that will be injected at the CPT-15 Area during the first injection event has been developed based on the estimated target dosing described in Section 4.3, the reactive transport of the potassium permanganate that will occur during injections, and the proposed injection location spacing and target

vertical depth intervals described in Section 4.5. At each of the five injection locations, the injections will be performed as follows:

- Over four 5-foot vertical intervals from 15 to 35 feet bgs (i.e., 15 to 20 feet bgs, 20 to 25 feet bgs, etc.);
- Nominal target volume of potassium permanganate solution injected will be approximately 1,200 gallons per 5-foot interval at each injection location;
- Concentration of potassium permanganate in the injection solution will be 15 g/L;
- Total nominal injection volume will be 24,000 gallons per injection event, corresponding to the injection of 3,000 pounds of potassium permanganate; and
- Resulting potassium permanganate dosing is estimated to be 0.7 g/kg per injection event, assuming a 10-foot injection ROI.

The injection locations, target injection volume, and target potassium permanganate dosing will be refined based on the process monitoring and performance monitoring data collected during the first injection event.

If permanganate surfacing, preferential pathways, or other potentially negative impacts are observed during the injections and cannot be remedied by refinement of the ISCO pilot study design, the USEPA will be notified and additional pilot study injections will not be implemented.

4.6.2 CPT-21 Area

A minimum of two permanganate injections and two post-injection monitoring events will be conducted in the CPT-15 Area prior to conducting injections in the CPT-21 Area. Because performance monitoring of the CPT-21 Area will be limited due to logistical constraints, two injections at the CPT-15 Area will be conducted first and the injection approach at the CPT-21 Area will be refined if necessary based on experience at the CPT-15 Area.

The volume of potassium permanganate solution that will be injected at the CPT-21 Area during the first injection event has been developed based on the estimated target dosing described in Section 4.3, the reactive transport of the potassium permanganate that will occur during injections, and the proposed injection location spacing and target

vertical depth intervals described in Section 4.5. At both of the injection locations, injections will be performed as follows:

- Over two 5-foot vertical intervals from 15 to 25 feet bgs (i.e., 15 to 20 feet bgs and 20 to 25 feet bgs);
- Nominal target volume of potassium permanganate solution injected will be approximately 1,200 gallons per 5-foot interval at each injection location;
- Concentration of potassium permanganate in the injection solution will be 15 g/L;
- Total nominal injection volume will be 4,800 gallons per injection event, corresponding to the injection of 600 pounds of potassium permanganate; and
- Resulting potassium permanganate dosing is estimated to be 0.7 g/kg per injection event, assuming a 10-foot injection ROI.

It is expected that at least two ISCO injection events will be required in the CPT-21 Area to achieve the pilot study objectives. A third potassium permanganate injection at the CPT-21 Area may be conducted as part of the pilot study based on performance monitoring results. Potential implementation of the third injection event will be based on the observed permanganate distribution, the observed rate of permanganate consumption, and cVOC concentrations in groundwater samples.

The CPT-21 Area injection events will occur approximately every two months, with performance monitoring conducted approximately one month after each injection event. Upon completion of the pilot test injections, performance monitoring results will be used to establish a post-pilot study monitoring program and frequency. The post-pilot study program will monitor geochemical conditions as they return to baseline.

5. IMPLEMENTATION WORK PLAN

The following section presents a work plan for implementing the CPT-15 and CPT-21 area pilot study.

5.1 Field Preparation

5.1.1 Permitting and Notification

Prior to the start of field activities, the following will be obtained:

- Access agreements for any work to be conducted on private property;
- Encroachment permits from the City of Mountain View for any work to be conducted in public right-of-ways; and
- Drilling permits from the Santa Clara Valley Water District (SCVWD).

The EPA, City of Mountain View, SCVWD, and private property owners in the CPT-21 and CPT-15 areas will be notified of the planned work schedule prior to the start of field activities.

5.1.2 Health and Safety

The existing site-specific health and safety plan (HASP) will be updated to include all field activities associated with the ISCO pilot study implementation. The HASP will contain procedures for hazard identification and mitigation, emergency response including a map of the nearest hospital and emergency contact information, incident reporting, use of appropriate personal protective equipment (PPE), and air monitoring procedures.

Prior to the start of field activities each day, a safety tailgate meeting will be conducted that will include a discussion of the field activities to be performed, safe work practices, identification of potential hazards, use of PPE, decontamination procedures, and emergency response protocols. Health and safety protocols related to potassium permanganate handling are discussed in Section 5.4.1.

5.1.3 Utility Clearance

Boring locations will be marked with white paint and Underground Service Alert (USA) North will be contacted a minimum of 48 hours prior to commencement of drilling activities. Additionally, a private utility locator will perform a geophysical survey in the vicinity of each proposed boring location area to identify potential utilities, pipelines, or other subsurface obstructions prior to drilling.

5.2 Injection Rate Test

An injection rate test using municipal water will be conducted downgradient of the CPT-15 Area near monitoring well 79A prior to the implementation of the ISCO injections in order to develop a location-specific estimate for the achievable injection rates and pressures within the pilot study area. The proposed injection test location is shown on Figure 6.

During the injection rate test, a high resolution injection testing tool (HRIT) will be advanced by a C-57 licensed drilling contractor using a direct push drilling rig to the target injection zone. The HRIT is a direct push tool that is equipped with an integrated down-hole pressure transducer and electrical conductivity sensor. While the tool is advanced through the subsurface, electrical conductivity readings will be collected to obtain an indication of soil lithology and select the target injection test zones. Injection rate tests will be performed at up to three intervals. The injection test intervals will be located between 15 and 35 feet bgs (corresponding to the design injection depth interval) and soil intervals containing both primarily coarse-grained (i.e., silty sand and sand) and fine-grained (i.e., silts and clays) material will be tested.

Once each of the target injection test intervals is reached, a step injection rate versus pressure test will be conducted. During the step injection test, potable water will be injected through the HRIT tooling into the subsurface at injection rates similar to those previously observed at MEW and consistent with the ISCO pilot study design basis (Section 4.2.1). The initial injection rate will be approximately 1 gpm and will be increased step-wise to a final injection pressure of approximately 8 to 10 pounds per square inch (psi) (estimated maximum rate of up to 7 gpm). After each increase, the injection rate will be maintained at a constant rate for a period of at least 15 minutes. Injection pressures (down-hole on the HRIT tooling and aboveground at the injection wellhead) and flow rates will be continuously monitored and recorded during testing and the data used to determine the injection rates that are achievable at low injection

pressures (approximately 8 to 10 psi) in the formation. The subsequent potassium permanganate injections would be conducted at maximum injection pressures of 8 to 10 psi in order to reduce the potential for flow into preferential pathways or surfacing of the permanganate solution.

If the injection rate test results are consistent with the design basis, the ISCO injection program would proceed as designed and the injection test results would be submitted to EPA as part of the Pilot Study Report (Section 6). If the achievable injection rate at the pilot study area differs significantly from the design basis, the injection rates and dosing described in Section 4 may be modified prior to ISCO injections. If modifications to the ISCO injection program are required, the results of the injection rate test will be provided to EPA and changes to the initial ISCO pilot study injection rates or dosing based on the results would be determined in consultation with EPA.

5.3 Temporary Performance Monitoring Well Installation

As described in Section 4.5, a total of nine temporary performance monitoring wells will be installed in the CPT-15 Area at the following locations:

- Two temporary monitoring well clusters will be installed approximately 20 feet downgradient of the injection locations. At each cluster, one temporary monitoring well will be screened from approximately 15 to 25 feet bgs and the other temporary monitoring well will be screened from approximately 25 to 35 feet bgs;
- One temporary monitoring well cluster will be installed approximately 35 feet downgradient of the injection locations. The well cluster will contain three temporary monitoring wells, with approximate screen intervals of 15 to 25, 25 to 35, and 65 to 75 feet bgs; and
- One temporary monitoring well cluster will be installed approximately 60 feet downgradient of the injection locations. The well cluster will contain two temporary monitoring wells, with approximate screen intervals 15 to 25, and 25 to 35 feet bgs.

The proposed temporary performance monitoring well locations are shown in Figure 6 (plan view) and Figure 8 (cross-sectional view).

5.3.1 Well Drilling

The temporary performance monitoring wells will be drilled and installed by a C-57 licensed drilling contractor using the hollow stem auger drilling method.

At each well cluster location, the deepest well will be drilled, logged for geology, and installed first. Since the wells in each cluster will be co-located, the subsequent shallower well or wells will not be logged for geology during drilling and installation. Geologic logging of the hollow stem auger soil cuttings will be conducted by field staff under the direction of a California Professional Geologist using the Unified Soil Classification System. The soil will be field-screened for volatile organic compounds using a photoionization detector (PID) and the readings recorded on the boring logs. All downhole equipment will be decontaminated prior to use and between boring locations.

Once the target depth is reached at each boring, the monitoring well will be constructed through the hollow stem auger casing. The monitoring well casing will consist of 2-inch diameter, Schedule 40 PVC pipe, with 0.020-inch factory-cut, slotted well screen, flush-threaded joints and a bottom cap. The annular space between the borehole wall and well screen for each well will be filled with #3 filter pack sand to a depth of about 3 feet above the top of the well screen. Approximately 2 to 3 feet of bentonite chips or pellets will be placed above the sand pack and hydrated to provide a seal above the filter pack. The remainder of the borehole will be tremie filled with Portland cement to the ground surface in accordance with SCVWD requirements. The surface completions will consist of a flush-mount traffic-rated well box and the tops of the well casings will be fitted with locking expandable-gasket caps.

After installation, the locations and elevations of the temporary performance monitoring wells will be recorded using a Trimble GeoXH handheld global positioning system (GPS) unit, or equivalent.

5.3.2 Well Development

The performance monitoring wells will be developed a minimum of 48 hours following installation. Development will consist of a combination of bailing, surging, and pumping. As described in the MEW QAPP (Canonie, 1991), wells will be developed to remove fine-grained materials from inside the filter pack and casing, to stabilize the filter pack around the well screen, and to produce representative water samples from the

water-bearing zone. Development will be continued until the well is judged to be adequately developed (EPA, 2001).

5.4 Potassium Permanganate Injections

5.4.1 Materials Handling and Mixing

Potassium permanganate handling will be in compliance with City of Mountain View Fire Department requirements and the *National Fire Protection Association (NFPA) 430: Code for the Storage of Liquid and Solid Oxidizers* (NFPA, 2004). The HASP will include a list of emergency response materials that will be present onsite such as containment materials, adsorbent, neutralizing solution (sodium thiosulfate, $\text{Na}_2\text{S}_2\text{O}_3$), and personal protective equipment.

The project team will receive onsite training in potassium permanganate handling and emergency response. Emergency response supplies and equipment will be staged near the work area in the event of a release and verified daily.

On the first day of each ISCO injection event, the following activities will be conducted as part of the mixing equipment set up:

- Establishment of site control areas (i.e., exclusion zone, decontamination zone, etc.);
- Confirmation of traffic and pedestrian controls around the proposed injection locations; and
- Receipt of potassium permanganate and staging in secondary containment system.

Potassium permanganate will be mixed with water in an aboveground tank to achieve the target solution concentrations for each area as discussed in Section 4. The potassium permanganate batch mixing will be performed numerous times during the injection activities and will include the following activities:

- Checking safety supplies and donning personal protective equipment;
- Connecting to the water supply and filling the mix tank(s) with water;
- Adding the granular potassium permanganate to the mix tank(s);

- Mixing the tank contents, using an electric tank mixer; and
- Sampling the solution for confirmation analysis of potassium permanganate concentration.

5.4.2 Oxidant Borings and Injections

Temporary borings for oxidant injections will be advanced by a C-57 licensed drilling contractor using direct-push drilling. All down-hole equipment will be decontaminated prior to use.

At each location, hollow steel direct-push rods will be advanced to the target injection interval. Injections will be completed in a top-down manner over approximate 5-foot vertical depth intervals at each injection location. At the CPT-15 Area, each injection location will have four target injection intervals: 15 to 20, 20 to 25, 25 to 30 and 30 to 35 feet bgs. At the CPT-21 Area, each injection location will have two target injection intervals: 15 to 20 and 20 to 25 feet bgs. Multiple injection locations at each area may be manifolded together during the potassium permanganate injections.

Potassium permanganate solution will be injected from the aboveground storage tank through an injection line connected to the hollow steel direct push rods. Prior to starting injections, the injection line will be inspected for signs of damage or leaks and connections will be checked. The injection line will be equipped with a mechanical flow totalizer, flow meter, pressure gauge, and flow control valve to monitor the injection volume, rate, and pressure. The maximum operational pressure will be determined based on the results of the injection rate test discussed in Section 5.2.

Design injection volumes and rates are described in Section 4. If possible based on achievable injection rates and pressures, the design volume of potassium permanganate solution will be injected during each oxidant injection event. During each injection, the rate and pressure will be slowly increased from conservatively low values at the start of injections to the design injection rate. The oxidant delivery rate and target injection volume may be adjusted during implementation based on observed field conditions.³

³ EPA will be notified if there is a need to revise the oxidant delivery rate or target injection volume.

5.4.3 Surfacing and Preferential Pathway Monitoring

As potassium permanganate solution is injected into the subsurface, it will move away from the injection point and can be influenced by natural heterogeneities in the subsurface, bedding and backfill materials associated with buried utilities, and compromised buried utility conduits (i.e., leaking storm sewers). A preferential pathway monitoring program will be implemented to expeditiously identify potential preferential pathways that could influence the movement of potassium permanganate solution during injection activities. Prior to the start of injections, features where potassium permanganate solution could surface (i.e. manholes, storm drains, etc.) will be identified.

Temporary Piezometer

A temporary piezometer will be installed between the injection locations and the storm sewer in order to ensure the groundwater elevations during the ISCO injections remain below the storm sewer elevation. Hollow steel direct-push rods equipped with a disposable tip and a section of slotted polyvinyl chloride (PVC) screen will be pushed to a depth of five feet below the first encountered groundwater (approximately 15 to 20 feet bgs). The steel rods will be retracted approximately five feet, leaving the stainless steel disposable tip in the ground and exposing the slotted PVC screen. This temporary piezometer will be left in the ground during the injections and the water level will be monitored. Injection flow rates and pressures may be adjusted as the water level measured in the temporary piezometer rises to ensure that the groundwater elevation remains below the storm drain elevation during the injections.

Visual Monitoring

During injection activities, potential preferential pathways in close proximity to the injection wells will be visually monitored for a purple color indicative of the presence of potassium permanganate. If a purple color is observed in a potential preferential pathway, the injections will be stopped. In the event that the presence of excess permanganate solution requires neutralization emergency response, procedures will be implemented as discussed in the following section.

5.4.4 Emergency Response Procedures

In the event that the presence of excess permanganate solution requires neutralization or process chemical are spilled during site operations and require neutralization, emergency response procedures will be implemented. Activities involved include the following:

- Stopping the potassium permanganate injections;
- Notifying the Project Manager and Site Safety Officer in accordance with the HASP;
- Notifying the EPA and City of Mountain View if the spill exceeds the reportable quantity of 100 pounds of potassium permanganate;
- Managing spilled solid potassium permanganate;
- Managing spilled potassium permanganate solutions;
- Managing any surface seepage of potassium permanganate solutions; and
- Neutralize spilled potassium permanganate using sodium thiosulfate solution.

5.5 Sampling and Analysis Plan

The follow section describes the baseline and performance monitoring that will be conducted to evaluate the progress of the pilot study.

5.5.1 Baseline Sampling

A minimum of 72 hours after the completion of well development, baseline groundwater samples will be collected from the CPT-15 Area temporary performance monitoring wells to establish baseline geochemical conditions prior to the implementation of oxidant injections.

During baseline sampling, the temporary performance monitoring wells will be purged three to five casing volumes prior to collection of groundwater samples. The wells will be purged using a submersible pump equipped with new disposable tubing. Water will be pumped through an enclosed flow-through cell fitted with a multi-parameter groundwater meter. Temperature, pH, electrical conductivity, turbidity, dissolved oxygen (DO), and oxidation reduction potential (ORP) will be measured during

purging. Groundwater will be purged until the field parameter values stabilize. Groundwater levels will be monitored during purging to confirm that drawdown stabilizes prior to sampling.

Following stabilization of field parameters, groundwater samples will be collected. Samples will be analyzed for the following compounds:

- cVOCs by EPA Method 8260B;
- Total dissolved solids (TDS) by Method SM 2540C;
- Chloride by EPA Method 300.0;
- Dissolved manganese, iron, and chromium by EPA Method 6010B; and
- Dissolved hexavalent chromium [Cr(VI)] by EPA Method 7196.

Groundwater samples will be collected in laboratory-supplied sample containers and labeled with project identification, sample location, analytical parameters, time and date of sampling, and any preservative added to the sample. Samples will be stored in an ice-cooled chest, maintained at approximately 4° C, for transport under chain-of-custody procedures to a State of California-certified laboratory for analysis.

Quality assurance/quality control (QA/QC) samples will be collected for cVOC samples. In accordance with the MEW QAPP, one duplicate, one field blank and one equipment blank will be collected for every 20 groundwater samples collected for cVOC analysis. In addition a laboratory provided trip blank will be included with each cooler containing groundwater samples for cVOC analysis that is sent to the laboratory.

For the CPT-21 Area, the grab-groundwater sampling conducted between November 2012 and April 2013 will serve as the baseline sampling event.

5.5.2 Performance Monitoring

Performance monitoring will be conducted to assess the progress of the pilot study with respect to achieving the pilot study objectives (Section 3). Pilot study effectiveness will be indicated if cVOC degradation is observed following implementation of the pilot study ISCO injections, with cVOCs considered to be degrading if concentrations of TCE are reduced from the baseline sample concentrations. However, the observed cVOC concentrations may be low while permanganate is present in the subsurface with

a “rebound” in the cVOC concentrations as residual oxidant is depleted and geochemical conditions return to near baseline (ITRC, 2005). Therefore, evaluation of cVOC concentration reduction at the CPT-15 and CPT-21 areas will be based on observed cVOC concentrations once oxidant has been depleted from the system.

In the CPT-15 Area, three performance monitoring events will be conducted following the first injection event and two performance monitoring events will be conducted following the second and third injection events. During the CPT-15 Area performance monitoring, groundwater samples will be collected at the performance monitoring wells approximately every two weeks. In the CPT-21 Area, performance monitoring grab-groundwater samples will be collected approximately one month after each injection event. The interval between performance monitoring events may be adjusted during implementation based on observed field conditions.⁴

During each performance monitoring event, the performance monitoring wells will be purged three to five casing volumes prior to collection of groundwater samples. The wells will be purged using a submersible pump equipped with new disposable tubing. Water will be pumped through an enclosed flow-through cell fitted with a multi-parameter groundwater meter. Temperature, pH, electrical conductivity, turbidity, dissolved oxygen (DO), and oxidation reduction potential (ORP) will be measured during purging. Groundwater will be purged until the field parameter values stabilize. Groundwater levels will be monitored during purging to confirm that drawdown stabilizes prior to sampling.

Following stabilization of field parameters, groundwater samples will be collected. Samples collected from the CPT-15 Area wells will be analyzed for the following compounds:

- Quenched cVOCs by EPA Method 8260B;
- Permanganate ion using a commercially available field test kit;
- TDS by Method SM 2540C;
- Chloride by EPA Method 300.0;

⁴ EPA will be notified if there is a need to adjust the performance monitoring schedule.

- Dissolved total manganese, iron, and chromium by EPA Method 6010B; and
- Dissolved hexavalent chromium [Cr(VI)] by EPA Method 7196. This analysis is subject to interference in the presence of permanganate. If groundwater is pink or purple, samples will not be analyzed for this compound.

Samples collected from the performance monitoring grab-groundwater locations at the CPT-21 Area will be analyzed for the following compounds:

- Quenched cVOCs by EPA Method 8260B; and
- Permanganate ion using a commercially available field test kit.

In order to ensure that residual permanganate in the groundwater (if present) does not further oxidize the cVOCs between sample collection and laboratory analysis, cVOC samples will be quenched in the field immediately following sample collection. The sample preparation for quenched cVOCs involves the addition of approximately 2 to 3 grams of anhydrous manganese sulfate ($MnSO_4$) to a groundwater sample in the field. The groundwater sample is allowed to react with the $MnSO_4$ for approximately ten minutes, after which the sample is decanted into a VOA vial containing hydrochloric acid for transport to the analytical laboratory.

Performance monitoring samples will be collected in laboratory-supplied sample containers and labeled with project identification, sample location, analytical parameters, time and date of sampling, and any preservative added to the sample. Samples will be stored in an ice-cooled chest, maintained at approximately 4° C, for transport under chain-of-custody procedures to a State of California-certified laboratory for analysis.

QA/QC samples will be collected for cVOC samples. In accordance with the MEW QAPP, one duplicate, one field blank and one equipment blank will be collected for every 20 groundwater samples collected for cVOC analysis. In addition a laboratory provided trip blank will be included with each cooler containing groundwater samples for cVOC analysis that is sent to the laboratory.

5.6 Temporary Performance Monitoring Well Destruction Plan

At the conclusion of the pilot study, the temporary performance monitoring wells will be destroyed. The performance monitoring wells will be overdrilled by a C-57 licensed

drilling contractor and the well materials removed. The boring will then be grouted to the surface in accordance with County, State and Federal requirements.

5.7 Investigation-Derived Waste Management

Water generated during the implementation activities will be neutralized if residual permanganate is present, and then treated and discharged through the North 101 or South 101 RGRP groundwater treatment systems. Soil cuttings will be temporarily stored at one of the treatment systems in 55-gallon drums or roll off bins pending analysis. Following waste profiling, soil cuttings will be disposed of in accordance with Federal and State requirements at an appropriate offsite facility.

6. REPORTING AND SCHEDULE

The following section summarizes the pilot study reporting and presents a schedule for implementing the pilot study.

6.1 Pilot Study Reporting

A Pilot Study Implementation Report will be prepared and submitted to EPA at the conclusion of the Pilot Study. The Pilot Study Implementation Report will include the following:

- A description of activities related to performance monitoring well installation and development, including boring logs and well construction diagrams;
- A summary of the results of the baseline sampling, including data tabulation;
- A summary of the oxidant injection events, including the volume and concentration of oxidant injected, the observed injection rate and pressure, and the results of surfacing and preferential pathways monitoring;
- The results of performance monitoring sampling, including data tabulation and creation of data summary figures;
- A discussion of the performance monitoring results; and
- Recommendations for follow-on work. Follow-on work could potentially include additional ISCO injections, additional monitoring of the pilot study area to assess long-term cVOC concentration trends, or expansion of the MEW groundwater remedy (i.e., groundwater extraction and treatment) to address residual cVOCs in the pilot study area.

6.2 Schedule

A summary of the proposed schedule is as follows:

- 30 September 2013 – EPA approval of work plan.
- October 2013 – Injection rate testing and permitting, installation, development, and baseline sampling of CPT-15 Area performance monitoring wells.
- November through December 2013 – First CPT-15 Area injection event and associated performance monitoring.

- January through March 2014 – Second CPT-15 Area injection event and associated performance monitoring.
- March through May 2014 – Third CPT-15 Area injection event and associated performance monitoring. First CPT-21 Area injection event and associated performance monitoring.
- May through July 2014 – Second CPT-21 Area injection event and associated performance monitoring.
- July through August 2014 – Third CPT-21 Area injection event (if implemented based on performance monitoring data) and associated performance monitoring.
- September through October 2014 – Prepare and submit Pilot Study Implementation Report.

The schedule may be adjusted as needed following EPA review and approval of the work plan, delays in obtaining required access or permits, or due to conditions encountered during field implementation. EPA will be notified if there is a need to adjust the pilot study implementation schedule.

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TABLES

Table 1
CPT-15 and CPT-21 Area cVOC Analytical Results in Groundwater
Pilot Study Design and Implementation Work Plan
MEW Regional Program
Mountain View, CA

CPT Identification	GPS Coordinates		Sample Depth (ft bgs) ¹	Sample Date	PCE ²	TCE ³	cis-DCE ⁴	trans-1,2-DCE	1,1-DCE	Vinyl Chloride	1,1,1-TCA ⁵	1,1,2-TCA	1,1-DCA ⁶	1,2-DCA	Benzene	Toluene	Ethylbenzene	Xylenes, Total	1,2-DCB ⁷	1,4-DCB	Freon 113	Other VOCs ⁸			
	Easting	Northing																							
CPT-01	1547828.024	332633.3149	24-29	11/26/2012	ND	ND	ND	ND	ND	ND	ND	ND	5.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
			36-41	11/26/2012	ND	51	1.6	ND	1.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
			42-47	11/26/2012	ND	40	1.4	ND	1.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CPT-02	1547624.379	332696.1835	21-26	11/26/2012	ND	7.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
			37-42	11/26/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
CPT-03	1547374.249	332774.8573	17-22	11/27/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
			35.5-40.5	11/27/2012	ND	8.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
CPT-04	1547155.768	332846.9014	19-24	11/27/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
			33-38	11/27/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
CPT-05	1547801.971	333088.8454	12-17	11/28/2012	ND	20	1.5	ND	0.63	ND	ND	ND	0.85	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
			26-30	11/28/2012	ND	980	230	82	7.8	1.2	ND	ND	6.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
CPT-05a	1547801.971	333088.8454	65-69	12/13/2012	ND	300	7.0	ND	2.2	ND	1.6	ND	0.81	ND	ND	ND	ND	ND	ND	ND	ND	4.8	ND		
CPT-06	1547449.519	333207.1519	17-21	11/28/2012	ND	47	0.62	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
			31-35	11/28/2012	ND	8.8	0.70	ND	1.4	ND	0.65	ND	0.57	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.5	ND	
CPT-07	1547692.296	333122.7034	18-22	11/28/2012	0.92	9,600	38	2.2	2.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
			26-30	11/29/2012	ND	7,600	100	7.8	1.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
			56-60	11/29/2012	ND	15,000	40	1.3	3.3	0.51	0.97	ND	0.80	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.3	ND	
CPT-08	1547357.26	333235.7126	21-25	11/29/2012	ND	3.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
			33-37	11/29/2012	ND	17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.67	ND	
			64-68	11/29/2012	ND	7.8	ND	ND	ND	ND	ND	ND	ND	ND	0.93	0.71	ND	ND	ND	ND	ND	ND	0.76	ND	ND
CPT-09	1547119.043	333301.4577	18-22	11/30/2012	ND	240	1.4	ND	0.87	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
			44-48	11/30/2012	ND	2.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
			70-74	12/11/2012	ND	0.72	ND	ND	2.2	ND	1.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.6	ND	
CPT-10	1546874.667	333377.7699	18-22	11/30/2012	ND	7.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
			43-47	11/30/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
			52-56	11/30/2012	ND	1.7	ND	ND	3.5	ND	1.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.1	ND	
CPT-11	1546675.306	333440.1934	15-19	12/10/2012	ND	47	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
			20-24	12/10/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
			30-34	12/10/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
			47-50	12/10/2012	ND	19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
			55-58	12/10/2012	ND	18	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.53	ND	ND	ND	ND	ND	ND	ND	ND	ND
CPT-13	1547519.366	332728.7768	62-64	12/10/2012	ND	58	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
			20-24	12/12/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
			28-32	12/12/2012	ND	1.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
CPT-14	1547708.264	333117.8065	18-22	12/12/2012	ND	480	1.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
			26-30	12/12/2012	ND	1,200	17	3.8	0.93	ND	ND	0.50	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.78	ND		
			48-52	12/12/2012	ND	180	3.2	ND	1.2	ND	1.1	ND	0.83	ND	ND	ND	ND	ND	ND	ND	0.92	ND	2.3	ND	
			56-60	12/12/2012	ND	180	3.7	ND	1.8	ND	1.1	ND	0.61	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.3	ND	
CPT-15	1547675.213	333127.9898	20-23	12/13/2012	8.6	100,000	4,100	46	23	6.6	ND	0.68	2.3	ND	ND	2.6	2.5	1.4	ND	1.7	ND	ND			
			32-36	12/13/2012	2.3	130,000	4,600	61	30	13	ND	ND	8.6	ND	ND	2.4	1.7	8.0	ND	ND	0.67	ND	ND		
			56-60	12/13/2012	ND	5,000	130	1.3	12	1.3	0.67	ND	3.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.4	ND	
CPT-18	1547632.492	333141.2382	22-26	12/17/2012	ND	1,500	330	79	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			
			40-44	12/17/2012	ND	360	6.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
			58-62	12/17/2012	ND	370	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
CPT-19	1547296.249	333255.7417	22-25	12/17/2012	ND	14	0.78	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			
CPT-20	1547207.818	333283.1396	17-21	12/18/2012	ND	6.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			
CPT-21	1547010.429	333335.1756	19-23	12/18/2012	ND	4,000	200	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			
CPT-22	1546943.673	333354.6977	18-22	12/18/2012	ND	4.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			
CPT-28	1547777.868	333733.4976	17-20	12/21/2012	ND	52	21	0.91	2.9	0.60	1.1	ND	6.0	ND	ND	ND	ND	ND	ND	ND	ND	2.6	ND		
			26-30	12/21/2012	ND	84	290	2.0	3.7	ND	ND	1.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.4	ND		
			53-56	12/21/2012	0.63	1,800	35	1.4	6.9	ND	ND	3.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ND	ND	
CPT-29	1548266.045	333654.0844	22-25	12/26/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
			34-38	12/26/2012	13	390	34	3.6	5.5	ND	ND	10	ND	ND	ND	ND	ND	ND	ND	3.8	ND	0.70	ND		
			50-54	12/26/2012	2.6	1,400	67	5.2	6.2	ND	1.4	ND	3.6	ND	ND	ND	ND	ND	ND	2.9	ND	4.2	ND	ND	
CPT-30	1548004.984	333672.3454	16-18	12/26/2012	ND	38	3.2	0.60	0.84	ND	ND	0.63	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.3	ND		
			26-28	12/26/2012	ND	510	55	4.0	4.2	0.58	ND	ND	3.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
			47-50	12/26/2012	ND	ND	ND	ND	ND	1.5	ND	ND	0.71	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
CPT-31	1547737.926	333196.9112	19-21	12/27/2012	ND	7,300	400	3.7	3.1	2.6	ND	1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
			38-40	12/27/2012	1.0	650	24	1.4	2.7	ND	0.70	ND	1.4	ND	ND	ND	ND	ND	ND	ND	ND	1.5	ND		
			58-62	12/27/2012	ND	910	4.8																		

Table 1
CPT-15 and CPT-21 Area cVOC Analytical Results in Groundwater
Pilot Study Design and Implementation Work Plan
MEW Regional Program
Mountain View, CA

CPT Identification	GPS Coordinates		Sample Depth (ft bgs) ¹	Sample Date	PCE ²	TCE ³	cis-DCE ⁴	trans-1,2-DCE	1,1-DCE	Vinyl Chloride	1,1,1-TCA ⁵	1,1,2-TCA	1,1-DCA ⁶	1,2-DCA	Benzene	Toluene	Ethylbenzene	Xylenes, Total	1,2-DCB ⁷	1,4-DCB	Freon 113	Other VOCs ⁸	
	Easting	Northing																					
SB-1	1546954.513	333249.9263	19-23	2/13/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	15	ND	ND	ND	ND	ND	ND	ND
SB-3	1547876.318	333065.1884	15-19	2/14/2013	ND/ND	300/300	0.54/0.54	ND/ND	0.91/0.91	ND/ND	2.3/2.1	ND/ND	ND/ND	ND/ND	ND/ND	56/38	ND/ND	ND/ND	ND/ND	ND/ND	ND/ND	ND/ND	ND/ND
			29-33	2/14/2013	ND	150	21	12	2.0	ND	ND	1.9	ND	ND	ND	9.1	ND	ND	ND	ND	ND	ND	ND
SB-4	1548026.277	333027.9173	14-18	2/15/2013	1.6	77	0.69	ND	0.69	ND	1.2	ND	1.1	ND	ND	4.7	ND	ND	ND	ND	ND	ND	ND
			38-42	2/15/2013	4.3	170	420	5.3	3.2	0.73	ND	ND	8.0	ND	ND	1.7	ND	ND	ND	2.5	ND	ND	ND
SB-5	1546986.138	333344.4841	18-22	4/17/2013	ND	8.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SB-6	1547028.499	333331.4401	13-14.5	4/17/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SB-8	1547167.895	333288.314	13.5-14.5	4/17/2013	ND	6.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SB-9	1547685.468	333152.2279	20-23	4/18/2013	ND	31,000	5,100	35	23	26	ND	ND	12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
			40-43	4/18/2013	ND	220	270	96	2.2	ND	ND	1.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SB-10	1547691.685	333173.7145	20.5-23	4/18/2013	ND	730	620	4.8	4.1	5.5	ND	ND	9.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
			35.5-38.5	4/18/2013	ND	1,400	1,100	42	53	7.8	ND	ND	44	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.89

Notes

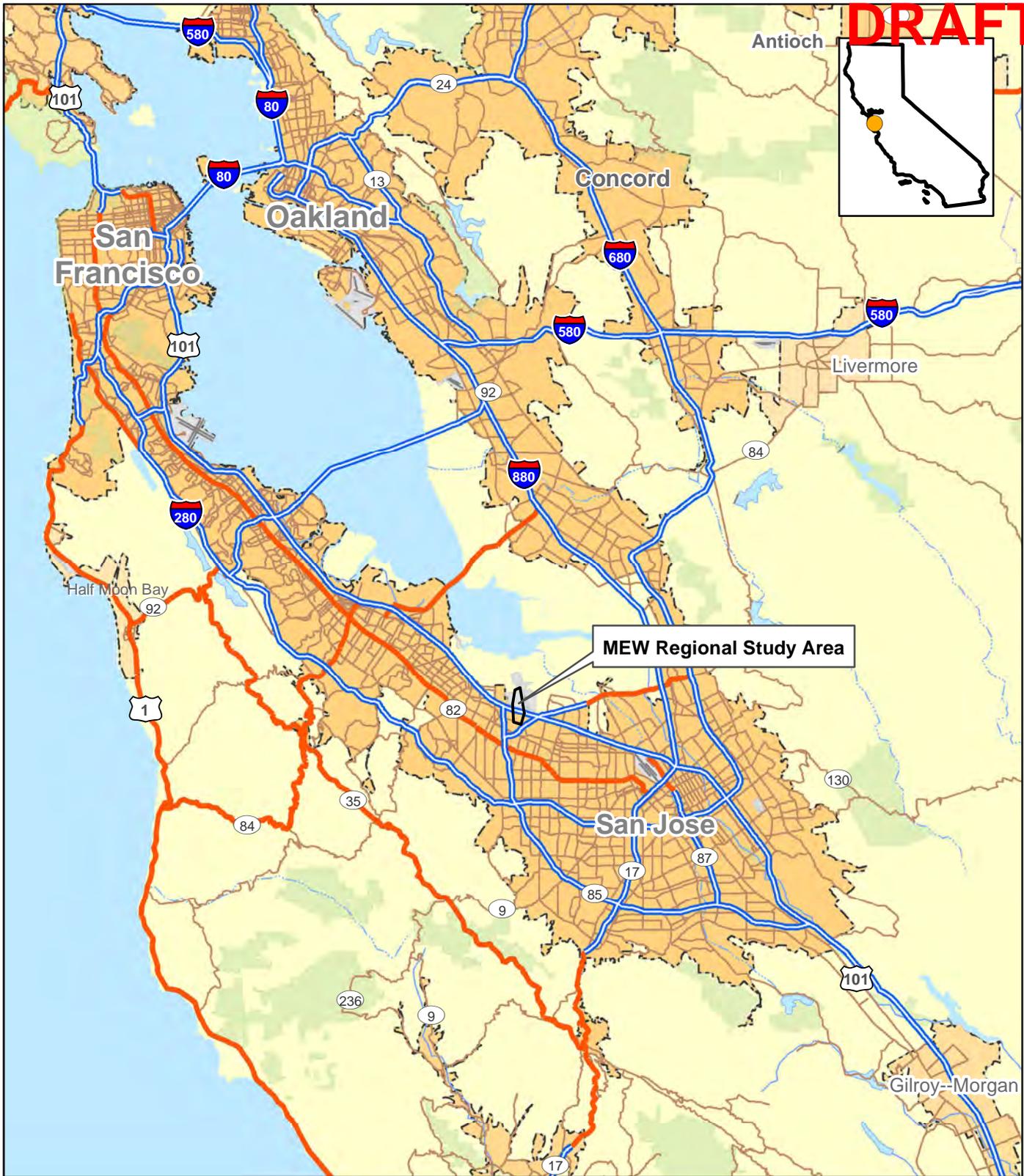
1. All samples analyzed by EPA Method 8260B
2. All units in micrograms per liter (µg/L)

Abbreviations

1. ft bgs = feet below ground surface
2. PCE = tetrachloroethene
3. TCE = trichloroethene
4. DCE = dichloroethene
5. TCA = trichloroethane
6. DCA = dichloroethane
7. DCB = dichlorobenzene
8. VOCs = volatile organic compounds
9. ND = not detected
10. / = sample result/duplicate sample result

FIGURES

DRAFT



Site Location Map

MEW Regional Groundwater Remediation Program
Mountain View, California

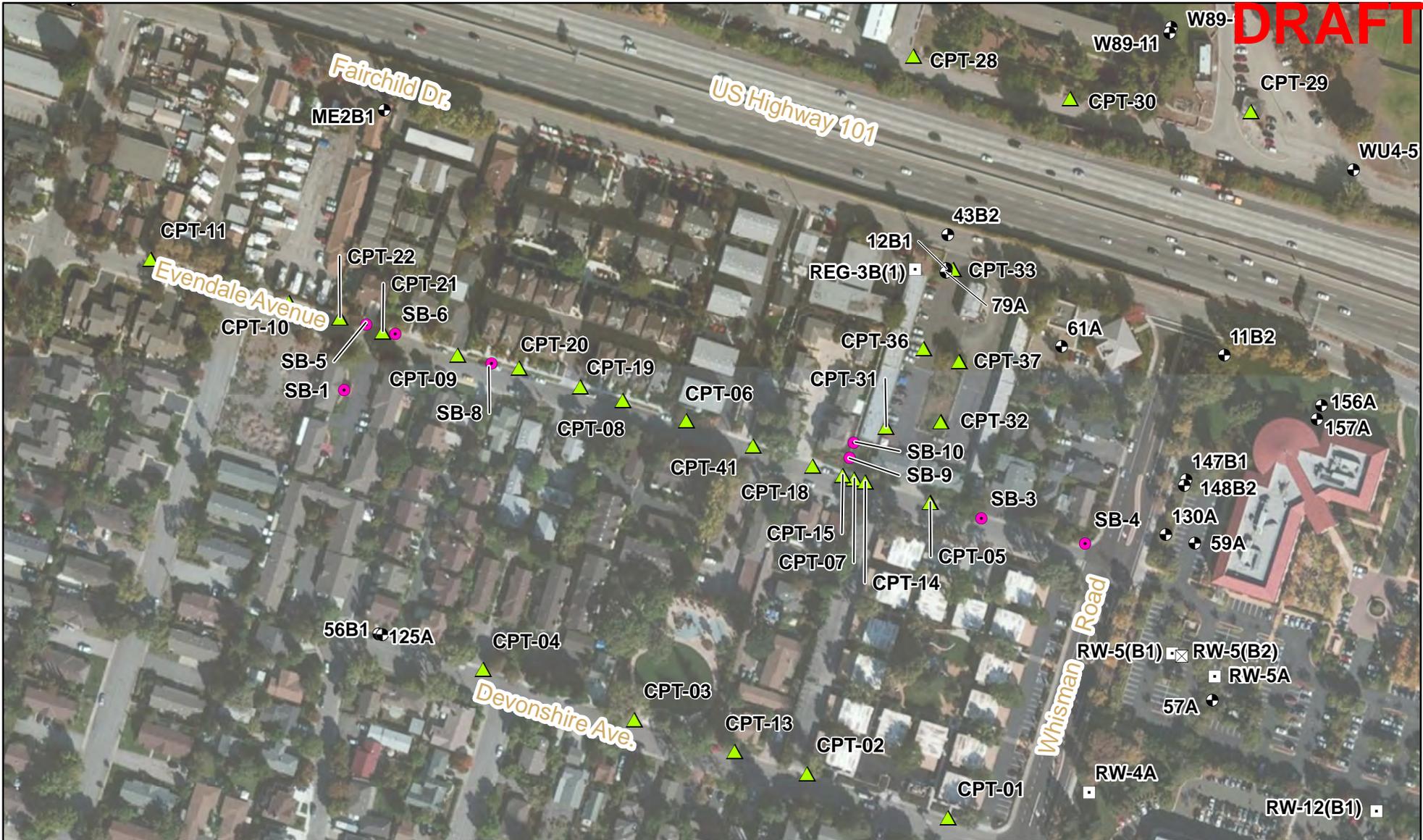


Figure

1

Oakland

August 2013



Legend

- Recovery Well On
- ⊠ Recovery Well Off
- Monitoring Well
- ▲ CPT and Grab-Groundwater Location (Geosyntec, 2013)
- Soil Boring and Grab-Groundwater Location (Geosyntec, 2013)

Aerial Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community



Site Investigation Map

MEW Regional Groundwater Remediation Program
Mountain View, California

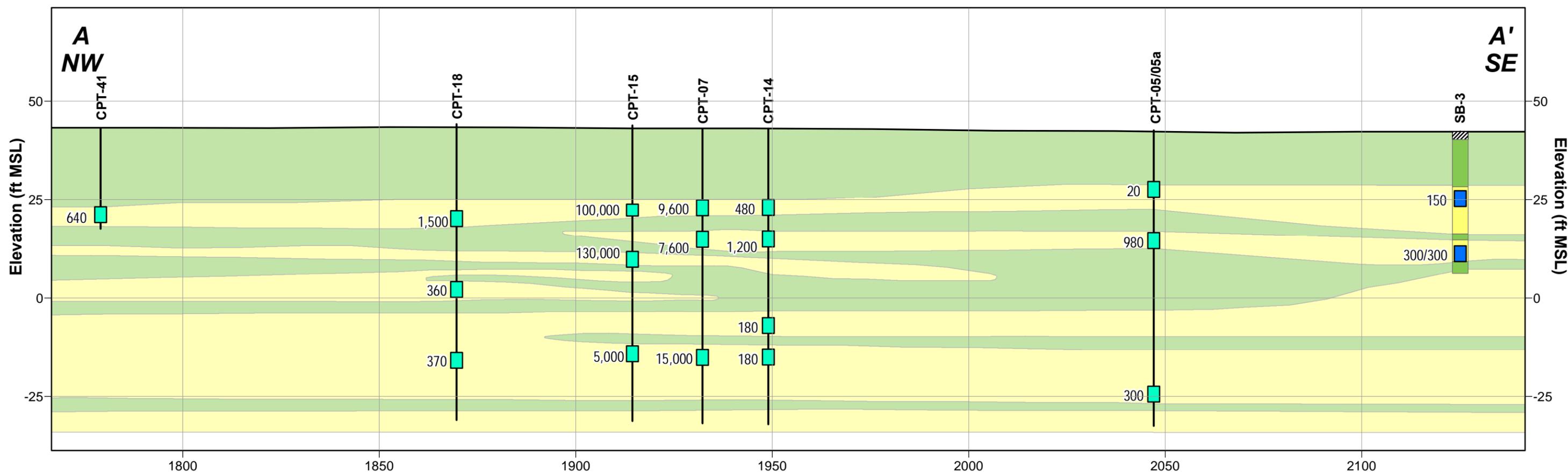
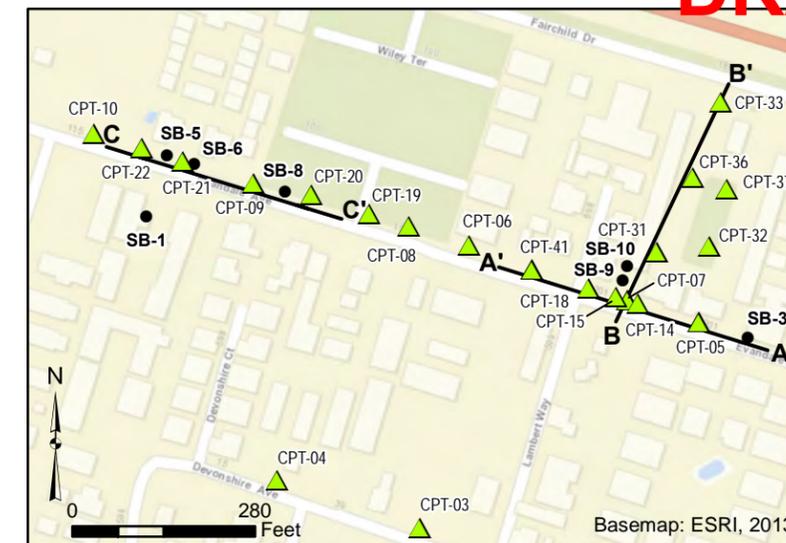


Figure

2

Oakland

August 2013



Legend

Lithology Interpretation

- Primarily Coarse-Grained (silty sands, sands, gravels)
- Primarily Fine-Grained (clays, silts)

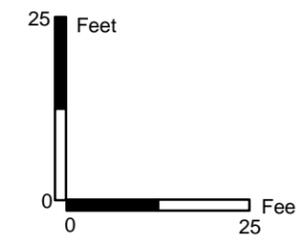
SB-3

- Soil Boring
- Coarse
- Fine
- No Recovery
- Grab Groundwater Sample (Geosyntec, 2013)
- TCE Concentration (ug/L)

CPT-41

- CPT or Soil Boring
- Grab Groundwater Sample (Geosyntec, 2013)
- TCE Concentration (ug/L)

Notes:
 Locations are approximate.
 Interpretation of lithology based on CPT and soil boring data.
 CPT = cone penetration test
 TCE = trichloroethene
 ug/L = micrograms per liter
 ft = feet
 ft MSL = feet above mean sea level



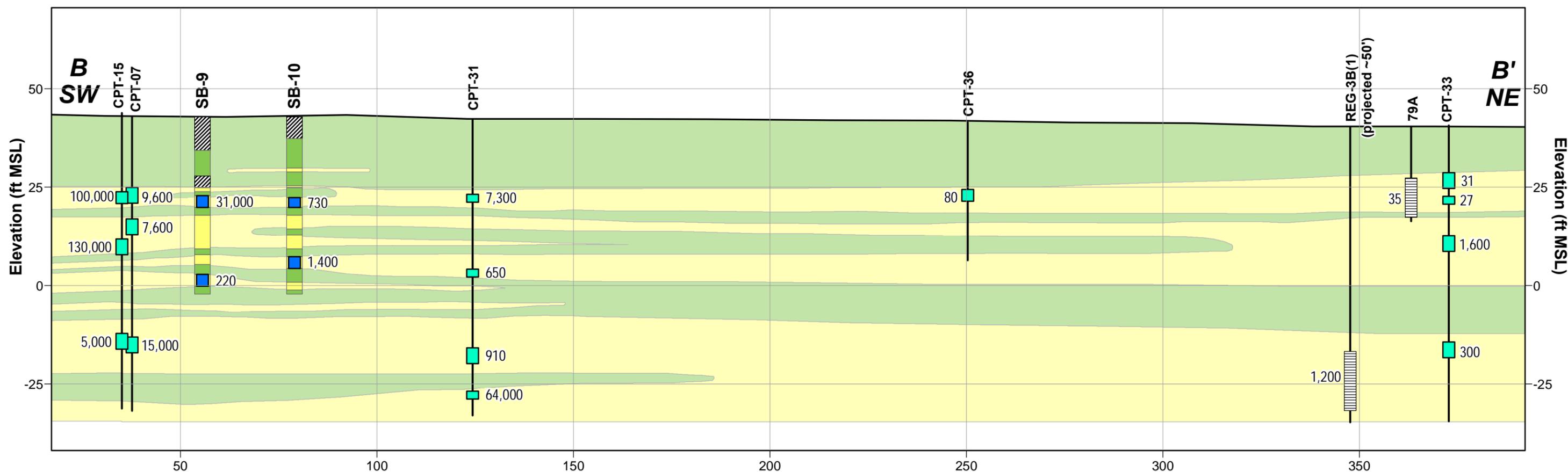
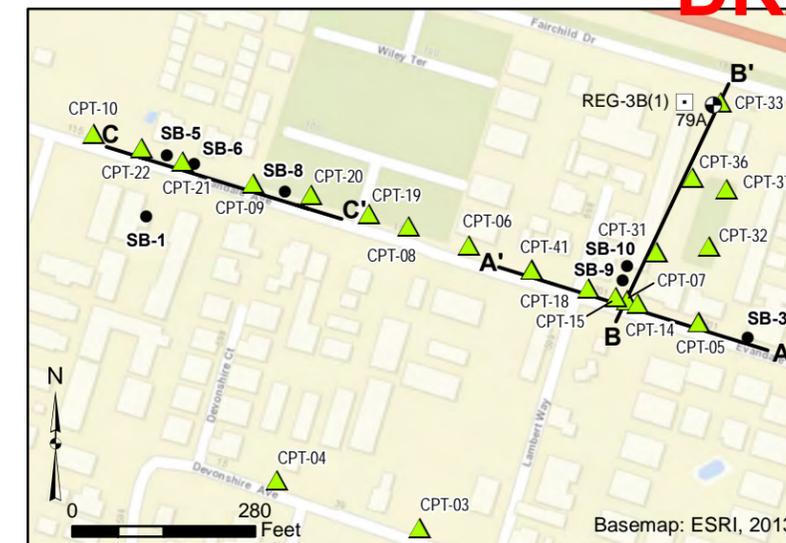
CPT-15 Area
Cross-Section A-A'
 MEW Regional Groundwater Remediation Program
 Mountain View, California

Geosyntec
 consultants

Oakland

August 2013

Figure
3



Legend

Lithology Interpretation

- Primarily Coarse-Grained (silty sands, sands, gravels)
- Primarily Fine-Grained (clays, silts)

SB-9

- Soil Boring
- Coarse
- Fine
- No Recovery
- Grab Groundwater Sample (Geosyntec, 2013)

220
TCE Concentration (ug/L)

CPT-31

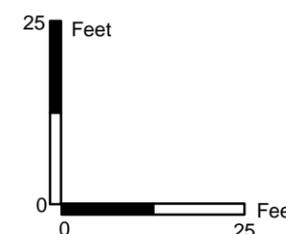
910
TCE Concentration (ug/L)

REG-3B(1)

1,200
2012 TCE Concentration (ug/L)

Notes:

Locations are approximate.
 Interpretation of lithology based on CPT and soil boring data.
 CPT = cone penetration test
 TCE = trichloroethene
 ug/L = micrograms per liter
 ft = feet
 ft MSL = feet above mean sea level



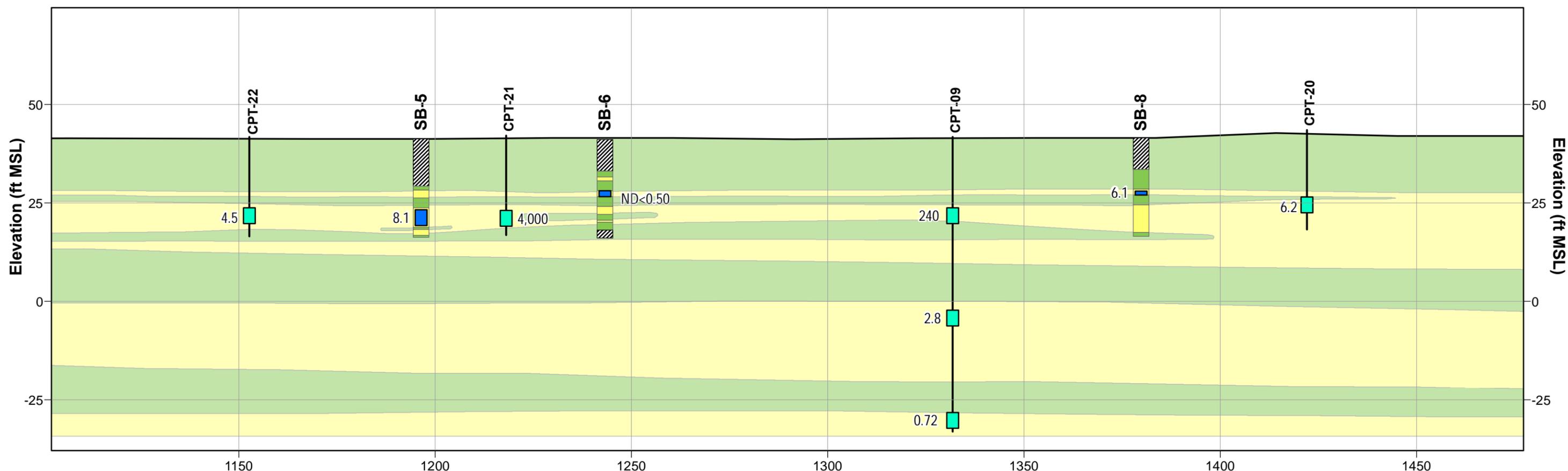
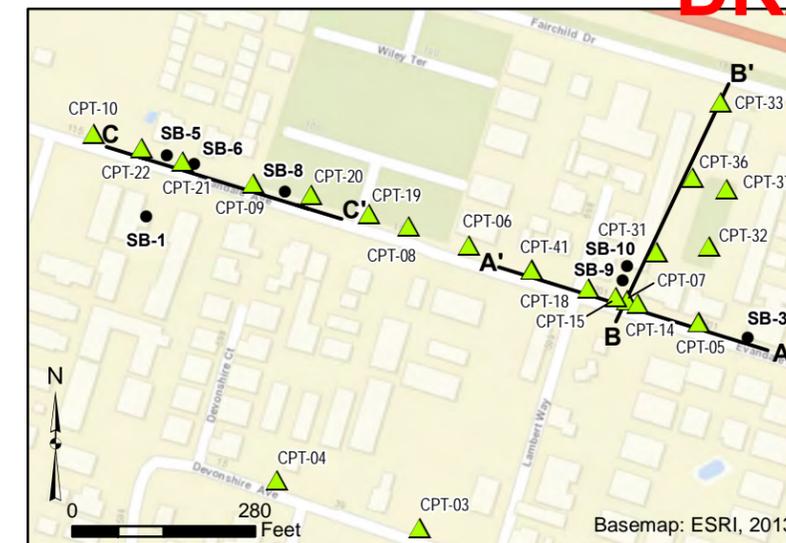
CPT-15 Area
Cross-Section B-B'
 MEW Regional Groundwater Remediation Program
 Mountain View, California

Geosyntec
 consultants

Figure
4

Oakland

August 2013



Legend

Lithology Interpretation

- Primarily Coarse-Grained (silty sands, sands, gravels)
- Primarily Fine-Grained (Clays, Silts)

Soil Boring

Soil Boring Lithology

- Coarse
- Fine
- No Recovery
- Grab Groundwater Sample (Geosyntec, 2013)

TCE Concentration (ug/L)

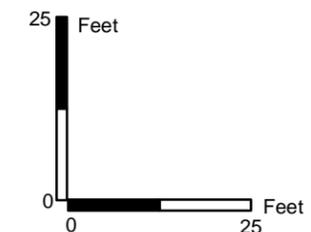
CPT

Grab Groundwater Sample (Geosyntec, 2013)

TCE Concentration (ug/L)

Notes:

Locations are approximate.
 Interpretation of lithology based on CPT and soil boring data.
 CPT = cone penetration test
 TCE = trichloroethene
 ug/L = micrograms per liter
 ft = feet
 ft MSL = feet above mean sea level



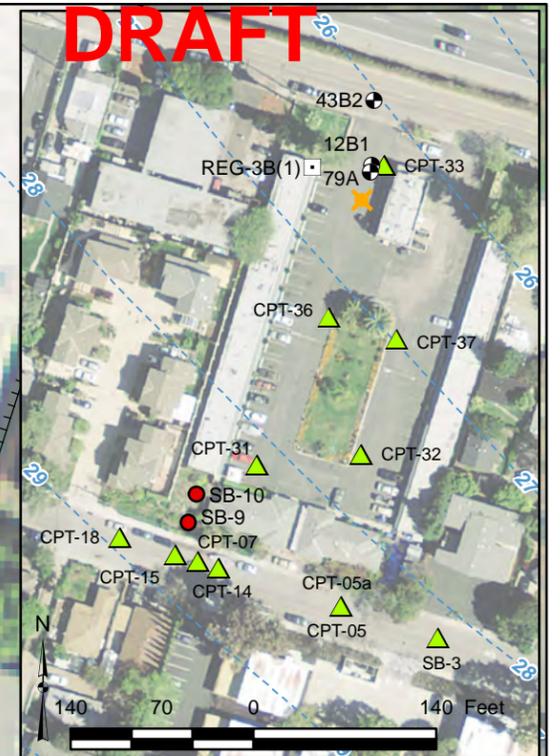
CPT-21 Area
Cross-Section C-C'
 MEW Regional Groundwater Remediation Program
 Mountain View, California

Geosyntec
 consultants

Oakland August 2013

Figure
5

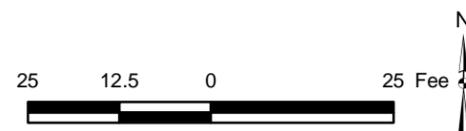
DRAFT



Abbreviations:
 ft: Feet
 ft bgs: Feet Below Ground Surface
 Aerial Source: USGS High Resolution Orthoimagery, April 2011

- Legend**
- Abandoned Sanitary Sewer
 - Overhead Power Lines
 - Underground Gas Line
 - Sanitary Sewer Line
 - Storm Sewer Line
 - Unidentified Underground Line
 - Water Distribution Line
 - Groundwater Elevation: 1 ft Contour
 - Design Extent of Injections
 - 228/236 Property Limit
 - Proposed temporary monitoring well group screened from 15-25 ft bgs, 25 - 35 ft bgs and 65-75 ft bgs
 - Proposed temporary monitoring well group screened from 15-25 ft bgs and 25-35 ft bgs
 - ✦ Proposed injection point (approximate location)
 - ▽ Proposed temporary piezometer to monitor injection mounding
 - ▲ CPT Location (Geosyntec, 2013)
 - Soil Borings (Geosyntec, 2013)
 - ✦ Proposed injection test location (shown in inset)

Note: Locations are approximate.



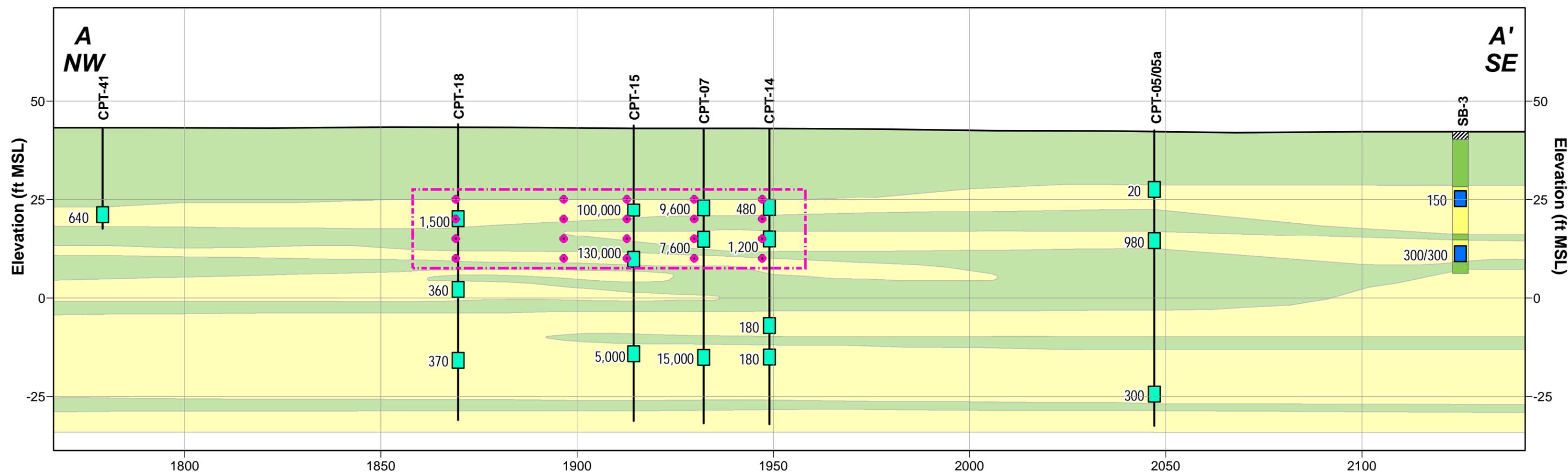
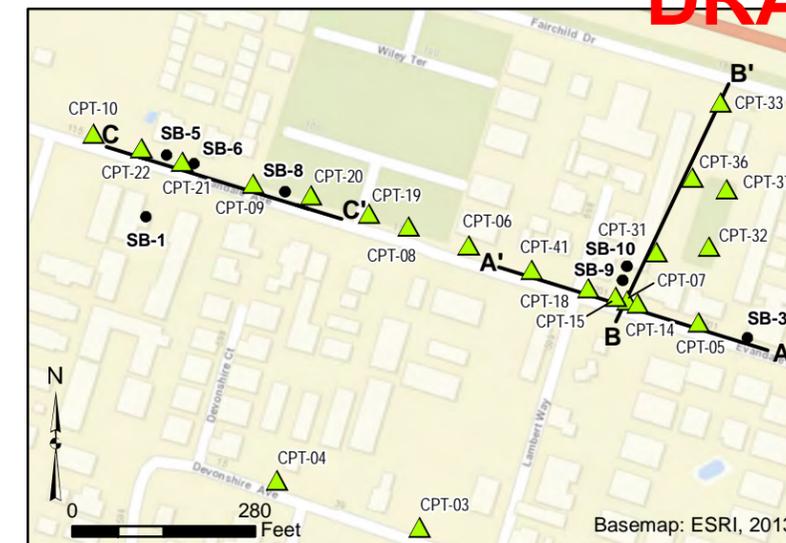
CPT-15 Area
Injection Locations and Monitoring Well Network
Plan View

MEW Regional Groundwater Remediation Program
 Mountain View, California

Geosyntec
 consultants

Oakland August 2013

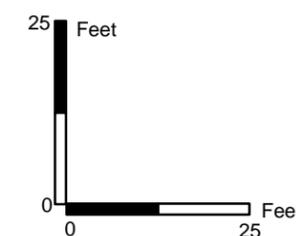
Figure
6



Legend

- Proposed Injection Point
- Design Extent of Injections
- Lithology Interpretation**
- Primarily Coarse-Grained (silty sands, sands, gravels)
- Primarily Fine-Grained (clays, silts)
- Soil Boring
- Soil Boring Lithology**
- Coarse
- Fine
- No Recovery
- Grab Groundwater Sample (Geosyntec, 2013)
- CPT or Soil Boring
- Grab Groundwater Sample (Geosyntec, 2013)
- | TCE Concentration (ug/L)

Notes:
 Locations are approximate.
 Interpretation of lithology based on CPT and soil boring data.
 CPT = cone penetration test
 TCE = trichloroethene
 ug/L = micrograms per liter
 ft = feet
 ft MSL = feet above mean sea level



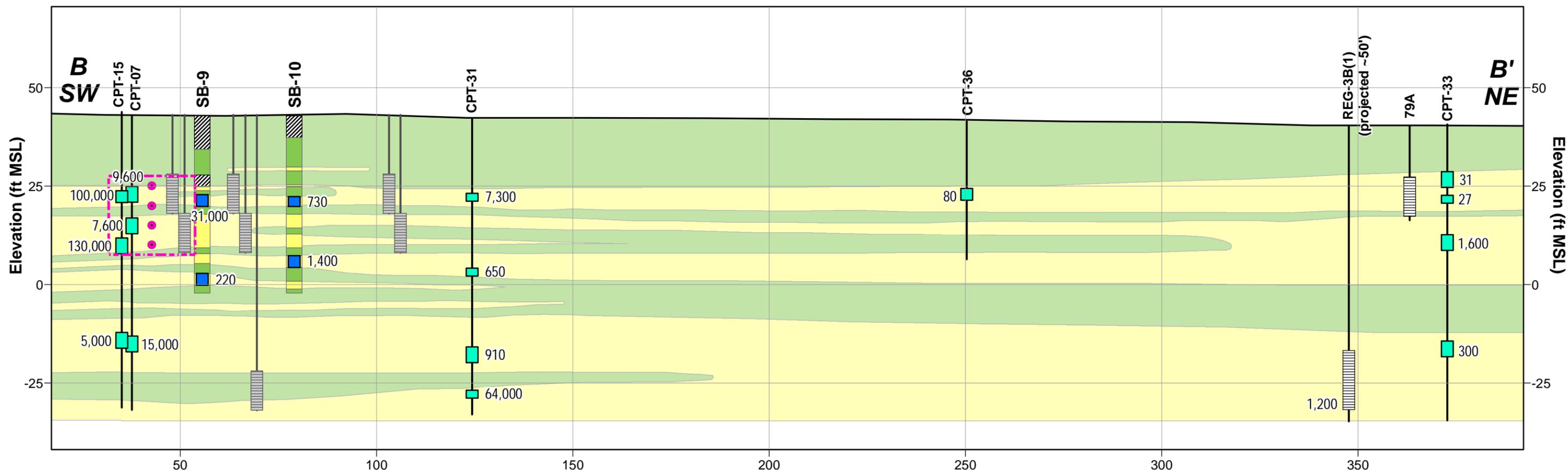
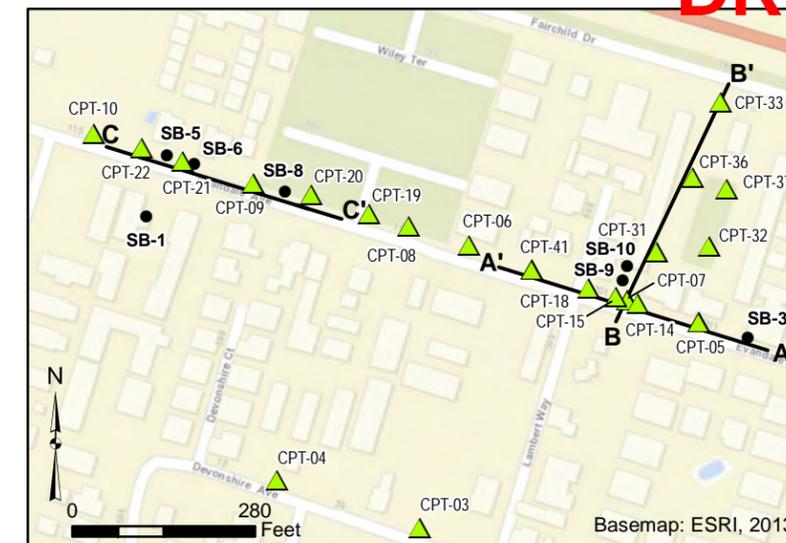
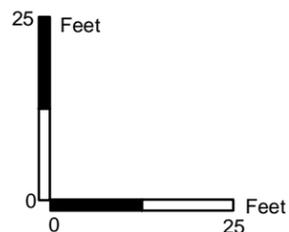
CPT-15 Area Injection Locations
A-A' Cross Section
 MEW Regional Groundwater Remediation Program
 Mountain View, California

Geosyntec
 consultants

Oakland

August 2013

Figure
7



Legend

- Proposed Injection Point
 - Design Extent of Injections
 - Proposed Well Boring
 - ▨ Proposed Temporary Monitoring Well Screen Interval
- Lithology Interpretation**
- Primarily Coarse-Grained (silty sands, sands, gravels)
 - Primarily Fine-Grained (clays, silts)
- Soil Boring Lithology**
- Soil Boring
 - Coarse
 - Fine
 - ▨ No Recovery
 - ▨ Grab Groundwater Sample (Geosyntec, 2013)
- SB-9**
- 220 TCE Concentration (ug/L)
- CPT-31**
- 910 TCE Concentration (ug/L)
- REG-3B(1)**
- 1,200 TCE Concentration (ug/L)

Notes:
 Locations are approximate.
 Interpretation of lithology based on CPT and soil boring data.
 Locations are approximate.
 CPT = cone penetration test
 TCE = trichloroethene
 ug/L = micrograms per liter
 ft = feet
 ft MSL = feet above mean sea level

CPT-15 Area Injection Locations and Monitoring Network
B-B' Cross Section
 MEW Regional Groundwater Remediation Program
 Mountain View, California



Oakland August 2013

Figure
8

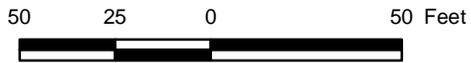
DRAFT



Legend

- Proposed Injection Point (Approximate Location)
- Groundwater Elevation: 1 ft Contour
- Proposed Monitoring Well Locations (Geosyntec, 2013a)
- Design Extent of Injections
- Proposed Temporary Piezometer to Monitor Injection Mounding
- CPT Location (Geosyntec, 2013)
- Potential Grab - Groundwater Sample Location - Pilot Study Performance Monitoring

Notes:
TCE = Trichloroethene
ug/L = micrograms per liter



CPT-21 Area
Injection Locations and Monitoring Network
 MEW Regional Groundwater Remediation Program
 Mountain View, California

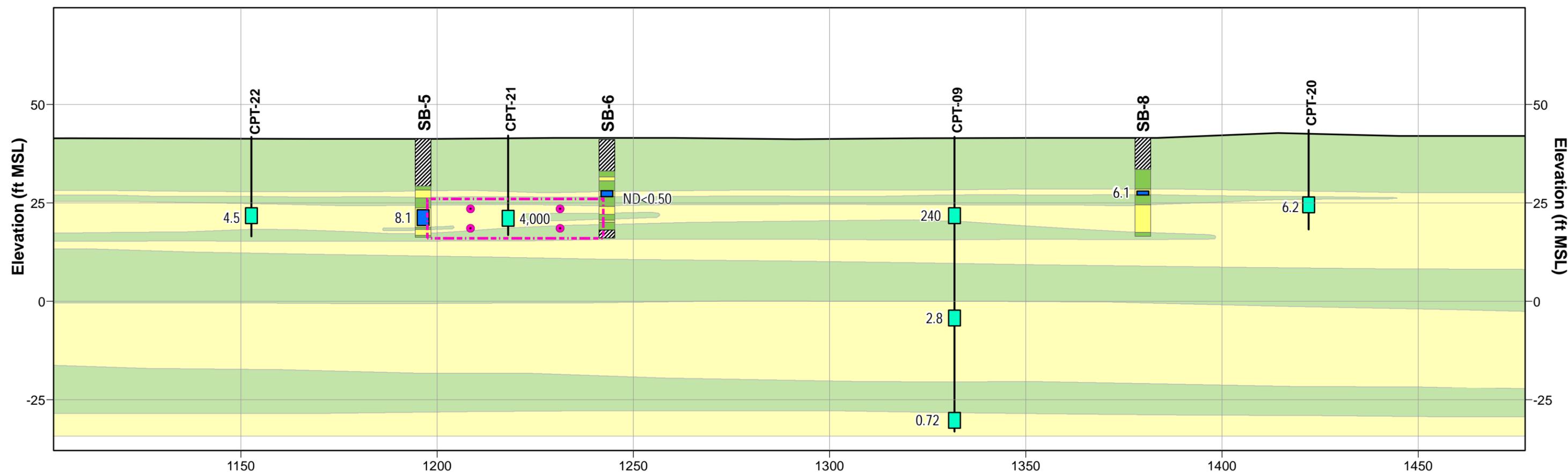
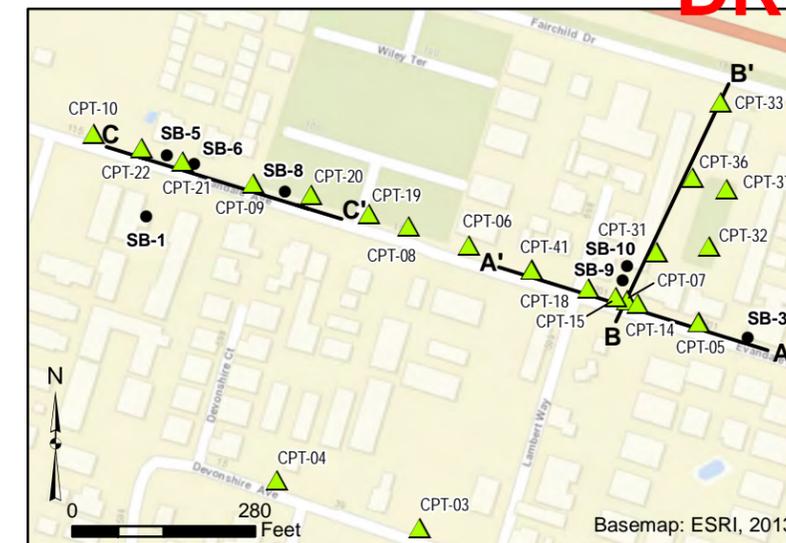
Geosyntec
consultants

Figure

9

Oakland

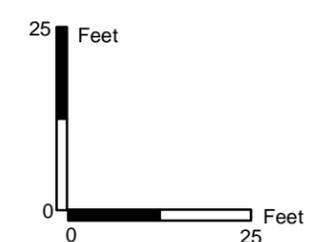
August 2013



Legend

- Proposed Injection Point
- Design Extent of Injections
- Lithology Interpretation**
- Primarily Coarse-Grained (silty sands, sands, gravels)
- Primarily Fine-Grained (Clays, Silts)
- Soil Boring
- Soil Boring Lithology**
- Coarse
- Fine
- No Recovery
- Grab Groundwater Sample (Geosyntec, 2013)
- TCE Concentration (ug/L)
- CPT
- Grab Groundwater Sample (Geosyntec, 2013)
- TCE Concentration (ug/L)

Notes:
 Locations are approximate.
 Interpretation of lithology based on CPT and soil boring data.
 CPT = cone penetration test
 TCE = trichloroethene
 ug/L = micrograms per liter
 ft = feet
 ft MSL = feet above mean sea level



CPT-21 Area Section Locations
C-C' Cross Section
 MEW Regional Groundwater Remediation Program
 Mountain View, California



Oakland August 2013

Figure
10

DRAFT

APPENDIX A

Remedy Design Data Collection Report

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A-1. INTRODUCTION

This appendix has been prepared to document supplemental soil and grab-groundwater sampling that was conducted to collect site-specific data used to design the groundwater remedy for the CPT-15 and CPT-21 areas located along Evandale Avenue west of the Middlefield-Ellis-Whisman (MEW) Study Area (Figure A1). The work described in this appendix is consistent with the scope of work proposed in the *Final Work Plan for Remedy Design Data Collection*¹.

A-2. SOIL AND GRAB-GROUNDWATER SAMPLING PROGRAM

Supplemental soil and grab-groundwater sampling was conducted on 17 and 18 April 2013. The supplemental sampling boring locations are presented in Figure A1.

A-2.1 Pre-Field Activities

Prior to beginning work, an Excavation Permit was obtained from the City of Mountain View. Boring permits were not required from the Santa Clara Valley Water District due to the depth of the borings.

The supplemental sampling boring locations were marked with white paint and Underground Service Alert (USA) was notified of the work more than 48 hours prior to the start of field activities. Additionally, a private utility location survey was conducted at the proposed boring locations to identify subsurface utilities or other obstructions. Some boring locations were modified slightly from those proposed in the work plan if the presence of subsurface or overhead utilities prevented safe operation of the direct-push drilling rig.

All field activities were performed in accordance with the site-specific health and safety plan (HASP). A safety tailgate meeting was held each day prior to the start of field activities and all on-site field personnel signed the HASP acknowledging the discussion of potential hazards.

¹ Geosyntec 2013, Final Work Plan for Remedy Design Data Collection, Middlefield-Ellis-Whisman Regional Groundwater Remediation Program, Mountain View, California. 12 April.

A-2.2 Sample Depths and Locations

The following section summarizes the location and soil and grab-groundwater sampling depths of the supplemental sampling borings.

CPT-21 Area

Samples were collected from three supplemental boring locations on Evandale Avenue in the CPT-21 area:

- Two soil samples and one grab-groundwater sample were collected from boring SB-5, located 22 feet west of CPT-21;
- Two soil samples and one grab-groundwater sample were collected from boring SB-6, located 25 feet east of CPT-21; and,
- One grab-groundwater sample was collected from boring SB-8, located 161 feet east of CPT-21, 48 feet east of CPT-9, and 43 feet west of CPT-20.

Soil and grab-groundwater samples were collected in the A/A1 zone between the first encountered groundwater and 25 feet below ground surface (bgs). The sample depth intervals for grab-groundwater samples are included in Table A1.

CPT-15 Area

Samples were collected from two supplemental boring locations in the CPT-15 area as follows:

- Four soil and two grab-groundwater samples were collected from boring SB-9, located 28 feet north of CPT-15 on the 228 Evandale Avenue property; and
- Two grab-groundwater samples were collected from boring SB-10, located 46 feet north of CPT-15 on the 228 Evandale Avenue property (SB-10).

Soil and grab-groundwater samples were collected in the A/A1 and B1/A2 zones in the CPT-15 remedy area². Samples were collected between the first encountered groundwater and 45 feet bgs³.

² The transition from the A/A1 to B1/A2 zone is considered to occur at 25 feet bgs.

³ Samples have been previously collected on Evandale Avenue to define the extent of the B1/A2 zone plume in this area.

A-2.3 Direct-Push Borings

All supplemental sampling borings were advanced using a direct-push drill rig. At each location, direct-push drill rods were fitted with vinyl acetate sleeve liners and advanced to the target total boring depth for collection of continuous core samples. The soil cores were logged by field staff under the direction of a California Professional Geologist using the Unified Soil Classification System. The soil was field-screened for the presence of volatile organic compounds (VOCs) using a photoionization detector (PID) and the readings recorded on the boring logs. Geologic logs for the direct-push borings are included in Attachment A1.

The boring logs were used to select soil and grab-groundwater sample depth intervals. The proposed depth intervals were transmitted to EPA prior to collection of samples.

A-2.4 Soil Sampling

Soil samples were collected for permanganate soil oxidant demand (PSOD) bench-scale testing to provide information regarding the rate and extent of oxidant consumption by site soil and groundwater when dosed with permanganate.

The soil sample depth intervals were selected based on geologic logging. Samples were collected from borings SB-5, SB-6, and SB-9 at depth intervals that were representative of the more permeable soil types present in the CPT-15 and CPT-21 areas. Soil samples from the less permeable soil types (silt/clay) present in the CPT-15 area were also collected at SB-9.

Soil samples from the selected intervals were collected by transferring soil from the acetate sleeves into laboratory-provided glass jars. The samples were labeled, placed on ice, and shipped under standard chain-of-custody procedures to the bench-scale testing laboratory.

A-2.5 Grab-Groundwater Sampling

Grab-groundwater samples were collected from borings advanced adjacent to each direct-push boring location. At each location, hollow steel direct-push rods equipped with a disposable tip and a section of slotted polyvinyl chloride (PVC) screen was advanced to the sampling depth interval that was selected based on the geologic logs. Once the bottom of the sampling depth was reached, the rods were retracted approximately 1 to 4 feet, exposing the slotted PVC screen while the disposable tip remained stationary. In locations where samples were collected from multiple depth intervals the shallowest sample was collected first. The rods were then decontaminated

using a steam cleaner in accordance with the MEW Quality Assurance Project Plan (QAPP)⁴ before being driven to the next sample depth interval in the boring. This process was repeated between every sample collection depth.

Groundwater samples were collected with a peristaltic pump into laboratory-supplied containers. New polyethylene tubing was used for each groundwater sample. The samples were labeled and placed in coolers with ice, and shipped to the analytical laboratory under chain-of-custody procedures. All samples were analyzed for halogenated VOCs (HVOCs) by EPA Method 8260B. In addition five samples were analyzed for 1,4-dioxane by EPA Method 8270C, and total dissolved solids by SM 2540C, and four samples were analyzed for chromium VI by EPA Method 7199. As part of quality assurance/quality control protocol (QA/QC), a trip blank was included and analyzed for VOCs.

Following advancement of the direct-push borings and grab-groundwater sampling, the boreholes were grouted to the surface with a cement mix using a tremie pipe in accordance with SCVWD requirements. Boreholes were completed to match the surrounding surface, and roadways were repaired in accordance with City of Mountain View requirements.

A Trimble GeoXH handheld global positioning system (GPS) unit was used to record the locations of the borings.

A-2.6 Quality Assurance/Quality Control (QA/QC)

QA/QC of all laboratory data was conducted. One trip blank was submitted to the laboratory for analysis. No analytes were detected above the laboratory reporting limits. The laboratory followed media preparation procedures and sample analysis. Based on the results of the QA/QC review, the data are of acceptable quality for analytical parameters.

⁴ Canonie Environmental Services Corp. 1991. Quality Assurance Project Plan, Middlefield-Ellis-Whisman Site, Mountain View, California.

A-3. RESULTS

Table 1 presents a summary of the grab-groundwater sample results. Laboratory analytical reports are included in Attachment A2.

PSOD and grab-groundwater sampling results are discussed in the main body of the Treatability Study Design and Implementation Work Plan and are not repeated in this appendix.

TABLES

Table A.1
Supplemental Sampling Analytical Results in Groundwater
 Grab-Groundwater Assessment and Proposed Well Installations
 MEW Regional Program
 Mountain View, CA

CPT Identification	GPS Coordinates		Sample Depth (ft bgs) ¹	Sample Date	TCE ²	cis-DCE ³	trans-1,2-DCE	1,1-DCE	Vinyl Chloride	1,1-DCA ⁴	Freon 113	Other VOCs ⁵	1,4-Dioxane	Total Dissolved Solids	Chromium VI	Other VOCs ⁸
	Easting	Northing														
SB-5	1546986.138	333344.4841	18-22	4/17/2013	8.1	ND	ND	ND	ND	ND	ND	ND	ND	700	ND	ND
SB-6	1547028.499	333331.4401	13-14.5	4/17/2013	ND	ND	ND	ND	ND	ND	ND	ND	--	640	--	ND
SB-8	1547167.895	333288.314	13.5-14.5	4/17/2013	6.1	ND	ND	ND	ND	ND	ND	ND	--	--	--	ND
SB-9	1547685.468	333152.2279	20-23	4/18/2013	31,000	5,100	35	23	26	12	ND	ND	4.7	910	ND	ND
			40-43	4/18/2013	220	270	96	2.2	ND	1.5	ND	ND	ND	--	--	ND
SB-10	1547691.685	333173.7145	20.5-23	4/18/2013	730	620	4.8	4.1	5.5	9.7	ND	ND	6.6	810	ND	ND
			35.5-38.5	4/18/2013	1,400	1,100	42	53	7.8	44	0.89	ND	ND	6.8	690	ND

Notes

1. All VOC samples were analyzed by EPA Method 8260B, 1,4 Dioxane by EPA Method 8270C, total dissolved solids by SM 2540C, and Chromium VI by EPA Method 7199.
- 2 All units in micrograms per liter (µg/L) except total dissolved solids units in milligrams per liter (mg/L).

Abbreviations

1. ft bgs = feet below ground surface
2. TCE = trichloroethene
3. DCE = dichloroethene
4. DCA = dichloroethane
5. VOCs = volatile organic compounds
6. ND = not detected
7. -- = not analyzed

FIGURES

DRAFT



Legend

- ☐ Recovery Well On
- ☒ Recovery Well Off
- ⊕ Monitoring Well
- ▲ CPT Location (Geosyntec, 2012)
- Grab Groundwater Sample (Geosyntec, 2013)

Aerial Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community



Site Investigation Map

MEW Regional Groundwater Remediation Program
Mountain View, California



Figure

A1

Oakland

June 2013

DRAFT

ATTACHMENT A1

Geologic Logs

GS FORM:
OAKLAND

LOG OF SB-5

DEPTH (ft)	MATERIAL DESCRIPTION SOIL NAME (USCS SYMBOL): Color, Moisture, Grain Size and Percentage, Plasticity, Consistency/Density, Other (Odor, Dry Strength, Mineral Content)	SYMBOLIC LOG	ELEVATION (ft)	SAMPLES				TIME	COMMENTS
				NUMBER	TYPE	RECOVERY (%)	PID READING (ppm)		
0 - 10	Hand Augered.								
10 - 13	Sandy SILT (ML); black (10YR 2/1); moist; fine sand, silt [0,30,70]; medium stiff.					20			
13 - 15	Poorly graded SAND with gravel (SP); dark grayish brown (10YR 4/2); wet; small gravel, fine to medium sand, fines [15, 80, 5].					100	2.9		Wet at 13'
15 - 17	Sandy SILT (ML); dark brown (10 YR 3/4); moist; small gravel, fine to medium sand, silt [10, 40, 50].					2.5			
17 - 20	Poorly graded SAND with gravel (SP); dark grayish brown (10YR 4/2); wet; small gravel, fine to medium sand, fines [15, 80, 5].					100	2.9		
20 - 23	Well graded SAND with gravel (SW); black (10YR 2/1); wet; small gravel, coarse sand [20, 80, 0].								
23 - 24	Sandy SILT (ML); dark brown (10 YR 3/4); moist; small gravel, fine to medium sand, silt [10, 40, 50].					100	7.8		
24 - 25	Poorly graded SAND with gravel (SP); dark grayish brown (10YR 4/2); wet; small gravel, fine to medium sand, fines [15, 80, 5].								
25 - 25	Lean CLAY (CL), greenish black (10GY 2.5/1), moist, clay [0, 0, 100], high plasticity, medium stiff. Total Depth = 25'								

BORING LOG NO WELL (OAKLAND) MEW - SB-5 - SB-10.GPJ GEOSYNTEC.GDT 6/10/13

CONTRACTOR Vironex
EQUIPMENT
DRILL MTHD Direct Push
DIAMETER (in) 2"
LOGGER MF
REVIEWER NKG

NORTHING
EASTING
ANGLE Vertical
BEARING -----
PRINTED 06/10/13

REMARKS:

COORDINATE SYSTEM:
SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

GS FORM:
OAKLAND

LOG OF SB-6

DEPTH (ft)	MATERIAL DESCRIPTION <small>SOIL NAME (USCS SYMBOL): Color, Moisture, Grain Size and Percentage, Plasticity, Consistency/Density, Other (Odor, Dry Strength, Mineral Content)</small>	SYMBOLIC LOG	ELEVATION (ft)	SAMPLES				TIME	COMMENTS
				NUMBER	TYPE	RECOVERY (%)	PID READING (ppm)		
	Hand Augered.								
5									
	Sandy SILT (ML); black (10YR 2/1); moist; fine sand, silt [0, 30, 70]; medium stiff.					100			
10	Well graded SAND (SW); black (10YR 2/1); moist; medium to coarse sand [0, 100, 0].								
	SILT (ML); brown (10YR 4/3); moist; fine sand, silt [0, 15, 85]; very hard.						1.4		
	Poorly graded SAND with gravel (SP); dark grayish brown (10 YR 4/2); wet; small gravel, medium sand, fines [15, 80, 5].					100	0.7		Wet at 13'
15	SILT (ML); brown (10YR 4/3); moist; fine sand, silt [0, 15, 85]; very hard.						1.6		
	Sandy SILT (ML); brown (10YR 4/3); moist; fine sand, silt [0, 40, 60]; stiff.						1.3		
	Poorly graded SAND with gravel (SP); dark grayish brown (10 YR 4/2); wet; small gravel, medium sand, fines [15, 80, 5].					100	2.9		
20	SILT with sand (ML); brown (10YR 4/3); wet; small gravel, fine to medium sand, silt [15, 30, 55]; low plasticity; stiff.						1.4		
	Poorly graded SAND with gravel (SP); dark grayish brown (10 YR 4/2); wet; small gravel, medium sand, fines [15, 80, 5].						2.3		
	Sandy SILT (ML); brown (10YR 4/3); moist; fine sand, silt [0, 40, 60]; stiff.								
	No recovery.					0	2.9		
25	Total Depth = 25'								

BORING LOG NO WELL (OAKLAND) MEW - SB-5 - SB-10.GPJ - GEOSYNTEC.GDT 6/10/13

CONTRACTOR Vironex
EQUIPMENT
DRILL MTHD Direct Push
DIAMETER (in) 2"
LOGGER MF **REVIEWER** NKG

NORTHING
EASTING
ANGLE Vertical
BEARING -----
PRINTED 06/10/13

REMARKS:

COORDINATE SYSTEM:
SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

GS FORM:
OAKLAND

LOG OF SB-8

DEPTH (ft)	MATERIAL DESCRIPTION <small>SOIL NAME (USCS SYMBOL): Color, Moisture, Grain Size and Percentage, Plasticity, Consistency/Density, Other (Odor, Dry Strength, Mineral Content)</small>	SYMBOLIC LOG	ELEVATION (ft)	SAMPLES				TIME	COMMENTS
				NUMBER	TYPE	RECOVERY (%)	PID READING (ppm)		
	Hand Augered.								
5									
	Sandy SILT (ML); black (10YR 2/1); moist; fine sand, silt, [0, 30, 70]; medium dense.					100	3.7		
10	Color change to dark gray (10YR 4/4); sand, silt [0, 45, 55].						2.2		
	Sandy SILT with gravel (ML); dark gray (10YR 4/4); moist; small gravel, fine sand, silt [15, 35, 50]; medium stiff.						3.8		
	Poorly graded SAND with silt (SP-SM); dark grayish brown (10YR 4/2); wet; fine sand, silt [0, 80, 20].						3.5		
15	Well graded GRAVEL with silt (GW-GM); dark gray (10YR 4/1); wet; small gravel, fine sand, silt [85, 5, 10].					100	4.1		Wet at 13.5'
	Sandy SILT with gravel (ML); dark gray (10YR 4/4); moist; small gravel, fine sand, silt [15, 35, 50]; medium stiff.						4.3		
	Poorly graded SAND with silt (SP-SM); dark brown (10YR 3/3); moist; fine sand, silt [0, 90, 10].						5.4		
20	Poorly graded SAND with silt and gravel (SP-SM); dark brown (10YR 3/3); wet; small gravel, fine sand, silt [15, 70, 15].					100	4.7		
	Poorly graded SAND with silt (SP-SM); dark brown (10YR 3/3); moist; fine sand, silt [0, 90, 10].						6.3		
	Poorly graded SAND with silt and gravel (SP-SM); dark brown (10YR 3/3); wet; small gravel, fine sand, silt [15, 70, 15].						6.2		
25	Lean CLAY (CL); greenish black (10GY 2.5/1); dry; clay [0, 0, 100]; high plasticity; medium stiff.						6.9		
	Total Depth = 25'						5.5		
							7.2		

BORING LOG NO WELL (OAKLAND) MEW - SB-5 - SB-10.GPJ GEOSYNTEC.GDT 6/10/13

CONTRACTOR Vironex
EQUIPMENT
DRILL MTHD Direct Push
DIAMETER (in) 2"
LOGGER MF

NORTHING EASTING
ANGLE Vertical
BEARING -----
PRINTED 06/10/13

REVIEWER NKG

REMARKS:

COORDINATE SYSTEM:
SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

GS FORM:
OAKLAND

LOG OF SB-9

DEPTH (ft)	MATERIAL DESCRIPTION SOIL NAME (USCS SYMBOL): Color, Moisture, Grain Size and Percentage, Plasticity, Consistency/Density, Other (Odor, Dry Strength, Mineral Content)	SYMBOLIC LOG	ELEVATION (ft)	SAMPLES				TIME	COMMENTS
				NUMBER	TYPE	RECOVERY (%)	PID READING (ppm)		
Hand Augered.									
5									
10	Lean CLAY (ML); grayish brown (10YR 5/2); moist; clay [0, 0, 100]; medium plasticity; medium stiff.						0.2 0.5 1.4 1.4		
15	Clayey SAND (SM); olive gray (5Y 5/2); wet; fine sand, clay [0, 70, 30].					20	0.2		Wet at 18'
20	Lean CLAY (CL); very dark gray (5Y 4/2); moist; fine sand, clay [0, 20, 80]; medium plasticity; soft.						0.5		▽
	Clayey SAND (SM); very dark gray (5Y 4/2); wet; small gravel, fine sand, clay [5, 60, 35]; white (5Y 8/1) color globules, 0.2 to 1.5 cm diameter, 10% throughout.					100	15.4		
	Lean CLAY (ML); dark brown (10YR 3/3); moist; clay [0, 0, 100]; medium plasticity; stiff.						1.6 2.9		
25	Lean CLAY (CL); very dark gray (5Y 4/2); moist; fine sand, clay [0, 20, 80]; medium plasticity; soft.					100			
	Silty SAND (SM); dark olive gray (5Y 3/2); wet; small gravel, fine sand, silt [5, 75, 20].								
30	Clayey SAND (SM); olive gray (5Y 5/2); moist; fine sand, clay [0, 70, 30].								
	Silty SAND (SM); dark olive gray (5Y 3/2); wet; small gravel, fine sand, silt [5, 75, 20].					100	4.0		

BORING LOG NO WELL (OAKLAND) MEW - SB-5 - SB-10.GPJ GEOSYNTEC.GDT 6/10/13

CONTRACTOR Vironex
EQUIPMENT
DRILL MTHD Direct Push
DIAMETER (in) 2"
LOGGER MF **REVIEWER** NKG

NORTHING EASTING
ANGLE Vertical
BEARING -----
PRINTED 06/10/13

REMARKS:

COORDINATE SYSTEM:
SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

GS FORM:
OAKLAND

LOG OF SB-9

DEPTH (ft)	MATERIAL DESCRIPTION <small>SOIL NAME (USCS SYMBOL): Color, Moisture, Grain Size and Percentage, Plasticity, Consistency/Density, Other (Odor, Dry Strength, Mineral Content)</small>	SYMBOLIC LOG	ELEVATION (ft)	SAMPLES				TIME	COMMENTS
				NUMBER	TYPE	RECOVERY (%)	PID READING (ppm)		
	Becomes moist at 32.5'								
	Lean CLAY (CL); greenish black (10GY 2.5/1); moist; clay [0, 0, 100]; medium plasticity; stiff.								
35	Silty SAND (SM); greenish black (10GY 2.5/1); wet; fine sand, silt [0, 70, 30].					100			
	Lean CLAY (CL); greenish black (10GY 2.5/1); moist; clay [0, 0, 100]; medium plasticity; stiff.								
40	Silty SAND (SM); greenish black (10GY 2.5/1); wet; fine sand, silt [0, 70, 30].					100			
	Lean CLAY (CL); greenish black (10GY 2.5/1); dry; clay [0, 0, 100]; medium plasticity; stiff.								
45	Total Depth = 45'								

BORING LOG NO WELL (OAKLAND) MEW - SB-5 - SB-10.GPJ - GEOSYNTEC.GDT 6/10/13

CONTRACTOR Vironex
EQUIPMENT
DRILL MTHD Direct Push
DIAMETER (in) 2"
LOGGER MF REVIEWER NKG
NORTHING
EASTING
ANGLE Vertical
BEARING -----
PRINTED 06/10/13

REMARKS:

COORDINATE SYSTEM:
SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

GS FORM:
OAKLAND

LOG OF SB-10

DEPTH (ft)	MATERIAL DESCRIPTION <small>SOIL NAME (USCS SYMBOL): Color, Moisture, Grain Size and Percentage, Plasticity, Consistency/Density, Other (Odor, Dry Strength, Mineral Content)</small>	SYMBOLIC LOG	ELEVATION (ft)	SAMPLES				TIME	COMMENTS
				NUMBER	TYPE	RECOVERY (%)	PID READING (ppm)		
	Bentonite fill.								
5	Lean CLAY (CL); brown (10YR 4/3); dry; clay [0, 0, 100]; medium plasticity; very stiff.					100			
10	Well graded GRAVEL with sand (GW); light gray (10Y 7/); dry; small gravel; fine sand [60, 40, 0].					100			
15	Lean CLAY (CL); dark grayish brown (10YR 4/2); moist; small gravel, fine sand, clay [5, 5, 90]; medium plasticity; medium stiff.					100			
20	Well graded GRAVEL with sand (GW); light gray (10Y 7/); dry; small gravel, fine sand [60, 40, 0].					100			
	Sandy lean CLAY (CL); dark grayish brown (25Y 4/2); moist; fine sand, clay [0, 40, 60]; medium plasticity; medium stiff.					100			
	Clayey SAND (SC); dark grayish brown (2.5Y 4/2); wet; fine sand, clay [0, 80, 20]; 20.5' to 21.5' 20% white and yellow globules with 0.1 - 1.2 cm diameter, medium plasticity.					100			Wet at 20.5' to 21.5'
	Silty SAND (SM); dark grayish brown (2.5Y 4/2); wet; fine sand, clay [0, 80, 20].					100			
	Clayey SAND (SC); dark grayish brown (2.5Y 4/2); wet; fine sand, clay [0, 80, 20].					100			
25	Lean CLAY (CL), dark gray (N 4), moist, clay [0, 0, 100], medium plasticity, medium stiff.					100			
	Poorly graded SAND with silt (SW-SM); dark gray (2.5Y 4/1); wet; fine sand, silt [0,90,10].					100			
	Lean CLAY (CL); dark gray (N 4); moist; clay [0,0,100], medium plasticity; stiff.					100			
30	Poorly graded SAND with silt (SW-SM); dark gray (2.5Y 4/1); wet; fine sand, silt [0,90,10].					100			

BORING LOG NO WELL (OAKLAND) MEW - SB-5 - SB-10.GPJ GEOSYNTEC.GDT 6/10/13

CONTRACTOR Vironex
EQUIPMENT
DRILL MTHD Direct Push
DIAMETER (in) 2"
LOGGER MF **REVIEWER** NKG

NORTHING EASTING
ANGLE Vertical
BEARING -----
PRINTED 06/10/13

REMARKS:

COORDINATE SYSTEM:
SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

GS FORM:
OAKLAND

LOG OF SB-10

DEPTH (ft)	MATERIAL DESCRIPTION <small>SOIL NAME (USCS SYMBOL): Color, Moisture, Grain Size and Percentage, Plasticity, Consistency/Density, Other (Odor, Dry Strength, Mineral Content)</small>	SYMBOLIC LOG	ELEVATION (ft)	SAMPLES				TIME	COMMENTS
				NUMBER	TYPE	RECOVERY (%)	PID READING (ppm)		
35	Lean CLAY (CL); dark gray (N 4); moist; clay [0,0,100], medium plasticity; stiff.					100			
	Poorly graded SAND with silt (SW-SM); dark gray (2.5Y 4/1); wet; fine sand, silt [0,90,10].								
40	Lean CLAY (CL); dark gray (N 4); moist; clay [0,0,100], medium plasticity; stiff.					100			
	Well graded SAND with silt (SW-SM); very dark gray (N 3); wet; fine sand, silt [0, 80, 20].								
45	Lean CLAY (CL); very dark gray (N 3); dry; clay [0, 0, 100]; medium plasticity; very stiff					100			
	Total Depth = 45'								

BORING LOG NO WELL (OAKLAND) MEW - SB-5 - SB-10.GPJ - GEOSYNTEC.GDT 6/10/13

CONTRACTOR Vironex
EQUIPMENT
DRILL MTHD Direct Push
DIAMETER (in) 2"
LOGGER MF REVIEWER NKG
NORTHING
EASTING
ANGLE Vertical
BEARING -----
PRINTED 06/10/13

REMARKS:

COORDINATE SYSTEM:
SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

DRAFT

ATTACHMENT A2
Laboratory Analytical Reports

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pleasanton
1220 Quarry Lane
Pleasanton, CA 94566
Tel: (925)484-1919

TestAmerica Job ID: 720-49202-1
Client Project/Site: Regional MEW

For:
Geosyntec Consultants, Inc.
1111 Broadway
6th Floor
Oakland, California 94612

Attn: Mr. Eric Suchomel



Authorized for release by:
4/24/2013 4:22:12 PM

Micah Smith
Project Manager I
micah.smith@testamericainc.com

LINKS

Review your project
results through
TotalAccess

Have a Question?



Visit us at:
www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

- 1
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- 3
- 4
- 5
- 6
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- 12
- 13
- 14

DRAFT

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- 13
- 14

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Client Sample Results	6
QC Sample Results	12
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Definitions/Glossary

DRAFT
TestAmerica Job ID: 120-49202-1

Client: Geosyntec Consultants, Inc.
Project/Site: Regional MEW

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
▫	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

DRAFT
TestAmerica Job ID: 720-49202-1

Client: Geosyntec Consultants, Inc.
Project/Site: Regional MEW

Job ID: 720-49202-1

Laboratory: TestAmerica Pleasanton

Narrative

Job Narrative 720-49202-1

Comments

No additional comments.

Receipt

The samples were received on 4/17/2013 5:30 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.9° C.

GC/MS VOA

Method(s) 8260B: The following sample submitted for volatiles analysis was received with insufficient preservation (pH >2): SB-5 (720-49202-3).

No other analytical or quality issues were noted.

GC/MS Semi VOA

Method(s) 8270C LL: The only surrogate that will be reported for these samples will be 2-Fluorobiphenyl, which is associated to the only target compound, 1,4-Dioxane. The other surrogates requested are either not needed and/or not extracted.

No other analytical or quality issues were noted.

Metals

No analytical or quality issues were noted.

General Chemistry

No analytical or quality issues were noted.

Organic Prep

Method(s) 3520C: Insufficient sample volume was available to perform batch matrix spike/matrix spike duplicate (MS/MSD) associated with batch 170520,3520_Base(8270C LL). The laboratory control sample (LCS) was performed in duplicate to provide precision data for this batch.

No other analytical or quality issues were noted.

Detection Summary

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: Regional MEW

TestAmerica Job ID: 720-49202-1

Client Sample ID: SB-8

Lab Sample ID: 720-49202-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Trichloroethene	6.1		0.50		ug/L	1		8260B	Total/NA

Client Sample ID: SB-6

Lab Sample ID: 720-49202-2

No Detections.

Client Sample ID: SB-5

Lab Sample ID: 720-49202-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Trichloroethene	8.1		0.50		ug/L	1		8260B	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Total Dissolved Solids	700		10		mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Pleasanton

Client Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: Regional MEW

DRAFT
TestAmerica Job ID: 120-49202-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Client Sample ID: SB-8

Date Collected: 04/17/13 11:15

Date Received: 04/17/13 17:30

Lab Sample ID: 720-49202-1

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	ND		0.50		ug/L			04/20/13 04:00	1
1,1-Dichloroethane	ND		0.50		ug/L			04/20/13 04:00	1
Dichlorodifluoromethane	ND		0.50		ug/L			04/20/13 04:00	1
Vinyl chloride	ND		0.50		ug/L			04/20/13 04:00	1
Chloroethane	ND		1.0		ug/L			04/20/13 04:00	1
Trichlorofluoromethane	ND		1.0		ug/L			04/20/13 04:00	1
Methylene Chloride	ND		5.0		ug/L			04/20/13 04:00	1
trans-1,2-Dichloroethene	ND		0.50		ug/L			04/20/13 04:00	1
cis-1,2-Dichloroethene	ND		0.50		ug/L			04/20/13 04:00	1
Chloroform	ND		1.0		ug/L			04/20/13 04:00	1
1,1,1-Trichloroethane	ND		0.50		ug/L			04/20/13 04:00	1
Carbon tetrachloride	ND		0.50		ug/L			04/20/13 04:00	1
1,2-Dichloroethane	ND		0.50		ug/L			04/20/13 04:00	1
Trichloroethene	6.1		0.50		ug/L			04/20/13 04:00	1
1,2-Dichloropropane	ND		0.50		ug/L			04/20/13 04:00	1
Dichlorobromomethane	ND		0.50		ug/L			04/20/13 04:00	1
trans-1,3-Dichloropropene	ND		0.50		ug/L			04/20/13 04:00	1
cis-1,3-Dichloropropene	ND		0.50		ug/L			04/20/13 04:00	1
1,1,2-Trichloroethane	ND		0.50		ug/L			04/20/13 04:00	1
Tetrachloroethene	ND		0.50		ug/L			04/20/13 04:00	1
Chlorodibromomethane	ND		0.50		ug/L			04/20/13 04:00	1
Chlorobenzene	ND		0.50		ug/L			04/20/13 04:00	1
Bromoform	ND		1.0		ug/L			04/20/13 04:00	1
1,1,2,2-Tetrachloroethane	ND		0.50		ug/L			04/20/13 04:00	1
1,3-Dichlorobenzene	ND		0.50		ug/L			04/20/13 04:00	1
1,4-Dichlorobenzene	ND		0.50		ug/L			04/20/13 04:00	1
1,2-Dichlorobenzene	ND		0.50		ug/L			04/20/13 04:00	1
Chloromethane	ND		1.0		ug/L			04/20/13 04:00	1
Bromomethane	ND		1.0		ug/L			04/20/13 04:00	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50		ug/L			04/20/13 04:00	1
EDB	ND		0.50		ug/L			04/20/13 04:00	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			04/20/13 04:00	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
<i>Toluene-d8 (Surr)</i>	95		70 - 130		04/20/13 04:00	1
<i>4-Bromofluorobenzene</i>	88		67 - 130		04/20/13 04:00	1
<i>1,2-Dichloroethane-d4 (Surr)</i>	96		75 - 138		04/20/13 04:00	1

Client Sample ID: SB-6

Date Collected: 04/17/13 13:45

Date Received: 04/17/13 17:30

Lab Sample ID: 720-49202-2

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	ND		0.50		ug/L			04/20/13 04:31	1
1,1-Dichloroethane	ND		0.50		ug/L			04/20/13 04:31	1
Dichlorodifluoromethane	ND		0.50		ug/L			04/20/13 04:31	1
Vinyl chloride	ND		0.50		ug/L			04/20/13 04:31	1
Chloroethane	ND		1.0		ug/L			04/20/13 04:31	1
Trichlorofluoromethane	ND		1.0		ug/L			04/20/13 04:31	1
Methylene Chloride	ND		5.0		ug/L			04/20/13 04:31	1
trans-1,2-Dichloroethene	ND		0.50		ug/L			04/20/13 04:31	1

TestAmerica Pleasanton

Client Sample Results

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: Regional MEW

TestAmerica Job ID: 20-49202-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Client Sample ID: SB-6
Date Collected: 04/17/13 13:45
Date Received: 04/17/13 17:30

Lab Sample ID: 720-49202-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	ND		0.50		ug/L			04/20/13 04:31	1
Chloroform	ND		1.0		ug/L			04/20/13 04:31	1
1,1,1-Trichloroethane	ND		0.50		ug/L			04/20/13 04:31	1
Carbon tetrachloride	ND		0.50		ug/L			04/20/13 04:31	1
1,2-Dichloroethane	ND		0.50		ug/L			04/20/13 04:31	1
Trichloroethene	ND		0.50		ug/L			04/20/13 04:31	1
1,2-Dichloropropane	ND		0.50		ug/L			04/20/13 04:31	1
Dichlorobromomethane	ND		0.50		ug/L			04/20/13 04:31	1
trans-1,3-Dichloropropene	ND		0.50		ug/L			04/20/13 04:31	1
cis-1,3-Dichloropropene	ND		0.50		ug/L			04/20/13 04:31	1
1,1,2-Trichloroethane	ND		0.50		ug/L			04/20/13 04:31	1
Tetrachloroethene	ND		0.50		ug/L			04/20/13 04:31	1
Chlorodibromomethane	ND		0.50		ug/L			04/20/13 04:31	1
Chlorobenzene	ND		0.50		ug/L			04/20/13 04:31	1
Bromoform	ND		1.0		ug/L			04/20/13 04:31	1
1,1,2,2-Tetrachloroethane	ND		0.50		ug/L			04/20/13 04:31	1
1,3-Dichlorobenzene	ND		0.50		ug/L			04/20/13 04:31	1
1,4-Dichlorobenzene	ND		0.50		ug/L			04/20/13 04:31	1
1,2-Dichlorobenzene	ND		0.50		ug/L			04/20/13 04:31	1
Chloromethane	ND		1.0		ug/L			04/20/13 04:31	1
Bromomethane	ND		1.0		ug/L			04/20/13 04:31	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50		ug/L			04/20/13 04:31	1
EDB	ND		0.50		ug/L			04/20/13 04:31	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			04/20/13 04:31	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	99		70 - 130		04/20/13 04:31	1
4-Bromofluorobenzene	96		67 - 130		04/20/13 04:31	1
1,2-Dichloroethane-d4 (Surr)	96		75 - 138		04/20/13 04:31	1

Client Sample ID: SB-5
Date Collected: 04/17/13 15:40
Date Received: 04/17/13 17:30

Lab Sample ID: 720-49202-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	ND		0.50		ug/L			04/20/13 05:04	1
1,1-Dichloroethane	ND		0.50		ug/L			04/20/13 05:04	1
Dichlorodifluoromethane	ND		0.50		ug/L			04/20/13 05:04	1
Vinyl chloride	ND		0.50		ug/L			04/20/13 05:04	1
Chloroethane	ND		1.0		ug/L			04/20/13 05:04	1
Trichlorofluoromethane	ND		1.0		ug/L			04/20/13 05:04	1
Methylene Chloride	ND		5.0		ug/L			04/20/13 05:04	1
trans-1,2-Dichloroethene	ND		0.50		ug/L			04/20/13 05:04	1
cis-1,2-Dichloroethene	ND		0.50		ug/L			04/20/13 05:04	1
Chloroform	ND		1.0		ug/L			04/20/13 05:04	1
1,1,1-Trichloroethane	ND		0.50		ug/L			04/20/13 05:04	1
Carbon tetrachloride	ND		0.50		ug/L			04/20/13 05:04	1
1,2-Dichloroethane	ND		0.50		ug/L			04/20/13 05:04	1
Trichloroethene	8.1		0.50		ug/L			04/20/13 05:04	1
1,2-Dichloropropane	ND		0.50		ug/L			04/20/13 05:04	1
Dichlorobromomethane	ND		0.50		ug/L			04/20/13 05:04	1

TestAmerica Pleasanton

Client Sample Results

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: Regional MEW

TestAmerica Job ID: 720-49202-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Client Sample ID: SB-5

Lab Sample ID: 720-49202-3

Date Collected: 04/17/13 15:40

Matrix: Water

Date Received: 04/17/13 17:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
trans-1,3-Dichloropropene	ND		0.50		ug/L			04/20/13 05:04	1
cis-1,3-Dichloropropene	ND		0.50		ug/L			04/20/13 05:04	1
1,1,2-Trichloroethane	ND		0.50		ug/L			04/20/13 05:04	1
Tetrachloroethene	ND		0.50		ug/L			04/20/13 05:04	1
Chlorodibromomethane	ND		0.50		ug/L			04/20/13 05:04	1
Chlorobenzene	ND		0.50		ug/L			04/20/13 05:04	1
Bromoform	ND		1.0		ug/L			04/20/13 05:04	1
1,1,1,2-Tetrachloroethane	ND		0.50		ug/L			04/20/13 05:04	1
1,3-Dichlorobenzene	ND		0.50		ug/L			04/20/13 05:04	1
1,4-Dichlorobenzene	ND		0.50		ug/L			04/20/13 05:04	1
1,2-Dichlorobenzene	ND		0.50		ug/L			04/20/13 05:04	1
Chloromethane	ND		1.0		ug/L			04/20/13 05:04	1
Bromomethane	ND		1.0		ug/L			04/20/13 05:04	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50		ug/L			04/20/13 05:04	1
EDB	ND		0.50		ug/L			04/20/13 05:04	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			04/20/13 05:04	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	94		70 - 130					04/20/13 05:04	1
4-Bromofluorobenzene	88		67 - 130					04/20/13 05:04	1
1,2-Dichloroethane-d4 (Surr)	97		75 - 138					04/20/13 05:04	1

Client Sample Results

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: Regional MEW

TestAmerica Job ID: 720-49202-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Client Sample ID: SB-5
Date Collected: 04/17/13 15:40
Date Received: 04/17/13 17:30

Lab Sample ID: 720-49202-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND		1.1		ug/L		04/21/13 11:20	04/23/13 14:03	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl	68		57 - 120				04/21/13 11:20	04/23/13 14:03	1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

Client Sample Results

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: Regional MEW

TestAmerica Job ID: 720-49202-1

General Chemistry

Client Sample ID: SB-5
Date Collected: 04/17/13 15:40
Date Received: 04/17/13 17:30

Lab Sample ID: 720-49202-3
Matrix: Water

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	700		10		mg/L			04/19/13 16:46	1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

Client Sample Results

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: Regional MEW

TestAmerica Job ID: 720-49202-1

General Chemistry - Dissolved

Client Sample ID: SB-5
Date Collected: 04/17/13 15:40
Date Received: 04/17/13 17:30

Lab Sample ID: 720-49202-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	ND		0.50		ug/L			04/17/13 19:41	1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

QC Sample Results

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: Regional MEW

TestAmerica Job ID: 20-49202-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 720-134813/3

Matrix: Water

Analysis Batch: 134813

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	ND		0.50		ug/L			04/19/13 19:15	1
1,1-Dichloroethane	ND		0.50		ug/L			04/19/13 19:15	1
Dichlorodifluoromethane	ND		0.50		ug/L			04/19/13 19:15	1
Vinyl chloride	ND		0.50		ug/L			04/19/13 19:15	1
Chloroethane	ND		1.0		ug/L			04/19/13 19:15	1
Trichlorofluoromethane	ND		1.0		ug/L			04/19/13 19:15	1
Methylene Chloride	ND		5.0		ug/L			04/19/13 19:15	1
trans-1,2-Dichloroethene	ND		0.50		ug/L			04/19/13 19:15	1
cis-1,2-Dichloroethene	ND		0.50		ug/L			04/19/13 19:15	1
Chloroform	ND		1.0		ug/L			04/19/13 19:15	1
1,1,1-Trichloroethane	ND		0.50		ug/L			04/19/13 19:15	1
Carbon tetrachloride	ND		0.50		ug/L			04/19/13 19:15	1
1,2-Dichloroethane	ND		0.50		ug/L			04/19/13 19:15	1
Trichloroethene	ND		0.50		ug/L			04/19/13 19:15	1
1,2-Dichloropropane	ND		0.50		ug/L			04/19/13 19:15	1
Dichlorobromomethane	ND		0.50		ug/L			04/19/13 19:15	1
trans-1,3-Dichloropropene	ND		0.50		ug/L			04/19/13 19:15	1
cis-1,3-Dichloropropene	ND		0.50		ug/L			04/19/13 19:15	1
1,1,2-Trichloroethane	ND		0.50		ug/L			04/19/13 19:15	1
Tetrachloroethene	ND		0.50		ug/L			04/19/13 19:15	1
Chlorodibromomethane	ND		0.50		ug/L			04/19/13 19:15	1
Chlorobenzene	ND		0.50		ug/L			04/19/13 19:15	1
Bromoform	ND		1.0		ug/L			04/19/13 19:15	1
1,1,2,2-Tetrachloroethane	ND		0.50		ug/L			04/19/13 19:15	1
1,3-Dichlorobenzene	ND		0.50		ug/L			04/19/13 19:15	1
1,4-Dichlorobenzene	ND		0.50		ug/L			04/19/13 19:15	1
1,2-Dichlorobenzene	ND		0.50		ug/L			04/19/13 19:15	1
Chloromethane	ND		1.0		ug/L			04/19/13 19:15	1
Bromomethane	ND		1.0		ug/L			04/19/13 19:15	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50		ug/L			04/19/13 19:15	1
EDB	ND		0.50		ug/L			04/19/13 19:15	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			04/19/13 19:15	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	106		70 - 130		04/19/13 19:15	1
4-Bromofluorobenzene	105		67 - 130		04/19/13 19:15	1
1,2-Dichloroethane-d4 (Surr)	87		75 - 138		04/19/13 19:15	1

Lab Sample ID: LCS 720-134813/4

Matrix: Water

Analysis Batch: 134813

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	23.5		ug/L		94	64 - 128
1,1-Dichloroethane	25.0	23.5		ug/L		94	70 - 130
Dichlorodifluoromethane	25.0	19.6		ug/L		79	34 - 132
Vinyl chloride	25.0	24.1		ug/L		97	54 - 135
Chloroethane	25.0	24.9		ug/L		100	62 - 138

TestAmerica Pleasanton

QC Sample Results

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: Regional MEW

TestAmerica Job ID: 120-49202-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 720-134813/4

Matrix: Water

Analysis Batch: 134813

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Trichlorofluoromethane	25.0	24.5		ug/L		98	66 - 132
Methylene Chloride	25.0	22.6		ug/L		90	70 - 147
trans-1,2-Dichloroethene	25.0	24.3		ug/L		97	68 - 130
cis-1,2-Dichloroethene	25.0	25.0		ug/L		100	70 - 130
Chloroform	25.0	23.0		ug/L		92	70 - 130
1,1,1-Trichloroethane	25.0	23.7		ug/L		95	70 - 130
Carbon tetrachloride	25.0	23.5		ug/L		94	70 - 146
1,2-Dichloroethane	25.0	23.4		ug/L		94	61 - 132
Trichloroethene	25.0	25.1		ug/L		100	70 - 130
1,2-Dichloropropane	25.0	25.1		ug/L		100	70 - 130
Dichlorobromomethane	25.0	24.9		ug/L		99	70 - 130
trans-1,3-Dichloropropene	25.0	20.2		ug/L		81	70 - 140
cis-1,3-Dichloropropene	25.0	22.2		ug/L		89	70 - 130
1,1,2-Trichloroethane	25.0	25.9		ug/L		104	70 - 130
Tetrachloroethene	25.0	25.3		ug/L		101	70 - 130
Chlorodibromomethane	25.0	23.6		ug/L		94	70 - 145
Chlorobenzene	25.0	24.3		ug/L		97	70 - 130
Bromoform	25.0	25.8		ug/L		103	68 - 136
1,1,2,2-Tetrachloroethane	25.0	24.2		ug/L		97	70 - 130
1,3-Dichlorobenzene	25.0	26.0		ug/L		104	70 - 130
1,4-Dichlorobenzene	25.0	24.1		ug/L		96	70 - 130
1,2-Dichlorobenzene	25.0	24.8		ug/L		99	70 - 130
Chloromethane	25.0	21.9		ug/L		88	52 - 175
Bromomethane	25.0	24.6		ug/L		98	43 - 151
1,1,2-Trichloro-1,2,2-trifluoroethane	25.0	24.2		ug/L		97	42 - 162
EDB	25.0	24.4		ug/L		98	70 - 130
1,2,4-Trichlorobenzene	25.0	26.6		ug/L		107	70 - 130

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Toluene-d8 (Surr)	125		70 - 130
4-Bromofluorobenzene	115		67 - 130
1,2-Dichloroethane-d4 (Surr)	84		75 - 138

Lab Sample ID: LCSD 720-134813/5

Matrix: Water

Analysis Batch: 134813

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
1,1-Dichloroethene	25.0	23.8		ug/L		95	64 - 128	1	20
1,1-Dichloroethane	25.0	24.4		ug/L		98	70 - 130	4	20
Dichlorodifluoromethane	25.0	19.7		ug/L		79	34 - 132	0	20
Vinyl chloride	25.0	23.5		ug/L		94	54 - 135	3	20
Chloroethane	25.0	24.9		ug/L		100	62 - 138	0	20
Trichlorofluoromethane	25.0	23.4		ug/L		93	66 - 132	5	20
Methylene Chloride	25.0	23.4		ug/L		94	70 - 147	4	20
trans-1,2-Dichloroethene	25.0	25.0		ug/L		100	68 - 130	3	20
cis-1,2-Dichloroethene	25.0	25.9		ug/L		104	70 - 130	4	20

TestAmerica Pleasanton

QC Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: Regional MEW

DRAFT
TestAmerica Job ID: 12049202-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 720-134813/5

Matrix: Water

Analysis Batch: 134813

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits		RPD	
							RPD	Limit	RPD	Limit
Chloroform	25.0	23.8		ug/L		95	70 - 130	4	20	
1,1,1-Trichloroethane	25.0	24.0		ug/L		96	70 - 130	1	20	
Carbon tetrachloride	25.0	23.6		ug/L		95	70 - 146	1	20	
1,2-Dichloroethane	25.0	25.2		ug/L		101	61 - 132	7	20	
Trichloroethene	25.0	26.5		ug/L		106	70 - 130	6	20	
1,2-Dichloropropane	25.0	27.9		ug/L		112	70 - 130	10	20	
Dichlorobromomethane	25.0	27.0		ug/L		108	70 - 130	8	20	
trans-1,3-Dichloropropene	25.0	24.4		ug/L		98	70 - 140	19	20	
cis-1,3-Dichloropropene	25.0	26.5		ug/L		106	70 - 130	18	20	
1,1,2-Trichloroethane	25.0	29.5		ug/L		118	70 - 130	13	20	
Tetrachloroethene	25.0	26.9		ug/L		108	70 - 130	6	20	
Chlorodibromomethane	25.0	26.5		ug/L		106	70 - 145	12	20	
Chlorobenzene	25.0	26.2		ug/L		105	70 - 130	8	20	
Bromoform	25.0	27.2		ug/L		109	68 - 136	5	20	
1,1,2,2-Tetrachloroethane	25.0	26.2		ug/L		105	70 - 130	8	20	
1,3-Dichlorobenzene	25.0	28.1		ug/L		112	70 - 130	8	20	
1,4-Dichlorobenzene	25.0	26.4		ug/L		106	70 - 130	9	20	
1,2-Dichlorobenzene	25.0	26.4		ug/L		106	70 - 130	6	20	
Chloromethane	25.0	24.3		ug/L		97	52 - 175	10	20	
Bromomethane	25.0	24.3		ug/L		97	43 - 151	1	20	
1,1,2-Trichloro-1,2,2-trifluoroethane	25.0	24.1		ug/L		96	42 - 162	0	20	
EDB	25.0	28.6		ug/L		114	70 - 130	16	20	
1,2,4-Trichlorobenzene	25.0	28.5		ug/L		114	70 - 130	7	20	

Surrogate	LCSD		Limits
	%Recovery	Qualifier	
Toluene-d8 (Surr)	127		70 - 130
4-Bromofluorobenzene	113		67 - 130
1,2-Dichloroethane-d4 (Surr)	84		75 - 138

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 280-170520/1-A

Matrix: Water

Analysis Batch: 170843

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 170520

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
1,4-Dioxane	ND		1.0		ug/L		04/21/13 11:20	04/23/13 12:25	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
2-Fluorobiphenyl	81		57 - 120	04/21/13 11:20	04/23/13 12:25	1

Lab Sample ID: LCS 280-170520/2-A

Matrix: Water

Analysis Batch: 170843

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 170520

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits	
							RPD	Limit
1,4-Dioxane	10.0	5.24		ug/L		52	38 - 120	

TestAmerica Pleasanton

QC Sample Results

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: Regional MEW

TestAmerica Job ID: 120-49202-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCS 280-170520/2-A
Matrix: Water
Analysis Batch: 170843

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 170520

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2-Fluorobiphenyl	85		57 - 120

Lab Sample ID: LCSD 280-170520/3-A
Matrix: Water
Analysis Batch: 170843

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 170520

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	10.0	5.67		ug/L		57	38 - 120	8	30

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
2-Fluorobiphenyl	80		57 - 120

Method: 7199 - Chromium, Hexavalent (IC)

Lab Sample ID: MB 720-135039/1-A
Matrix: Water
Analysis Batch: 134594

Client Sample ID: Method Blank
Prep Type: Dissolved

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	ND		0.50		ug/L			04/17/13 16:59	1

Lab Sample ID: LCS 720-135039/2-A
Matrix: Water
Analysis Batch: 134594

Client Sample ID: Lab Control Sample
Prep Type: Dissolved

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cr (VI)	2.00	1.88		ug/L		94	90 - 110

Lab Sample ID: LCSD 720-135039/3-A
Matrix: Water
Analysis Batch: 134594

Client Sample ID: Lab Control Sample Dup
Prep Type: Dissolved

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Cr (VI)	2.00	1.90		ug/L		95	90 - 110	2	20

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 720-134805/2
Matrix: Water
Analysis Batch: 134805

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10		mg/L			04/19/13 16:46	1

TestAmerica Pleasanton

QC Sample Results

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: Regional MEW

TestAmerica Job ID: 120-49202-1

Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

Lab Sample ID: LCS 720-134805/1
Matrix: Water
Analysis Batch: 134805

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	1000	1030		mg/L		103	85 - 115

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QC Association Summary

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: Regional MEW

TestAmerica Job ID: 720-49202-1

GC/MS VOA

Analysis Batch: 134813

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-49202-1	SB-8	Total/NA	Water	8260B	
720-49202-2	SB-6	Total/NA	Water	8260B	
720-49202-3	SB-5	Total/NA	Water	8260B	
LCS 720-134813/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 720-134813/5	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 720-134813/3	Method Blank	Total/NA	Water	8260B	

GC/MS Semi VOA

Prep Batch: 170520

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-49202-3	SB-5	Total/NA	Water	3520C	
LCS 280-170520/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 280-170520/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 280-170520/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 170843

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-49202-3	SB-5	Total/NA	Water	8270C LL	170520
LCS 280-170520/2-A	Lab Control Sample	Total/NA	Water	8270C LL	170520
LCSD 280-170520/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	170520
MB 280-170520/1-A	Method Blank	Total/NA	Water	8270C LL	170520

General Chemistry

Analysis Batch: 134594

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-49202-3	SB-5	Dissolved	Water	7199	
LCS 720-135039/2-A	Lab Control Sample	Dissolved	Water	7199	
LCSD 720-135039/3-A	Lab Control Sample Dup	Dissolved	Water	7199	
MB 720-135039/1-A	Method Blank	Dissolved	Water	7199	

Analysis Batch: 134805

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-49202-3	SB-5	Total/NA	Water	SM 2540C	
LCS 720-134805/1	Lab Control Sample	Total/NA	Water	SM 2540C	
MB 720-134805/2	Method Blank	Total/NA	Water	SM 2540C	

Lab Chronicle

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: Regional MEW

TestAmerica Job ID: 720-49202-1

Client Sample ID: SB-8

Lab Sample ID: 720-49202-1

Date Collected: 04/17/13 11:15

Matrix: Water

Date Received: 04/17/13 17:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	134813	04/20/13 04:00	LL	TAL PLS

Client Sample ID: SB-6

Lab Sample ID: 720-49202-2

Date Collected: 04/17/13 13:45

Matrix: Water

Date Received: 04/17/13 17:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	134813	04/20/13 04:31	LL	TAL PLS

Client Sample ID: SB-5

Lab Sample ID: 720-49202-3

Date Collected: 04/17/13 15:40

Matrix: Water

Date Received: 04/17/13 17:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	134813	04/20/13 05:04	LL	TAL PLS
Total/NA	Prep	3520C			170520	04/21/13 11:20	CDC	TAL DEN
Total/NA	Analysis	8270C LL		1	170843	04/23/13 14:03	KGV	TAL DEN
Dissolved	Analysis	7199		1	134594	04/17/13 19:41	EYT	TAL PLS
Total/NA	Analysis	SM 2540C		1	134805	04/19/13 16:46	EYT	TAL PLS

Laboratory References:

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL PLS = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

Certification Summary

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: Regional MEW

TestAmerica Job ID: 120-49202-1

Laboratory: TestAmerica Pleasanton

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
California	State Program	9	2496	01-31-14

Laboratory: TestAmerica Denver

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2907.01	10-31-13
A2LA	ISO/IEC 17025		2907.01	10-31-13
Alaska (UST)	State Program	10	UST-30	04-05-14
Arizona	State Program	9	AZ0713	12-19-13
Arkansas DEQ	State Program	6	88-0687	06-01-13
California	State Program	9	2513	08-31-14
Colorado	State Program	8	N/A	09-30-13
Connecticut	State Program	1	PH-0686	09-30-14
Florida	NELAP	4	E87667	06-30-13
Idaho	State Program	10	CO00026	09-30-13
Illinois	NELAP	5	200017	04-30-13
Iowa	State Program	7	370	12-01-14
Kansas	NELAP	7	E-10166	04-30-13
Louisiana	NELAP	6	30785	06-30-13
Maine	State Program	1	CO0002	03-03-15
Maryland	State Program	3	268	03-31-14
Minnesota	NELAP	5	8-999-405	12-31-13
Nevada	State Program	9	CO0026	07-30-13
New Hampshire	NELAP	1	205310	04-28-13
New Jersey	NELAP	2	CO004	06-30-13
New Mexico	State Program	6	CO00026	06-30-13
New York	NELAP	2	11964	04-01-14
North Carolina DENR	State Program	4	358	12-31-13
North Dakota	State Program	8	R-034	06-30-13
Oklahoma	State Program	6	8614	08-31-13
Oregon	NELAP	10	CO200001	01-16-14
Pennsylvania	NELAP	3	68-00664	07-31-13
South Carolina	State Program	4	72002	06-30-13
Texas	NELAP	6	T104704183-08-TX	09-30-13
USDA	Federal		P330-08-00036	02-08-14
Utah	NELAP	8	QUAN5	06-30-13
Virginia	NELAP	3	460232	06-14-13
Washington	State Program	10	C583	08-03-13
West Virginia DEP	State Program	3	354	11-30-13
Wisconsin	State Program	5	999615430	08-31-13
Wyoming (UST)	A2LA	8		10-31-13

Method Summary

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: Regional MEW

TestAmerica Job ID: 120-49202-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL PLS
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL DEN
7199	Chromium, Hexavalent (IC)	SW846	TAL PLS
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL PLS

Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL PLS = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919



Sample Summary

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: Regional MEW

TestAmerica Job ID: 720-49202-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
720-49202-1	SB-8	Water	04/17/13 11:15	04/17/13 17:30
720-49202-2	SB-6	Water	04/17/13 13:45	04/17/13 17:30
720-49202-3	SB-5	Water	04/17/13 15:40	04/17/13 17:30

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TestAmerica Pleasanton
 1220 Quarry Lane
 Pleasanton, CA 94566
 Phone 925.484.1919 fax 925.600.3002

720-49202

Chain of Custody Record

Regulatory Program: DW NPDES RCRA Other:

TestAmerica
 THE LEADER IN ENVIRONMENTAL TESTING
 TestAmerica Laboratories, Inc.
 145475

Client Contact: Geosyntec Consultants
 111 Broadway, 6th Floor
 Oakland, CA 94607
 Phone: 285.2700
 FAX: 836.3114

Project Name: **MENU**
 Site: **MENU, MAJUMBARIA VIEW, CA**
 P O #: **WR128A**

Project Manager: **Eric S. Schmel**
 Tel/Fax: **925.285.2300 / 925.836.3114**

Analysis Turnaround Time:
 CALENDAR DAYS WORKING DAYS
 TAT if different from Below: 2 weeks 1 week 2 days 1 day

Sample Identification	Sample Date	Sample Time	Sample Type (G-Comp, G-Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	Lab Contact: M. C. Smith	Date: 17 April 2013	Carrier:	COC No. 1 of 1 COCs
SB-8	4/12/13	11:15	W	W	3		8270C	8260B			
SB-4	4/12/13	13:45	W	W	4		X	1,4-Dioxane			
SB-5	4/12/13	15:40	W	W	8		X	IDS			
								Chromium IV			

Hold 250ml container

Sample Specific Notes:

720-49202 Chain of Custody

Preservation Used: 1=Ice, 2=HCl; 3=H2SO4; 4=HNO3; 5=NaOH; 6=Other

Possible Hazard Identification:
 Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample

Non-Hazard Flammable Skin Irritant Poison B Unknown

Special Instructions/QC Requirements & Comments:
0.9°C

Return to Client Disposal by Lab Archive for _____ Months

Custody Seals Intact: Yes No

Relinquished by: **[Signature]** Company: **Geosyntec** Date/Time: **4/12/13 11:15** Received by: **[Signature]** Date/Time: **04/11/13 @ 16:15**

Relinquished by: **[Signature]** Company: **TRSF** Date/Time: **04/17/13 @ 17:30** Received in Laboratory by: **[Signature]** Date/Time: **04-17-13 17:30**

Form No. CA-C-WI-002, Rev. 4.1, dated 02/20/2013

Salimpour, Afsaneh

From: Nicole Gotberg [NGotberg@Geosyntec.com]
Sent: Friday, April 19, 2013 11:06 AM
To: Salimpour, Afsaneh; Eric Suchomel
Cc: Morgan Fahlman; John Gallinatti
Subject: RE: Sample Login Confirmation for 720-49233, MEW
Afsaneh,

Per our conversation please make the following revisions to the requested analysis for 720-49233 and 720-49202.

- 1. Remove the SVOC 8270C analysis, we would only like to run 1,4 Dioxane by 8270C
2. For 8260B only run the halogenated VOC (HVOC) list
3. For the trip blank only run the HVOC analysis

I will have Morgan revise and initial changes on the Chain of Custody forms to be included with the lab reports.

Thanks,
Nicole

Nicole K. Gotberg, P.G.
Professional Geologist

1111 Broadway, 6th Floor
Oakland, CA 94607
Main Phone: 510.836.3034, ext. 2771
Direct Phone: 510.285.2771
Fax: 510.836.3036
www.geosyntec.com



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10:41 AM

To: Eric Suchomel; Nicole Gotberg
Subject: Sample Login Confirmation for 720-49233, MEW

Insufficient sample volume was provided for the following sample(s) for the 8270C; 1,4-Dioxane analysis: TAL SF TB. Received 2-40ml Hcl voa vials, can only run for 8260B.

AFSANEH SALIMPOUR

TestAmerica Pleasanton
THE LEADER IN ENVIRONMENTAL TESTING

Tel: 925.484.1919
www.testamericainc.com

Reference: [128017]
Attachments: 3

TestAmerica Pleasanton
1220 Quarry Lane
Pleasanton, CA 94566
phone 925.484.1919 fax 925.600.3002

720-49202 - REV

Chain of Custody Record

TestAmerica
145477
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.

Client Contact

Geosyntec Consultants
1111 Broadway, 6th Floor
Oakland, CA 94607
Phone 510.285.2700
FAX 510.536.3114

Project Name: **WETUS**
Site: **MERCY MAGNOLIA VIEW, CA**
P.O.#: **WRL128A**

Project Manager: **Eric Scholonek**
Tel/Fax: **510-285-2400 / 510-934-3114**

Analysis Turnaround Time
 CALENDAR DAYS
 WORKING DAYS
TAT if different from below
 2 weeks
 1 week
 2 days
 1 day

Sample Identification	Sample Date	Sample Time	Sample Type (G-cont, G-sed)	Matrix	# of Cont.
SB-8	4/17/13	11:15	W	W	3
SB-4	4/17/13	13:45	W	W	4
SB-5	4/17/13	15:40	W	W	8

Preservation Used: 1=Ice, 2=HCl; 3=H2SO4; 4=HNO3; 5=NaOH; 6=Other
Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section. If the lab is to dispose of the sample

Special Instructions/QC Requirements & Comments:
 No-Hazard Flammable Non Injant Poison B Unknown
0.9°C

Custody Seal Intact: Yes No

Relinquished by: *[Signature]*
Relinquished by: *[Signature]*
Relinquished by: *[Signature]*

Regulatory Program: DW NPDES RCRA Other

Site Contact: **Maryann Farkas**
Lab Contact: **M. Clark Smith**
Carrier: **17 April 2013**

Filtered Sample (Y/N)
Perform MS/MSD (Y/N)
82706 MF 4/2/13
82400B (HVOG)
1.4-Dioxane (82706)
IDS
Chromium IV



720-49202 Chain of Custody

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return to Client Disposal by Lab Archive for _____ Months

Relinquished by: *[Signature]*
Relinquished by: *[Signature]*
Relinquished by: *[Signature]*

Relinquished by: *[Signature]*
Relinquished by: *[Signature]*
Relinquished by: *[Signature]*

COC No. _____ of _____ COCs

For Lab Use Only:
Walk-in Client: _____
Lab Sampling: _____
Job / SDG No.: **WRL128A**
Sampler: **Maryann Farkas**

Sample Specific Notes:
HOLD 250ml container

Relinquished by: *[Signature]* Date/Time: **4/17/13 17:30**
Relinquished by: *[Signature]* Date/Time: **04/17/13 16:15**
Relinquished by: *[Signature]* Date/Time: **4/17/13 17:30**

Form No. CA-C-WI-002, Rev. 4.1, dated 02/20/2013

Login Sample Receipt Checklist

Client: Geosyntec Consultants, Inc.

Job Number: 720-49202-1

Login Number: 49202

List Number: 1

Creator: Bullock, Tracy

List Source: TestAmerica Pleasanton

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Geosyntec Consultants, Inc.

Job Number: 720-49202-1

Login Number: 49202

List Number: 1

Creator: Sanders, Stephanie

List Source: TestAmerica Denver

List Creation: 04/19/13 03:18 PM

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pleasanton
1220 Quarry Lane
Pleasanton, CA 94566
Tel: (925)484-1919

TestAmerica Job ID: 720-49202-2
Client Project/Site: Regional MEW

For:
Geosyntec Consultants, Inc.
1111 Broadway
6th Floor
Oakland, California 94612

Attn: Mr. Eric Suchomel



Authorized for release by:
4/30/2013 3:59:21 PM

Micah Smith
Project Manager I
micah.smith@testamericainc.com

LINKS

Review your project
results through
TotalAccess

Have a Question?



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www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: Geosyntec Consultants, Inc.
Project/Site: Regional MEW

DRAFT
TestAmerica Job ID: 120-49202-2

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
▫	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: Regional MEW

TestAmerica Job ID: 720-49202-2

Job ID: 720-49202-2

Laboratory: TestAmerica Pleasanton

Narrative

Job Narrative
720-49202-2

Comments

No additional comments.

Receipt

The samples were received on 4/17/2013 5:30 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.9° C.

General Chemistry

No analytical or quality issues were noted.

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Detection Summary

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: Regional MEW

TestAmerica Job ID: 720-49202-2

Client Sample ID: SB-6

Lab Sample ID: 720-49202-2

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Total Dissolved Solids	640		10		mg/L	1		SM 2540C	Total/NA

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This Detection Summary does not include radiochemical test results.

TestAmerica Pleasanton

Client Sample Results

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: Regional MEW

TestAmerica Job ID: 720-49202-2

General Chemistry

Client Sample ID: SB-6
Date Collected: 04/17/13 13:45
Date Received: 04/17/13 17:30

Lab Sample ID: 720-49202-2
Matrix: Water

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	640		10		mg/L			04/23/13 18:54	1

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QC Sample Results

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: Regional MEW

TestAmerica Job ID: 720-49202-2

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 720-135058/2
Matrix: Water
Analysis Batch: 135058

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10		mg/L			04/23/13 18:54	1

Lab Sample ID: LCS 720-135058/1
Matrix: Water
Analysis Batch: 135058

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	1000	1020		mg/L		102	85 - 115

Lab Sample ID: 720-49202-2 DU
Matrix: Water
Analysis Batch: 135058

Client Sample ID: SB-6
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	640		660		mg/L		4	10

QC Association Summary

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: Regional MEW

TestAmerica Job ID: 720-49202-2

General Chemistry

Analysis Batch: 135058

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-49202-2	SB-6	Total/NA	Water	SM 2540C	
720-49202-2 DU	SB-6	Total/NA	Water	SM 2540C	
LCS 720-135058/1	Lab Control Sample	Total/NA	Water	SM 2540C	
MB 720-135058/2	Method Blank	Total/NA	Water	SM 2540C	

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Lab Chronicle

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: Regional MEW

TestAmerica Job ID: 720-49202-2

Client Sample ID: SB-6

Lab Sample ID: 720-49202-2

Date Collected: 04/17/13 13:45

Matrix: Water

Date Received: 04/17/13 17:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540C		1	135058	04/23/13 18:54	EYT	TAL PLS

Laboratory References:

TAL PLS = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

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Certification Summary

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: Regional MEW

TestAmerica Job ID: 120-49202-2

Laboratory: TestAmerica Pleasanton

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
California	State Program	9	2496	01-31-14

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Method Summary

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: Regional MEW

TestAmerica Job ID: 120-49202-2

Method	Method Description	Protocol	Laboratory
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL PLS

Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater",

Laboratory References:

TAL PLS = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

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Sample Summary

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: Regional MEW

TestAmerica Job ID: 720-49202-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
720-49202-2	SB-6	Water	04/17/13 13:45	04/17/13 17:30

- 1
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TestAmerica Pleasanton
 1220 Quarry Lane
 Pleasanton, CA 94566
 Phone 925.484.1919 fax 925.600.3002

720-49202

Chain of Custody Record

Regulatory Program: DW NPDES RCRA Other:

TestAmerica
 THE LEADER IN ENVIRONMENTAL TESTING
 TestAmerica Laboratories, Inc.
 145475

Client Contact: Geosyntec Consultants
 111 Broadway, 6th Floor
 Oakland, CA 94607
 Phone: 285.2700
 FAX: 836.3114
 Project Name: **MENU**
 Site: **MENU, MAJUMBA VIEW, CA**
 P O #: **WR128A**

Project Manager: **Eric S. Schmel**
 Tel/Fax: **90-285-2700/90-836-3114**

Analysis Turnaround Time
 CALENDAR DAYS WORKING DAYS
 TAT if different from Below: 2 weeks 1 week 2 days 1 day

Sample Identification	Sample Date	Sample Time	Sample Type (G-Comp, G-Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	Lab Contact: M. C. Smith	Date: 17 April 2013	Carrier:	COC No. 1 of 1 COCs
SB-8	4/12/13	11:15	W	W	3		8270C	8260B	14-Dioxane		
SB-4	4/12/13	13:45	W	W	4		X	X	X		
SB-5	4/12/13	15:40	W	W	8		X	X	X		

Sample Specific Notes: **HOLD 250ml container**

Sampler: **Margaret Feldman**

Job / SDG No.: **WR128A**

For Lab Use Only:
 Walk-in Client: _____
 Lab Sampling: _____
 Job / SDG No.: **WR128A**

Preservation Used: **1=Ice, 2=HCl; 3=H2SO4; 4=HNO3; 5=NaOH; 6=Other**

Possible Hazard Identification:
 Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample

Special Instructions/QC Requirements & Comments: **0.9°C**

Return to Client: Disposal by Lab: Archive for _____ Months

Custody Seals Intact: Yes No

Relinquished by: **[Signature]** Company: **Geosyntec** Date/Time: **4/12/13 16:15**

Relinquished by: **[Signature]** Company: **TRSF** Date/Time: **04/12/13 17:30**

Received by: **[Signature]** Company: **TRSF** Date/Time: **04/11/13 16:15**

Received in Laboratory by: **[Signature]** Company: **TRSF** Date/Time: **04-12-13 17:30**

Barcode: **720-49202 Chain of Custody**

720-49202-2 **DRAFT**

Smith, Micah

From: Morgan Fahlman [MFahlman@Geosyntec.com]
Sent: Tuesday, April 23, 2013 1:03 PM
To: Smith, Micah
Subject: RE: Sample Login Confirmation for 720-49202, Regional MEW

Thank you, Micah. We would like to run TDS.

Morgan

Morgan Fahlman
Staff Scientist

1111 Broadway
6th Floor
Oakland, CA 94607
Phone: 510.285.2763
Fax: 510.836.3114
www.Geosyntec.com



Empowering Environmental Professionals

From: Smith, Micah [mailto:Micah.Smith@testamericainc.com]
Sent: Tuesday, April 23, 2013 12:59 PM
To: Morgan Fahlman
Subject: RE: Sample Login Confirmation for 720-49202, Regional MEW

No. TDS is 7 days. Hexavalent Cr is 1 day

MICAH SMITH
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

1220 Quarry Lane
Pleasanton, CA 94566
TEL 925.484.1919 ext. 137 | Fax 925.600.3002
micah.smith@testamericainc.com

From: Morgan Fahlman [mailto:MFahlman@Geosyntec.com]
Sent: Tuesday, April 23, 2013 12:56 PM
To: Smith, Micah
Subject: RE: Sample Login Confirmation for 720-49202, Regional MEW

Would it be out of hold time if we ran TDS?

Thank you,

Morgan Fahlman
Staff Scientist

1111 Broadway
6th Floor
Oakland, CA 94607
Phone: 510.285.2763
Fax: 510.836.3114
www.Geosyntec.com



Empowering Environmental Professionals



720-49202 Chain of Custody

From: Smith, Micah [mailto:Micah.Smith@testamericainc.com]
Sent: Tuesday, April 23, 2013 12:52 PM
To: Morgan Fahlman
Subject: RE: Sample Login Confirmation for 720-49202, Regional MEW

We can run this sample but it will be out of holding time. Would you like to proceed?
Thanks

MICAH SMITH
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

1220 Quarry Lane
Pleasanton, CA 94566

4/23/2013

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TEL 925.484.1919 ext. 137 | Fax 925.600.3002
micah.smith@testamericainc.com

From: Salimpour, Afsaneh
Sent: Tuesday, April 23, 2013 12:15 PM
To: Smith, Micah
Subject: FW: Sample Login Confirmation for 720-49202, Regional MEW

From: Morgan Fahiman [<mailto:MFahiman@Geosyntec.com>]
Sent: Tuesday, April 23, 2013 12:08 PM
To: Salimpour, Afsaneh
Subject: RE: Sample Login Confirmation for 720-49202, Regional MEW

Hi Afsaneh,

Please run sample SB-6 from 720-49202 for Chromium VI.

Thank you,

Morgan Fahiman
Staff Scientist

1111 Broadway
6th Floor
Oakland, CA 94607
Phone 510.285.2763
Fax: 510.836.3114
www.Geosyntec.com



an environmental science & technology company

From: Nicole Gotberg
Sent: Friday, April 19, 2013 11:07 AM
To: Morgan Fahiman
Subject: FW: Sample Login Confirmation for 720-49202, Regional MEW

Nicole K. Gotberg, P.G.
Professional Geologist

1111 Broadway, 6th Floor
Oakland, CA 94607
Main Phone 510.836.3034, ext. 2771
Direct Phone 510.285.2771
Fax: 510.836.3036
www.geosyntec.com



an environmental science & technology company

From: Salimpour, Afsaneh
[<mailto:afsaneh.salimpour@testamericainc.com>]

Sent: Friday, April 19, 2013 10:21 AM
To: Eric Suchomel; Nicole Gotberg
Subject: Sample Login Confirmation for 720-49202, Regional MEW

This electronic mail message contains information that (a) is or may be LEGALLY PRIVILEGED, CONFIDENTIAL, PROPRIETARY IN NATURE, OR OTHERWISE PROTECTED BY LAW FROM DISCLOSURE, and (b) is intended only for the use of the Addressee(s) named herein. If you are not the intended recipient, an addressee, or the person responsible for delivering this to an addressee, you are hereby notified that reading, using, copying, or distributing any part of this message is strictly prohibited. If you have received this electronic mail message in error, please contact us immediately and take the steps necessary to delete the message completely from your computer system.

AFSANEH SALIMPOUR

TestAmerica Pleasanton
THE LEADER IN ENVIRONMENTAL TESTING

Tel 925.484.1919
www.testamericainc.com

Reference: {128013}
Attachments: 3

Login Sample Receipt Checklist

Client: Geosyntec Consultants, Inc.

Job Number: 720-49202-2

Login Number: 49202

List Number: 1

Creator: Bullock, Tracy

List Source: TestAmerica Pleasanton

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pleasanton
1220 Quarry Lane
Pleasanton, CA 94566
Tel: (925)484-1919

TestAmerica Job ID: 720-49233-1
Client Project/Site: MEW

For:
Geosyntec Consultants, Inc.
1111 Broadway
6th Floor
Oakland, California 94612

Attn: Mr. Eric Suchomel



Authorized for release by:
4/25/2013 4:17:31 PM

Micah Smith
Project Manager I
micah.smith@testamericainc.com

LINKS

Review your project
results through
TotalAccess

Have a Question?



Visit us at:
www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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DRAFT

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Definitions/Glossary

Client: Geosyntec Consultants, Inc.
Project/Site: MEW

DRAFT
TestAmerica Job ID: 120-49203-1

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
▫	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

DRAFT
TestAmerica Job ID: 720-49233-1

Client: Geosyntec Consultants, Inc.
Project/Site: MEW

Job ID: 720-49233-1

Laboratory: TestAmerica Pleasanton

Narrative

Job Narrative
720-49233-1

Comments

No additional comments.

Receipt

The samples were received on 4/18/2013 7:10 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.9° C.

GC/MS VOA

No analytical or quality issues were noted.

GC/MS Semi VOA

Method(s) 8270C LL: The only surrogate that will be reported for these samples will be 2-Fluorobiphenyl, which is associated to the only target compound, 1,4-Dioxane. The other surrogates requested are either not needed and/or not extracted.

No other analytical or quality issues were noted.

Metals

No analytical or quality issues were noted.

General Chemistry

No analytical or quality issues were noted.

Organic Prep

Method(s) 3520C: Insufficient sample volume was available to perform batch matrix spike/matrix spike duplicate (MS/MSD) associated with batch 170520, 3520_Base(8270C LL). The laboratory control sample (LCS) was performed in duplicate to provide precision data for this batch.

Method(s) 3520C: Batch 170520, 3520_Base. These samples contained noticeable amounts of sediment in the container jar.

No other analytical or quality issues were noted.

Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: MEW

DRAFT
TestAmerica Job ID: 20-49233-1

Client Sample ID: SB-9-20-23

Lab Sample ID: 720-49233-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,1-Dichloroethene	23		0.50		ug/L	1		8260B	Total/NA
1,1-Dichloroethane	12		0.50		ug/L	1		8260B	Total/NA
Vinyl chloride	26		0.50		ug/L	1		8260B	Total/NA
trans-1,2-Dichloroethene	35		0.50		ug/L	1		8260B	Total/NA
cis-1,2-Dichloroethene	5100		250		ug/L	500		8260B	Total/NA
Trichloroethene	31000		250		ug/L	500		8260B	Total/NA
1,4-Dioxane	4.7		1.1		ug/L	1		8270C LL	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Total Dissolved Solids	910		10		mg/L	1		SM 2540C	Total/NA

Client Sample ID: SB-9-40-43

Lab Sample ID: 720-49233-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,1-Dichloroethene	2.2		0.50		ug/L	1		8260B	Total/NA
1,1-Dichloroethane	1.5		0.50		ug/L	1		8260B	Total/NA
trans-1,2-Dichloroethene	96		0.50		ug/L	1		8260B	Total/NA
cis-1,2-Dichloroethene	270		2.5		ug/L	5		8260B	Total/NA
Trichloroethene	220		2.5		ug/L	5		8260B	Total/NA

Client Sample ID: SB-10-20.5-23

Lab Sample ID: 720-49233-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,1-Dichloroethene	4.1		0.50		ug/L	1		8260B	Total/NA
1,1-Dichloroethane	9.7		0.50		ug/L	1		8260B	Total/NA
Vinyl chloride	5.5		0.50		ug/L	1		8260B	Total/NA
trans-1,2-Dichloroethene	4.8		0.50		ug/L	1		8260B	Total/NA
cis-1,2-Dichloroethene	620		5.0		ug/L	10		8260B	Total/NA
Trichloroethene	730		5.0		ug/L	10		8260B	Total/NA
1,4-Dioxane	6.6		1.2		ug/L	1		8270C LL	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Total Dissolved Solids	810		10		mg/L	1		SM 2540C	Total/NA

Client Sample ID: SB-10-35.5-38.5

Lab Sample ID: 720-49233-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,1-Dichloroethene	53		0.50		ug/L	1		8260B	Total/NA
1,1-Dichloroethane	44		0.50		ug/L	1		8260B	Total/NA
Vinyl chloride	7.8		0.50		ug/L	1		8260B	Total/NA
trans-1,2-Dichloroethene	42		0.50		ug/L	1		8260B	Total/NA
cis-1,2-Dichloroethene	1100		25		ug/L	50		8260B	Total/NA
Trichloroethene	1400		25		ug/L	50		8260B	Total/NA
1,1,2-Trichloro-1,2,2-trifluoroethane	0.89		0.50		ug/L	1		8260B	Total/NA
1,4-Dioxane	6.8		1.2		ug/L	1		8270C LL	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Total Dissolved Solids	690		10		mg/L	1		SM 2540C	Total/NA

Client Sample ID: TAL SF TB

Lab Sample ID: 720-49233-5

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Pleasanton

Client Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: MEW

DRAFT
TestAmerica Job ID: 20-49233-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Client Sample ID: SB-9-20-23

Date Collected: 04/18/13 10:45

Date Received: 04/18/13 19:10

Lab Sample ID: 720-49233-1

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	23		0.50		ug/L			04/19/13 17:43	1
1,1-Dichloroethane	12		0.50		ug/L			04/19/13 17:43	1
Dichlorodifluoromethane	ND		0.50		ug/L			04/19/13 17:43	1
Vinyl chloride	26		0.50		ug/L			04/19/13 17:43	1
Chloroethane	ND		1.0		ug/L			04/19/13 17:43	1
Trichlorofluoromethane	ND		1.0		ug/L			04/19/13 17:43	1
Methylene Chloride	ND		5.0		ug/L			04/19/13 17:43	1
trans-1,2-Dichloroethene	35		0.50		ug/L			04/19/13 17:43	1
cis-1,2-Dichloroethene	5100		250		ug/L			04/20/13 19:11	500
Chloroform	ND		1.0		ug/L			04/19/13 17:43	1
1,1,1-Trichloroethane	ND		0.50		ug/L			04/19/13 17:43	1
Carbon tetrachloride	ND		0.50		ug/L			04/19/13 17:43	1
1,2-Dichloroethane	ND		0.50		ug/L			04/19/13 17:43	1
Trichloroethene	31000		250		ug/L			04/20/13 19:11	500
1,2-Dichloropropane	ND		0.50		ug/L			04/19/13 17:43	1
Dichlorobromomethane	ND		0.50		ug/L			04/19/13 17:43	1
trans-1,3-Dichloropropene	ND		0.50		ug/L			04/19/13 17:43	1
cis-1,3-Dichloropropene	ND		0.50		ug/L			04/19/13 17:43	1
1,1,2-Trichloroethane	ND		0.50		ug/L			04/19/13 17:43	1
Tetrachloroethene	ND		0.50		ug/L			04/19/13 17:43	1
Chlorodibromomethane	ND		0.50		ug/L			04/19/13 17:43	1
Chlorobenzene	ND		0.50		ug/L			04/19/13 17:43	1
Bromoform	ND		1.0		ug/L			04/19/13 17:43	1
1,1,2,2-Tetrachloroethane	ND		0.50		ug/L			04/19/13 17:43	1
1,3-Dichlorobenzene	ND		0.50		ug/L			04/19/13 17:43	1
1,4-Dichlorobenzene	ND		0.50		ug/L			04/19/13 17:43	1
1,2-Dichlorobenzene	ND		0.50		ug/L			04/19/13 17:43	1
Chloromethane	ND		1.0		ug/L			04/19/13 17:43	1
Bromomethane	ND		1.0		ug/L			04/19/13 17:43	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50		ug/L			04/19/13 17:43	1
EDB	ND		0.50		ug/L			04/19/13 17:43	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			04/19/13 17:43	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
<i>Toluene-d8 (Surr)</i>	96		70 - 130		04/19/13 17:43	1
<i>Toluene-d8 (Surr)</i>	95		70 - 130		04/20/13 19:11	500
<i>4-Bromofluorobenzene</i>	104		67 - 130		04/19/13 17:43	1
<i>4-Bromofluorobenzene</i>	91		67 - 130		04/20/13 19:11	500
<i>1,2-Dichloroethane-d4 (Surr)</i>	104		75 - 138		04/19/13 17:43	1
<i>1,2-Dichloroethane-d4 (Surr)</i>	107		75 - 138		04/20/13 19:11	500

Client Sample ID: SB-9-40-43

Date Collected: 04/18/13 12:05

Date Received: 04/18/13 19:10

Lab Sample ID: 720-49233-2

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	2.2		0.50		ug/L			04/19/13 18:11	1
1,1-Dichloroethane	1.5		0.50		ug/L			04/19/13 18:11	1
Dichlorodifluoromethane	ND		0.50		ug/L			04/19/13 18:11	1
Vinyl chloride	ND		0.50		ug/L			04/19/13 18:11	1
Chloroethane	ND		1.0		ug/L			04/19/13 18:11	1

TestAmerica Pleasanton

Client Sample Results

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: MEW

TestAmerica Job ID: 20-49233-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Client Sample ID: SB-9-40-43
Date Collected: 04/18/13 12:05
Date Received: 04/18/13 19:10

Lab Sample ID: 720-49233-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Trichlorofluoromethane	ND		1.0		ug/L			04/19/13 18:11	1
Methylene Chloride	ND		5.0		ug/L			04/19/13 18:11	1
trans-1,2-Dichloroethene	96		0.50		ug/L			04/19/13 18:11	1
cis-1,2-Dichloroethene	270		2.5		ug/L			04/20/13 18:44	5
Chloroform	ND		1.0		ug/L			04/19/13 18:11	1
1,1,1-Trichloroethane	ND		0.50		ug/L			04/19/13 18:11	1
Carbon tetrachloride	ND		0.50		ug/L			04/19/13 18:11	1
1,2-Dichloroethane	ND		0.50		ug/L			04/19/13 18:11	1
Trichloroethene	220		2.5		ug/L			04/20/13 18:44	5
1,2-Dichloropropane	ND		0.50		ug/L			04/19/13 18:11	1
Dichlorobromomethane	ND		0.50		ug/L			04/19/13 18:11	1
trans-1,3-Dichloropropene	ND		0.50		ug/L			04/19/13 18:11	1
cis-1,3-Dichloropropene	ND		0.50		ug/L			04/19/13 18:11	1
1,1,2-Trichloroethane	ND		0.50		ug/L			04/19/13 18:11	1
Tetrachloroethene	ND		0.50		ug/L			04/19/13 18:11	1
Chlorodibromomethane	ND		0.50		ug/L			04/19/13 18:11	1
Chlorobenzene	ND		0.50		ug/L			04/19/13 18:11	1
Bromoform	ND		1.0		ug/L			04/19/13 18:11	1
1,1,2,2-Tetrachloroethane	ND		0.50		ug/L			04/19/13 18:11	1
1,3-Dichlorobenzene	ND		0.50		ug/L			04/19/13 18:11	1
1,4-Dichlorobenzene	ND		0.50		ug/L			04/19/13 18:11	1
1,2-Dichlorobenzene	ND		0.50		ug/L			04/19/13 18:11	1
Chloromethane	ND		1.0		ug/L			04/19/13 18:11	1
Bromomethane	ND		1.0		ug/L			04/19/13 18:11	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50		ug/L			04/19/13 18:11	1
EDB	ND		0.50		ug/L			04/19/13 18:11	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			04/19/13 18:11	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
<i>Toluene-d8 (Surr)</i>	101		70 - 130		04/19/13 18:11	1
<i>Toluene-d8 (Surr)</i>	100		70 - 130		04/20/13 18:44	5
<i>4-Bromofluorobenzene</i>	104		67 - 130		04/19/13 18:11	1
<i>4-Bromofluorobenzene</i>	97		67 - 130		04/20/13 18:44	5
<i>1,2-Dichloroethane-d4 (Surr)</i>	105		75 - 138		04/19/13 18:11	1
<i>1,2-Dichloroethane-d4 (Surr)</i>	102		75 - 138		04/20/13 18:44	5

Client Sample ID: SB-10-20.5-23
Date Collected: 04/18/13 14:45
Date Received: 04/18/13 19:10

Lab Sample ID: 720-49233-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	4.1		0.50		ug/L			04/19/13 18:40	1
1,1-Dichloroethane	9.7		0.50		ug/L			04/19/13 18:40	1
Dichlorodifluoromethane	ND		0.50		ug/L			04/19/13 18:40	1
Vinyl chloride	5.5		0.50		ug/L			04/19/13 18:40	1
Chloroethane	ND		1.0		ug/L			04/19/13 18:40	1
Trichlorofluoromethane	ND		1.0		ug/L			04/19/13 18:40	1
Methylene Chloride	ND		5.0		ug/L			04/19/13 18:40	1
trans-1,2-Dichloroethene	4.8		0.50		ug/L			04/19/13 18:40	1
cis-1,2-Dichloroethene	620		5.0		ug/L			04/20/13 19:13	10
Chloroform	ND		1.0		ug/L			04/19/13 18:40	1

TestAmerica Pleasanton

Client Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: MEW

DRAFT
TestAmerica Job ID: 120-49233-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Client Sample ID: SB-10-20.5-23

Date Collected: 04/18/13 14:45

Date Received: 04/18/13 19:10

Lab Sample ID: 720-49233-3

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.50		ug/L			04/19/13 18:40	1
Carbon tetrachloride	ND		0.50		ug/L			04/19/13 18:40	1
1,2-Dichloroethane	ND		0.50		ug/L			04/19/13 18:40	1
Trichloroethene	730		5.0		ug/L			04/20/13 19:13	10
1,2-Dichloropropane	ND		0.50		ug/L			04/19/13 18:40	1
Dichlorobromomethane	ND		0.50		ug/L			04/19/13 18:40	1
trans-1,3-Dichloropropene	ND		0.50		ug/L			04/19/13 18:40	1
cis-1,3-Dichloropropene	ND		0.50		ug/L			04/19/13 18:40	1
1,1,2-Trichloroethane	ND		0.50		ug/L			04/19/13 18:40	1
Tetrachloroethene	ND		0.50		ug/L			04/19/13 18:40	1
Chlorodibromomethane	ND		0.50		ug/L			04/19/13 18:40	1
Chlorobenzene	ND		0.50		ug/L			04/19/13 18:40	1
Bromoform	ND		1.0		ug/L			04/19/13 18:40	1
1,1,2,2-Tetrachloroethane	ND		0.50		ug/L			04/19/13 18:40	1
1,3-Dichlorobenzene	ND		0.50		ug/L			04/19/13 18:40	1
1,4-Dichlorobenzene	ND		0.50		ug/L			04/19/13 18:40	1
1,2-Dichlorobenzene	ND		0.50		ug/L			04/19/13 18:40	1
Chloromethane	ND		1.0		ug/L			04/19/13 18:40	1
Bromomethane	ND		1.0		ug/L			04/19/13 18:40	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50		ug/L			04/19/13 18:40	1
EDB	ND		0.50		ug/L			04/19/13 18:40	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			04/19/13 18:40	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	101		70 - 130		04/19/13 18:40	1
Toluene-d8 (Surr)	100		70 - 130		04/20/13 19:13	10
4-Bromofluorobenzene	104		67 - 130		04/19/13 18:40	1
4-Bromofluorobenzene	98		67 - 130		04/20/13 19:13	10
1,2-Dichloroethane-d4 (Surr)	105		75 - 138		04/19/13 18:40	1
1,2-Dichloroethane-d4 (Surr)	101		75 - 138		04/20/13 19:13	10

Client Sample ID: SB-10-35.5-38.5

Date Collected: 04/18/13 15:40

Date Received: 04/18/13 19:10

Lab Sample ID: 720-49233-4

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	53		0.50		ug/L			04/19/13 19:09	1
1,1-Dichloroethane	44		0.50		ug/L			04/19/13 19:09	1
Dichlorodifluoromethane	ND		0.50		ug/L			04/19/13 19:09	1
Vinyl chloride	7.8		0.50		ug/L			04/19/13 19:09	1
Chloroethane	ND		1.0		ug/L			04/19/13 19:09	1
Trichlorofluoromethane	ND		1.0		ug/L			04/19/13 19:09	1
Methylene Chloride	ND		5.0		ug/L			04/19/13 19:09	1
trans-1,2-Dichloroethene	42		0.50		ug/L			04/19/13 19:09	1
cis-1,2-Dichloroethene	1100		25		ug/L			04/22/13 13:46	50
Chloroform	ND		1.0		ug/L			04/19/13 19:09	1
1,1,1-Trichloroethane	ND		0.50		ug/L			04/19/13 19:09	1
Carbon tetrachloride	ND		0.50		ug/L			04/19/13 19:09	1
1,2-Dichloroethane	ND		0.50		ug/L			04/19/13 19:09	1
Trichloroethene	1400		25		ug/L			04/22/13 13:46	50
1,2-Dichloropropane	ND		0.50		ug/L			04/19/13 19:09	1

TestAmerica Pleasanton

Client Sample Results

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: MEW

TestAmerica Job ID: 120-49233-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Client Sample ID: SB-10-35.5-38.5

Lab Sample ID: 720-49233-4

Date Collected: 04/18/13 15:40

Matrix: Water

Date Received: 04/18/13 19:10

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorobromomethane	ND		0.50		ug/L			04/19/13 19:09	1
trans-1,3-Dichloropropene	ND		0.50		ug/L			04/19/13 19:09	1
cis-1,3-Dichloropropene	ND		0.50		ug/L			04/19/13 19:09	1
1,1,2-Trichloroethane	ND		0.50		ug/L			04/19/13 19:09	1
Tetrachloroethene	ND		0.50		ug/L			04/19/13 19:09	1
Chlorodibromomethane	ND		0.50		ug/L			04/19/13 19:09	1
Chlorobenzene	ND		0.50		ug/L			04/19/13 19:09	1
Bromoform	ND		1.0		ug/L			04/19/13 19:09	1
1,1,2,2-Tetrachloroethane	ND		0.50		ug/L			04/19/13 19:09	1
1,3-Dichlorobenzene	ND		0.50		ug/L			04/19/13 19:09	1
1,4-Dichlorobenzene	ND		0.50		ug/L			04/19/13 19:09	1
1,2-Dichlorobenzene	ND		0.50		ug/L			04/19/13 19:09	1
Chloromethane	ND		1.0		ug/L			04/19/13 19:09	1
Bromomethane	ND		1.0		ug/L			04/19/13 19:09	1
1,1,2-Trichloro-1,2,2-trifluoroethane	0.89		0.50		ug/L			04/19/13 19:09	1
EDB	ND		0.50		ug/L			04/19/13 19:09	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			04/19/13 19:09	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
<i>Toluene-d8 (Surr)</i>	101		70 - 130		04/19/13 19:09	1
<i>Toluene-d8 (Surr)</i>	97		70 - 130		04/22/13 13:46	50
<i>4-Bromofluorobenzene</i>	105		67 - 130		04/19/13 19:09	1
<i>4-Bromofluorobenzene</i>	94		67 - 130		04/22/13 13:46	50
<i>1,2-Dichloroethane-d4 (Surr)</i>	104		75 - 138		04/19/13 19:09	1
<i>1,2-Dichloroethane-d4 (Surr)</i>	99		75 - 138		04/22/13 13:46	50

Client Sample ID: TAL SF TB

Lab Sample ID: 720-49233-5

Date Collected: 04/18/13 00:00

Matrix: Water

Date Received: 04/18/13 19:10

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	ND		0.50		ug/L			04/20/13 14:59	1
1,1-Dichloroethane	ND		0.50		ug/L			04/20/13 14:59	1
Dichlorodifluoromethane	ND		0.50		ug/L			04/20/13 14:59	1
Vinyl chloride	ND		0.50		ug/L			04/20/13 14:59	1
Chloroethane	ND		1.0		ug/L			04/20/13 14:59	1
Trichlorofluoromethane	ND		1.0		ug/L			04/20/13 14:59	1
Methylene Chloride	ND		5.0		ug/L			04/20/13 14:59	1
trans-1,2-Dichloroethene	ND		0.50		ug/L			04/20/13 14:59	1
cis-1,2-Dichloroethene	ND		0.50		ug/L			04/20/13 14:59	1
Chloroform	ND		1.0		ug/L			04/20/13 14:59	1
1,1,1-Trichloroethane	ND		0.50		ug/L			04/20/13 14:59	1
Carbon tetrachloride	ND		0.50		ug/L			04/20/13 14:59	1
1,2-Dichloroethane	ND		0.50		ug/L			04/20/13 14:59	1
Trichloroethene	ND		0.50		ug/L			04/20/13 14:59	1
1,2-Dichloropropane	ND		0.50		ug/L			04/20/13 14:59	1
Dichlorobromomethane	ND		0.50		ug/L			04/20/13 14:59	1
trans-1,3-Dichloropropene	ND		0.50		ug/L			04/20/13 14:59	1
cis-1,3-Dichloropropene	ND		0.50		ug/L			04/20/13 14:59	1
1,1,2-Trichloroethane	ND		0.50		ug/L			04/20/13 14:59	1

TestAmerica Pleasanton

Client Sample Results

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: MEW

TestAmerica Job ID: 720-49233-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Client Sample ID: TAL SF TB
Date Collected: 04/18/13 00:00
Date Received: 04/18/13 19:10

Lab Sample ID: 720-49233-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene	ND		0.50		ug/L			04/20/13 14:59	1
Chlorodibromomethane	ND		0.50		ug/L			04/20/13 14:59	1
Chlorobenzene	ND		0.50		ug/L			04/20/13 14:59	1
Bromoform	ND		1.0		ug/L			04/20/13 14:59	1
1,1,2,2-Tetrachloroethane	ND		0.50		ug/L			04/20/13 14:59	1
1,3-Dichlorobenzene	ND		0.50		ug/L			04/20/13 14:59	1
1,4-Dichlorobenzene	ND		0.50		ug/L			04/20/13 14:59	1
1,2-Dichlorobenzene	ND		0.50		ug/L			04/20/13 14:59	1
Chloromethane	ND		1.0		ug/L			04/20/13 14:59	1
Bromomethane	ND		1.0		ug/L			04/20/13 14:59	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50		ug/L			04/20/13 14:59	1
EDB	ND		0.50		ug/L			04/20/13 14:59	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			04/20/13 14:59	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>Toluene-d8 (Surr)</i>	96		70 - 130					04/20/13 14:59	1
<i>4-Bromofluorobenzene</i>	93		67 - 130					04/20/13 14:59	1
<i>1,2-Dichloroethane-d4 (Surr)</i>	97		75 - 138					04/20/13 14:59	1

Client Sample Results

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: MEW

TestAmerica Job ID: 20-49233-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Client Sample ID: SB-9-20-23

Date Collected: 04/18/13 10:45

Date Received: 04/18/13 19:10

Lab Sample ID: 720-49233-1

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	4.7		1.1		ug/L		04/21/13 11:20	04/23/13 14:36	1
Surrogate	%Recovery	Qualifier	Limits						
2-Fluorobiphenyl	76		57 - 120				Prepared	Analyzed	Dil Fac
							04/21/13 11:20	04/23/13 14:36	1

Client Sample ID: SB-9-40-43

Date Collected: 04/18/13 12:05

Date Received: 04/18/13 19:10

Lab Sample ID: 720-49233-2

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND		1.1		ug/L		04/21/13 11:20	04/23/13 15:09	1
Surrogate	%Recovery	Qualifier	Limits						
2-Fluorobiphenyl	75		57 - 120				Prepared	Analyzed	Dil Fac
							04/21/13 11:20	04/23/13 15:09	1

Client Sample ID: SB-10-20.5-23

Date Collected: 04/18/13 14:45

Date Received: 04/18/13 19:10

Lab Sample ID: 720-49233-3

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	6.6		1.2		ug/L		04/21/13 11:20	04/23/13 15:42	1
Surrogate	%Recovery	Qualifier	Limits						
2-Fluorobiphenyl	83		57 - 120				Prepared	Analyzed	Dil Fac
							04/21/13 11:20	04/23/13 15:42	1

Client Sample ID: SB-10-35.5-38.5

Date Collected: 04/18/13 15:40

Date Received: 04/18/13 19:10

Lab Sample ID: 720-49233-4

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	6.8		1.2		ug/L		04/21/13 11:20	04/23/13 16:15	1
Surrogate	%Recovery	Qualifier	Limits						
2-Fluorobiphenyl	76		57 - 120				Prepared	Analyzed	Dil Fac
							04/21/13 11:20	04/23/13 16:15	1

Client Sample Results

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: MEW

TestAmerica Job ID: 720-49233-1

General Chemistry

Client Sample ID: SB-9-20-23
Date Collected: 04/18/13 10:45
Date Received: 04/18/13 19:10

Lab Sample ID: 720-49233-1
Matrix: Water

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	910		10		mg/L			04/19/13 16:46	1

Client Sample ID: SB-10-20.5-23
Date Collected: 04/18/13 14:45
Date Received: 04/18/13 19:10

Lab Sample ID: 720-49233-3
Matrix: Water

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	810		10		mg/L			04/19/13 16:46	1

Client Sample ID: SB-10-35.5-38.5
Date Collected: 04/18/13 15:40
Date Received: 04/18/13 19:10

Lab Sample ID: 720-49233-4
Matrix: Water

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	690		10		mg/L			04/19/13 16:46	1

Client Sample Results

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: MEW

TestAmerica Job ID: 720-49233-1

General Chemistry - Dissolved

Client Sample ID: SB-9-20-23
Date Collected: 04/18/13 10:45
Date Received: 04/18/13 19:10

Lab Sample ID: 720-49233-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	ND		0.50		ug/L			04/18/13 21:46	1

Client Sample ID: SB-10-20.5-23
Date Collected: 04/18/13 14:45
Date Received: 04/18/13 19:10

Lab Sample ID: 720-49233-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	ND		0.50		ug/L			04/18/13 21:58	1

Client Sample ID: SB-10-35.5-38.5
Date Collected: 04/18/13 15:40
Date Received: 04/18/13 19:10

Lab Sample ID: 720-49233-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	ND		0.50		ug/L			04/18/13 22:09	1

QC Sample Results

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: MEW

TestAmerica Job ID: 120-49203-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 720-134740/4

Matrix: Water

Analysis Batch: 134740

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	ND		0.50		ug/L			04/19/13 10:03	1
1,1-Dichloroethane	ND		0.50		ug/L			04/19/13 10:03	1
Dichlorodifluoromethane	ND		0.50		ug/L			04/19/13 10:03	1
Vinyl chloride	ND		0.50		ug/L			04/19/13 10:03	1
Chloroethane	ND		1.0		ug/L			04/19/13 10:03	1
Trichlorofluoromethane	ND		1.0		ug/L			04/19/13 10:03	1
Methylene Chloride	ND		5.0		ug/L			04/19/13 10:03	1
trans-1,2-Dichloroethene	ND		0.50		ug/L			04/19/13 10:03	1
cis-1,2-Dichloroethene	ND		0.50		ug/L			04/19/13 10:03	1
Chloroform	ND		1.0		ug/L			04/19/13 10:03	1
1,1,1-Trichloroethane	ND		0.50		ug/L			04/19/13 10:03	1
Carbon tetrachloride	ND		0.50		ug/L			04/19/13 10:03	1
1,2-Dichloroethane	ND		0.50		ug/L			04/19/13 10:03	1
Trichloroethene	ND		0.50		ug/L			04/19/13 10:03	1
1,2-Dichloropropane	ND		0.50		ug/L			04/19/13 10:03	1
Dichlorobromomethane	ND		0.50		ug/L			04/19/13 10:03	1
trans-1,3-Dichloropropene	ND		0.50		ug/L			04/19/13 10:03	1
cis-1,3-Dichloropropene	ND		0.50		ug/L			04/19/13 10:03	1
1,1,2-Trichloroethane	ND		0.50		ug/L			04/19/13 10:03	1
Tetrachloroethene	ND		0.50		ug/L			04/19/13 10:03	1
Chlorodibromomethane	ND		0.50		ug/L			04/19/13 10:03	1
Chlorobenzene	ND		0.50		ug/L			04/19/13 10:03	1
Bromoform	ND		1.0		ug/L			04/19/13 10:03	1
1,1,2,2-Tetrachloroethane	ND		0.50		ug/L			04/19/13 10:03	1
1,3-Dichlorobenzene	ND		0.50		ug/L			04/19/13 10:03	1
1,4-Dichlorobenzene	ND		0.50		ug/L			04/19/13 10:03	1
1,2-Dichlorobenzene	ND		0.50		ug/L			04/19/13 10:03	1
Chloromethane	ND		1.0		ug/L			04/19/13 10:03	1
Bromomethane	ND		1.0		ug/L			04/19/13 10:03	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50		ug/L			04/19/13 10:03	1
EDB	ND		0.50		ug/L			04/19/13 10:03	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			04/19/13 10:03	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	100		70 - 130		04/19/13 10:03	1
4-Bromofluorobenzene	103		67 - 130		04/19/13 10:03	1
1,2-Dichloroethane-d4 (Surr)	103		75 - 138		04/19/13 10:03	1

Lab Sample ID: LCS 720-134740/5

Matrix: Water

Analysis Batch: 134740

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	22.6		ug/L		90	64 - 128
1,1-Dichloroethane	25.0	24.7		ug/L		99	70 - 130
Dichlorodifluoromethane	25.0	16.3		ug/L		65	34 - 132
Vinyl chloride	25.0	20.9		ug/L		84	54 - 135
Chloroethane	25.0	23.0		ug/L		92	62 - 138

TestAmerica Pleasanton

QC Sample Results

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: MEW

TestAmerica Job ID: 120-49203-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 720-134740/5

Matrix: Water

Analysis Batch: 134740

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Trichlorofluoromethane	25.0	23.7		ug/L		95	66 - 132
Methylene Chloride	25.0	23.0		ug/L		92	70 - 147
trans-1,2-Dichloroethene	25.0	24.4		ug/L		98	68 - 130
cis-1,2-Dichloroethene	25.0	25.3		ug/L		101	70 - 130
Chloroform	25.0	24.7		ug/L		99	70 - 130
1,1,1-Trichloroethane	25.0	24.6		ug/L		98	70 - 130
Carbon tetrachloride	25.0	25.4		ug/L		102	70 - 146
1,2-Dichloroethane	25.0	25.2		ug/L		101	61 - 132
Trichloroethene	25.0	25.4		ug/L		101	70 - 130
1,2-Dichloropropane	25.0	25.1		ug/L		100	70 - 130
Dichlorobromomethane	25.0	26.5		ug/L		106	70 - 130
trans-1,3-Dichloropropene	25.0	27.6		ug/L		110	70 - 140
cis-1,3-Dichloropropene	25.0	28.7		ug/L		115	70 - 130
1,1,2-Trichloroethane	25.0	25.8		ug/L		103	70 - 130
Tetrachloroethene	25.0	24.6		ug/L		99	70 - 130
Chlorodibromomethane	25.0	27.5		ug/L		110	70 - 145
Chlorobenzene	25.0	24.6		ug/L		98	70 - 130
Bromoform	25.0	27.9		ug/L		112	68 - 136
1,1,2,2-Tetrachloroethane	25.0	25.5		ug/L		102	70 - 130
1,3-Dichlorobenzene	25.0	25.1		ug/L		100	70 - 130
1,4-Dichlorobenzene	25.0	25.0		ug/L		100	70 - 130
1,2-Dichlorobenzene	25.0	25.2		ug/L		101	70 - 130
Chloromethane	25.0	20.8		ug/L		83	52 - 175
Bromomethane	25.0	22.9		ug/L		92	43 - 151
1,1,2-Trichloro-1,2,2-trifluoroethane	25.0	25.1		ug/L		100	42 - 162
EDB	25.0	26.8		ug/L		107	70 - 130
1,2,4-Trichlorobenzene	25.0	26.5		ug/L		106	70 - 130

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Toluene-d8 (Surr)	102		70 - 130
4-Bromofluorobenzene	96		67 - 130
1,2-Dichloroethane-d4 (Surr)	99		75 - 138

Lab Sample ID: LCSD 720-134740/6

Matrix: Water

Analysis Batch: 134740

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	25.0	23.7		ug/L		95	64 - 128	5	20
1,1-Dichloroethane	25.0	24.7		ug/L		99	70 - 130	0	20
Dichlorodifluoromethane	25.0	17.6		ug/L		71	34 - 132	8	20
Vinyl chloride	25.0	21.8		ug/L		87	54 - 135	4	20
Chloroethane	25.0	25.2		ug/L		101	62 - 138	9	20
Trichlorofluoromethane	25.0	25.0		ug/L		100	66 - 132	5	20
Methylene Chloride	25.0	23.9		ug/L		96	70 - 147	4	20
trans-1,2-Dichloroethene	25.0	24.4		ug/L		97	68 - 130	0	20
cis-1,2-Dichloroethene	25.0	25.3		ug/L		101	70 - 130	0	20

TestAmerica Pleasanton

QC Sample Results

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: MEW

TestAmerica Job ID: 120-49203-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 720-134740/6

Matrix: Water

Analysis Batch: 134740

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits		RPD	
							RPD	Limit		
Chloroform	25.0	24.8		ug/L		99	70 - 130	1	20	
1,1,1-Trichloroethane	25.0	25.1		ug/L		100	70 - 130	2	20	
Carbon tetrachloride	25.0	26.0		ug/L		104	70 - 146	2	20	
1,2-Dichloroethane	25.0	25.4		ug/L		101	61 - 132	1	20	
Trichloroethene	25.0	25.6		ug/L		102	70 - 130	1	20	
1,2-Dichloropropane	25.0	25.3		ug/L		101	70 - 130	1	20	
Dichlorobromomethane	25.0	26.9		ug/L		108	70 - 130	2	20	
trans-1,3-Dichloropropene	25.0	28.3		ug/L		113	70 - 140	3	20	
cis-1,3-Dichloropropene	25.0	29.1		ug/L		116	70 - 130	1	20	
1,1,2-Trichloroethane	25.0	26.6		ug/L		106	70 - 130	3	20	
Tetrachloroethene	25.0	25.2		ug/L		101	70 - 130	2	20	
Chlorodibromomethane	25.0	28.5		ug/L		114	70 - 145	4	20	
Chlorobenzene	25.0	24.8		ug/L		99	70 - 130	1	20	
Bromoform	25.0	28.8		ug/L		115	68 - 136	3	20	
1,1,2,2-Tetrachloroethane	25.0	26.4		ug/L		106	70 - 130	3	20	
1,3-Dichlorobenzene	25.0	25.0		ug/L		100	70 - 130	0	20	
1,4-Dichlorobenzene	25.0	25.1		ug/L		101	70 - 130	1	20	
1,2-Dichlorobenzene	25.0	25.2		ug/L		101	70 - 130	0	20	
Chloromethane	25.0	22.2		ug/L		89	52 - 175	6	20	
Bromomethane	25.0	25.0		ug/L		100	43 - 151	9	20	
1,1,2-Trichloro-1,2,2-trifluoroethane	25.0	26.9		ug/L		108	42 - 162	7	20	
EDB	25.0	28.5		ug/L		114	70 - 130	6	20	
1,2,4-Trichlorobenzene	25.0	26.9		ug/L		108	70 - 130	2	20	

Surrogate	LCSD		Limits
	%Recovery	Qualifier	
Toluene-d8 (Surr)	103		70 - 130
4-Bromofluorobenzene	101		67 - 130
1,2-Dichloroethane-d4 (Surr)	102		75 - 138

Lab Sample ID: MB 720-134846/4

Matrix: Water

Analysis Batch: 134846

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
1,1-Dichloroethene	ND		0.50		ug/L			04/20/13 09:50	1
1,1-Dichloroethane	ND		0.50		ug/L			04/20/13 09:50	1
Dichlorodifluoromethane	ND		0.50		ug/L			04/20/13 09:50	1
Vinyl chloride	ND		0.50		ug/L			04/20/13 09:50	1
Chloroethane	ND		1.0		ug/L			04/20/13 09:50	1
Trichlorofluoromethane	ND		1.0		ug/L			04/20/13 09:50	1
Methylene Chloride	ND		5.0		ug/L			04/20/13 09:50	1
trans-1,2-Dichloroethene	ND		0.50		ug/L			04/20/13 09:50	1
cis-1,2-Dichloroethene	ND		0.50		ug/L			04/20/13 09:50	1
Chloroform	ND		1.0		ug/L			04/20/13 09:50	1
1,1,1-Trichloroethane	ND		0.50		ug/L			04/20/13 09:50	1
Carbon tetrachloride	ND		0.50		ug/L			04/20/13 09:50	1
1,2-Dichloroethane	ND		0.50		ug/L			04/20/13 09:50	1

TestAmerica Pleasanton

QC Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: MEW

DRAFT
TestAmerica Job ID: 20-49203-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 720-134846/4

Matrix: Water

Analysis Batch: 134846

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Trichloroethene	ND		0.50		ug/L			04/20/13 09:50	1
1,2-Dichloropropane	ND		0.50		ug/L			04/20/13 09:50	1
Dichlorobromomethane	ND		0.50		ug/L			04/20/13 09:50	1
trans-1,3-Dichloropropene	ND		0.50		ug/L			04/20/13 09:50	1
cis-1,3-Dichloropropene	ND		0.50		ug/L			04/20/13 09:50	1
1,1,2-Trichloroethane	ND		0.50		ug/L			04/20/13 09:50	1
Tetrachloroethene	ND		0.50		ug/L			04/20/13 09:50	1
Chlorodibromomethane	ND		0.50		ug/L			04/20/13 09:50	1
Chlorobenzene	ND		0.50		ug/L			04/20/13 09:50	1
Bromoform	ND		1.0		ug/L			04/20/13 09:50	1
1,1,2,2-Tetrachloroethane	ND		0.50		ug/L			04/20/13 09:50	1
1,3-Dichlorobenzene	ND		0.50		ug/L			04/20/13 09:50	1
1,4-Dichlorobenzene	ND		0.50		ug/L			04/20/13 09:50	1
1,2-Dichlorobenzene	ND		0.50		ug/L			04/20/13 09:50	1
Chloromethane	ND		1.0		ug/L			04/20/13 09:50	1
Bromomethane	ND		1.0		ug/L			04/20/13 09:50	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50		ug/L			04/20/13 09:50	1
EDB	ND		0.50		ug/L			04/20/13 09:50	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			04/20/13 09:50	1

Surrogate	MB	MB	Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
Toluene-d8 (Surr)	101		70 - 130		04/20/13 09:50	1
4-Bromofluorobenzene	101		67 - 130		04/20/13 09:50	1
1,2-Dichloroethane-d4 (Surr)	103		75 - 138		04/20/13 09:50	1

Lab Sample ID: LCS 720-134846/5

Matrix: Water

Analysis Batch: 134846

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	%Rec. Limits
		Result	Qualifier				
1,1-Dichloroethene	25.0	24.2		ug/L		97	64 - 128
1,1-Dichloroethane	25.0	25.0		ug/L		100	70 - 130
Dichlorodifluoromethane	25.0	20.1		ug/L		80	34 - 132
Vinyl chloride	25.0	24.0		ug/L		96	54 - 135
Chloroethane	25.0	26.9		ug/L		108	62 - 138
Trichlorofluoromethane	25.0	25.7		ug/L		103	66 - 132
Methylene Chloride	25.0	23.9		ug/L		96	70 - 147
trans-1,2-Dichloroethene	25.0	24.6		ug/L		98	68 - 130
cis-1,2-Dichloroethene	25.0	25.8		ug/L		103	70 - 130
Chloroform	25.0	25.2		ug/L		101	70 - 130
1,1,1-Trichloroethane	25.0	25.0		ug/L		100	70 - 130
Carbon tetrachloride	25.0	26.2		ug/L		105	70 - 146
1,2-Dichloroethane	25.0	26.0		ug/L		104	61 - 132
Trichloroethene	25.0	25.8		ug/L		103	70 - 130
1,2-Dichloropropane	25.0	25.7		ug/L		103	70 - 130
Dichlorobromomethane	25.0	27.1		ug/L		108	70 - 130
trans-1,3-Dichloropropene	25.0	28.9		ug/L		116	70 - 140
cis-1,3-Dichloropropene	25.0	29.8		ug/L		119	70 - 130

TestAmerica Pleasanton

QC Sample Results

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: MEW

TestAmerica Job ID: 120-49203-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 720-134846/5

Matrix: Water

Analysis Batch: 134846

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,2-Trichloroethane	25.0	27.6		ug/L		110	70 - 130
Tetrachloroethene	25.0	25.4		ug/L		102	70 - 130
Chlorodibromomethane	25.0	29.1		ug/L		117	70 - 145
Chlorobenzene	25.0	25.5		ug/L		102	70 - 130
Bromoform	25.0	31.1		ug/L		124	68 - 136
1,1,2,2-Tetrachloroethane	25.0	27.7		ug/L		111	70 - 130
1,3-Dichlorobenzene	25.0	25.2		ug/L		101	70 - 130
1,4-Dichlorobenzene	25.0	25.0		ug/L		100	70 - 130
1,2-Dichlorobenzene	25.0	25.1		ug/L		100	70 - 130
Chloromethane	25.0	24.7		ug/L		99	52 - 175
Bromomethane	25.0	27.4		ug/L		110	43 - 151
1,1,2-Trichloro-1,2,2-trifluoroethane	25.0	27.4		ug/L		110	42 - 162
EDB	25.0	29.3		ug/L		117	70 - 130
1,2,4-Trichlorobenzene	25.0	26.3		ug/L		105	70 - 130

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Toluene-d8 (Surr)	103		70 - 130
4-Bromofluorobenzene	105		67 - 130
1,2-Dichloroethane-d4 (Surr)	103		75 - 138

Lab Sample ID: LCSD 720-134846/6

Matrix: Water

Analysis Batch: 134846

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	25.0	24.2		ug/L		97	64 - 128	0	20
1,1-Dichloroethane	25.0	25.1		ug/L		100	70 - 130	0	20
Dichlorodifluoromethane	25.0	20.4		ug/L		82	34 - 132	1	20
Vinyl chloride	25.0	24.0		ug/L		96	54 - 135	0	20
Chloroethane	25.0	26.4		ug/L		105	62 - 138	2	20
Trichlorofluoromethane	25.0	26.0		ug/L		104	66 - 132	1	20
Methylene Chloride	25.0	23.7		ug/L		95	70 - 147	1	20
trans-1,2-Dichloroethene	25.0	24.8		ug/L		99	68 - 130	1	20
cis-1,2-Dichloroethene	25.0	25.6		ug/L		102	70 - 130	1	20
Chloroform	25.0	25.2		ug/L		101	70 - 130	0	20
1,1,1-Trichloroethane	25.0	25.4		ug/L		101	70 - 130	1	20
Carbon tetrachloride	25.0	26.2		ug/L		105	70 - 146	0	20
1,2-Dichloroethane	25.0	25.5		ug/L		102	61 - 132	2	20
Trichloroethene	25.0	25.7		ug/L		103	70 - 130	1	20
1,2-Dichloropropane	25.0	25.6		ug/L		102	70 - 130	0	20
Dichlorobromomethane	25.0	27.1		ug/L		109	70 - 130	0	20
trans-1,3-Dichloropropene	25.0	28.5		ug/L		114	70 - 140	1	20
cis-1,3-Dichloropropene	25.0	29.5		ug/L		118	70 - 130	1	20
1,1,2-Trichloroethane	25.0	26.9		ug/L		107	70 - 130	3	20
Tetrachloroethene	25.0	25.4		ug/L		102	70 - 130	0	20
Chlorodibromomethane	25.0	28.3		ug/L		113	70 - 145	3	20
Chlorobenzene	25.0	25.6		ug/L		102	70 - 130	0	20

TestAmerica Pleasanton

QC Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: MEW

DRAFT
TestAmerica Job ID: 120-49203-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 720-134846/6

Matrix: Water

Analysis Batch: 134846

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec.		RPD	Limit
							Limits	RPD		
Bromoform	25.0	29.9		ug/L		120	68 - 136	4	20	
1,1,2,2-Tetrachloroethane	25.0	26.7		ug/L		107	70 - 130	4	20	
1,3-Dichlorobenzene	25.0	25.3		ug/L		101	70 - 130	1	20	
1,4-Dichlorobenzene	25.0	25.3		ug/L		101	70 - 130	2	20	
1,2-Dichlorobenzene	25.0	25.4		ug/L		102	70 - 130	1	20	
Chloromethane	25.0	24.3		ug/L		97	52 - 175	2	20	
Bromomethane	25.0	26.6		ug/L		107	43 - 151	3	20	
1,1,2-Trichloro-1,2,2-trifluoroethane	25.0	27.6		ug/L		110	42 - 162	1	20	
EDB	25.0	28.6		ug/L		114	70 - 130	2	20	
1,2,4-Trichlorobenzene	25.0	26.9		ug/L		108	70 - 130	2	20	

Surrogate	LCSD		Limits
	%Recovery	Qualifier	
Toluene-d8 (Surr)	102		70 - 130
4-Bromofluorobenzene	104		67 - 130
1,2-Dichloroethane-d4 (Surr)	102		75 - 138

Lab Sample ID: MB 720-134847/4

Matrix: Water

Analysis Batch: 134847

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
1,1-Dichloroethene	ND		0.50		ug/L		04/20/13 09:47	1	
1,1-Dichloroethane	ND		0.50		ug/L		04/20/13 09:47	1	
Dichlorodifluoromethane	ND		0.50		ug/L		04/20/13 09:47	1	
Vinyl chloride	ND		0.50		ug/L		04/20/13 09:47	1	
Chloroethane	ND		1.0		ug/L		04/20/13 09:47	1	
Trichlorofluoromethane	ND		1.0		ug/L		04/20/13 09:47	1	
Methylene Chloride	ND		5.0		ug/L		04/20/13 09:47	1	
trans-1,2-Dichloroethene	ND		0.50		ug/L		04/20/13 09:47	1	
cis-1,2-Dichloroethene	ND		0.50		ug/L		04/20/13 09:47	1	
Chloroform	ND		1.0		ug/L		04/20/13 09:47	1	
1,1,1-Trichloroethane	ND		0.50		ug/L		04/20/13 09:47	1	
Carbon tetrachloride	ND		0.50		ug/L		04/20/13 09:47	1	
1,2-Dichloroethane	ND		0.50		ug/L		04/20/13 09:47	1	
Trichloroethene	ND		0.50		ug/L		04/20/13 09:47	1	
1,2-Dichloropropane	ND		0.50		ug/L		04/20/13 09:47	1	
Dichlorobromomethane	ND		0.50		ug/L		04/20/13 09:47	1	
trans-1,3-Dichloropropene	ND		0.50		ug/L		04/20/13 09:47	1	
cis-1,3-Dichloropropene	ND		0.50		ug/L		04/20/13 09:47	1	
1,1,2-Trichloroethane	ND		0.50		ug/L		04/20/13 09:47	1	
Tetrachloroethene	ND		0.50		ug/L		04/20/13 09:47	1	
Chlorodibromomethane	ND		0.50		ug/L		04/20/13 09:47	1	
Chlorobenzene	ND		0.50		ug/L		04/20/13 09:47	1	
Bromoform	ND		1.0		ug/L		04/20/13 09:47	1	
1,1,2,2-Tetrachloroethane	ND		0.50		ug/L		04/20/13 09:47	1	
1,3-Dichlorobenzene	ND		0.50		ug/L		04/20/13 09:47	1	
1,4-Dichlorobenzene	ND		0.50		ug/L		04/20/13 09:47	1	

TestAmerica Pleasanton

QC Sample Results

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: MEW

TestAmerica Job ID: 20-49203-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 720-134847/4

Matrix: Water

Analysis Batch: 134847

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichlorobenzene	ND		0.50		ug/L			04/20/13 09:47	1
Chloromethane	ND		1.0		ug/L			04/20/13 09:47	1
Bromomethane	ND		1.0		ug/L			04/20/13 09:47	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50		ug/L			04/20/13 09:47	1
EDB	ND		0.50		ug/L			04/20/13 09:47	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			04/20/13 09:47	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	96		70 - 130		04/20/13 09:47	1
4-Bromofluorobenzene	92		67 - 130		04/20/13 09:47	1
1,2-Dichloroethane-d4 (Surr)	99		75 - 138		04/20/13 09:47	1

Lab Sample ID: LCS 720-134847/5

Matrix: Water

Analysis Batch: 134847

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	21.5		ug/L		86	64 - 128
1,1-Dichloroethane	25.0	22.2		ug/L		89	70 - 130
Dichlorodifluoromethane	25.0	17.2		ug/L		69	34 - 132
Vinyl chloride	25.0	20.6		ug/L		82	54 - 135
Chloroethane	25.0	20.7		ug/L		83	62 - 138
Trichlorofluoromethane	25.0	22.1		ug/L		89	66 - 132
Methylene Chloride	25.0	22.0		ug/L		88	70 - 147
trans-1,2-Dichloroethene	25.0	22.4		ug/L		90	68 - 130
cis-1,2-Dichloroethene	25.0	22.9		ug/L		92	70 - 130
Chloroform	25.0	22.7		ug/L		91	70 - 130
1,1,1-Trichloroethane	25.0	21.6		ug/L		87	70 - 130
Carbon tetrachloride	25.0	23.3		ug/L		93	70 - 146
1,2-Dichloroethane	25.0	22.7		ug/L		91	61 - 132
Trichloroethene	25.0	21.9		ug/L		88	70 - 130
1,2-Dichloropropane	25.0	22.8		ug/L		91	70 - 130
Dichlorobromomethane	25.0	23.9		ug/L		96	70 - 130
trans-1,3-Dichloropropene	25.0	26.1		ug/L		104	70 - 140
cis-1,3-Dichloropropene	25.0	27.5		ug/L		110	70 - 130
1,1,2-Trichloroethane	25.0	22.8		ug/L		91	70 - 130
Tetrachloroethene	25.0	22.7		ug/L		91	70 - 130
Chlorodibromomethane	25.0	24.5		ug/L		98	70 - 145
Chlorobenzene	25.0	22.0		ug/L		88	70 - 130
Bromoform	25.0	24.7		ug/L		99	68 - 136
1,1,2,2-Tetrachloroethane	25.0	21.8		ug/L		87	70 - 130
1,3-Dichlorobenzene	25.0	22.2		ug/L		89	70 - 130
1,4-Dichlorobenzene	25.0	22.4		ug/L		90	70 - 130
1,2-Dichlorobenzene	25.0	22.6		ug/L		90	70 - 130
Chloromethane	25.0	21.1		ug/L		85	52 - 175
Bromomethane	25.0	24.6		ug/L		98	43 - 151
1,1,2-Trichloro-1,2,2-trifluoroethane	25.0	22.8		ug/L		91	42 - 162

TestAmerica Pleasanton

QC Sample Results

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: MEW

TestAmerica Job ID: 120-49203-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 720-134847/5

Matrix: Water

Analysis Batch: 134847

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
EDB	25.0	23.4		ug/L		94	70 - 130
1,2,4-Trichlorobenzene	25.0	22.4		ug/L		90	70 - 130

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Toluene-d8 (Surr)	99		70 - 130
4-Bromofluorobenzene	96		67 - 130
1,2-Dichloroethane-d4 (Surr)	95		75 - 138

Lab Sample ID: LCSD 720-134847/6

Matrix: Water

Analysis Batch: 134847

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	25.0	21.7		ug/L		87	64 - 128	1	20
1,1-Dichloroethane	25.0	22.5		ug/L		90	70 - 130	1	20
Dichlorodifluoromethane	25.0	17.0		ug/L		68	34 - 132	1	20
Vinyl chloride	25.0	20.8		ug/L		83	54 - 135	1	20
Chloroethane	25.0	21.1		ug/L		85	62 - 138	2	20
Trichlorofluoromethane	25.0	21.9		ug/L		88	66 - 132	1	20
Methylene Chloride	25.0	22.7		ug/L		91	70 - 147	3	20
trans-1,2-Dichloroethene	25.0	22.6		ug/L		91	68 - 130	1	20
cis-1,2-Dichloroethene	25.0	23.3		ug/L		93	70 - 130	2	20
Chloroform	25.0	23.0		ug/L		92	70 - 130	1	20
1,1,1-Trichloroethane	25.0	21.7		ug/L		87	70 - 130	0	20
Carbon tetrachloride	25.0	23.2		ug/L		93	70 - 146	0	20
1,2-Dichloroethane	25.0	22.8		ug/L		91	61 - 132	0	20
Trichloroethene	25.0	21.9		ug/L		88	70 - 130	0	20
1,2-Dichloropropane	25.0	22.9		ug/L		92	70 - 130	1	20
Dichlorobromomethane	25.0	24.1		ug/L		96	70 - 130	1	20
trans-1,3-Dichloropropene	25.0	26.9		ug/L		108	70 - 140	3	20
cis-1,3-Dichloropropene	25.0	27.8		ug/L		111	70 - 130	1	20
1,1,2-Trichloroethane	25.0	23.2		ug/L		93	70 - 130	1	20
Tetrachloroethene	25.0	22.7		ug/L		91	70 - 130	0	20
Chlorodibromomethane	25.0	25.2		ug/L		101	70 - 145	3	20
Chlorobenzene	25.0	22.4		ug/L		90	70 - 130	2	20
Bromoform	25.0	25.3		ug/L		101	68 - 136	2	20
1,1,2,2-Tetrachloroethane	25.0	21.7		ug/L		87	70 - 130	0	20
1,3-Dichlorobenzene	25.0	22.6		ug/L		90	70 - 130	2	20
1,4-Dichlorobenzene	25.0	22.7		ug/L		91	70 - 130	1	20
1,2-Dichlorobenzene	25.0	23.0		ug/L		92	70 - 130	2	20
Chloromethane	25.0	21.4		ug/L		86	52 - 175	1	20
Bromomethane	25.0	24.5		ug/L		98	43 - 151	0	20
1,1,2-Trichloro-1,2,2-trifluoroethane	25.0	22.6		ug/L		90	42 - 162	1	20
EDB	25.0	23.8		ug/L		95	70 - 130	2	20
1,2,4-Trichlorobenzene	25.0	23.4		ug/L		93	70 - 130	4	20

TestAmerica Pleasanton

QC Sample Results

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: MEW

TestAmerica Job ID: 120-49203-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 720-134847/6

Matrix: Water

Analysis Batch: 134847

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

<i>Surrogate</i>	<i>LCSD %Recovery</i>	<i>LCSD Qualifier</i>	<i>Limits</i>
<i>Toluene-d8 (Surr)</i>	98		70 - 130
<i>4-Bromofluorobenzene</i>	98		67 - 130
<i>1,2-Dichloroethane-d4 (Surr)</i>	94		75 - 138

Lab Sample ID: MB 720-134880/5

Matrix: Water

Analysis Batch: 134880

Client Sample ID: Method Blank

Prep Type: Total/NA

<i>Analyte</i>	<i>MB Result</i>	<i>MB Qualifier</i>	<i>RL</i>	<i>MDL</i>	<i>Unit</i>	<i>D</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
1,1-Dichloroethene	ND		0.50		ug/L			04/22/13 08:59	1
1,1-Dichloroethane	ND		0.50		ug/L			04/22/13 08:59	1
Dichlorodifluoromethane	ND		0.50		ug/L			04/22/13 08:59	1
Vinyl chloride	ND		0.50		ug/L			04/22/13 08:59	1
Chloroethane	ND		1.0		ug/L			04/22/13 08:59	1
Trichlorofluoromethane	ND		1.0		ug/L			04/22/13 08:59	1
Methylene Chloride	ND		5.0		ug/L			04/22/13 08:59	1
trans-1,2-Dichloroethene	ND		0.50		ug/L			04/22/13 08:59	1
cis-1,2-Dichloroethene	ND		0.50		ug/L			04/22/13 08:59	1
Chloroform	ND		1.0		ug/L			04/22/13 08:59	1
1,1,1-Trichloroethane	ND		0.50		ug/L			04/22/13 08:59	1
Carbon tetrachloride	ND		0.50		ug/L			04/22/13 08:59	1
1,2-Dichloroethane	ND		0.50		ug/L			04/22/13 08:59	1
Trichloroethene	ND		0.50		ug/L			04/22/13 08:59	1
1,2-Dichloropropane	ND		0.50		ug/L			04/22/13 08:59	1
Dichlorobromomethane	ND		0.50		ug/L			04/22/13 08:59	1
trans-1,3-Dichloropropene	ND		0.50		ug/L			04/22/13 08:59	1
cis-1,3-Dichloropropene	ND		0.50		ug/L			04/22/13 08:59	1
1,1,2-Trichloroethane	ND		0.50		ug/L			04/22/13 08:59	1
Tetrachloroethene	ND		0.50		ug/L			04/22/13 08:59	1
Chlorodibromomethane	ND		0.50		ug/L			04/22/13 08:59	1
Chlorobenzene	ND		0.50		ug/L			04/22/13 08:59	1
Bromoform	ND		1.0		ug/L			04/22/13 08:59	1
1,1,2,2-Tetrachloroethane	ND		0.50		ug/L			04/22/13 08:59	1
1,3-Dichlorobenzene	ND		0.50		ug/L			04/22/13 08:59	1
1,4-Dichlorobenzene	ND		0.50		ug/L			04/22/13 08:59	1
1,2-Dichlorobenzene	ND		0.50		ug/L			04/22/13 08:59	1
Chloromethane	ND		1.0		ug/L			04/22/13 08:59	1
Bromomethane	ND		1.0		ug/L			04/22/13 08:59	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50		ug/L			04/22/13 08:59	1
EDB	ND		0.50		ug/L			04/22/13 08:59	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			04/22/13 08:59	1

<i>Surrogate</i>	<i>MB %Recovery</i>	<i>MB Qualifier</i>	<i>Limits</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
<i>Toluene-d8 (Surr)</i>	95		70 - 130		04/22/13 08:59	1
<i>4-Bromofluorobenzene</i>	93		67 - 130		04/22/13 08:59	1
<i>1,2-Dichloroethane-d4 (Surr)</i>	100		75 - 138		04/22/13 08:59	1

QC Sample Results

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: MEW

TestAmerica Job ID: 120-49203-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 720-134880/6

Matrix: Water

Analysis Batch: 134880

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	21.4		ug/L		86	64 - 128
1,1-Dichloroethane	25.0	21.5		ug/L		86	70 - 130
Dichlorodifluoromethane	25.0	17.5		ug/L		70	34 - 132
Vinyl chloride	25.0	20.8		ug/L		83	54 - 135
Chloroethane	25.0	20.5		ug/L		82	62 - 138
Trichlorofluoromethane	25.0	23.1		ug/L		92	66 - 132
Methylene Chloride	25.0	21.1		ug/L		84	70 - 147
trans-1,2-Dichloroethene	25.0	21.7		ug/L		87	68 - 130
cis-1,2-Dichloroethene	25.0	22.5		ug/L		90	70 - 130
Chloroform	25.0	22.8		ug/L		91	70 - 130
1,1,1-Trichloroethane	25.0	21.6		ug/L		87	70 - 130
Carbon tetrachloride	25.0	23.3		ug/L		93	70 - 146
1,2-Dichloroethane	25.0	22.8		ug/L		91	61 - 132
Trichloroethene	25.0	21.3		ug/L		85	70 - 130
1,2-Dichloropropane	25.0	21.7		ug/L		87	70 - 130
Dichlorobromomethane	25.0	24.2		ug/L		97	70 - 130
trans-1,3-Dichloropropene	25.0	26.8		ug/L		107	70 - 140
cis-1,3-Dichloropropene	25.0	27.3		ug/L		109	70 - 130
1,1,2-Trichloroethane	25.0	22.1		ug/L		89	70 - 130
Tetrachloroethene	25.0	22.6		ug/L		90	70 - 130
Chlorodibromomethane	25.0	25.5		ug/L		102	70 - 145
Chlorobenzene	25.0	21.6		ug/L		87	70 - 130
Bromoform	25.0	26.4		ug/L		106	68 - 136
1,1,1,2-Tetrachloroethane	25.0	21.8		ug/L		87	70 - 130
1,3-Dichlorobenzene	25.0	21.9		ug/L		87	70 - 130
1,4-Dichlorobenzene	25.0	22.0		ug/L		88	70 - 130
1,2-Dichlorobenzene	25.0	22.2		ug/L		89	70 - 130
Chloromethane	25.0	20.7		ug/L		83	52 - 175
Bromomethane	25.0	24.4		ug/L		98	43 - 151
1,1,2-Trichloro-1,2,2-trifluoroethane	25.0	22.8		ug/L		91	42 - 162
EDB	25.0	23.7		ug/L		95	70 - 130
1,2,4-Trichlorobenzene	25.0	22.3		ug/L		89	70 - 130

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
Toluene-d8 (Surr)	99		70 - 130
4-Bromofluorobenzene	98		67 - 130
1,2-Dichloroethane-d4 (Surr)	98		75 - 138

Lab Sample ID: LCSD 720-134880/7

Matrix: Water

Analysis Batch: 134880

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	
								RPD	Limit
1,1-Dichloroethene	25.0	20.3		ug/L		81	64 - 128	5	20
1,1-Dichloroethane	25.0	21.4		ug/L		85	70 - 130	1	20
Dichlorodifluoromethane	25.0	16.5		ug/L		66	34 - 132	6	20
Vinyl chloride	25.0	20.3		ug/L		81	54 - 135	2	20

TestAmerica Pleasanton

QC Sample Results

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: MEW

TestAmerica Job ID: 120-49203-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 720-134880/7

Matrix: Water

Analysis Batch: 134880

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloroethane	25.0	20.5		ug/L		82	62 - 138	0	20
Trichlorofluoromethane	25.0	22.0		ug/L		88	66 - 132	5	20
Methylene Chloride	25.0	21.2		ug/L		85	70 - 147	1	20
trans-1,2-Dichloroethene	25.0	21.9		ug/L		87	68 - 130	1	20
cis-1,2-Dichloroethene	25.0	22.5		ug/L		90	70 - 130	0	20
Chloroform	25.0	22.5		ug/L		90	70 - 130	1	20
1,1,1-Trichloroethane	25.0	21.9		ug/L		88	70 - 130	1	20
Carbon tetrachloride	25.0	23.5		ug/L		94	70 - 146	1	20
1,2-Dichloroethane	25.0	22.8		ug/L		91	61 - 132	0	20
Trichloroethene	25.0	21.1		ug/L		85	70 - 130	1	20
1,2-Dichloropropane	25.0	22.2		ug/L		89	70 - 130	2	20
Dichlorobromomethane	25.0	24.1		ug/L		97	70 - 130	0	20
trans-1,3-Dichloropropene	25.0	26.9		ug/L		108	70 - 140	0	20
cis-1,3-Dichloropropene	25.0	27.2		ug/L		109	70 - 130	0	20
1,1,2-Trichloroethane	25.0	22.2		ug/L		89	70 - 130	0	20
Tetrachloroethene	25.0	22.0		ug/L		88	70 - 130	2	20
Chlorodibromomethane	25.0	25.4		ug/L		102	70 - 145	0	20
Chlorobenzene	25.0	21.8		ug/L		87	70 - 130	1	20
Bromoform	25.0	26.4		ug/L		106	68 - 136	0	20
1,1,2,2-Tetrachloroethane	25.0	21.6		ug/L		86	70 - 130	1	20
1,3-Dichlorobenzene	25.0	21.9		ug/L		88	70 - 130	0	20
1,4-Dichlorobenzene	25.0	22.2		ug/L		89	70 - 130	1	20
1,2-Dichlorobenzene	25.0	22.4		ug/L		90	70 - 130	1	20
Chloromethane	25.0	20.8		ug/L		83	52 - 175	0	20
Bromomethane	25.0	23.4		ug/L		93	43 - 151	4	20
1,1,2-Trichloro-1,2,2-trifluoroethane	25.0	22.1		ug/L		88	42 - 162	3	20
EDB	25.0	23.3		ug/L		93	70 - 130	1	20
1,2,4-Trichlorobenzene	25.0	22.4		ug/L		90	70 - 130	0	20

Surrogate	LCSD		Limits
	%Recovery	Qualifier	
Toluene-d8 (Surr)	99		70 - 130
4-Bromofluorobenzene	99		67 - 130
1,2-Dichloroethane-d4 (Surr)	97		75 - 138

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 280-170520/1-A

Matrix: Water

Analysis Batch: 170843

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 170520

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND		1.0		ug/L		04/21/13 11:20	04/23/13 12:25	1

Surrogate	MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
2-Fluorobiphenyl	81		57 - 120	04/21/13 11:20	04/23/13 12:25	1

TestAmerica Pleasanton

QC Sample Results

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: MEW

TestAmerica Job ID: 20-49233-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCS 280-170520/2-A

Matrix: Water

Analysis Batch: 170843

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 170520

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	5.24		ug/L		52	38 - 120
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
2-Fluorobiphenyl	85		57 - 120				

Lab Sample ID: LCSD 280-170520/3-A

Matrix: Water

Analysis Batch: 170843

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 170520

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	10.0	5.67		ug/L		57	38 - 120	8	30
Surrogate	LCSD %Recovery	LCSD Qualifier	Limits						
2-Fluorobiphenyl	80		57 - 120						

Method: 7199 - Chromium, Hexavalent (IC)

Lab Sample ID: MB 720-135127/1-A

Matrix: Water

Analysis Batch: 134726

Client Sample ID: Method Blank

Prep Type: Dissolved

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	ND		0.50		ug/L			04/18/13 21:17	1

Lab Sample ID: LCS 720-135127/2-A

Matrix: Water

Analysis Batch: 134726

Client Sample ID: Lab Control Sample

Prep Type: Dissolved

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cr (VI)	2.00	1.88		ug/L		94	90 - 110

Lab Sample ID: 720-49233-4 MS

Matrix: Water

Analysis Batch: 134726

Client Sample ID: SB-10-35.5-38.5

Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Cr (VI)	ND		2.00	1.92		ug/L		96	80 - 120

Lab Sample ID: 720-49233-4 MSD

Matrix: Water

Analysis Batch: 134726

Client Sample ID: SB-10-35.5-38.5

Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Cr (VI)	ND		2.00	1.93		ug/L		96	80 - 120	0	20

TestAmerica Pleasanton

QC Sample Results

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: MEW

TestAmerica Job ID: 720-49233-1

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 720-134805/2
Matrix: Water
Analysis Batch: 134805

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10		mg/L			04/19/13 16:46	1

Lab Sample ID: LCS 720-134805/1
Matrix: Water
Analysis Batch: 134805

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	1000	1030		mg/L		103	85 - 115

Lab Sample ID: 720-49233-4 DU
Matrix: Water
Analysis Batch: 134805

Client Sample ID: SB-10-35.5-38.5
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	690		700		mg/L		1	10

QC Association Summary

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: MEW

TestAmerica Job ID: 720-49233-1

GC/MS VOA

Analysis Batch: 134740

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-49233-1	SB-9-20-23	Total/NA	Water	8260B	
720-49233-2	SB-9-40-43	Total/NA	Water	8260B	
720-49233-3	SB-10-20.5-23	Total/NA	Water	8260B	
720-49233-4	SB-10-35.5-38.5	Total/NA	Water	8260B	
LCS 720-134740/5	Lab Control Sample	Total/NA	Water	8260B	
LCSD 720-134740/6	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 720-134740/4	Method Blank	Total/NA	Water	8260B	

Analysis Batch: 134846

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-49233-2	SB-9-40-43	Total/NA	Water	8260B	
720-49233-3	SB-10-20.5-23	Total/NA	Water	8260B	
LCS 720-134846/5	Lab Control Sample	Total/NA	Water	8260B	
LCSD 720-134846/6	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 720-134846/4	Method Blank	Total/NA	Water	8260B	

Analysis Batch: 134847

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-49233-1	SB-9-20-23	Total/NA	Water	8260B	
720-49233-5	TAL SF TB	Total/NA	Water	8260B	
LCS 720-134847/5	Lab Control Sample	Total/NA	Water	8260B	
LCSD 720-134847/6	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 720-134847/4	Method Blank	Total/NA	Water	8260B	

Analysis Batch: 134880

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-49233-4	SB-10-35.5-38.5	Total/NA	Water	8260B	
LCS 720-134880/6	Lab Control Sample	Total/NA	Water	8260B	
LCSD 720-134880/7	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 720-134880/5	Method Blank	Total/NA	Water	8260B	

GC/MS Semi VOA

Prep Batch: 170520

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-49233-1	SB-9-20-23	Total/NA	Water	3520C	
720-49233-2	SB-9-40-43	Total/NA	Water	3520C	
720-49233-3	SB-10-20.5-23	Total/NA	Water	3520C	
720-49233-4	SB-10-35.5-38.5	Total/NA	Water	3520C	
LCS 280-170520/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 280-170520/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 280-170520/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 170843

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-49233-1	SB-9-20-23	Total/NA	Water	8270C LL	170520
720-49233-2	SB-9-40-43	Total/NA	Water	8270C LL	170520
720-49233-3	SB-10-20.5-23	Total/NA	Water	8270C LL	170520
720-49233-4	SB-10-35.5-38.5	Total/NA	Water	8270C LL	170520
LCS 280-170520/2-A	Lab Control Sample	Total/NA	Water	8270C LL	170520

TestAmerica Pleasanton

QC Association Summary

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: MEW

TestAmerica Job ID: 120-49233-1

GC/MS Semi VOA (Continued)

Analysis Batch: 170843 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 280-170520/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	170520
MB 280-170520/1-A	Method Blank	Total/NA	Water	8270C LL	170520

General Chemistry

Analysis Batch: 134726

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-49233-1	SB-9-20-23	Dissolved	Water	7199	
720-49233-3	SB-10-20.5-23	Dissolved	Water	7199	
720-49233-4	SB-10-35.5-38.5	Dissolved	Water	7199	
720-49233-4 MS	SB-10-35.5-38.5	Dissolved	Water	7199	
720-49233-4 MSD	SB-10-35.5-38.5	Dissolved	Water	7199	
LCS 720-135127/2-A	Lab Control Sample	Dissolved	Water	7199	
MB 720-135127/1-A	Method Blank	Dissolved	Water	7199	

Analysis Batch: 134805

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-49233-1	SB-9-20-23	Total/NA	Water	SM 2540C	
720-49233-3	SB-10-20.5-23	Total/NA	Water	SM 2540C	
720-49233-4	SB-10-35.5-38.5	Total/NA	Water	SM 2540C	
720-49233-4 DU	SB-10-35.5-38.5	Total/NA	Water	SM 2540C	
LCS 720-134805/1	Lab Control Sample	Total/NA	Water	SM 2540C	
MB 720-134805/2	Method Blank	Total/NA	Water	SM 2540C	

Lab Chronicle

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: MEW

TestAmerica Job ID: 720-49233-1

Client Sample ID: SB-9-20-23

Lab Sample ID: 720-49233-1

Date Collected: 04/18/13 10:45

Matrix: Water

Date Received: 04/18/13 19:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	134740	04/19/13 17:43	AC	TAL PLS
Total/NA	Analysis	8260B		500	134847	04/20/13 19:11	AC	TAL PLS
Total/NA	Prep	3520C			170520	04/21/13 11:20	CDC	TAL DEN
Total/NA	Analysis	8270C LL		1	170843	04/23/13 14:36	KGV	TAL DEN
Dissolved	Analysis	7199		1	134726	04/18/13 21:46	EYT	TAL PLS
Total/NA	Analysis	SM 2540C		1	134805	04/19/13 16:46	EYT	TAL PLS

Client Sample ID: SB-9-40-43

Lab Sample ID: 720-49233-2

Date Collected: 04/18/13 12:05

Matrix: Water

Date Received: 04/18/13 19:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	134740	04/19/13 18:11	AC	TAL PLS
Total/NA	Analysis	8260B		5	134846	04/20/13 18:44	AC	TAL PLS
Total/NA	Prep	3520C			170520	04/21/13 11:20	CDC	TAL DEN
Total/NA	Analysis	8270C LL		1	170843	04/23/13 15:09	KGV	TAL DEN

Client Sample ID: SB-10-20.5-23

Lab Sample ID: 720-49233-3

Date Collected: 04/18/13 14:45

Matrix: Water

Date Received: 04/18/13 19:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	134740	04/19/13 18:40	AC	TAL PLS
Total/NA	Analysis	8260B		10	134846	04/20/13 19:13	AC	TAL PLS
Total/NA	Prep	3520C			170520	04/21/13 11:20	CDC	TAL DEN
Total/NA	Analysis	8270C LL		1	170843	04/23/13 15:42	KGV	TAL DEN
Dissolved	Analysis	7199		1	134726	04/18/13 21:58	EYT	TAL PLS
Total/NA	Analysis	SM 2540C		1	134805	04/19/13 16:46	EYT	TAL PLS

Client Sample ID: SB-10-35.5-38.5

Lab Sample ID: 720-49233-4

Date Collected: 04/18/13 15:40

Matrix: Water

Date Received: 04/18/13 19:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	134740	04/19/13 19:09	AC	TAL PLS
Total/NA	Analysis	8260B		50	134880	04/22/13 13:46	AC	TAL PLS
Total/NA	Prep	3520C			170520	04/21/13 11:20	CDC	TAL DEN
Total/NA	Analysis	8270C LL		1	170843	04/23/13 16:15	KGV	TAL DEN
Dissolved	Analysis	7199		1	134726	04/18/13 22:09	EYT	TAL PLS
Total/NA	Analysis	SM 2540C		1	134805	04/19/13 16:46	EYT	TAL PLS

Lab Chronicle

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: MEW

TestAmerica Job ID: 720-49233-1

Client Sample ID: TAL SF TB

Lab Sample ID: 720-49233-5

Date Collected: 04/18/13 00:00

Matrix: Water

Date Received: 04/18/13 19:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	134847	04/20/13 14:59	AC	TAL PLS

Laboratory References:

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL PLS = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

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Certification Summary

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: MEW

TestAmerica Job ID: 120-49203-1

Laboratory: TestAmerica Pleasanton

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
California	State Program	9	2496	01-31-14

Laboratory: TestAmerica Denver

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2907.01	10-31-13
A2LA	ISO/IEC 17025		2907.01	10-31-13
Alaska (UST)	State Program	10	UST-30	04-05-14
Arizona	State Program	9	AZ0713	12-19-13
Arkansas DEQ	State Program	6	88-0687	06-01-13
California	State Program	9	2513	08-31-14
Colorado	State Program	8	N/A	09-30-13
Connecticut	State Program	1	PH-0686	09-30-14
Florida	NELAP	4	E87667	06-30-13
Idaho	State Program	10	CO00026	09-30-13
Illinois	NELAP	5	200017	04-30-13
Iowa	State Program	7	370	12-01-14
Kansas	NELAP	7	E-10166	04-30-13
Louisiana	NELAP	6	30785	06-30-13
Maine	State Program	1	CO0002	03-03-15
Maryland	State Program	3	268	03-31-14
Minnesota	NELAP	5	8-999-405	12-31-13
Nevada	State Program	9	CO0026	07-30-13
New Hampshire	NELAP	1	205310	04-28-13
New Jersey	NELAP	2	CO004	06-30-13
New Mexico	State Program	6	CO00026	06-30-13
New York	NELAP	2	11964	04-01-14
North Carolina DENR	State Program	4	358	12-31-13
North Dakota	State Program	8	R-034	06-30-13
Oklahoma	State Program	6	8614	08-31-13
Oregon	NELAP	10	CO200001	01-16-14
Pennsylvania	NELAP	3	68-00664	07-31-13
South Carolina	State Program	4	72002	06-30-13
Texas	NELAP	6	T104704183-08-TX	09-30-13
USDA	Federal		P330-08-00036	02-08-14
Utah	NELAP	8	QUAN5	06-30-13
Virginia	NELAP	3	460232	06-14-13
Washington	State Program	10	C583	08-03-13
West Virginia DEP	State Program	3	354	11-30-13
Wisconsin	State Program	5	999615430	08-31-13
Wyoming (UST)	A2LA	8		10-31-13

Method Summary

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: MEW

TestAmerica Job ID: 120-49203-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL PLS
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL DEN
7199	Chromium, Hexavalent (IC)	SW846	TAL PLS
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL PLS

Protocol References:

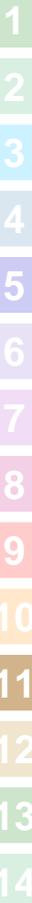
SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL PLS = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919



Sample Summary

DRAFT

Client: Geosyntec Consultants, Inc.
Project/Site: MEW

TestAmerica Job ID: 720-49233-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
720-49233-1	SB-9-20-23	Water	04/18/13 10:45	04/18/13 19:10
720-49233-2	SB-9-40-43	Water	04/18/13 12:05	04/18/13 19:10
720-49233-3	SB-10-20.5-23	Water	04/18/13 14:45	04/18/13 19:10
720-49233-4	SB-10-35.5-38.5	Water	04/18/13 15:40	04/18/13 19:10
720-49233-5	TAL SF TB	Water	04/18/13 00:00	04/18/13 19:10

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Chain of Custody Record

TestAmerica Pleasanton
1220 Quarry Lane
Pleasanton, CA 94566
Phone: 925.484.1919 fax: 925.600.3002

720-49233

145501

TestAmerica Laboratories, Inc.

Client Contact: **Regulatory Program:** DW NPDES RCRA Other: _____

Project Manager: **Eric Sullivan** Date: **18 April 2013**

Tell/Fax: **(510) 285-2750 / (510) 285-3114** Lab Contact: **Morgan Estlin**

Analysis Turnaround Time: CALENDAR DAYS WORKING DAYS

TAT if different from Below: 1 day 1 week 2 days 2 weeks

Project Name: **MCW** Site: **MCW**

Job / SDG No.:

Sampler: **Morgan Estlin**

Sample Specific Notes:

PO # **WB1125A**

Sample Identification	Sample Date	Sample Time	Sample Type (C-Comp, G-Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)
SB-9-20-23	4/18/13	10:45	G	W	8	X	X X X X X
SB-9-40-43	4/18/13	12:05	G	W	4	X	X X X X X
SB-10-20.5-23	4/18/13	14:45	G	W	7	X	X X X X X
SB-10-35.5-38.5	4/19/13	15:40	G	W	9	X	X X X X X
TAL SF TB			G	W	2	X	X X X X X



720-49233 Chain of Custody

Preservation Used: 1= Ice, 2= HCl, 3= H2SO4, 4= HNO3, 5= NaOH, 6= Other _____

Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

Special Instructions/QC Requirements & Comments: **3.905**

Non-Hazard Flammable Skin Irritant Poison B Unknown Return to Client Disposal by Lab Archive for _____ Months

Custody Seals Intact Yes No

Relinquished by: **W. [Signature]** Company: **GRASP** Date/Time: **4/18/13, 13:40** Received by: **[Signature]** Date/Time: **4/18/13, 14:10** Company: **TRSE**

Relinquished by: **[Signature]** Company: **TRSE** Date/Time: **4/18/13, 19:10** Received in Laboratory by: **[Signature]** Date/Time: **4/18/13, 19:10** Company: **TRSE**

Relinquished by: **[Signature]** Company: **TRSE** Date/Time: **4/18/13, 19:10**

Form No. CA-C-WI-002, Rev. 4.1, dated 02/20/2013

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Salimpour, Afsaneh

From: Nicole Gotberg [NGotberg@Geosyntec.com]
Sent: Friday, April 19, 2013 11:06 AM
To: Salimpour, Afsaneh; Eric Suchomel
Cc: Morgan Fahlman; John Gallinatti
Subject: RE: Sample Login Confirmation for 720-49233, MEW

Afsaneh,

Per our conversation please make the following revisions to the requested analysis for 720-49233 and 720-49202.

1. Remove the SVOC 8270C analysis, we would only like to run 1,4 Dioxane by 8270C
2. For 8260B only run the halogenated VOC (HVOC) list
3. For the trip blank only run the HVOC analysis

I will have Morgan revise and initial changes on the Chain of Custody forms to be included with the lab reports.

Thanks,
Nicole

Nicole K. Gotberg, P.G.
Professional Geologist

1111 Broadway, 6th Floor
Oakland, CA 94607
Main Phone: 510.836.3034, ext. 2771
Direct Phone: 510.285.2771
Fax: 510.836.3036
www.geosyntec.com



engineers | scientists | innovators

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10:41 AM

To: Eric Suchomel; Nicole Gotberg
Subject: Sample Login Confirmation for 720-49233, MEW

Insufficient sample volume was provided for the following sample(s) for the 8270C; 1,4-Dioxane, TDS, CrVI analysis: TAL SF TB. Received 2-40ml Hcl voa vials, can only run for 8260B.

AFSANEH SALIMPOUR

TestAmerica Pleasanton
THE LEADER IN ENVIRONMENTAL TESTING

Tel: 925.484.1919
www.testamericainc.com

Reference: [128017]
Attachments: 3



720-49233 Chain of Custody

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TestAmerica Pleasanton
1220 Quarry Lane
Pleasanton, CA 94566
phone 925.484.1919 fax 925.600.3002

720-49233-REV

Chain of Custody Record

145501

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

COC No. 1 of 1

For Lab Use Only:

Walk-in Client

Lab Sampling:

Job / SDG No.:

Sampler: Margan Eskinova

Sample Specific Notes:

Project Manager: Eric Salzman

Regulatory Program: DW WDES RCRA Other

Site Contact: Margan Eskinova Date: 18 April 2013

Carrier: Margan Eskinova

Lab Contact: Margan Eskinova

Tel/Fax: (510) 925-2450 / (510) 925-3114

Analysis Turnaround Time

CALENDAR DAYS WORKING DAYS

TAT if different from Below

2 weeks 1 week 2 days 1 day

Project Name: MCMU

Site: MCMU

P.O.#: WE1122A

Sample Date	Sample Time	Sample Type (Is-comp, Gas-adj)	Matrix	# of Cont.
SB-9-20-23	10:45	G	W	8
SB-9-40-43	12:05	G	W	4
SB-10-20-5-73	14:45	G	W	7
SB-10-35.5-38.5	15:40	G	W	9
TAL SF TB		G	W	2

Filtered Sample (Y/N)	Perform MS/MSD (Y/N)
	826013 (HVOCS)
	82706 MF 2/22/13
	TDS
	Chromium VI
	1,4-Dioxane (82706)



Preservation Used: 1=Ice, 2=HCl, 3=H2SO4, 4=HNO3, 5=NaOH, 6=Other

Possible Hazard Identification: Age any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

Special Instructions/QC Requirements & Comments: 390

Non-Hazard Flammable Skin Irritant Poison B Unknown Return to Client Disposal by Lab Archive for _____ Months

Custody Seal Intact Yes No

Relinquished by: [Signature] Company: Greensource Date/Time: 4/18/13 13:46

Relinquished by: [Signature] Company: TASC Date/Time: 04/18/13 09:10

Received by: [Signature] Date/Time: 04/18/13 09:10

Received in Laboratory by: [Signature] Date/Time: 4/18/13 19:10

Company: TASC Date/Time: 04/18/13 09:10

Company: TASC Date/Time: 4/18/13 19:10

Login Sample Receipt Checklist

Client: Geosyntec Consultants, Inc.

Job Number: 720-49233-1

Login Number: 49233

List Number: 1

Creator: Bullock, Tracy

List Source: TestAmerica Pleasanton

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	False	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Geosyntec Consultants, Inc.

Job Number: 720-49233-1

Login Number: 49233

List Number: 1

Creator: Wheeler, Virginia L

List Source: TestAmerica Denver

List Creation: 04/20/13 12:10 PM

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

APPENDIX B

Permanganate Soil Oxidant Demand Testing Results Report

Natural Oxidant Demand Test
(Permanganate)
Certificate of Analysis

Customer : Geosyntec Consultants
Eric Suchomel

SiREM Reference #: S-2811

Project: MEW

Report Issued: May 16, 2013

Customer Reference #: WR1128A

Data Files: S-2811_NOD

Site Sampling Date: April 17, 2013

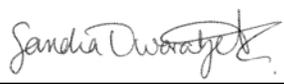
Test Results Summary:

Treatment	Customer Sample ID	Measured Natural Oxidant Demand (g/kg) MnO ₄	Calculated Natural Oxidant Demand (g/kg) KMnO ₄	Calculated Natural Oxidant Demand (g/kg) NaMnO ₄
Location 1 5 g/L	SB-5 23-23.5	4.28	5.68	5.10
Location 1 10 g/L	SB-5 23-23.5	4.62	6.13	5.51
Location 1 30 g/L	SB-5 23-23.5	3.87	5.15	4.62
Location 2 5 g/L	SB-6 19.5-20	3.07	4.08	3.67
Location 2 10 g/L	SB-6 19.5-20	3.47	4.61	4.14
Location 2 30 g/L	SB-6 19.5-20	4.78	6.36	5.71
Location 3 5 g/L	SB-5 22.5-23	2.34	3.11	2.79
Location 3 10 g/L	SB-5 22.5-23	1.88	2.49	2.24
Location 3 30 g/L	SB-5 22.5-23	3.69	4.91	4.41
Location 4 5 g/L	SB-6 20-20.5	2.57	3.41	3.07
Location 4 10 g/L	SB-6 20-20.5	1.27	1.69	1.51
Location 4 30 g/L	SB-6 20-20.5	1.56	2.08	1.87
Location 5 5 g/L	SB-9 20-21	3.44	4.57	4.11
Location 5 10 g/L	SB-9 20-21	3.69	4.90	4.40
Location 5 30 g/L	SB-9 20-21	2.93	3.89	3.50

Notes:

- NOD-Natural oxidant demand
- NOD based on 7 day incubation and reported as grams of specified oxidant per kilogram of sediment.
- MnO₄⁻ permanganate
- KMnO₄ potassium permanganate
- NaMnO₄ sodium permanganate
- NaMnO₄ and KMnO₄ values are calculated from the MnO₄⁻ NOD and the relative molecular weights of the compounds

Analyst: 
Kela Bartle, B.Sc.
Laboratory Technician

Reviewed by: 
Sandra Dworatzek, M.Sc.
Senior Manager

Case Narrative

Twelve jars of soil and four jars of groundwater were received from Geosyntec on April 22, 2013. The samples arrived in good condition at a temperature of 3°C and were stored at 4°C upon arrival. Oxidant demand testing commenced on April 26, 2013.

Reactor Construction Details

Reactors were constructed by adding 25 grams (g) (wet weight) of geological material into 110 millilitres (mL) screw cap Boston round amber bottles. Site water was added to the reactors at a volume of 25 mL with 15 mL of Deionized water to yield a total of 40 mL. Reactors were constructed for 5 locations chosen by Geosyntec to be SB-5 23-23.5, SB-6 19.5-20, SB-5 22.5-23, SB-6 20-20.5 and SB-9 20-21 with groundwater labeled SB-5 18-22 for locations 1 through 4 and SB-9 20-23 for location 5. Each location was analyzed at 3 different concentrations of permanganate and in triplicate for a total of 45 reactors.

Reactors were amended with 1.0, 2.0 or 6.0 mL of a 300 g/L permanganate stock solution to reach target permanganate concentrations of 5, 10 and 30 g/L respectively. All reactors were sampled for permanganate at time zero and at days 1, 3, 7 and 10.

Analysis of Permanganate

Samples were collected from the control and treatment reactors using disposable 5 mL plastic syringes for analysis of permanganate. Permanganate concentration was quantified colorimetrically using a UV/VIS spectrophotometer (Biochrom Ultraspec 1000). Samples (3 mL) were collected from batch reactors, filtered through a 0.45 micron syringe filter and diluted as required so that absorbance readings at 525 nanometers (nm) were less than 2.0 absorbance units. A five point calibration curve was prepared using known concentrations of a standardized permanganate solution at each analysis event. The method detection limit was 0.79 milligrams per liter (mg/L).

Detailed Test Results:

Appendix A provides back up data for the test samples.

APPENDIX A: Detailed Test Results

Lab ID **Client ID**
Location 1: 5 g/L SB-5 23-23.5

Initial Concentration (g/L) 3.98
Volume of Solution (mL) 39.61
Average Mass of Soil (g) 23.97

Incubation Time (days)	Concentration of MnO ₄ (g/L)					Remaining MnO ₄ (g)	Consumed MnO ₄ (g)	Oxidant Demand (g/kg)
	Rep.1	Rep. 2	Rep. 3	Average	SD			
0	3.85	4.00	4.10	3.98	0.13	0.16	0.00	0.00
1	2.15	2.70	2.50	2.45	0.28	0.10	0.06	2.53
3	1.85	2.65	2.25	2.25	0.40	0.09	0.07	2.86
7	1.60	1.90	1.40	1.63	0.25	0.06	0.09	3.88
10	1.33	1.63	1.22	1.39	0.21	0.06	0.10	4.28

Lab ID **Client ID**
Location 1: 10 g/L SB-5 23-23.5

Initial Concentration (g/L) 8.17
Volume of Solution (mL) 39.55
Average Mass of Soil (g) 24.65

Incubation Time (days)	Concentration of MnO ₄ (g/L)					Remaining MnO ₄ (g)	Consumed MnO ₄ (g)	Oxidant Demand (g/kg)
	Rep.1	Rep. 2	Rep. 3	Average	SD			
0	8.20	8.10	8.20	8.17	0.06	0.32	0.00	0.00
1	5.90	6.05	6.45	6.13	0.28	0.24	0.08	3.26
3	5.55	5.90	6.95	6.13	0.73	0.24	0.08	3.26
7	5.10	4.90	6.60	5.53	0.93	0.22	0.10	4.23
10	4.59	4.80	6.48	5.29	1.04	0.21	0.11	4.62

Lab ID **Client ID**
Location 1: 30 g/L SB-5 23-23.5

Initial Concentration (g/L) 24.22
Volume of Solution (mL) 39.64
Average Mass of Soil (g) 25.05

Incubation Time (days)	Concentration of MnO ₄ (g/L)					Remaining MnO ₄ (g)	Consumed MnO ₄ (g)	Oxidant Demand (g/kg)
	Rep.1	Rep. 2	Rep. 3	Average	SD			
0	24.10	24.35	24.20	24.22	0.13	0.96	0.00	0.00
1	20.25	20.35	20.70	20.43	0.24	0.81	0.15	5.99
3	20.90	21.50	21.30	21.23	0.31	0.84	0.12	4.72
7	21.90	23.45	22.10	22.48	0.84	0.89	0.07	2.74
10	20.87	22.86	21.58	21.77	1.01	0.86	0.10	3.87

Lab ID **Client ID**
Location 2: 5 g/L SB-6 19.5-20

Initial Concentration (g/L) 4.15
Volume of Solution (mL) 39.70
Average Mass of Soil (g) 24.62

Incubation Time (days)	Concentration of MnO ₄ (g/L)					Mass of MnO ₄ Remaining (g)	Mass of MnO ₄ Consumed (g)	*Equivalent Oxidant Demand (g/kg)
	Rep.1	Rep. 2	Rep. 3	Average	SD			
0	4.15	4.05	4.25	4.15	0.10	0.16	0.00	0.00
1	3.50	3.25	3.00	3.25	0.25	0.13	0.04	1.45
3	3.40	3.15	3.10	3.22	0.16	0.13	0.04	1.51
7	2.75	2.60	2.65	2.67	0.08	0.11	0.06	2.39
10	2.40	2.19	2.14	2.24	0.13	0.09	0.08	3.07

Lab ID **Client ID**
Location 2: 10 g/L SB-6 19.5-20

Initial Concentration (g/L) 8.27
Volume of Solution (mL) 39.60
Average Mass of Soil (g) 25.03

Incubation Time (days)	Concentration of MnO ₄ (g/L)					Remaining MnO ₄ (g)	Consumed MnO ₄ (g)	Oxidant Demand (g/kg)
	Rep.1	Rep. 2	Rep. 3	Average	SD			
0	8.00	8.45	8.35	8.27	0.24	0.33	0.00	0.00
1	6.55	6.85	6.50	6.63	0.19	0.26	0.06	2.58
3	6.00	6.90	6.55	6.48	0.45	0.26	0.07	2.82
7	6.70	6.65	6.15	6.50	0.30	0.26	0.07	2.80
10	6.07	6.33	5.82	6.07	0.26	0.24	0.09	3.47

Lab ID **Client ID**
Location 2: 30 g/L SB-6 19.5-20

Initial Concentration (g/L) 24.27
Volume of Solution (mL) 39.59
Average Mass of Soil (g) 24.90

Incubation Time (days)	Concentration of MnO ₄ (g/L)					Remaining MnO ₄ (g)	Consumed MnO ₄ (g)	Oxidant Demand (g/kg)
	Rep.1	Rep. 2	Rep. 3	Average	SD			
0	24.30	24.40	24.10	24.27	0.15	0.96	0.00	0.00
1	20.40	21.00	20.50	20.63	0.32	0.82	0.14	5.78
3	20.10	21.75	20.10	20.65	0.95	0.82	0.14	5.75
7	21.25	21.70	21.25	21.40	0.26	0.85	0.11	4.56
10	21.02	21.58	21.17	21.26	0.29	0.84	0.12	4.78

Lab ID **Client ID**
Location 3: 5 g/L SB-5 22.5-23

Initial Concentration (g/L) 4.38
Volume of Solution (mL) 39.80
Average Mass of Soil (g) 25.07

Incubation Time (days)	Concentration of MnO ₄ (g/L)					Remaining MnO ₄ (g)	Consumed MnO ₄ (g)	Oxidant Demand (g/kg)
	Rep.1	Rep. 2	Rep. 3	Average	SD			
0	4.40	4.35	4.40	4.38	0.03	0.17	0.00	0.00
1	3.80	3.75	3.80	3.78	0.03	0.15	0.02	0.95
3	3.35	3.65	3.70	3.57	0.19	0.14	0.03	1.30
7	3.45	3.50	3.45	3.47	0.03	0.14	0.04	1.46
10	2.55	3.16	3.01	2.91	0.32	0.12	0.06	2.34

Lab ID **Client ID**
Location 3: 10 g/L SB-5 22.5-23

Initial Concentration (g/L) 8.42
Volume of Solution (mL) 39.94
Average Mass of Soil (g) 25.32

Incubation Time (days)	Concentration of MnO ₄ (g/L)					Remaining MnO ₄ (g)	Consumed MnO ₄ (g)	Oxidant Demand (g/kg)
	Rep.1	Rep. 2	Rep. 3	Average	SD			
0	8.30	8.55	8.40	8.42	0.13	0.34	0.00	0.00
1	6.95	7.10	7.20	7.08	0.13	0.28	0.05	2.10
3	6.45	7.95	7.95	7.45	0.87	0.30	0.04	1.52
7	7.65	7.75	7.55	7.65	0.10	0.31	0.03	1.21
10	7.09	7.35	7.24	7.23	0.13	0.29	0.05	1.88

Lab ID **Client ID**
Location 3: 30 g/L SB-5 22.5-23

Initial Concentration (g/L) 24.78
Volume of Solution (mL) 39.45
Average Mass of Soil (g) 25.47

Incubation Time (days)	Concentration of MnO ₄ (g/L)					Remaining MnO ₄ (g)	Consumed MnO ₄ (g)	Oxidant Demand (g/kg)
	Rep.1	Rep. 2	Rep. 3	Average	SD			
0	25.20	24.65	24.50	24.78	0.37	0.98	0.00	0.00
1	20.45	21.70	21.60	21.25	0.69	0.84	0.14	5.47
3	20.55	20.65	21.90	21.03	0.75	0.83	0.15	5.81
7	23.20	22.20	23.25	22.88	0.59	0.90	0.07	2.94
10	23.42	20.71	23.06	22.40	1.47	0.88	0.09	3.69

Lab ID Client ID
Location 4: 5 g/L SB-6 20-20.5

Initial Concentration (g/L) 4.13
Volume of Solution (mL) 39.51
Average Mass of Soil (g) 25.38

Incubation Time (days)	Concentration of MnO ₄ (g/L)					Mass of MnO ₄ Remaining (g)	Mass of MnO ₄ Consumed (g)	*Equivalent Oxidant Demand (g/kg)
	Rep.1	Rep. 2	Rep. 3	Average	SD			
0	4.05	4.05	4.30	4.13	0.14	0.16	0.00	0.00
1	3.10	3.05	3.25	3.13	0.10	0.12	0.04	1.56
3	3.55	2.80	2.95	3.10	0.40	0.12	0.04	1.61
7	2.60	2.65	2.70	2.65	0.05	0.10	0.06	2.31
10	2.45	2.14	2.86	2.48	0.36	0.10	0.07	2.57

Lab ID Client ID
Location 4: 10 g/L SB-6 20-20.5

Initial Concentration (g/L) 7.98
Volume of Solution (mL) 39.45
Average Mass of Soil (g) 25.08

Incubation Time (days)	Concentration of MnO ₄ (g/L)					Remaining MnO ₄ (g)	Consumed MnO ₄ (g)	Oxidant Demand (g/kg)
	Rep.1	Rep. 2	Rep. 3	Average	SD			
0	8.00	8.10	7.85	7.98	0.13	0.31	0.00	0.00
1	6.50	7.15	7.30	6.98	0.43	0.28	0.04	1.57
3	6.95	6.60	6.70	6.75	0.18	0.27	0.05	1.94
7	7.00	6.75	6.65	6.80	0.18	0.27	0.05	1.86
10	7.50	7.04	6.99	7.18	0.28	0.28	0.03	1.27

Lab ID Client ID
Location 4: 30 g/L SB-6 20-20.5

Initial Concentration (g/L) 23.37
Volume of Solution (mL) 39.84
Average Mass of Soil (g) 25.12

Incubation Time (days)	Concentration of MnO ₄ (g/L)					Remaining MnO ₄ (g)	Consumed MnO ₄ (g)	Oxidant Demand (g/kg)
	Rep.1	Rep. 2	Rep. 3	Average	SD			
0	23.85	23.00	23.25	23.37	0.44	0.93	0.00	0.00
1	20.80	20.30	20.90	20.67	0.32	0.82	0.11	4.28
3	20.65	20.25	21.25	20.72	0.50	0.83	0.11	4.20
7	22.30	21.70	22.10	22.03	0.31	0.88	0.05	2.11
10	22.70	22.19	22.24	22.38	0.28	0.89	0.04	1.56

Lab ID **Client ID**
Location 5: 5g/L SB-9 20-21

Initial Concentration (g/L) 4.40
Volume of Solution (mL) 39.27
Average Mass of Soil (g) 25.37

Incubation Time (days)	Concentration of MnO ₄ (g/L)					Remaining MnO ₄ (g)	Consumed MnO ₄ (g)	Oxidant Demand (g/kg)
	Rep.1	Rep. 2	Rep. 3	Average	SD			
0	4.40	4.50	4.30	4.40	0.10	0.17	0.00	0.00
1	2.25	2.15	2.65	2.35	0.26	0.09	0.08	3.17
3	2.70	2.75	2.95	2.80	0.13	0.11	0.06	2.48
7	1.85	2.25	1.90	2.00	0.22	0.08	0.09	3.71
10	2.09	2.35	2.09	2.18	0.15	0.09	0.09	3.44

Lab ID **Client ID**
Location 5: 10 g/L SB-9 20-21

Initial Concentration (g/L) 8.38
Volume of Solution (mL) 39.11
Average Mass of Soil (g) 25.25

Incubation Time (days)	Concentration of MnO ₄ (g/L)					Remaining MnO ₄ (g)	Consumed MnO ₄ (g)	Oxidant Demand (g/kg)
	Rep.1	Rep. 2	Rep. 3	Average	SD			
0	8.25	8.60	8.30	8.38	0.19	0.33	0.00	0.00
1	6.05	5.90	6.70	6.22	0.43	0.24	0.08	3.36
3	6.40	6.65	6.50	6.52	0.13	0.25	0.07	2.89
7	5.60	5.95	5.80	5.78	0.18	0.23	0.10	4.03
10	5.87	6.17	5.97	6.00	0.16	0.23	0.09	3.69

Lab ID **Client ID**
Location 5: 30 g/L SB-9 20-21

Initial Concentration (g/L) 22.50
Volume of Solution (mL) 39.18
Average Mass of Soil (g) 25.25

Incubation Time (days)	Concentration of MnO ₄ (g/L)					Remaining MnO ₄ (g)	Consumed MnO ₄ (g)	Oxidant Demand (g/kg)
	Rep.1	Rep. 2	Rep. 3	Average	SD			
0	22.40	21.85	23.25	22.50	0.71	0.88	0.00	0.00
1	19.35	19.95	18.85	19.38	0.55	0.76	0.12	4.84
3	20.10	20.40	21.30	20.60	0.62	0.81	0.07	2.95
7	19.75	20.15	20.80	20.23	0.53	0.79	0.09	3.52
10	20.00	20.92	20.92	20.61	0.53	0.81	0.07	2.93

Notes:

- g - grams
- g/kg - grams of MnO₄ per kilogram of soil
- g/L - grams of MnO₄ per liter
- MnO₄ - permanganate
- mg - milligram
- mL - milliliter
- SD - standard deviation
- ST - soil treatment