Prepared for

Hopyard Cleaners
2771 Hopyard Road
Pleasanton, California 94612

FIRST QUARTER 2009 GROUNDWATER AND SVE MONITORING REPORT

HOPYARD CLEANERS
2771 Hopyard Road
Pleasanton, California
Self- Monitoring Program No. R2-2006-0059

Prepared by

Geosyntec consultants

engineers | scientists | innovators

475 14th Street, Suite 400
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Project Number: WR0574

30 April 2009

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1. INTRODUCTION

On behalf of the property owner, Ms. Clare Leung, Geosyntec Consultants (Geosyntec) prepared this first quarter 2009 groundwater and soil vapor extraction (SVE) monitoring report for Hopyard Cleaners located at 2771 Hopyard Road, in Pleasanton, California (the "Site"). A Site location map is provided in Figure 1. The work described in this report was performed in compliance with the California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB) Order No. R2-2008-0032, issued on 29 May 2008.

1.1 Monitoring Well Network

The Site monitoring well network consists of seven wells (MW-1 through MW-7). For discussion purposes, the uppermost groundwater zone beneath the Site, which occurs from approximately 20 to 35 feet below ground surface (feet bgs), is referred to as the A Zone, and the deeper groundwater from approximately 40 to 60 feet bgs is referred to as the B Zone. Wells MW-1 through MW-4 are screened in the A Zone, and wells MW-5 through MW-7 are screened in the B Zone. B Zone wells MW-6 and MW-7 were installed in August 2008 and were monitored for the first time in the fourth quarter of 2008. Well completion details are summarized in Table 1. Well locations relative to the Site are shown on Figure 2.

1.2 SVE System

The SVE system was installed at the Site in August 2008 with five SVE wells (SVE-1 through SVE-5) located inside Hopyard Cleaners. Geosyntec conducted a pilot test of the SVE system on 19 and 21 August 2008. The SVE system installation, pilot test, and start-up were documented in the *SVE System Installation and Pilot Test Report*, which was submitted to the RWQCB on 29 September 2008. The full-scale SVE operations began on 21 August 2008. An *Addendum to the SVE System Installation and Pilot Test Report*, which included quarterly SVE influent volatile organic compounds (VOC) analysis and recommendations and conclusions, was submitted to the RWQCB on 1 December 2008. The *SVE System Installation and Pilot Test Report* and the *Addendum to the SVE System Installation and Pilot Test Report* was approved by the RWQCB on 9 December 2008. The SVE system layout is shown on Figure 2.

1.3 Work Performed This Quarter (First Quarter 2009)

The following work was performed in the first quarter of 2009:

- The first quarter groundwater monitoring event was performed on 26 January 2009 using passive diffusion bag (PDB) samplers. This work is discussed in detail in this report.
- SVE monitoring was conducted on 6 January, 21 January, 5 February, 19 February, 26 February, and 12 March 2009. This work is also discussed in detail in this report.
- On 26 January 2009, additional soil oxidant demand (SOD) soil samples were collected as detailed in the *Remedial Action Plan Addendum: Comprehensive Feasibility Study for ISCO & EISB* dated 24 November 2008. Results of the additional SOD sampling were submitted to the RWQCB on 16 March 2009 in a report titled *Results of Additional Soil Oxidant Demand Characterization.*
- On 26 January 2009, soil and groundwater samples were also collected for the enhanced in situ bioremediation (EISB) feasibility study. The EISB treatability study commenced on 9 February 2009 and is scheduled to be completed in by August 2009. Results of the groundwater Gene-Trac and anion analyses and preliminary treatability study results are presented in Section 5 of this report.

2. QUARTERLY GROUNDWATER MONITORING

Quarterly groundwater monitoring was performed at the Site on 26 January 2009. PDBs were used to collect samples from MW-1 through MW-7. A study to test the appropriateness of using PDBs was proposed in the *Results of Fourth Quarter 2007 Groundwater Monitoring* report submitted to the RWQCB on 31 January 2008[1] and was verbally approved by the RWQCB in a conference call on 12 March 2008. The PDB study was completed in the first and second quarters 2008. In general, the results of the study showed that cis-1,2-dichloroethene (cis-1,2-DCE), tetrachloroethene (PCE), and trichloroethene (TCE) concentrations were slightly higher in samples collected from PDBs compared to samples collected using a submersible pump. Sample results reported as non-detect using the conventional sampling method were also non-detect using the PDB sampling method. These results indicate that PDB samplers are an appropriate and reliable method of monitoring VOCs at this Site. Therefore, PDBs have replaced sampling via peristaltic pump starting in the third quarter 2008.

2.1 Sampling and Analytical Procedures

The groundwater sampling fieldwork was performed by Environmental Sampling Services, Inc. (ESS), of Martinez, California. ESS's report, including field procedures and sampling logs, is provided in Appendix A.

The PDBs were deployed on 10 December 2008, during the fourth quarter 2008 monitoring event, in monitoring wells MW-1 through MW-5. A stratification study was conducted on MW-6 and MW-7 during the fourth quarter 2008. Results of the stratification study indicated that stratification did not occur in either well, and PDBs were deployed in the middle of the well screens on 6 January 2009 in MW-6 and MW-7.

On 26 January 2009, the PDBs were removed from the wells and sampled. Samples were hand-delivered to Test America of Pleasanton, California, for analysis.

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[1] Geosyntec Consultants, 2008. *Results of the Fourth Quarter 2007 Groundwater Monitoring, Hopyard Cleaners, 2771 Hopyard Road, Pleasanton, California, Self-Monitoring Program No. R2-2006-0059,* 31 January 2008.

Groundwater samples from the Site monitoring wells were analyzed for VOCs by EPA Method 8260B. New PDBs for the second quarter 2009 sampling event were deployed in wells MW-1 through MW-7 on 26 January 2009 after the first quarter 2009 monitoring event was completed.

2.2 Groundwater Elevations and Flow Conditions

Table 2 summarizes groundwater elevations measured during this and previous sampling events. During the first quarter 2009, groundwater in the A Zone (MW-1 through MW-4) beneath the Site was encountered between 16.17 and 17.86 feet bgs, which is between 308.41 and 309.52 feet above Mean Sea Level (MSL). Groundwater in the B Zone was encountered between 28.10 and 30.61 feet bgs, which corresponds to groundwater elevations ranging from 296.36 to 296.58 feet MSL.

Water levels measured during the first quarter 2009 event were used to construct groundwater elevation contours for the A Zone and B Zone, as shown in Figure 3 and 4, respectively. Table 3 summarizes groundwater gradients and flow directions for this and previous monitoring events. The first quarter 2009 A Zone groundwater contours indicate a general groundwater flow to the west-northwest with an average gradient of 0.0045 feet per feet (ft/ft) (23.8 feet per mile (ft/mi)). This gradient and flow direction is consistent with previous monitoring events, as shown on Table 3. The B Zone groundwater contours indicate general groundwater flow to the southwest under a gradient of approximately 0.0012 ft/ft (6.4 ft/mi), consistent with the fourth quarter 2008 monitoring event.

Groundwater elevations over time are shown on Figure 5. Groundwater in the A Zone monitoring wells has fluctuated from 308.8 to 314.6 feet MSL since monitoring began in November 2006. Groundwater elevations in the B Zone are lower than those measured in the A Zone, with elevations ranging from 293.3 to 307.4 feet MSL. Both the A Zone and B Zone groundwater elevations tend to fluctuate seasonally with higher elevations during the winter and spring and lower elevations in the summary and fall.

2.3 Data QA/QC

Geosyntec performed a quality assurance/quality control (QA/QC) review of the analytical data. Data were reviewed for completeness, accuracy, precision, sample

contamination, conformance with holding times, and detection limits within acceptable ranges. Based on this review, the data are acceptable.

2.4 Analytical Results

Laboratory analytical reports are provided in Appendix B. Table 4 summarizes analytical results for groundwater samples collected during the first quarter 2009 event together with historical results. Analytical results for the current sampling event are also shown on Figures 3 and 4 for the A Zone and B Zone, respectively. Isoconcentration contour maps for PCE and TCE are shown on Figures 6 through 8. The isoconcentration contours were drawn using current data from monitoring wells along with results from grab groundwater samples previously collected at the Site. Results are summarized by zone, as follows:

2.4.1 A Zone Wells: MW-1 through MW-4

Analytical results for samples taken from the four A Zone monitoring wells show the highest VOC concentrations at MW-2. During the first quarter 2009, the PCE concentration in both the original and duplicate samples collected from MW-2 was 12,000 micrograms per liter (µg/L). The 12,000 µg/L result is within the range of historical PCE concentrations at MW-2, which have ranged from 4,700 to 15,000 µg/L. VOC concentrations observed during the first quarter 2009 in the other A Zone wells (MW-1, MW-3, and MW-4) were consistent with historical results.

2.4.2 B Zone Wells: MW-5 through MW-7

PCE is the only VOC detected in the B Zone groundwater. The highest detection of PCE was at the closest B Zone monitoring well to the Site, MW-5, and was at a concentration of 37 µg/L. Farther downgradient of the Site, PCE was detected at MW-7 at 9.9 µg/L and was not detected at MW-6.

2.5 Results Discussion

A time series of PCE and TCE concentration in monitoring wells that have been monitored for more than four quarters are shown on Figure 9. The highest concentrations of PCE and TCE have historically been detected in A Zone monitoring well MW-2, which shows a slight increasing trend over the past year. PCE and TCE

concentrations in the other A Zone wells MW-1, MW-3, and MW-4, and in B Zone well MW-5 are stable or declining.

As shown on Figure 10, concentrations in MW-2 tend to fluctuate inversely with groundwater elevations measured in this well. The highest PCE concentration of 15,000 µg/L corresponded to the lowest groundwater elevation observed at this well.

3. SVE SYSTEM MONITORING AND PERFORMANCE EVALUATION

The SVE system was installed at the Site in August 2008 with five SVE wells (SVE-1 through SVE-5) located inside Hopyard Cleaners. The full-scale SVE operations began on 21 August 2008. Startup monitoring of the SVE system was performed on day 1 through 5, day 7, and day 9 of system startup to evaluate system performance and air emissions for the Bay Area Air Quality Management District Permit to Operate (BAAQMD PTO). Monitoring was performed weekly for the first month and monthly, at a minimum, thereafter. During the first quarter 2009, Geosyntec conducted the system monitoring on 6 January, 21 January, 5 February, 19 February, 26 February, and 12 March 2009. The SVE system layout is shown on Figure 2. The SVE well locations and piping layout inside the dry cleaners is shown on Figure 11.

3.1 SVE Monitoring Procedures

SVE monitoring includes the following procedures:

- Perform photoionization detector (PID) screening via Tedlar® bags of:
  - Samples collected from the system influent, mid-point between the two granular activated carbon (GAC) vessels, and the system effluent, and
  - Samples collected at each SVE wellhead.
- Record vacuum response at each SVE wellhead;
- Record flow rate and vacuum response at the manifold;
- Record vacuum, temperature, and flow rate readings at system influent;
- Record hour meter;
- Inspect the moisture separator water level and drain into 55-gallon drums, if necessary; and
- Record the electrical meter reading.

As discussed in the *SVE System Installation and Pilot Test Report* and subsequent *Addendum SVE System Installation and Pilot Test Report*, influent SVE samples were collected in 1-liter Summa canisters for laboratory analysis by TO-15 during start-up testing and on a quarterly basis to correlate VOC concentrations with PID readings.

3.2 SVE Operation, Monitoring, and Maintenance

The system performance monitoring results are presented in Table 5. The laboratory analytical results for the SVE influent samples are summarized in Table 6 and the laboratory analytical reports are provided in Appendix B. The individual SVE well monitoring results are shown in Table 7.

The system was operated continuously 24 hours a day from the startup on 21 August 2008 through 2 September 2009, except for an approximately 2-hour time period on 29 August 2008 when the blower shut-off switch was tripped. Even though measures were taken to reduce the noise from the system blower, Geosyntec received complaints regarding the noise at night from residents in the vicinity of the dry cleaners (both across Hopyard Road and Valley Road). Therefore, on 3 September 2008, the SVE system was modified to run 14 hours a day from 8 am to 10 pm.

The PID readings measured from the wellheads after the startup and during the fourth quarter 2008 indicated that SVE-3 and SVE-5 were not as productive as SVE-1, SVE-2, and SVE-4, as shown in Table 7. In order to optimize the SVE system performance and efficiency, cycling of the SVE wells was started on 6 January 2009. The following operations and maintenance activities were performed during the first quarter 2009:

- **6 January 2009** – the low-yield SVE wells (SVE-3 and SVE-5) were turned off.
- **21 January 2009 –** SVE system monitoring was conducted before SVE-3 and SVE-5 were turned back on and the other three wells (SVE-1, SVE-2, and SVE-4) were turned off. SVE system monitoring was conducted again approximately 30 minutes after wells were cycled, as shown on Table 5.
- **5 February 2009** – SVE system monitoring was conducted before SVE-3 and SVE-5 were turned off and SVE-1, SVE-2, and SVE-4 were turned back on. SVE system monitoring was conducted again approximately 30 minutes after wells were cycled.
- **19 February 2009 –** SVE system monitoring was conducted before SVE-3 and SVE-5 were turned back on and the other three wells (SVE-1, SVE-2, and SVE-4) were turned off. SVE system monitoring was conducted again approximately 30 minutes after wells were cycled.
- **26 February 2009 to End of First Quarter 2009** – SVE system monitoring was conducted on 26 February 2009. Based on influent SVE concentrations

(0 µg/m^3 as PCE) on 19 and 26 February 2009, all five SVE wells were then turned on for only 2 hours per day (8 am to 10 am). On 12 March 2009, system monitoring was conducted again, and the influent SVE concentration was measured at 1,097 µg/m^3.

Due to the anomalously high mid-point and effluent concentrations observed during the 5 February 2009 SVE system monitoring, the blower was moved in front of the carbon vessels in the treatment process by Mako on 19 February 2009. The blower increases the temperature of the extracted vapor and therefore decreases the amount of water vapor that condenses in the carbon vessels, resulting in increased efficiency of the carbon. Since the carbon must remain below 120 degrees Fahrenheit, the recirculation valve on the system was opened to control the temperature. Monitoring of the temperature immediately before the carbon vessels was added to the system monitoring program, as shown in Table 5.

3.3 SVE Performance Evaluation

Influent concentrations of VOCs into the SVE system in the first quarter 2009 have ranged from 0 to 4,830 micrograms per cubic meter (µg/m^3) as equivalent PCE (0.0 to 0.7 parts per million by volume [ppmv]) with the highest concentrations detected at the beginning of cycling the SVE wells (Table 5 and Figure 12). During the first quarter 2009, the average influent VOCs concentration was 1,345 µg/m^3 as equivalent PCE (0.240 ppmv). After seven months of operations, the SVE system has removed a total of approximately 9.4 pounds (lbs) (0.69 gallons) of VOCs as equivalent PCE (Table 5 and Figure 13).

The laboratory analytical results indicate that PCE is the primary COC being removed from the target remediation zone, as shown on Table 6 and in the laboratory analytical report provided in Appendix B. The PID reading of the sample collected on 21 August 2008 was significantly higher than the analytical result due to the time lapse between the PID measurement and sample collection. The laboratory samples collected on 2 September 2008, 5 December 2008, and 12 March 2009 were collected right after the PID measurements and the analytical results indicate similar VOC concentrations.

Figure 14 presents the time concentration plots of PCE and TCE influent concentrations at the SVE system. The PCE concentrations decreased from 24,000 µg/m^3 on 21 August 2008, to 8,500 µg/m^3 on 2 September 2008, to 2,300 µg/m^3 on 5 December 2008, and to 1,700 µg/m^3 on 12 March 2009, approaching the soil gas clean up standard of 1,400

$\mu g/m^3$. Similarly, TCE concentrations have remained below the soil gas cleanup standard of 4,100 $\mu g/m^3$ and have decreased from 280 $\mu g/m^3$ on 21 August 2008 to 160 $\mu g/m^3$ on 2 September 2008, to 64 $\mu g/m^3$ on 5 December 2008, and to 36 $\mu g/m^3$ on 12 March 2009. The decreasing trend of PCE and TCE concentrations shows that the SVE system has been effective at removing the COCs from the subsurface.

Table 7 presents the PID screening results of the SVE wells. Cycling of the wells demonstrates the potential rebound effects. However, after two months of cycling, the rebound effects have significantly decreased. As of 12 March 2009, all wellhead PID screening results are below the soil gas cleanup standards for PCE (1,400 $\mu g/m^3$) except for SVE-2 (1,780 $\mu g/m^3$).

The SVE system operation time was increased to 4 hours a day (8 am to 12 pm) on 10 April 2009 with all five SVE wells turned on. The system will be operated in this configuration during the second quarter 2009 and the system performance will be evaluated and reported in the second quarter 2009 monitoring report.

4. SOD RESULTS SUMMARY

In order to evaluate in situ chemical oxidation (ISCO) as a remedial option for the Site, the soil oxidant demand (SOD) at the Site was evaluated to estimate the amount of permanganate that would be required. The Soil Oxidant Demand Characterization Work Plan (Work Plan) was submitted to the RWQCB on 30 June 2008 and approved verbally by the RWQCB on 13 August 2008 during a teleconference and in a letter on 22 August 2008. Geosyntec collected soil samples for SOD analyses in August 2008, and the results were reported in the *Remedial Action Plan Addendum: Comprehensive Feasibility Study for ISCO & EISB* (RAP Addendum) dated 24 November 2009. The results indicated that the ISCO with MNA remedy may not be the most effective remedy to treat the groundwater due to the high SOD detected at the Site.

To confirm the SOD results, additional SOD characterization was proposed, along with an EISB feasibility study, in the RAP Addendum. Additional characterization included collecting samples from two additional locations at three depths. The samples were collected on 26 January 2009, and the results are discussed below.

4.1 SOD Results

Sampling procedures and analytical methods were detailed in the *Results of Additional Soil Oxidant Demand Characterization* submitted to the RWQCB on 16 March 2009. Results are shown on Table 8 and are summarized as follows:

- Soil properties for the samples collected near MW-2 (SOD-1) are consistent between the three sample depths with an average bulk density of 96.7 pounds per cubic feet (lb/ft3) and an average porosity of 44.3%.

- In the vicinity of MW-2, the average foc at SOD-2 is consistent with the average foc at SOD-1. The average focs were 1.07% and 0.99%, respectively.

- The average foc at SOD-3, near MW-1, was 0.66%, which is lower than the foc near MW-2.

In the vicinity of MW-2, the permanganate SOD ranged from 5.19 to 23.92 grams of permanganate per kilogram of soil (g/kg). The highest oxidant demand between was

observed from 21 to 22 ft bgs at 23.92 g/kg. This corresponds to a potassium permanganate demand of 31.78 g/kg.

In the vicinity of MW-1, the SOD at each depth was similar and overall lower than the SODs observed near MW-2. The permanganate SOD at SOD-3 ranged from 4.27 to 5.59 g/kg, which corresponds to a potassium permanganate SOD of 5.67 to 7.43 g/kg.

4.2 Permanganate Requirements for A Zone Groundwater Remediation

Table 9 presents the estimated amount of permanganate, along with estimated injection volumes and times, required to treat shallow groundwater, using the soil analytical results and PCE and TCE concentrations detected at the Site. Because of the high reactivity and short reaction time of the oxidants, an ample amount of oxidant is needed to, not only meet the soil oxidant demand, but to react with the COCs. The bold columns on Table 9 highlight a most conservative ISCO design needed to achieve oxidation of the contaminants at the Site.

Due to the estimated high permanganate requirements to treat A Zone groundwater at the Site, the SOD characterization shows that ISCO with monitored natural attenuation (MNA) may not be the most effective remedy. ISCO with MNA will be evaluated in comparison to EISB with MNA at that time and will be reported along with the EISB with MNA evaluation to the RWQCB by 30 September 2009.

5. EISB FEASIBILITY STUDY PRELIMINARY RESULTS

As detailed in the *Remedial Action Plan Addendum: Comprehensive Feasibility Study for ISCO & EISB* dated 24 November 2008, soil and groundwater samples were collected on 26 January 2009 for the enhanced in situ bioremediation (EISB) feasibility study in order to conduct the following:

(1) A groundwater geochemistry and microbiology evaluation of the Site's ability to support reductive dechlorination; and

(2) A treatability study to assess the potential for EISB treatment of VOCs in A Zone groundwater at the Site.

Sample collection, analytical methods, and preliminary results are summarized in the following sections.

5.1 Background on Reductive Dechlorination

The dominant PCE biodegradation mechanism in groundwater environments is reductive dechlorination, which involves the sequential replacement of chlorine atoms on the alkene molecule with hydrogen atoms. Under reducing conditions, PCE serves as an electron acceptor and is dechlorinated via TCE, to cis-1,2-DCE, to vinyl chloride (VC) and then to ethene. Hydrogen, typically produced during the bacterial metabolism of simple organic carbon compounds such as alcohols, organic acids, sugars or edible oils, serves as the electron donor in the dechlorination reactions.

5.2 Groundwater Sample Collection and Analyses

ESS collected groundwater samples using a peristaltic pump, and Enprob Environmental Probing of Oroville, California, collected soil samples using a direct push drilling rig. Groundwater samplescollected from MW-1, MW-2, and MW-3 were analyzed for the following:

- VOCs by EPA Method 8260B by Test America;
- Anions, including nitrate, nitrite, sulfate, and chloride by EPA Method 300.0 by Test America; and

- Gene-Trac Testing for *Dehalococcoides* and vinyl-chloride reductase by SiREM Laboratory of Guelph, Ontario, Canada (SiREM).

5.3 EISB Treatability Study Procedures

The EISB treatability study is being conducted by SiREM. The study includes anaerobic treatments constructed to estimate the rate and extent of reductive dechlorination achievable at the Site by indigenous microbial populations under existing Site conditions (intrinsic control) and through the addition of two electron donors (biostimulation). The impact of biostimulation and the additional dechlorination microorganisms (bioaugmentation) is assessed through the addition of a commercial bioaugmentation culture (KB-1®).

Using the soil samples collected near MW-2 and groundwater samples collected from MW-2, six treatment and control microcosms were constructed by filling 250-milliter (mL) glass bottles with approximately 150 to 200 mL of Site groundwater and 60 grams of Site soil, leaving nominal headspace for gas production (i.e. ethene, carbon dioxide, and methane). The microcosms were constructed in a disposable anaerobic glove bag and will be stored in an anaerobic chamber. One replicate of each treatment was amended with resazurin, which turns pink when exposed to oxygen, in order to monitor redox conditions. The six treatment/control microcosms are as follows:

- One anaerobic sterile control, which was amended with mercuric chloride and sodium azide;

- One anaerobic intrinsic control, which was unamended and used to measure intrinsic biodegradation;

- Two electron donor treatments, which were amended with two different electron donors (one amended with lactate and one with a commercial emulsified vegetable oil (EVO) called Newman Zone®); and

- Two electron donor and bioaugmented treatments, which were amended with the two electron donors (one with lactate and one with EVO) and KB-1® to assess the ability of these bacteria to promote or accelerate complete dechlorination.

The incubation of the treatability study microcosms started on 9 February 2009. Samples were collected from the control and treatment microcosms and were analyzed for VOCs and dissolved hydrocarbon gases (i.e. ethene, ethane, and methane). Samples from the electron donor amended microcosms were also analyzed for volatile fatty acids analyses (i.e. lactate, acetate, and propionate). Other analyses include the measurement of pH and anions.

5.4 Preliminary Results

Results of the Gene-Trac analyses and anion analysis are summarized in Table 10 and the laboratory analytical reports are included in Appendix C. Preliminary treatability study results are shown on Figure 15.

5.4.1 Current Site Conditions

The detections of TCE and cis-1,2-DCE in samples collected from groundwater monitoring wells at the Site are at relatively low concentrations compared to PCE concentrations, as shown on Table 4. This implies that some limited intrinsic reductive dechlorination is occurring at the Site. The lack of vinyl chloride detections at the Site indicate that reductive dechlorination may be stalling at cis-1,2-DCE.

As shown in Table 10, the high oxidation reduction potential (ORP) (63.5 to 150.6 millivolts), low dissolved oxygen (DO) concentrations (0.12 to 0.24 mg/L), and the presence of nitrate and sulfate in groundwater indicate that the Site A Zone groundwater is currently not under the strong reducing conditions.

Gene-Trac testing for microbial populations native to the Site show that *Dehalococcoides* species are detected at a moderate concentrations which may, or may not, be associated with observable dechlorination. Vinyl chloride reductase gene, which is capable of producing enzymes that break down vinyl chloride, was detected at extremely low concentrations at or below the sample specific quantitation limit. The results on the Gene-Trac testing explains the stall in reductive dechlorination at cis-1,2-DCE under the current Site conditions.

5.4.2 Treatability Study

The treatability study was started on 9 February 2009. Samples were taken on 9 February (Day 0), 23 February (Day 14), and 9 March 2009 (Day 28) from the anaerobic sterile control microcosm and the anaerobic intrinsic control microcosms. As

shown on Figure 15, on Day 28, the PCE and TCE concentrations in the anaerobic sterile control microcosm decreased by 9 percent and 16 percent, respectively. The PCE concentration in the anaerobic intrinsic control microcosm decreased 37 percent and the TCE concentrations increased 15 percent, indicating some intrinsic biodegradation.

In the two electron donor treatment studies, samples were taken on 9 February (Day 0), 23 February (Day 14), 9 March (Day 28), and 23 March 2009 (Day 42). As shown on Figure 14, dechlorination of PCE and TCE to cis-1,2,-DCE was rapid following amendment with both electron donors, but stalled at cis-1,2-DCE with little or no production of vinyl chloride or ethene.

In the bioaugmented treatability studies, samples were taken on 9 February (Day 0), 23 February (Day 14), 9 March (Day 28), 16 March (Day 35), 20 March (Day 39), 23 March (Day 42), 30 March 2009 (Day 49). As shown on Figure 15, complete dechlorination of PCE and TCE to ethene occurred in microcosms containing donor amendments (EVO and lactate) bioaugmented with KB-1®. Complete dechlorination occurred quickly in both bioaugmented microcosms: within 14 days in the Newman Zone® & KB-1® microcosms and within 21 days in the lactate & KB-1® microcosms. Low, transient concentrations of vinyl chloride were detected in both microcosms, with less vinyl chloride detected with EVO.

5.4.3 Discussion

The preliminary treatability results indicate that the Site is amenable to EISB with bioaugmentation. Concentrations of non-VOC electron acceptors (i.e. nitrate and sulfate) at the Site are low to moderate, and in the treatability study reducing conditions were quickly achieved as evident by the decreasing PCE concentrations in the beginning of the study. These results indicate that Site geochemistry is compatible with PCE reductive dechlorination, since other electron acceptors, such as nitrate and sulfate, are reduced quickly and large quantities of donor are not required to achieve reducing conditions optimal for PCE dechlorination.

These results will be used along with the final results of the treatability study, which will be completed by mid-August 2009, to evaluate EISB as a remedial alternative for the Site. Results of this evaluation will be submitted to the RWQCB by 30 September 2009, as indicated in the "Approval of *Remedial Action Plan Addendum: Comprehensive Feasibility Study for ISCO & EISB*, and Requirement for Report for 2771 Hopyard Road, Pleasanton, Alameda County" letter from the RWQCB dated 16 December 2008.

6. FUTURE WORK

The following work will be completed during the second quarter 2009:

- The *Revised Remedial Action Plan*, including a human health risk assessment will be submitted to the RWQCB during the second quarter 2009.
- The next quarterly groundwater monitoring event will be performed in April 2009. Results of the second quarter 2009 monitoring report will be submitted to the RWQCB by 31 July 2009.
- SVE monitoring will continue on a monthly basis at a minimum with one sample being collected for TO-15 analysis during the second quarter 2009. Results of the monitoring will be presented in the second quarter 2009 monitoring report due to the RWQCB on 31 July 2009.
- Based on the SOD confirmation sampling results, a focused ISCO application at the Site is being evaluated and the evaluation will be presented in the second quarter 2009 monitoring report will be submitted to the RWQCB by 31 July 2009.
- The EISB treatability study will continue and the results will be reported in the second quarter 2009 monitoring report will be submitted to the RWQCB by 31 July 2009.

TABLES

Table 1
Monitoring Well Construction Summary
Hopyard Cleaners
Pleasanton, California

Well I.D.	Date of Completion	Northing	Easting	TOC Elevation (MSL)	Total Depth (ft bgs)		Screen Interval Depth (ft bgs)		Well Casing Material	Well Diameter (inches)
					Borehole	Well	Top	Bottom		
A Zone Monitoring Wells										
MW-1	9/29/2006	2071427.29	6157712.24	325.77	30	30	20.00	30.00	SCH 40 PVC	2
MW-2	9/26/2006	2071357.03	6157791.18	325.69	30	30	20.00	30.00	SCH 40 PVC	2
MW-3	9/27/2006	2071461.21	6157787.94	326.27	30	30	20.00	30.00	SCH 40 PVC	2
MW-4	7/20/2007	2071382.30	6157557.57	326.27	36.5	35	25.00	35.00	SCH 40 PVC	2
B Zone Monitoring Wells										
MW-5*	7/19/2007	2071292.25	6157654.24	327.19	60	60	50.00	60.00	SCH 40 PVC	2
MW-6	8/19/2008	2071280.12	6157384.43	324.48	59	59	49.00	59.00	SCH 40 PVC	2
MW-7	8/20/2008	2071076.06	6157645.52	324.55	56	55	45.00	55.00	SCH 40 PVC	2

Notes:
ft bgs = feet below ground surface
MSL = mean sea level
TOC = Top of Casing
Elevations are based on NAVD 88 Datum
* Conductor casing was installed from 0 to 40 ft bgs.

Table 2
Groundwater Elevations
Hopyard Cleaners
Pleasanton, California

Well I.D. (Screen Interval)	TOC Elevation (ft MSL)	Sample Date	Depth to Groundwater Below TOC (ft)	Groundwater Elevation (ft MSL)
A Zone Monitoring Wells				
MW-1 (20-30 ft bgs)	325.77	1/26/2009	16.71	309.06
		12/10/2008	16.78	308.99
		7/14/2008	13.79	311.98
		5/16/2008	11.70	314.07
		2/15/2008	11.38	314.39
		1/3/2008	13.63	312.14
		8/3/2007	14.40	311.37
		5/11/2007	12.27	313.50
		2/9/2007	13.98	311.79
		11/20/2006	14.88	310.89
MW-2 (20-30 ft bgs)	325.69	1/26/2009	16.17	309.52
		12/10/2008	16.24	309.45
		7/14/2008	13.23	312.46
		5/16/2008	11.30	314.39
		2/15/2008	10.87	314.82
		1/3/2008	13.21	312.48
		8/3/2007	13.72	311.97
		5/11/2007	11.87	313.82
		2/9/2007	13.55	312.14
		11/20/2006	14.36	311.33
MW-3 (20-30 ft bgs)	326.27	1/26/2009	17.10	309.17
		12/10/2008	17.17	309.10
		7/14/2008	14.21	312.06
		5/16/2008	12.18	314.09
		2/15/2008	11.68	314.59
		1/3/2008	14.02	312.25
		8/3/2007	14.68	311.59
		5/11/2007	12.72	313.55
		2/9/2007	14.41	311.86
		11/20/2006	15.28	310.99
MW-4 (25-35 ft bgs)	326.27	1/26/2009	17.86	308.41
		12/10/2008	18.41	307.86
		7/14/2008	13.81	312.46
		5/16/2008	12.12	314.15
		2/15/2008	12.05	314.22
		1/3/2008	14.73	311.54
		8/3/2007	15.85	310.42

Table 2
Groundwater Elevations
Hopyard Cleaners
Pleasanton, California

Well I.D. (Screen Interval)	TOC Elevation (ft MSL)	Sample Date	Depth to Groundwater Below TOC (ft)	Groundwater Elevation (ft MSL)
B Zone Monitoring Wells				
MW-5 (50-60 ft bgs)	327.19	1/26/2009	30.61	296.58
		12/10/2008	33.67	293.52
		7/14/2008	32.16	295.03
		5/16/2008	23.06	304.13
		2/15/2008	19.74	307.45
		1/3/2008	22.65	304.54
		8/3/2007	30.51	296.68
MW-6 (49-59 ft bgs)	324.48	1/26/2009	28.10	296.38
		12/10/2009	31.14	293.34
MW-7 (45-55 ft bgs)	324.55	1/26/2009	28.19	296.36
		12/10/2008	31.21	293.34

Notes:
ft MSL = feet above mean sea level
TOC = Top of Casing
ft bgs = feet below ground surface
Elevations are based on NAVD 88 Datum

Table 3
Groundwater Gradient Summary
Hopyard Cleaners
Pleasanton, California

Date	Gradient		General Flow Direction
	ft/ft	ft/mi	
A Zone			
1/26/2009	0.0045	23.8	West-Northwest
12/10/2008	0.0068	36.1	West-Northwest
7/14/2008	0.0048	25.5	North
5/16/2008	0.0031	16.5	North-Northwest
2/15/2008	0.0038	20.5	Northwest
1/3/2008	0.0025	13.2	Northwest
8/3/2007	0.0070	37.0	West-Northwest
5/11/2007	0.0030	15.8	North-Northwest
2/9/2007	0.0010	5.3	North-Northwest
11/20/2006	0.0040	22.0	Northwest
B Zone			
1/26/2009	0.0012	6.4	Southwest
12/10/2008	0.0012	6.1	Southwest

Notes:
ft/ft = feet per feet
ft/mi = feet per mile

Table 4
Groundwater Analytical Summary
Hopyard Cleaners
Pleasanton, California

Well I.D. (Screen Interval)	Sample Date	Sampling Method	Volatile Organic Compounds - EPA Method 8260B (ug/L)		
			cis-1,2-DCE	PCE	TCE
A Zone Monitoring Wells					
MW-1 (20-30 ft bgs)	1/26/2009	PDB Sampler	240	1,700	320
	12/10/2008	PDB Sampler	250	1,900	350
	7/14/2008	PDB Sampler	230	1,700	250
	5/16/2008	Purge and Sample	250	1,600	280
	5/16/2008	PDB Sampler*	260	1,900	310
	2/29/2008	PDB Sampler*	330	2,000	330
	2/15/2008	Purge and Sample	230	1,400	250
	1/2/2008	Purge and Sample	230	1,600	270
	8/3/2007	Purge and Sample	260	1,600	270
	5/11/2007	Purge and Sample	310	2,500	310
	2/9/2007	Purge and Sample	270 / 270	2,400 / 2,300	290 / 290
	11/20/2006	Purge and Sample	370	3,100	370
MW-2 (20-30 ft bgs)	1/26/2009	PDB Sampler	760 / 770	12,000 / 12,000	720 / 730
	12/10/2008	PDB Sampler	840 / 770	15,000/15,000	790 / 740
	7/14/2008	PDB Sampler	820 / 830	9,500 / 8,100	530 / 500
	5/16/2008	Purge and Sample	900 / 930	5,800 / 5,900	460 / 450
	5/16/2008	PDB Sampler*	940	6,700	480
	2/29/2008	PDB Sampler*	780	5,300	360
	2/15/2008	Purge and Sample	690 / 690	4,100 / 4,000	320 / 300
	1/2/2008	Purge and Sample	940 / 890	8,200 / 8,200	560 / 580
	8/3/2007	Purge and Sample	1,200 / 1,100	8,000 / 8,100	590 / 570
	5/11/2007	Purge and Sample	1,000 / 980	7,200 / 7,300	490 / 450
	2/9/2007	Purge and Sample	760	4,700	350
	11/20/2006	Purge and Sample	800 / 800	5,700 / 5,800	370 / 360
MW-3 (20-30 ft bgs)	1/26/2009	PDB Sampler	4.6	42	4.7
	12/10/2008	PDB Sampler	5.6	60	5.5
	7/14/2008	PDB Sampler	4.3	43	4.0
	5/16/2008	Purge and Sample	5.0	39	4.3
	5/16/2008	PDB Sampler*	5.4	46	4.4
	2/29/2008	PDB Sampler*	6.9	58	5.9
	2/15/2008	Purge and Sample	6.2	44	5.1
	1/2/2008	Purge and Sample	5.2	46	4.6
	8/3/2007	Purge and Sample	4.7	37	4.2
	5/11/2007	Purge and Sample	5.5	43	4.4
	2/9/2007	Purge and Sample	5.3	42	4.2
	11/20/2006	Purge and Sample	9.5	93	7.2

Table 4
Groundwater Analytical Summary
Hopyard Cleaners
Pleasanton, California

Well I.D. (Screen Interval)	Sample Date	Sampling Method	Volatile Organic Compounds - EPA Method 8260B (ug/L)		
			cis-1,2-DCE	PCE	TCE
MW-4 (25-35 ft bgs)	1/26/2009	PDB Sampler	4.3	<0.50	4.9
	12/10/2008	PDB Sampler	4.0	<0.50	3.7
	7/14/2008	PDB Sampler	4.7	<0.50	4.0
	5/16/2008	Purge and Sample	3.7	<0.50	2.6
	5/16/2008	PDB Sampler*	3.6	<0.50	2.7
	2/29/2008	PDB Sampler*	3.4	<0.50	3.0
	2/15/2008	Purge and Sample	4.2	<0.50	4.0
	1/3/2008	Purge and Sample	4.2	<0.50	3.5
	8/3/2007	Purge and Sample	4.6	<0.50	3.5
B Zone Monitoring Wells					
MW-5 (50-60 ft bgs)	1/26/2009	PDB Sampler	<0.50	37	<0.50
	12/10/2008	PDB Sampler	<0.50	49	<0.50
	7/14/2008	PDB Sampler	<0.50	31	<0.50
	5/16/2008	Purge and Sample	<0.50	24	<0.50
	5/16/2008	PDB Sampler*	<0.50	34	<0.50
	2/29/2008	PDB Sampler (52.5 ft bgs)*	<0.50	41	<0.50
	2/29/2008	PDB Sampler (57.5 ft bgs)*	<0.50	33	<0.50
	2/15/2008	Purge and Sample	<0.50	26	<0.50
	1/3/2008	Purge and Sample	<0.50	38	<0.50
	8/3/2007	Purge and Sample	<0.50	37	<0.50
MW-6 (49-59 ft bgs)	1/26/2009	PDB Sampler	<0.50	<0.50	<0.50
	12/10/2008	PDB Sampler (51.5 ft bgs)*	<0.50	<0.50	<0.50
	12/10/2008	PDB Sampler (56.5 ft bgs)*	<0.50	<0.50	<0.50
MW-7 (45-55 ft bgs)	1/26/2009	PDB Sampler	<0.50	9.9	<0.50
	12/10/2008	PDB Sampler (47.5 ft bgs)*	<0.50	9.8	<0.50
	12/10/2008	PDB Sampler (52.5 ft bgs)*	<0.50	10	<0.50

Notes:

Table shows only compounds detected above the laboratory reporting limit.

cis-1,2-DCE = cis-1,2-dichloroethene

PCE = tetrachloroethene

TCE = trichloroethene

"-- / --" = result on right represents duplicate sample

ft bgs = feet below ground surface

PDB = Passive Diffusion Bag Sampler

* Samples collected as part of the PDB comparison study. PDBs were deployed at two depths in the following wells to evaluate stratification: at 52.5 and 57.5 ft bgs in MW-5 for the 1st Quarter 2008 event, at 51.5 and 56.5 ft bgs in MW-6 for the 4th Quarter 2008 event, and at 47.5 and 52.5 ft bgs in MW-7 for the 4th Quarter 2008 event.

Table 5
SVE System Performance Monitoring Results
Hopyard Cleaners
2771 Hopyard Road, Pleasanton, California

	SYSTEM MEASUREMENTS									MASS REMOVAL CALCULATIONS								
Sample Date	Time	Operation Time (Hour)	Influent Flow Rate (ft/min)	System Temp. (^oF)	Influent Vacuum (in Hg)	Influent Conc. (ug/m^3)	Mid-Point Conc. (ug/m^3)	Effluent Conc. (ug/m^3)	Temp. Before GAC Vessels (^oF)*	Vacuum (in water)	Flowrate (cfm)	Flowrate (scfm)	Total Operation Time (hr)	PCE Conc. (mg/m^3)	Mass Removal Rate (lbs/hr)	Mass Removal Rate (lbs/day)	Mass Removed Since Last Sampling Event (lbs)	Cumulative Mass Removal (lbs)
21-Aug-08	9:15	7,569.2	--	--	10.0	89,700	1,380	690	--	136	--	--	--	89.7	--	--	0.00	0.00
22-Aug-08	9:25	7,593.3	4,590	83.5	10.0	37,950	2,070	0.0	--	136	210.54	136.22	24.17	38.0	0.0326	0.7817	0.79	0.79
23-Aug-08	10:00	7,618.0	4,690	78.3	9.5	4,830	1,380	690	--	129	215.13	144.06	48.75	4.8	0.0115	0.2770	0.28	1.07
24-Aug-08	14:02	7,646.0	4,550	79.5	10.0	6,210	2,070	0.0	--	136	208.71	136.04	76.78	6.2	0.0028	0.0675	0.08	1.15
25-Aug-08	16:22	7,672.4	4,450	87.2	10.0	7,590	2,070	690	--	136	204.12	131.17	103.12	7.6	0.0034	0.0814	0.09	1.24
27-Aug-08	8:14	7,712.1	4,520	74.0	10.0	45,540	690	0.0	--	136	207.33	136.53	142.98	45.5	0.0136	0.3261	0.54	1.78
29-Aug-08	8:02	7,757.7	4,380	77.9	9.5	12,420	--	--	--	129	200.91	134.64	190.78	12.4	0.0146	0.3508	0.70	2.48
2-Sep-08	9:14	7,853.3	4,250	77.5	10.0	12,420	690	0.0	--	136	194.95	127.54	287.98	12.4	0.0059	0.1424	0.58	3.06
8-Sep-08	8:40	7,996.2	4,290	76.8	8.5	14,490	690	0.0	--	116	196.78	138.60	379.14	14.5	0.0070	0.1677	0.64	3.69
18-Sep-08	10:40	8,238.2	4,300	79.0	8.0	4,830	0.0	0.0	--	109	197.24	141.59	520.31	4.8	0.0051	0.1230	0.72	4.42
8-Oct-08	10:00	8,715.1	4,300	83.8	8.0	5,520	0.0	0.0	--	109	197.24	140.34	799.92	5.5	0.0027	0.0653	0.76	5.18
17-Nov-08	9:30	9,675.1	4,300	66	8.0	6,210	0.0	0.0	--	109	197.24	145.09	1359.63	6.2	0.0032	0.0765	1.78	6.96
5-Dec-08	9:26	10,107.1	4,775	49.8	8.0	4,830	1,380	0.0	--	109	219.03	166.23	1611.59	4.8	0.0034	0.0825	0.87	7.83
6-Jan-09	9:10	10,847.7	4,610	53.5	7.5	1,380	0.0	0.0	--	102	211.46	162.96	2059.43	1.4	0.0019	0.0455	0.85	8.68
21-Jan-09	8:25	11,233.5	4,490	51.8	9.0	4,830	3,450	690	--	122	205.95	148.60	2268.99	4.8	0.0017	0.0415	0.36	9.04
21-Jan-09	15:30	11,240.5	3,445	67.8	10.5	3,450	2,070	2,070	--	143	158.02	102.64	2273.13	3.5	0.0016	0.0382	0.01	9.04
5-Feb-09	9:05	11,562.4	4,130	56.6	10.0	6,900**	5,520**	690**	--	136	189.44	128.95	2479.38	6.9**	0.0008	0.0200	0.17	9.22
5-Feb-09	10:30	11,563.8	4,470	59.1	10.0	154,600**	93,840**	104,880**	--	136	205.04	138.90	2480.21	154.56**	0.0009	0.0215	0.00	9.22
19-Feb-09	8:42	11,898.0	4,440	55.1	9.0	0.0	0.0	0.0	--	122	203.66	146.01	2675.16	0.0	0.0009	0.0226	0.18	9.40
19-Feb-09	12:00	11,899.7	3,110	63.8	10.0	0.0	0.0	0.0	102.3	136	142.65	95.77	2675.20	0.0	0.0000	0.0000	0.00	9.40
26-Feb-09	9:15	12,064.9	3,150	60.3	9.0	0.0	0.0	0.0	97.4	122	144.49	102.55	2771.60	0.0	0.0000	0.0000	0.00	9.40
26-Feb-09	10:07	12,068.8	3,500	60.9	8.0	0.0	0.0	0.0	94.8	109	160.54	119.25	2772.10	0.0	0.0000	0.0000	0.00	9.40
12-Mar-09	9:40	12,400.3	3,650	56.1	7.0	1,097	0.0	0.0	77.4	95	167.42	131.24	2800.06	1.1	0.0003	0.0065	0.01	9.41

Notes/Assumptions:

1. Inlet pipe diameter is 3".
2. SVE operations were reduced from 24 hours per day to 14 hours (8 am to 10 pm) per day on 3 September 2008. SVE operations were reduced to 2 hours (8 am to 10 am) per day on 26 February 2009.
3. Vapor density of PCE is estimated to be 6,900 g/m3 at 20C.
4. SCFM(at 14.7psia and 68°F) = CFM x([(Pg + Patm)/(Patm)] x [(68 +460)/(Tact +460)])
5. Concentrations and mass removal calculated as mass of PCE.

* On 19 February 2009, the blower was moved in front of the carbon vessels in the treatment process. Temperature measurement were collected before carbon vessels to confirm that vapor temperatures are below 120 prior to entering the carbon vessels.
** PID readings from 5 February 2009 were anomolously high, indicating possible instrumentation error. To be conservative, these influent concentrations were not included in mass removal calculations.
ft/min = feet per minute
ug/m^3 = micrograms per cubic meter
^oF = degrees fahrenheit
in Hg = inches mercury
in water = inches water
cfm = cubic feet per minute
scfm = standard cubic feet per minute
hr = hour
mg/m^3 = milligrams per cubic meter
yr = year
lbs = pounds

Table 6
SVE Influent Sample Analytical Summary
Hopyard Cleaners
Pleasanton, California

VOC	Sample Date							
	21-Aug-08		2-Sep-08		5-Dec-08		12-Mar-09	
units	**ppmv**	**ug/m^3**	**ppmv**	**ug/m^3**	**ppmv**	**ug/m^3**	**ppmv**	**ug/m^3**
PCE	3.600	24,000	1.200	8,500	0.340	2,300	0.250	1,700
TCE	0.051	280	0.029	160	0.012	64	0.0068	36
Other[1]	0.022	66	0.0075	22	0.043	112.6	0.0134	35.1
Total VOCs	*3.651*	*24,346*	*1.237*	*8,682*	*0.395*	*2,476.6*	*0.270*	*1,771.1*
Influent PID Reading[2]	*13.8*	*95,220*	*1.8*	*12,420*	*0.7*	*4,830*	*0.159*	*1,097*

Notes:

Table shows only compounds detected above the laboratory reporting limit

VOC - Volatile Organic Compound; analyzed by TO-15

ppmv - parts per million by volume

ug/m^3 - micrograms per cubic meter

cis-1,2-DCE - cis-1,2-dichloroethene

PCE - tetrachloroethene

TCE - trichloroethene

PID - Photoionization Detector

(1) Tetrahydrofuran was detected at a concentration of 0.022 ppmv on 21 August 2008; 2-butanone was detected at a concentration of 0.0075 ppmv on 2 September 2008; freon 12 was detected at a concentration of 0.0014 ppmv, ethanol was detected at 0.0082 ppmv, acetone was detected at 0.0099 ppmv, carbon disulfide was detected at 0.0025 ppmv, methylene chloride was detected at 0.0014 ppmv, 2-butanone was detected at 0.0025 ppmv, tetrahydrofuran was detected at 0.0014 ppmv, benzene was detected at 0.0045 ppmv, and toluene was detected at 0.0076 ppmv on 5 December 2008; and acetone was detected at 0.0079 ppmv, 2-butanono was detected at 0.0026 ppmv, and tetrahydrofuran was detected at 0.0029 ppmv on 12 March 2009.

(2) PID screening results from the date sampling was conducted, as presented on Table 5. PID results are calculated from part per million by volume to ug/m^3 as PCE.

Table 7
SVE Well Monitoring Results
Hopyard Cleaners
2771 Hopyard Road, Pleasanton, California

Monitoring Date	Monitoring Event	Extraction Duration [1] (hr/day)	MANIFOLD			SVE-1				SVE-2				SVE-3				SVE-4				SVE-5			
			Time	Flow Rate (scfm)	Vacuum (in Hg)	Time	Vacuum (in Hg)	PID [2] ug/m^3 as PCE	PID [2] ppmv	Time	Vacuum (in Hg)	PID [2] ug/m^3 as PCE	PID [2] ppmv	Time	Vacuum (in Hg)	PID [2] ug/m^3 as PCE	PID [2] ppmv	Time	Vacuum (in Hg)	PID [2] ug/m^3 as PCE	PID [2] ppmv	Time	Vacuum (in Hg)	PID [2] ug/m^3 as PCE	PID [2] ppmv
21-Aug-08	Start up Day 1	24	9:22	240	--	9:24	0	322,920	46.8	9:22	1.5	164,220	23.8	9:21	2.0	34,500	5.0	9:25	1.5	167,670	24.3	9:20	2.0	60,720	8.8
22-Aug-08	Start-up Day 2	24	9:41	240	--	9:42	0	141,450	20.5	9:40	1.75	82,800	12.0	9:38	2.0	14,490	2.1	9:44	1.5	57,960	8.4	9:37	2.0	28,980	4.2
23-Aug-08	Start-up Day 3	24	10:35	240	--	10:38	0	86,250	12.5	10:34	1.5	53,820	7.8	10:28	0	15,870	2.3	10:26	1.0	44,160	6.4	10:31	2.0	24,840	3.6
25-Aug-08	Start-up Day 5	24	16:52	235	--	16:50	0	64,170	9.3	16:58	0	33,810	4.9	16:55	1.0	11,040	1.6	4:46	1.0	33,120	4.8	16:53	2.0	17,940	2.6
27-Aug-08	Start-up Day 7	24	8:36	240	--	8:38	0	49,680	7.2	8:36	1.5	24,840	3.6	8:35	2.0	4,140	0.6	8:39	1.5	61,410	8.9	8:34	2.0	10,350	1.5
2-Sep-08	Start-up Day 13/Week 2	24	9:43	230	3.5	9:44	0	24,150	3.5	9:42	1.5	15,180	2.2	9:40	1.75	4,830	0.7	9:45	1.5	13,110	1.9	9:36	1.5	8,280	1.2
8-Sep-08	Start-up Week 3	14	8:58	230	3.75	9:01	0	17,940	2.6	8:59	1.25	19,320	2.8	8:58	1.5	16,560	2.4	9:02	1.25	8,280	1.2	8:57	1.5	14,490	2.1
18-Sep-08	1st Month	14	11:14	235	4	11:16	1.2	12,420	1.8	11:14	1.5	5,520	0.8	11:12	1.5	0	0.0	11:17	1.3	5,520	0.8	11:10	1.5	3,450	0.5
8-Oct-08	2nd Month	14	10:40	235	3.75	11:04	1.2	8,970	1.3	11:00	1.5	7,590	1.1	10:57	1.4	3,450	0.5	11:07	1.3	6,900	1.0	10:51	1.5	5,520	0.8
17-Nov-08	3rd Month	14	9:45	235	3.5	9:48	1.1	6,900	1.0	9:46	1.4	4,830	0.7	9:44	1.3	3,450	0.5	9:50	1.2	4,830	0.7	9:42	1.4	5,520	0.8
5-Dec-08	4th Month	14	11:20	240	3.5	11:21	1.1	4,830	0.7	11:19	1.3	3,450	0.5	11:18	1.3	2,070	0.3	11:22	1.1	3,450	0.5	11:17	1.4	3,450	0.5
6-Jan-09	5th Month	14	9:44	240	3.5	9:45	1.0	690	0.1	9:43	1.3	0	0	9:42	1.2	0	0.0	9:46	1.1	690	0.1	9:40	1.3	0	0.0
21-Jan-09	Cycle Wells [3]	14	9:02	235	4.5	9:03	1.5	10,350	1.5	9:00	2.4	11,730	1.7	10:06	OFF	115,230	16.7	9:06	1.7	44,850	6.5	10:05	OFF	124,890	18.1
21-Jan-09	Cycle Wells [3]	14	15:47	220	5.5	15:49	OFF	4,140	0.6	15:46	OFF	2,760	0.4	15:45	3.1	2,760	0.4	15:50	OFF	6,210	0.9	15:43	3.2	690	0.1
5-Feb-09	6th Month/Cycle Wells [3]	14	9:27	230	5.0	9:28	OFF	84,180*	12.2*	9:26	OFF	73,830*	10.7*	9:24	2.9	74,520*	10.8*	9:29	OFF	178,710*	25.9*	9:40	2.9	252,540*	36.6*
5-Feb-09	Cycle Wells [3]	14	10:41	230	4.5	10:43	1.5	189,750*	27.5*	10:42	1.2	158,700*	23.0*	10:40	OFF	107,640*	15.6*	10:45	1.5	230,460*	33.4*	10:39	OFF	142,830*	20.7*
19-Feb-09	Cycle Wells [3]	14	9:02	235	4.5	9:03	1.5	0	0.0	9:02	2.3	0	0.0	9:00	OFF	40,710	5.9	9:04	1.5	0	0.0	8:59	OFF	15,180	2.2
19-Feb-09	Cycle Wells [3]	14	12:10	165	3.0	12:10	OFF	0	0.0	12:09	OFF	0	0.0	12:07	2.0	0	0.0	12:12	OFF	0	0.0	12:06	2.1	0	0.0
26-Feb-09	Cycle Wells [3]	2	9:29	165	3.0	9:31	OFF	21,390	3.1	9:28	OFF	17,940	2.6	9:27	2.0	0	0.0	9:32	OFF	65,550	9.5	9:26	2.1	0	0.0
26-Feb-09	Cycle Wells [3]	2	10:19	230	2.0	10:19	0.7	690	0.1	10:18	0.7	0	0.0	10:17	0.7	0	0.0	10:20	0.8	690	0.1	10:16	0.9	0	0.0
12-Mar-09	7th Month	2	9:21	180	2.0	9:23	0.7	497	0.072	9:22	0.8	1,780	0.258	9:20	0.8	276	0.040	9:24	0.8	373	0.054	9:19	0.8	573	0.083

Notes:

1) A timer was installed on the system and was set to run from 8 am to 10 pm (14 hrs/day) on 3 September 2008. Operation was then reduced to 8 am to 10 am (2 hrs/day) on 26 February 2009 to optimize the systen
2) PID screening was conducted using a MiniRae 2000 capable of detecting VOCs in the ppmv range. Beginning on 12 March 2009, a ppbRae was used to detect concentrations at lower levels, in the parts per billior
3) On 21 January, 5 February, 19 February, and 26 February 2009, monitoring was conducted twice: before cycling the SVE wells and approximately 30 minutes after cycling the SVE well

*PID readings from 5 February 2009 were anomolously high, indicating possible instrumentation error.

ft = feet

min = minute

in Hg = inches of mercury

ug/m^3 as PCE= micrograms per cubic meter as equivalent tetrachloroethene

ppmv = parts per million volume

scfm = standard cubic feet per minute

OFF = well turned off during well cycling

Table 8
Soil Oxidant Demand Laboratory Results Summary
Hopyard Cleaners
Pleasanton, California

Analysis		Unit	SOD-1			SOD-2			SOD-3		
			21-22.5 ft bgs	27.5-29 ft bgs	30.5-32 ft bgs	21-22 ft bgs	25-26 ft bgs	29-30 ft bgs	21-22 ft bgs	25-26 ft bgs	29-30 ft bgs
Soil Properties	Soil Type	--	Dark Grayish Brown Clay	Olive Gray Clay	Dark Gray Silt	--	--	--	--	--	--
	Specific Gravity	--	2.77	2.78	2.79	--	--	--	--	--	--
	Dry Bulk Density	lbs/ft^3	94.8	98.8	96.5	--	--	--	--	--	--
	Porosity	%	45.2	43.1	44.6	--	--	--	--	--	--
	Foc	%	0.78	1.32	1.12	1.23	1.02	0.73	0.64	0.71	0.64
Metals	Antimony	mg/kg	<2.0	<2.1	<2.0	--	--	--	--	--	--
	Arsenic	mg/kg	5.1	7.7	1.6	--	--	--	--	--	--
	Barium	mg/kg	130	260	170	--	--	--	--	--	--
	Beryllium	mg/kg	<0.51	0.60	0.50	--	--	--	--	--	--
	Cadmium	mg/kg	<0.51	<0.52	<0.50	--	--	--	--	--	--
	Chromium	mg/kg	52	64	61	--	--	--	--	--	--
	Cobalt	mg/kg	11	16	11	--	--	--	--	--	--
	Copper	mg/kg	25	33	37	--	--	--	--	--	--
	Lead	mg/kg	5.9	7.3	7.7	--	--	--	--	--	--
	Molybdenum	mg/kg	<1.0	<1.0	<0.99	--	--	--	--	--	--
	Nickel	mg/kg	71	81	79	--	--	--	--	--	--
	Selenium	mg/kg	<2.0	<2.1	<2.0	--	--	--	--	--	--
	Silver	mg/kg	<1.0	<1.0	<0.99	--	--	--	--	--	--
	Thallium	mg/kg	<1.0	<1.0	<0.99	--	--	--	--	--	--
	Vanadium	mg/kg	26	36	30	--	--	--	--	--	--
	Zinc	mg/kg	41	52	58	--	--	--	--	--	--
Soil Oxidant Demand	MnO_4	g/kg	9.48	22.37	12.09	23.92	5.19	10.31	4.27	5.12	5.59
	$KMnO_4$ (1)	g/kg	12.60	29.73	16.07	31.78	6.90	13.70	5.67	6.80	7.43
	$NaMnO_4$ (1)	g/kg	11.32	26.70	14.43	28.54	6.19	12.30	5.10	6.11	6.67

Notes:
ft bgs = feet below ground surface
MnO_4 = permanganate
$KMnO_4$ = potassium permanganate
$NaMnO_4$ = sodium permanganate
Foc = fraction organic carbon
g/kg = grams per kilogram
mg/kg = milligram per kilogram
lbs/ft^3 = pounds per cubic feet
SOD-1 samples were collected on 21 August 2008. SOD-2 and SOD-3 samples were collected on 26 January 2009.
(1) NaMnO4 and KMnO4 values are calculated by the laboratory from the MnO4 SOD and relative molecular weights of the compounds.

Table 9
Permanganate Required for Treatment of Shallow Groundwater
Hopyard Cleaners
Pleasanton, California

SOD Sampling Location	Near MW-2												Near MW-1					
Amendment	$KMnO_4$						$NaMnO_4$						$KMnO_4$			$NaMnO_4$		
Sample Location	*SOD-1*	*SOD-2*	*SOD-1*	*SOD-2*	*SOD-1*	*SOD-2*	*SOD-1*	*SOD-2*	*SOD-1*	*SOD-2*	*SOD-1*	*SOD-2*	*SOD-3*	*SOD-3*	*SOD-3*	*SOD-3*	*SOD-3*	*SOD-3*
*Sample Depth (ft bgs)**	*21-22*	*21-22*	*27.5-28.5*	*25-26*	*30.5-31.5*	*29-30*	*21-22*	*21-22*	*27.5-28.5*	*25-26*	*30.5-31.5*	*29-30*	*21-22*	*25-26*	*29-30*	*21-22*	*25-26*	*29-30*
Soil Oxidant Demand (mg/kg)	12.60	**31.78**	29.73	6.90	16.07	13.70	11.32	**28.54**	26.70	6.19	14.43	12.30	5.67	6.80	**7.43**	5.10	6.11	**6.67**
Estimated Amendment Requirement (lbs) (1)	58,400	**147,000**	137,500	32,100	74,400	63,500	130,000	**327,100**	305,900	71,400	165,600	141,300	26,400	31,700	**34,500**	58,800	70,400	**76,900**
Injection Volume (gal) (2)	343,200	**863,700**	807,800	188,500	437,300	373,100	58,200	**146,400**	136,900	31,900	74,100	63,200	155,400	186,000	**203,000**	26,300	31,500	**34,400**
Portion of Pore Volume (%) (3)	36%	**93%**	90%	20%	47%	40%	6%	**16%**	15%	3%	8%	7%	17%	20%	**22%**	3%	3%	**4%**
Estimated Injection Time (business days) (4)	143	**360**	337	79	182	155	24	**61**	57	13	31	26	65	78	**85**	11	13	**14**

Notes:

Bold numbers indicate highest values.

--/-- = SOD-1 Result / SOD-2 Result

ft bgs = feet below ground surface

mg/kg = milligram per kilogram

lbs = pounds

gal = gallons

$KMnO_4$ = potassium permanganate

$NaMnO_4$ = sodium permanganate

lbs/yd^3 = pounds amendment per cubic yard of soil

*Samples Intervals for SOD-1 were 21-22.5, 27.5-29, and 30.5-32 ft bgs due to low sample recovery. The target sample intervals were achieved at SOD-2 and SOD-3.

(1) Assumes dry crystals for $KMnO_4$ and 40% liquid solution for $NaMnO_4$.

(2) Assumes 2% $KMnO_4$ solution and 10% $NaMnO_4$ solution, as recommended by Carus.

(3) Desired percent of pore space is less than 10%.

(4) Injection time only, assuming 5 gallons per minute injection rate at 1,500 pounds per square inch. Does not include time for solution preparation and time to move and setup on each injection point.

(5) Permanganate requirements for SOD-2 and SOD-3 were calculated using the average porosity of the three samples collected at SOD-1.

Table 10
EISB Study - Gene-Trac and Anion Results Summary
Hopyard Cleaners
Pleasanton, California

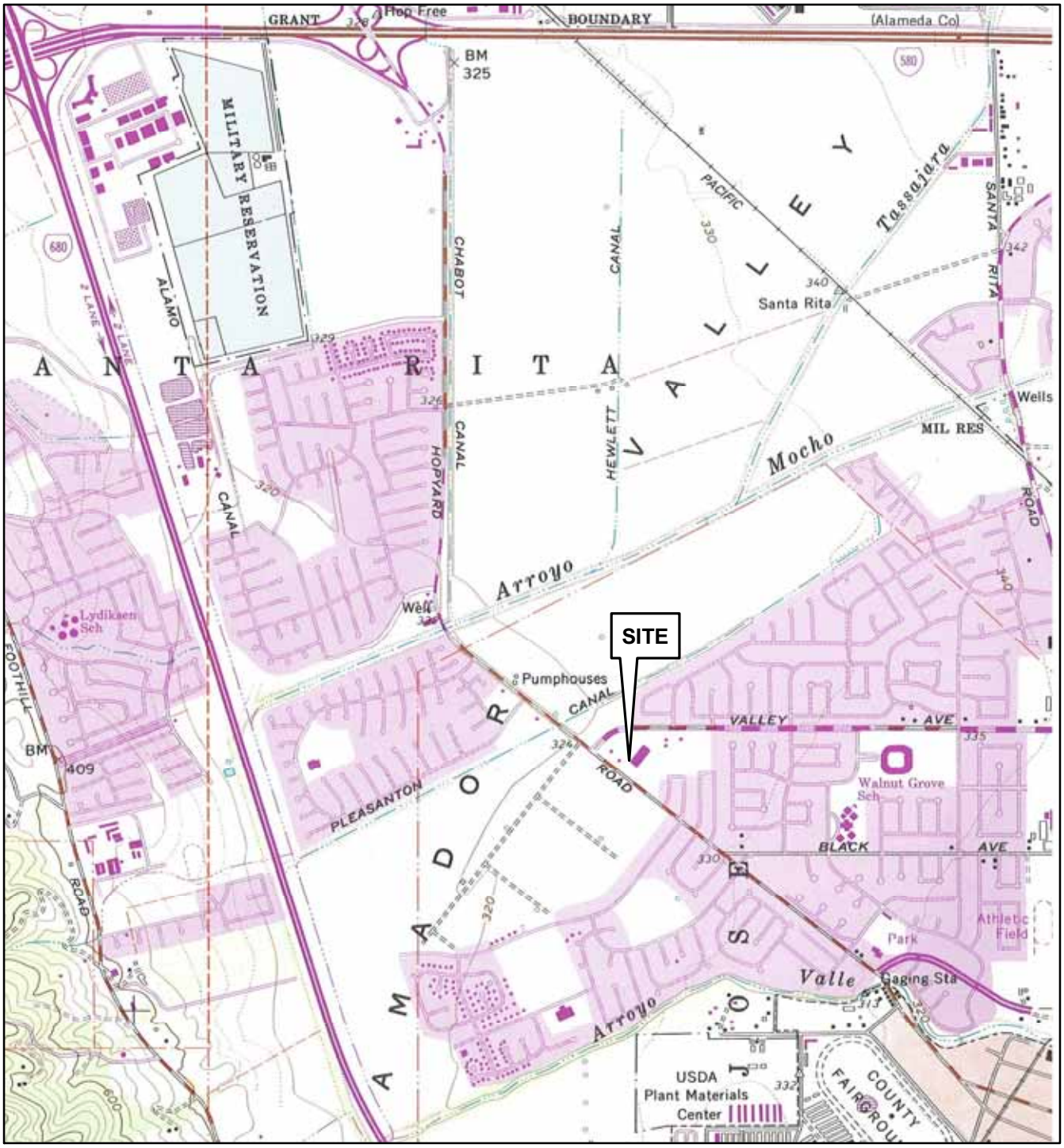
Well I.D.	Sample Date	Field Parameters		Quantitative Gene-Trac Results					Anions Results (EPA Method 300.0)			
				Dehalococcoides			*Vinyl Chloride Reductase*					
		ORP (mV)	DO (mg/L)	% of Microbial Population	Enumeration (cells/Liter)	Interpretation	% of Microbial Population	Enumeration (cells/L)	Chloride (mg/L)	Nitrate as NO3 (mg/L)	Nitrite as NO2 (mg/L)	Sulfate as SO4 (mg/L)
MW-1	1/26/2009	63.5	0.15	0.008-0.03%	2E+05	Moderate Concentration[1]	NQ[2]	Detected[3]	83	<0.50	<0.50	130
MW-2	1/26/2009	118.2	0.12	0.005-0.02% / 0.007-0.02%	2E+05 / 2E+05	Moderate Concentration[1]	NQ[2] / 0.0009-0.003%	Inconclusive[4] / 3E+04	110 / 110	3.9 / 3.9	<0.50 / <0.50	140 / 140
MW-3	1/26/2009	150.6	0.24	0.004-0.01%	1E+05	Moderate Concentration[1]	NQ[2]	Detected[3]	120	13	<0.50	140

Notes:

1. Moderate Concentration indicates the presence of dehalococcoides at concentrations which may, or may not, be associated with observable dechlorination.
2. Not Quantifiable (NQ) indicates that vinyl chloride reductase was detected but not able to be quantified.
3. Detected but not quantifiable. The sample specific quantitation limit is 2E+04/liter.
4. The results indicate extremely low concentrations of vinyl chloride reductase DNA at or below the sample specific quantitation limit (1E+04/liter); however, test results were insufficient to assign a conclusive positive results for this sample.

DO = dissolved oxygen
ORP = oxidation reduction potential
mg = milligrams
L = liter
mV = millivolts

FIGURES



Topo Source: U.S.G.S 7.5 Minute Series,
Dublin, CA Quadrangle (1980)
Contour Interval = 40 Feet

SITE LOCATION MAP
HOPYARD CLEANERS
2771 HOPYARD ROAD
PLEASANTON, CALIFORNIA

N

0 1,000 2,000 Feet

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FIGURE NO.	1
PROJECT NO.	WR0574
DATE:	APRIL 2009

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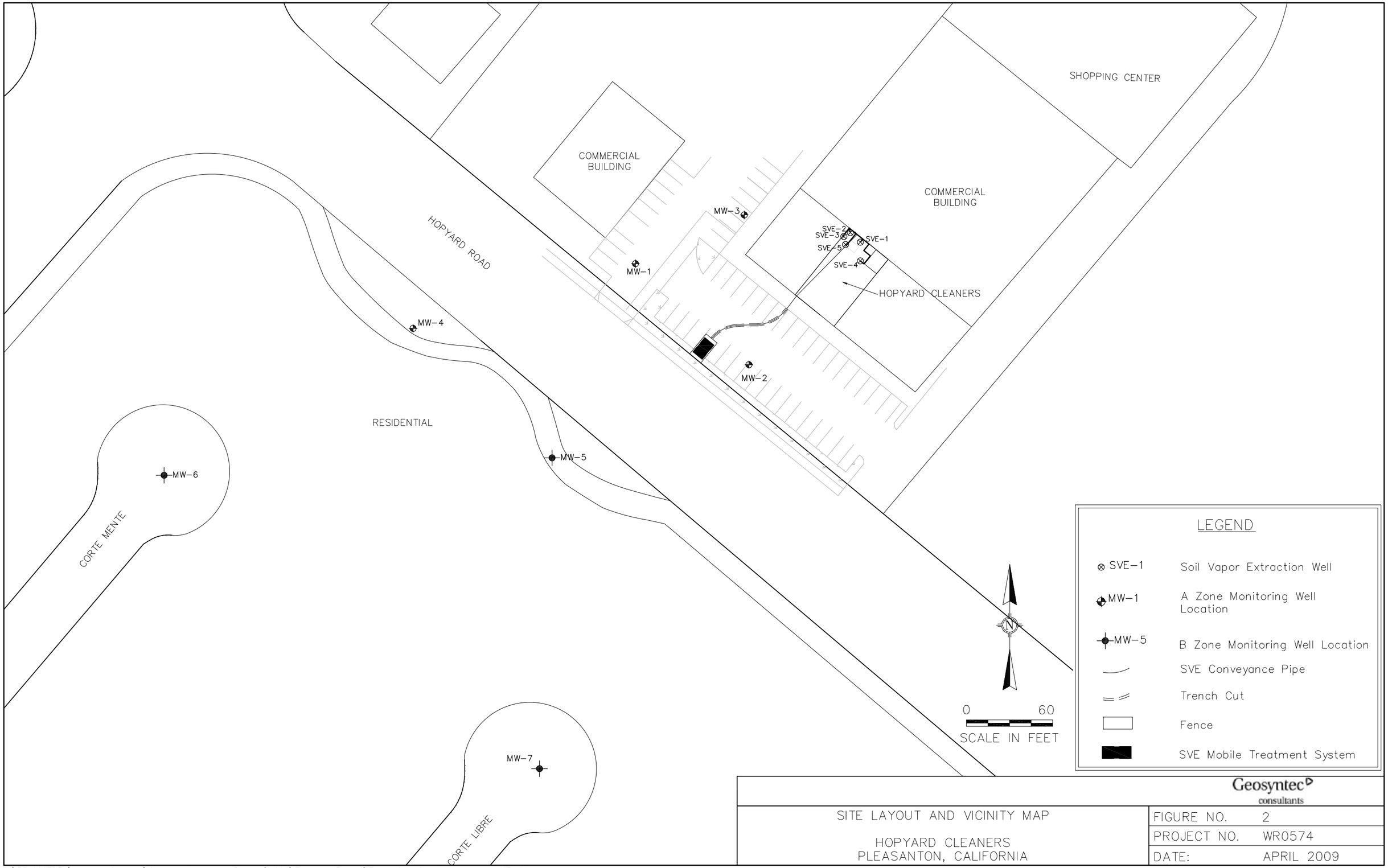

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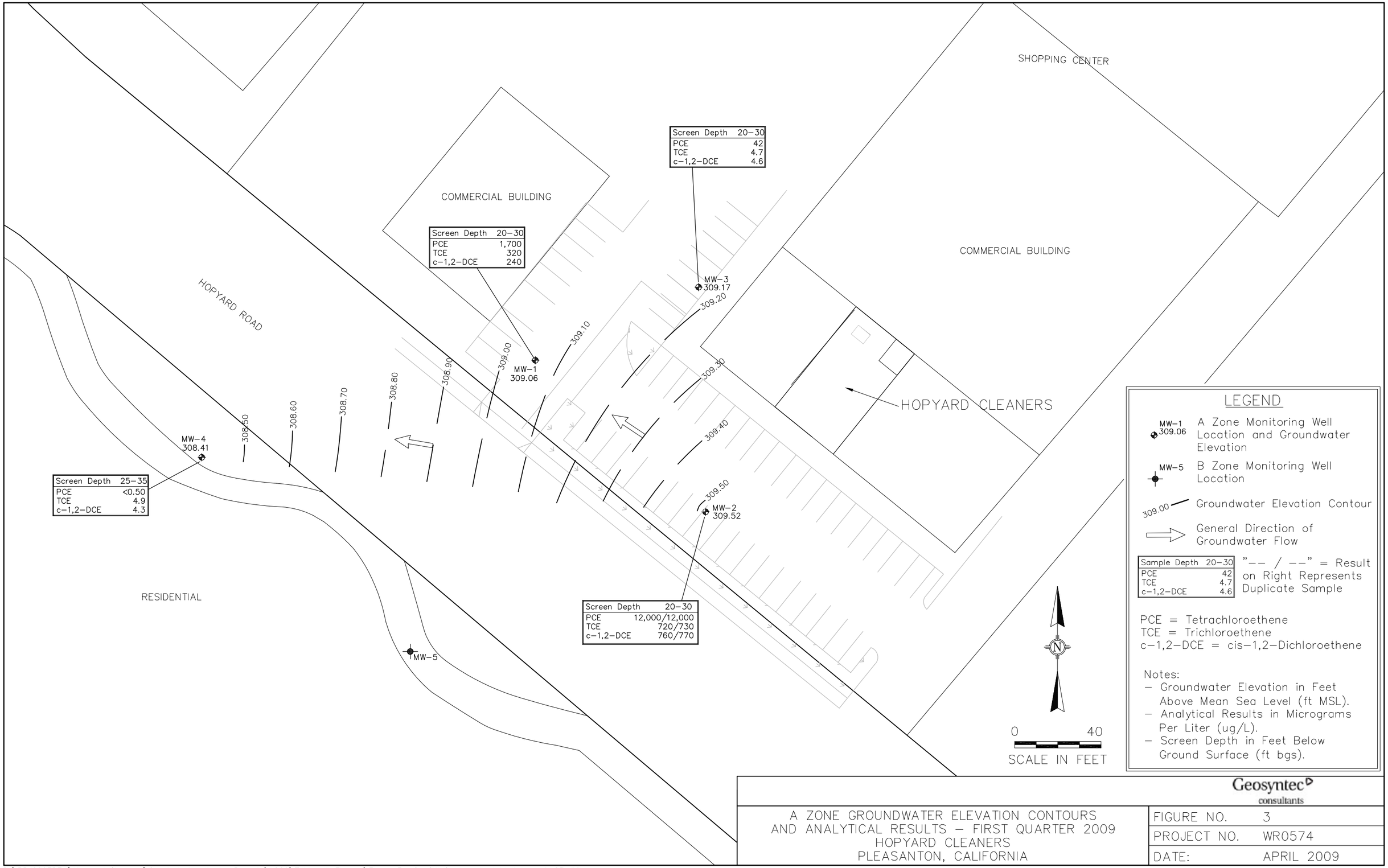
SITE LAYOUT AND VICINITY MAP

HOPYARD CLEANERS
PLEASANTON, CALIFORNIA

FIGURE NO.	2
PROJECT NO.	WR0574
DATE:	APRIL 2009

P:\PRJ2003REM\Hopyard Cleaners\Quarterly Monitoring Reports\1Q09\Tables & Figures\Figure 2 – Site Layout.dwg 4-07-09



Geosyntec consultants

A ZONE GROUNDWATER ELEVATION CONTOURS AND ANALYTICAL RESULTS – FIRST QUARTER 2009
HOPYARD CLEANERS
PLEASANTON, CALIFORNIA

FIGURE NO.	3
PROJECT NO.	WR0574
DATE:	APRIL 2009

P:\PRJ2003REM\Hopyard Cleaners\Quarterly Monitoring Reports\1Q09\Tables & Figures\Figure 3 –Sh GW Cont – Analytical.dwg 4–23–09

SHOPPING CENTER

COMMERCIAL BUILDING

COMMERCIAL BUILDING

HOPYARD ROAD

HOPYARD CLEANERS

MW-1

MW-2

MW-3

MW-4

MW-5
296.58

MW-6
296.38

MW-7
296.36

RESIDENTIAL

CORTE MENTE

CORTE LIBRE

Sample Depth	49–59
PCE	<0.50
TCE	<0.50
c–1,2–DCE	<0.50

Sample Depth	50–60
PCE	37
TCE	<0.50
c–1,2–DCE	<0.50

Sample Depth	45–55
PCE	9.9
TCE	<0.50
c–1,2–DCE	<0.50

296.38
296.54
296.52
296.50
296.48
296.46
296.44
296.42
296.40
296.38

N

0 60

SCALE IN FEET

LEGEND

MW–5
296.58 — B Zone Monitoring Well Location and Groundwater Elevation

MW–1 — A Zone Monitoring Well Location

296.50 — Groundwater Elevation Contour

General Direction of Groundwater Flow

Sample Depth	49–59
PCE	37
TCE	<0.50
c–1,2–DCE	<0.50

PCE = Tetrachloroethene
TCE = Trichloroethene
c–1,2–DCE = cis–1,2–Dichloroethene

Notes:
- Groundwater Elevation in Feet Above Mean Sea Level (ft MSL).
- Analytical Results in Micrograms Per Liter (ug/L).
- Screen Depth in Feet Below Ground Surface (ft bgs).

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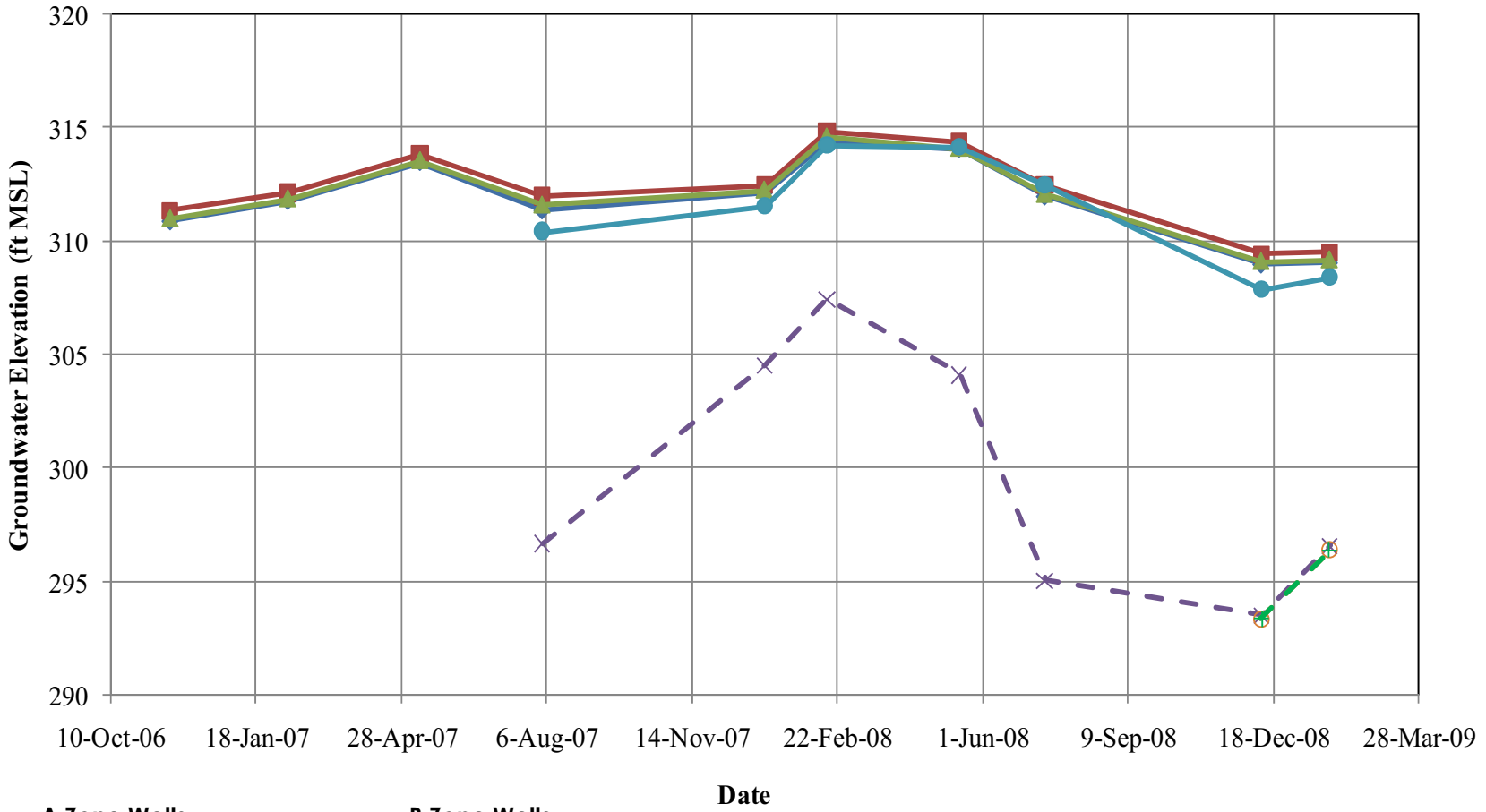
B ZONE GROUNDWATER ELEVATION CONTOURS
AND ANALYTICAL RESULTS – FIRST QUARTER 2009
HOPYARD CLEANERS
PLEASANTON, CALIFORNIA

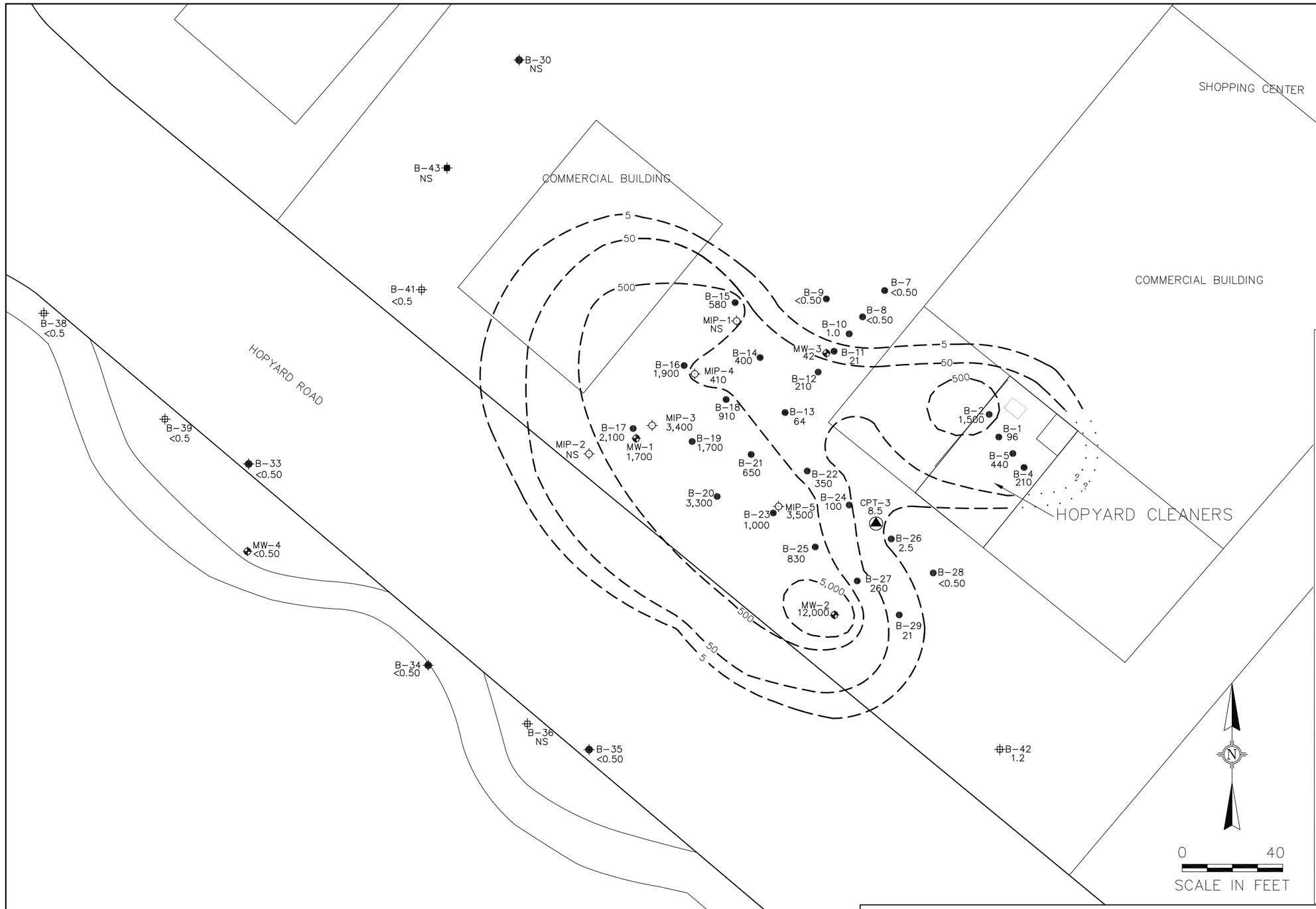
FIGURE NO.	4
PROJECT NO.	WR0574
DATE:	APRIL 2009

P:\PRJ2003REM\Hopyard Cleaners\Quarterly Monitoring Reports\1Q09\Tables & Figures\Figure 4 – Deep GW Cont – Analytical.dwg 4–07–09



Groundwater Hydrograph
Hopyard Cleaners, Pleasanton, California

April 2009	Figure: **5**	Geosyntec consultants



LEGEND

- MW-2 12,000 — Monitoring Well Location and PCE Concentration (ug/L) (January 2009)
- CPT-3 8.5 — CPT Groundwater Sampling Location and PCE Concentration (ug/L) (April 2008)
- B-43 NS — Temporary Well/Boring Location. Well Dry, Not Sampled (June 2007)
- B-37 1.2 — Hydropunch/Boring Location and PCE Concentration (ug/L) (March 2007)
- MIP-5 490 — MIP Groundwater Sample Location and PCE Concentration (ug/L) (January 2006)
- B-35 <0.50 — Grab Groundwater/Boring Location and PCE Concentration (ug/L) (January 2005)
- B-1 96 — Hydropunch/Boring Location and PCE Concentration (ug/L) (May 2004)
- 5 — PCE Concentration in Groundwater (ug/L)
- . . . ? — Estimated PCE Contour in Groundwater

Note:
– Concentrations Reported in Micrograms per Liter (ug/L)

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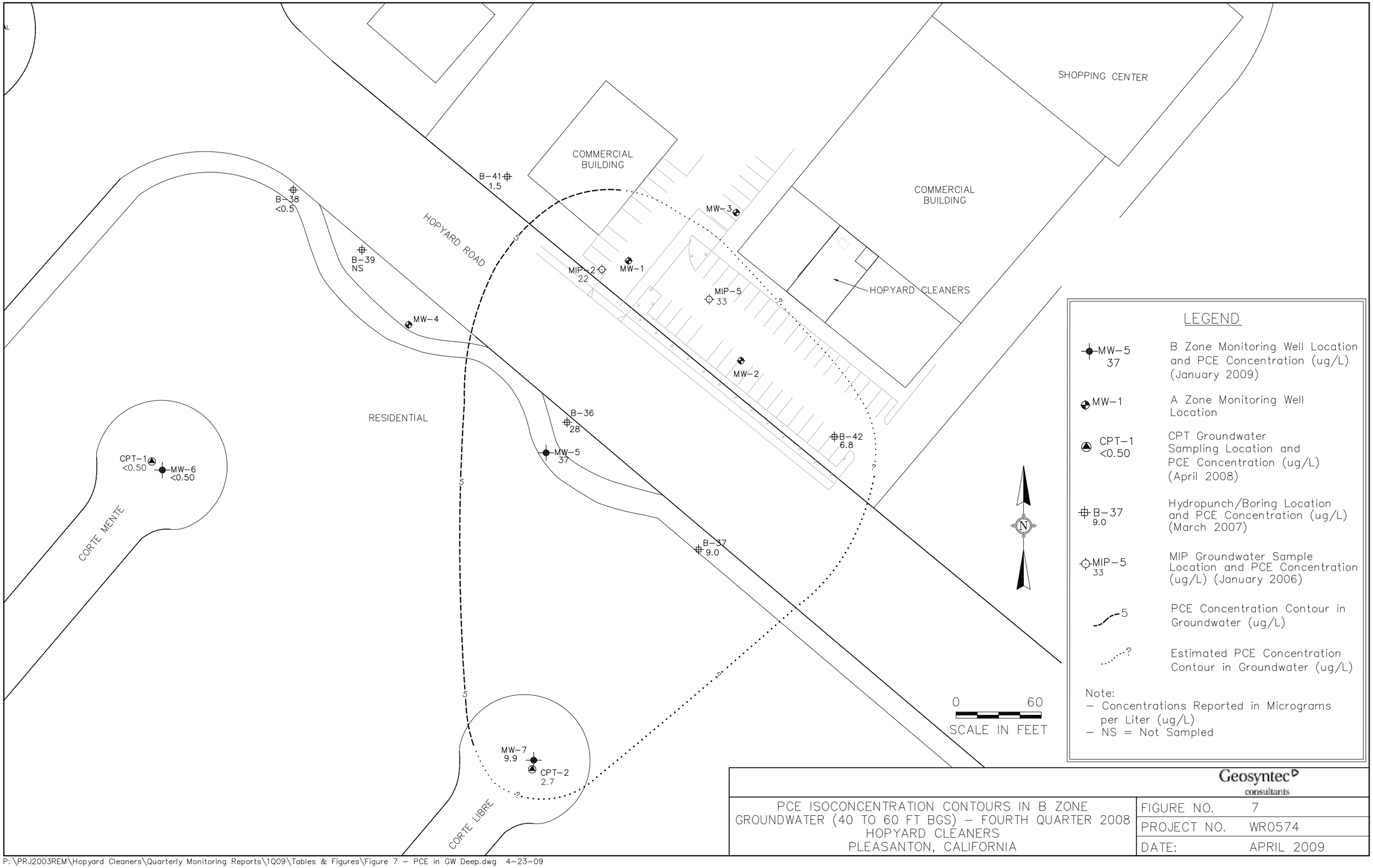
PCE ISOCONCENTRATION CONTOURS IN A ZONE GROUNDWATER (20 TO 35 FT BGS) – FIRST QUARTER 2009
HOPYARD CLEANERS
PLEASANTON, CALIFORNIA

FIGURE NO.	6
PROJECT NO.	WR0574
DATE:	APRIL 2009

P:\PRJ2003REM\Hopyard Cleaners\Quarterly Monitoring Reports\1Q09\Tables & Figures\Figure 6 – PCE in GW–Shallow.dwg 4–23–09



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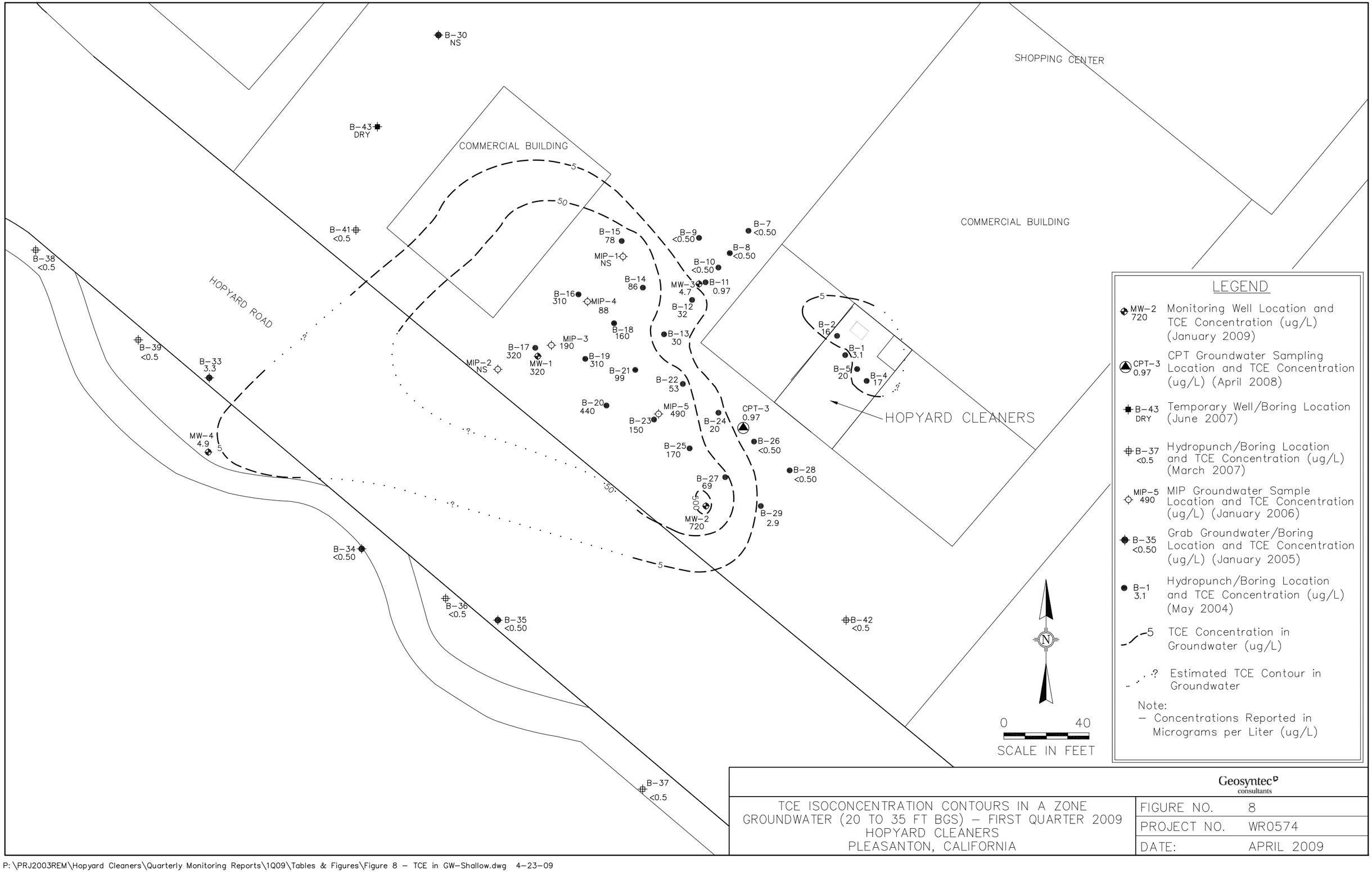
PCE ISOCONCENTRATION CONTOURS IN B ZONE GROUNDWATER (40 TO 60 FT BGS) – FOURTH QUARTER 2008
HOPYARD CLEANERS
PLEASANTON, CALIFORNIA

FIGURE NO.	7
PROJECT NO.	WR0574
DATE:	APRIL 2009

P:\PRJ2003REM\Hopyard Cleaners\Quarterly Monitoring Reports\1Q09\Tables & Figures\Figure 7 – PCE in GW Deep.dwg 4-23-09



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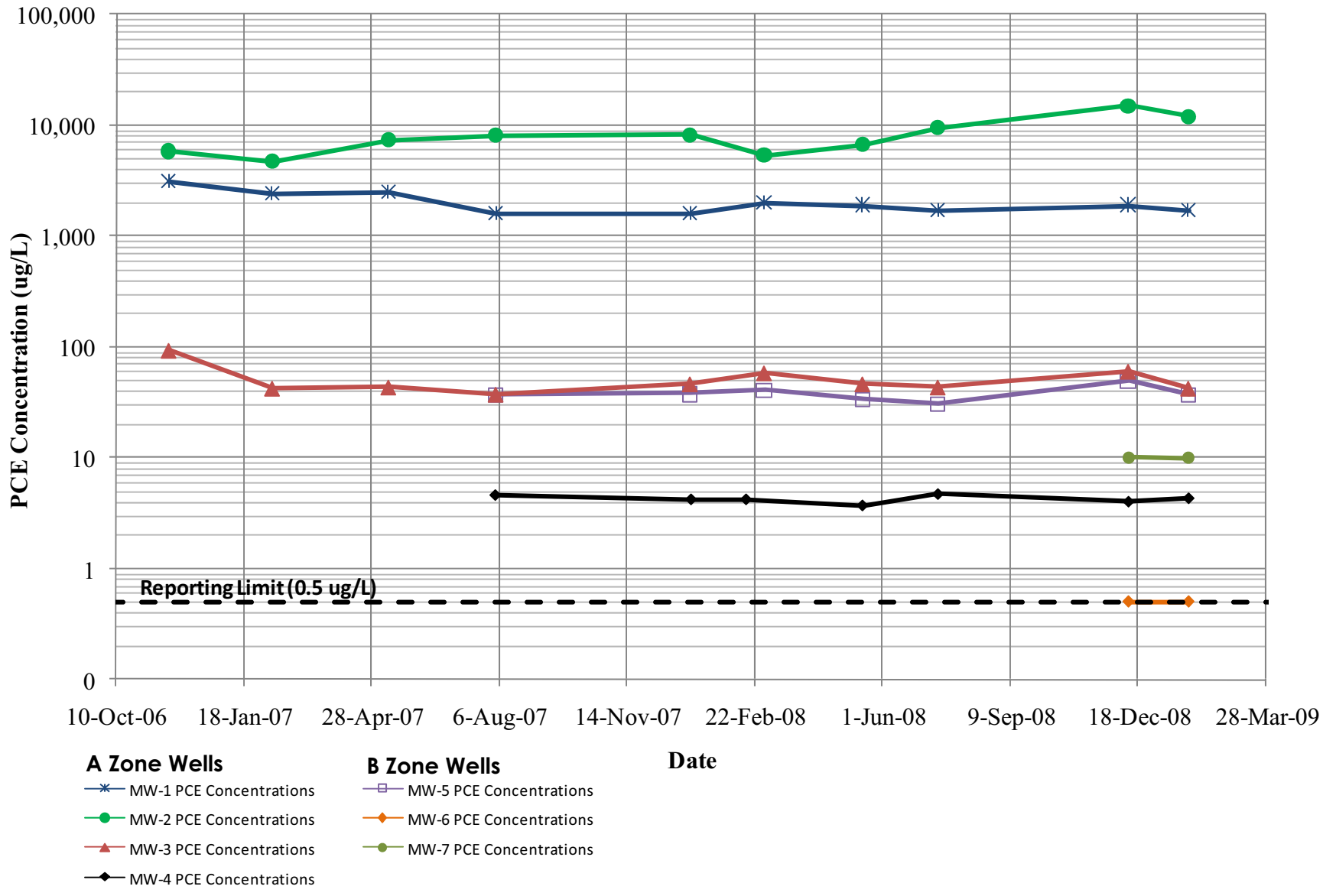
TCE ISOCONCENTRATION CONTOURS IN A ZONE GROUNDWATER (20 TO 35 FT BGS) – FIRST QUARTER 2009
HOPYARD CLEANERS
PLEASANTON, CALIFORNIA

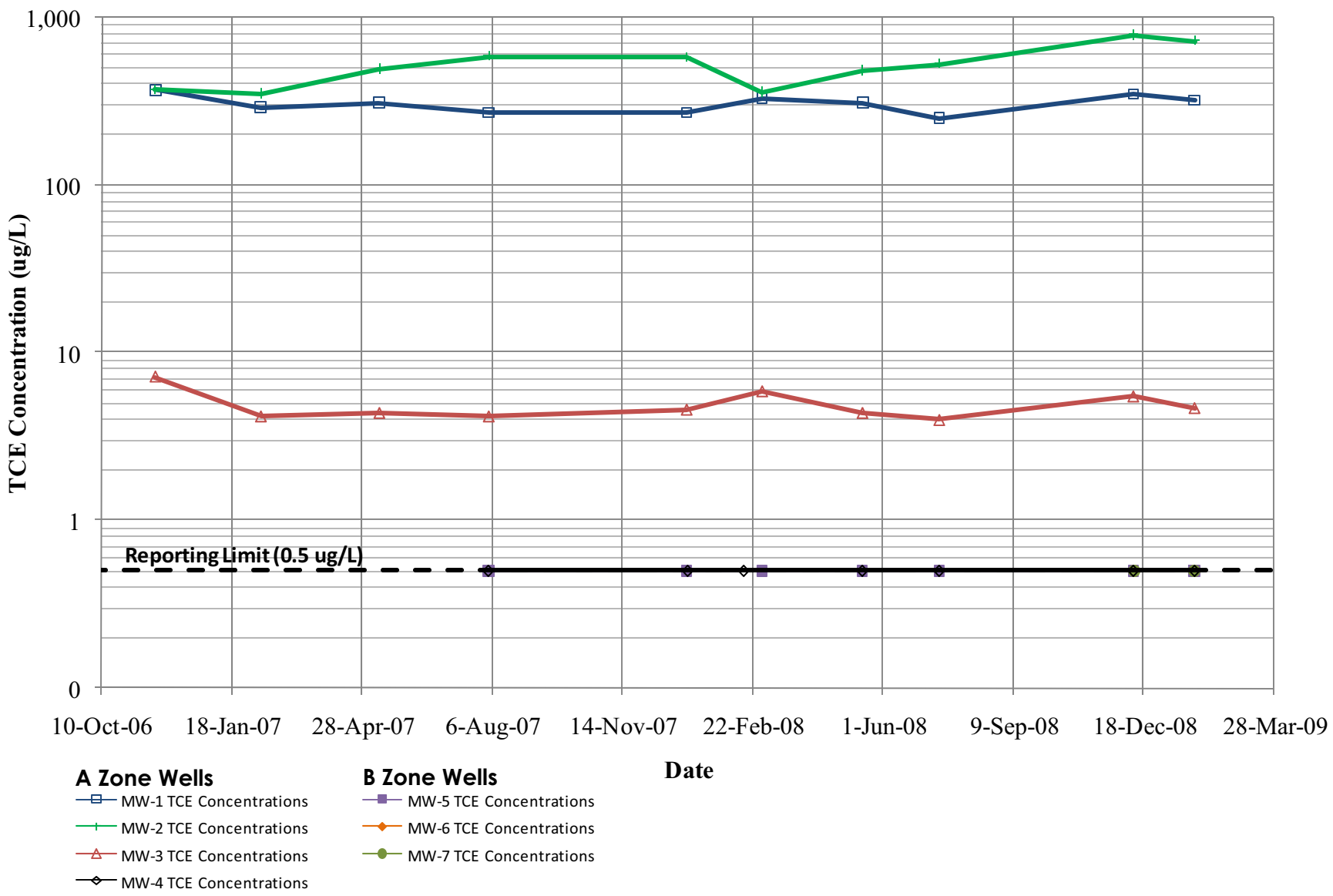
FIGURE NO.	8
PROJECT NO.	WR0574
DATE:	APRIL 2009

P:\PRJ2003REM\Hopyard Cleaners\Quarterly Monitoring Reports\1Q09\Tables & Figures\Figure 8 – TCE in GW–Shallow.dwg 4–23–09

PCE



TCE

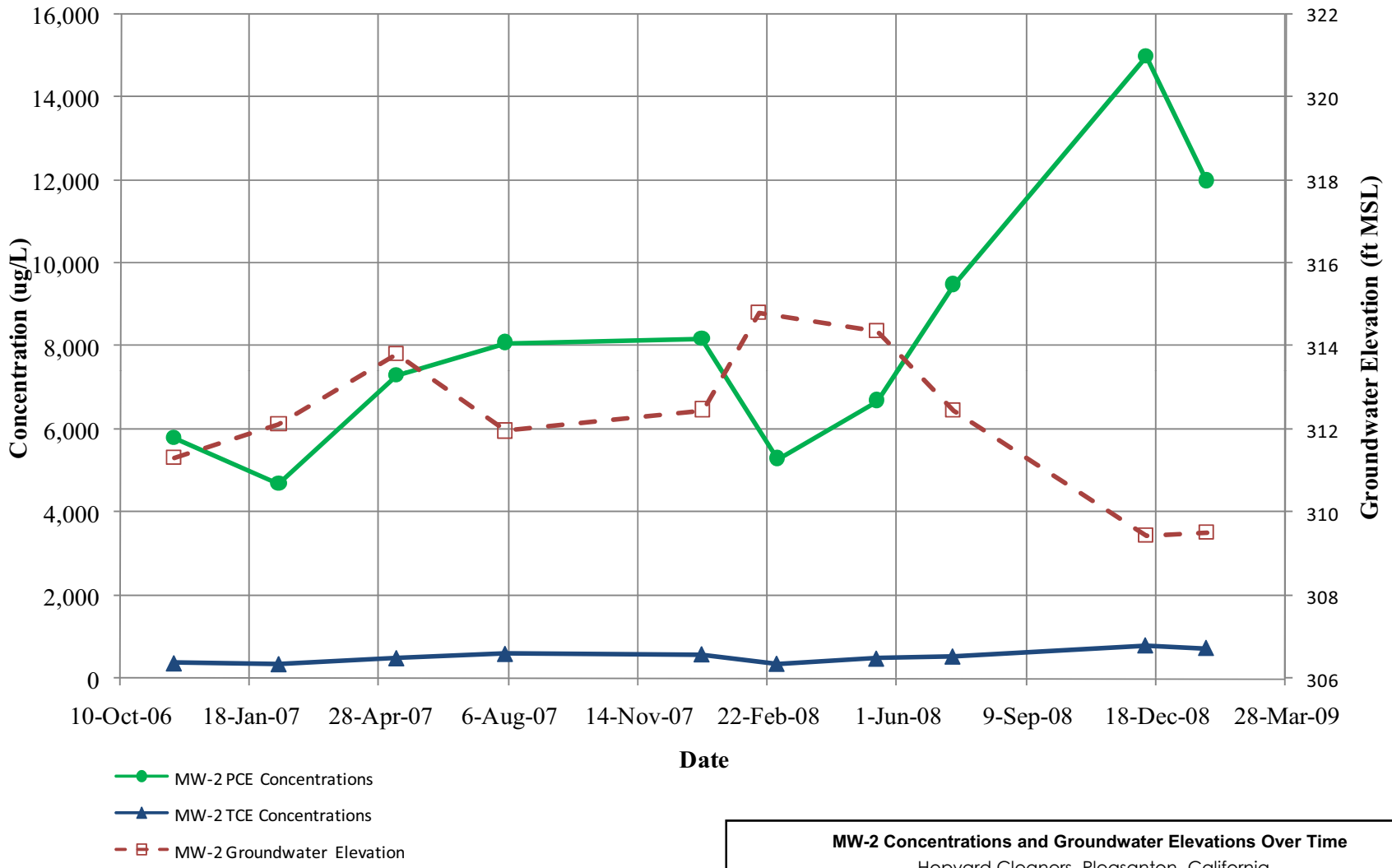


ug/L = micrograms per Liter

PCE and TCE Groundwater Concentrations Over Time

Hopyard Cleaners, Pleasanton, California

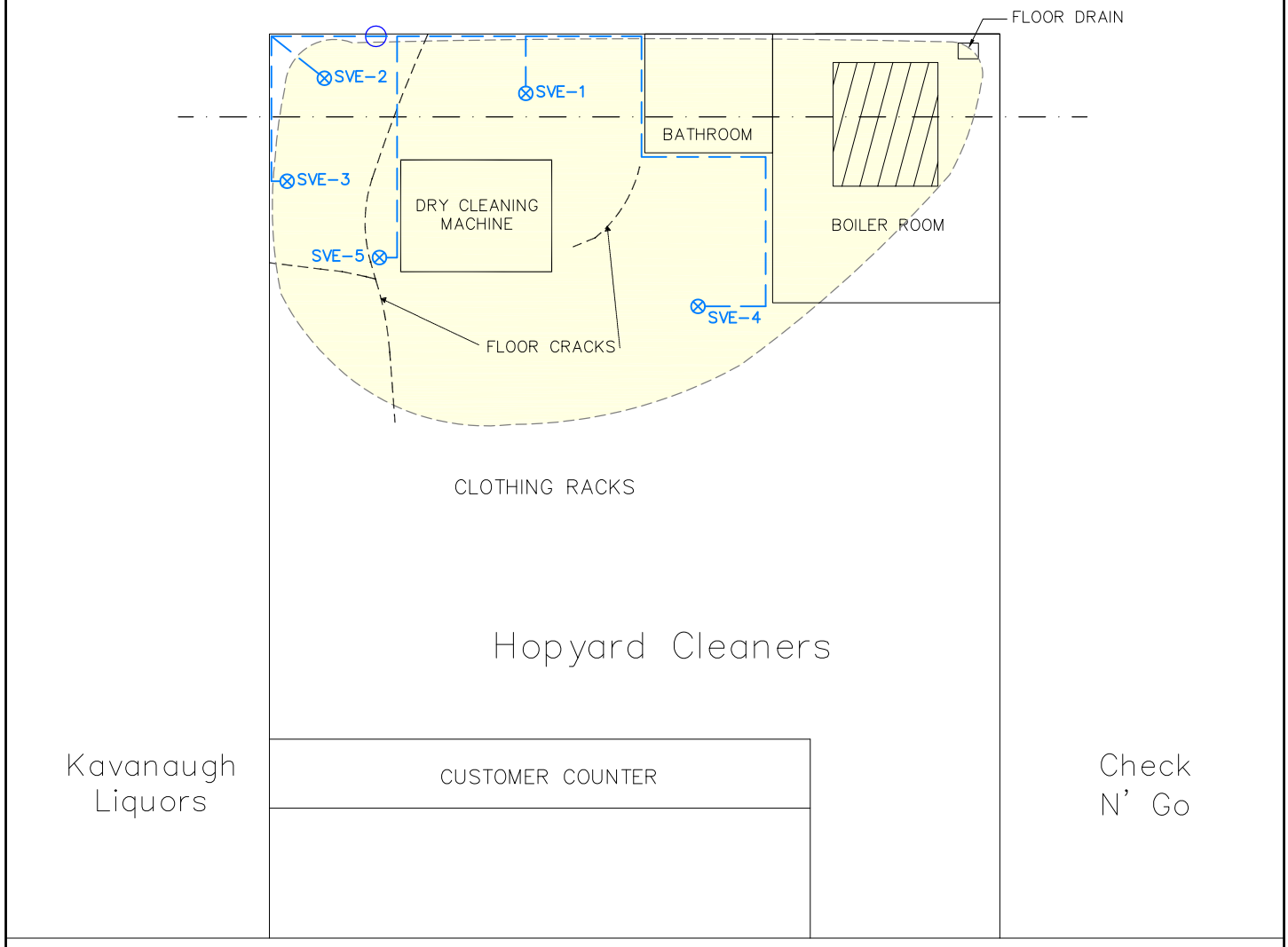
April 2009	Figure: **9**	Geosyntec consultants



ug/L = micrograms per Liter
ft MSL = feet above mean sea level

MW-2 Concentrations and Groundwater Elevations Over Time
Hopyard Cleaners, Pleasanton, California

April 2009	Figure: **10**	Geosyntec consultants



LEGEND

- SVE-1 — Soil Vapor Extraction Well
- Approximate SVE Conveyance Piping Location
- Approximate SVE Manifold Location
- Approximate Sewer Location
- Approximate Floor Crack Location
- On-Site Soil Target Remedial Area

0 4 8

APPROX. SCALE IN FEET

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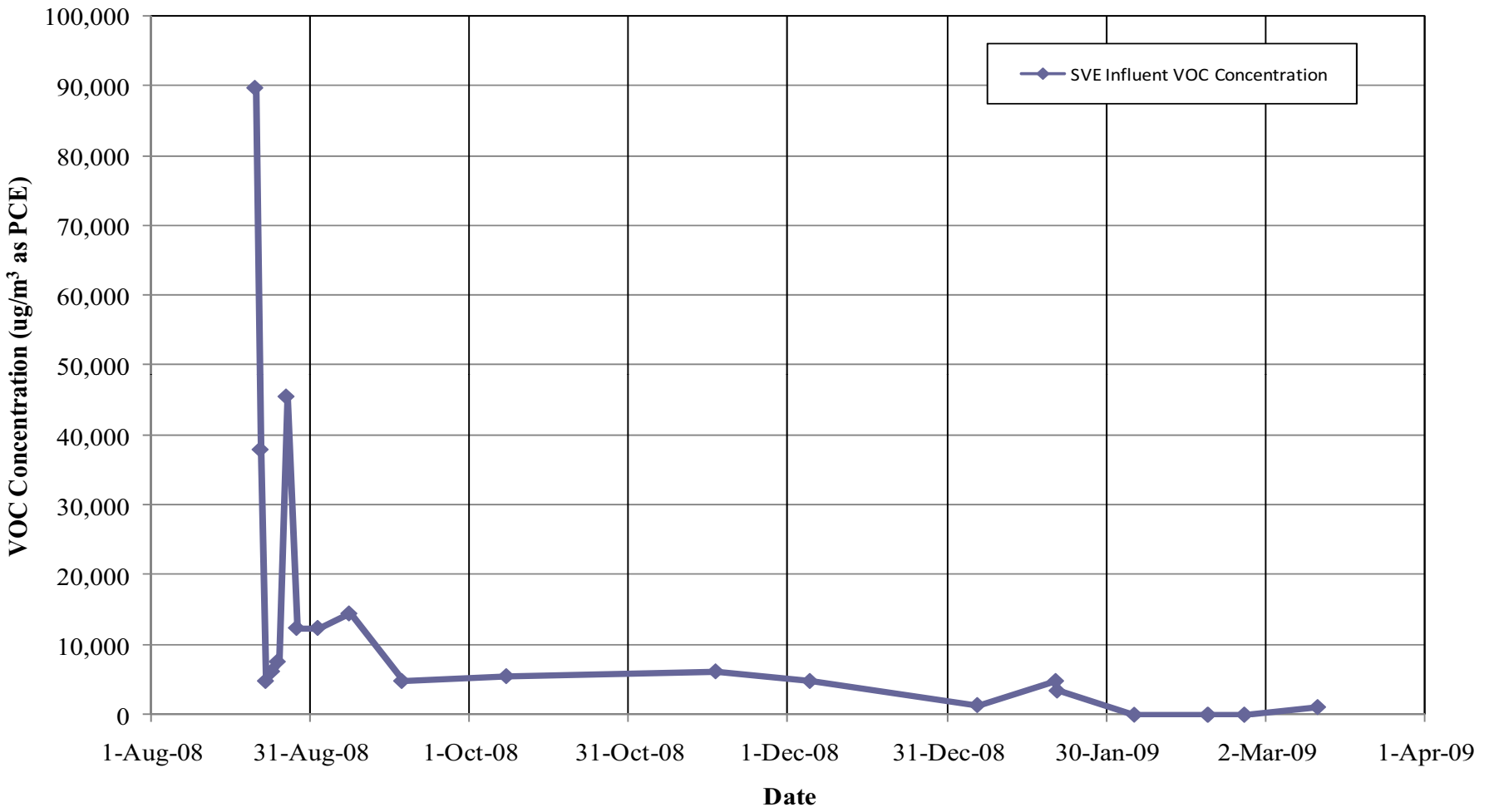
SOIL VAPOR EXTRACTION WELL LOCATIONS
AND PIPING LAYOUT
HOPYARD CLEANERS
PLEASANTON, CALIFORNIA

FIGURE NO.	11
PROJECT NO.	WR0574
DATE:	APRIL 2009

P:\PRJ2003REM\Hopyard Cleaners\Quarterly Monitoring Reports\1Q09\Tables & Figures\Figure 11 – SWE Well Loc.dwg 4-23-09

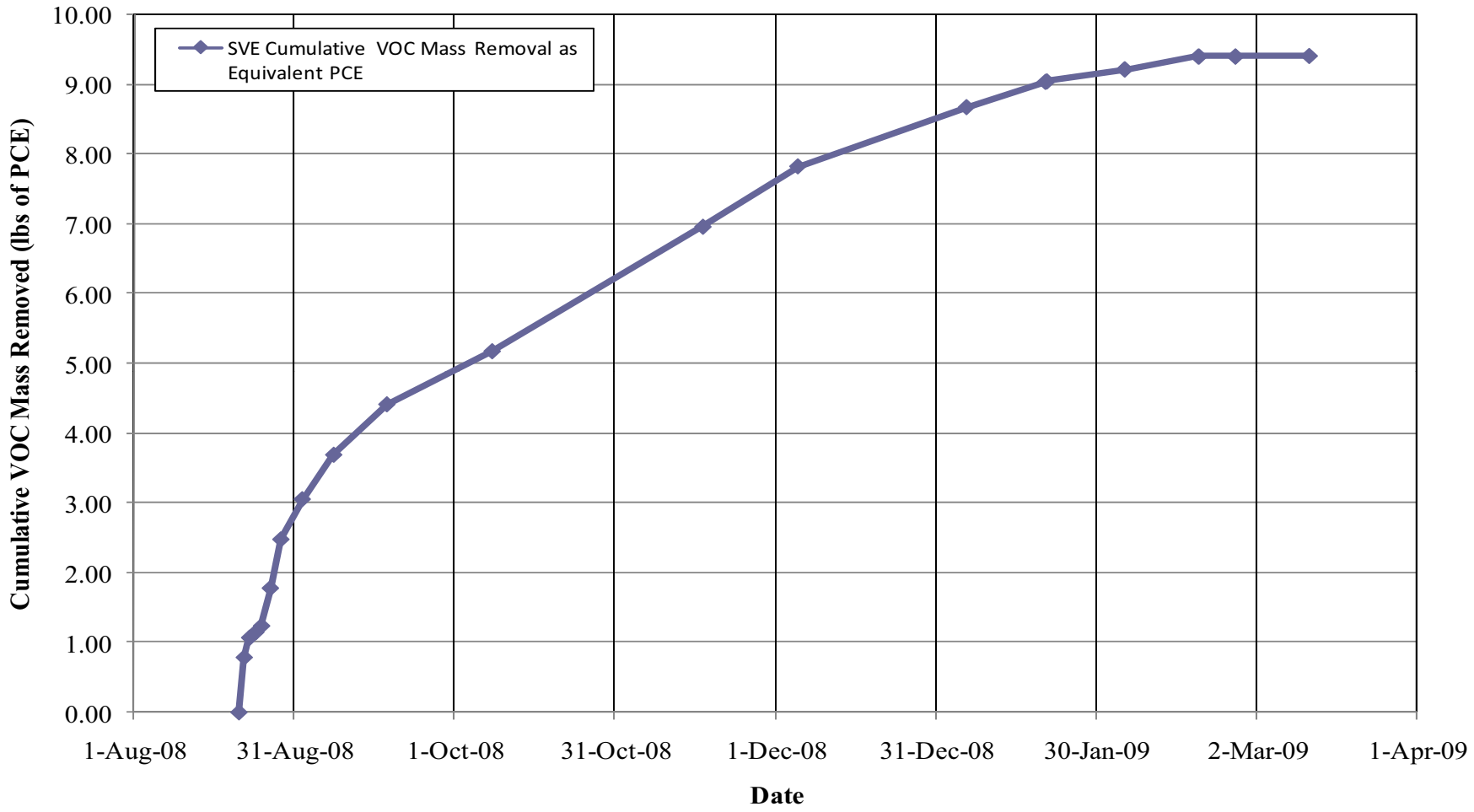


VOC = volatile organic compounds
ppmv = parts per million by volume

Note: On 21 January, 5 February, 19 February, and 26 February 2009, SVE system monitoring was conducted twice, once before and after cycling of the SVE wells.

SVE Influent Concentrations Over Time
Hopyard Cleaners, Pleasanton, California

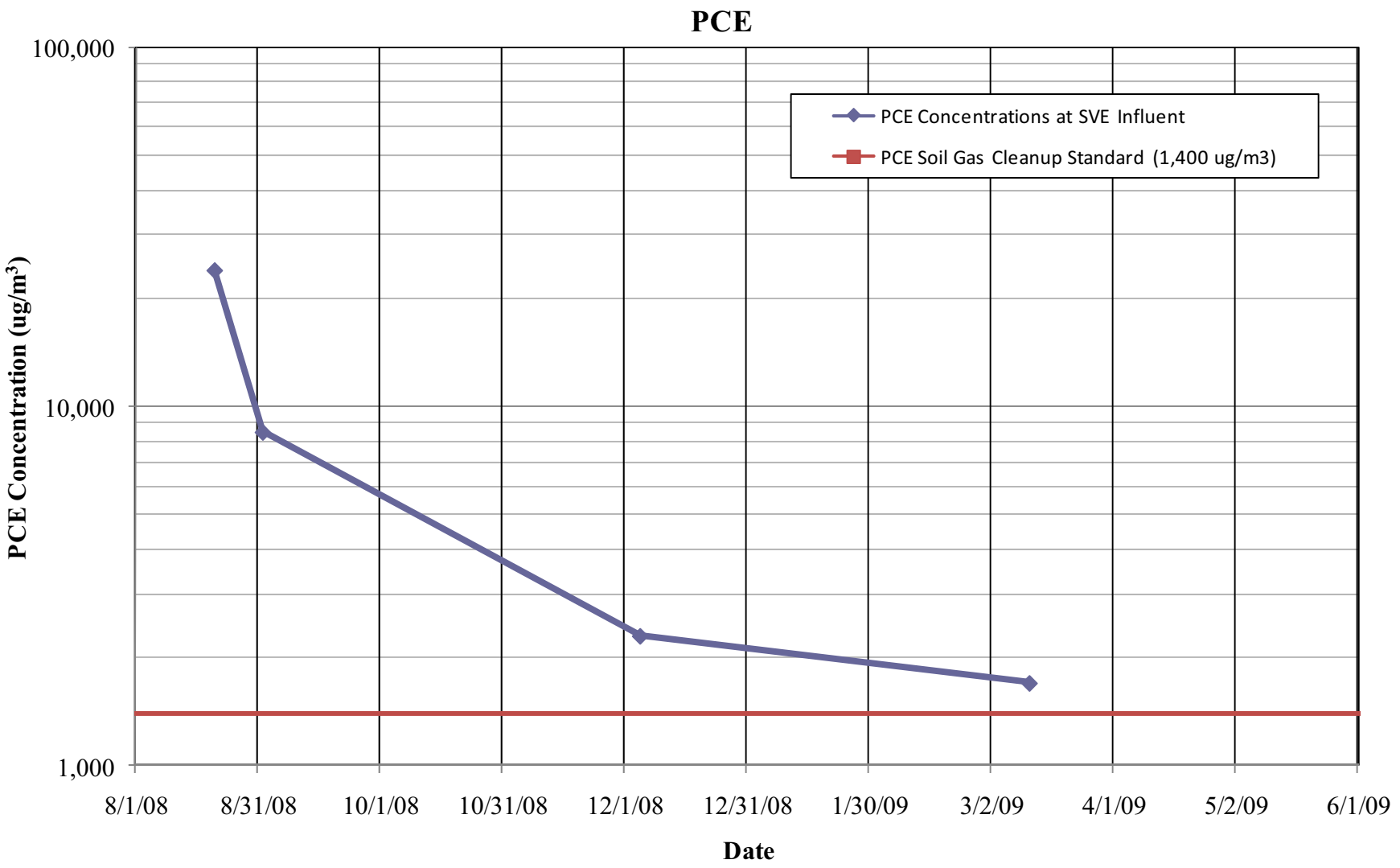
April 2009	Figure: **12**	Geosyntec consultants

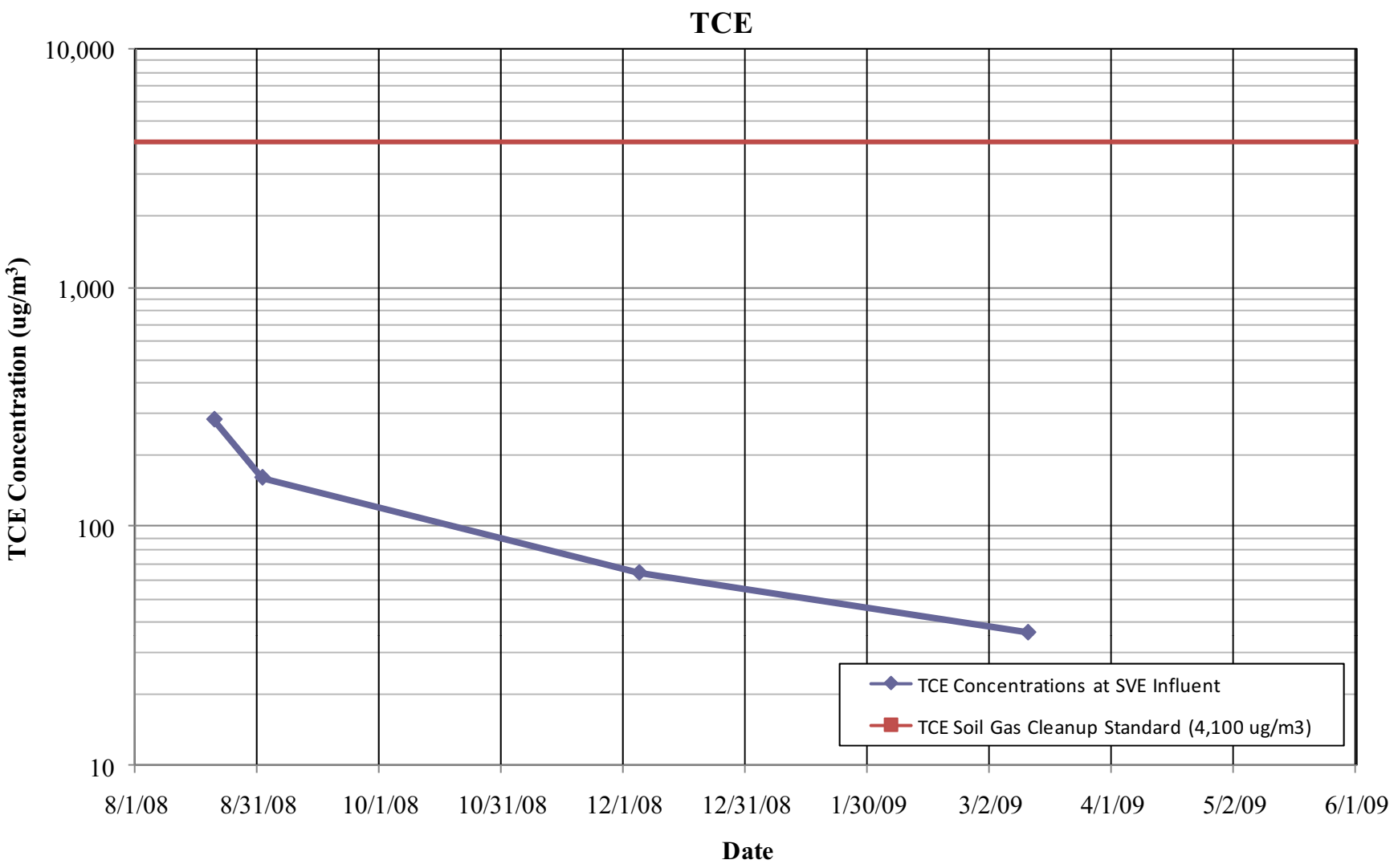


VOC = volatile organic compounds
PCE = tetrachloroethene
lbs = pounds

SVE Cumulative Mass Removal
Hopyard Cleaners, Pleasanton, California

April 2009	Figure: **13**	Geosyntec consultants





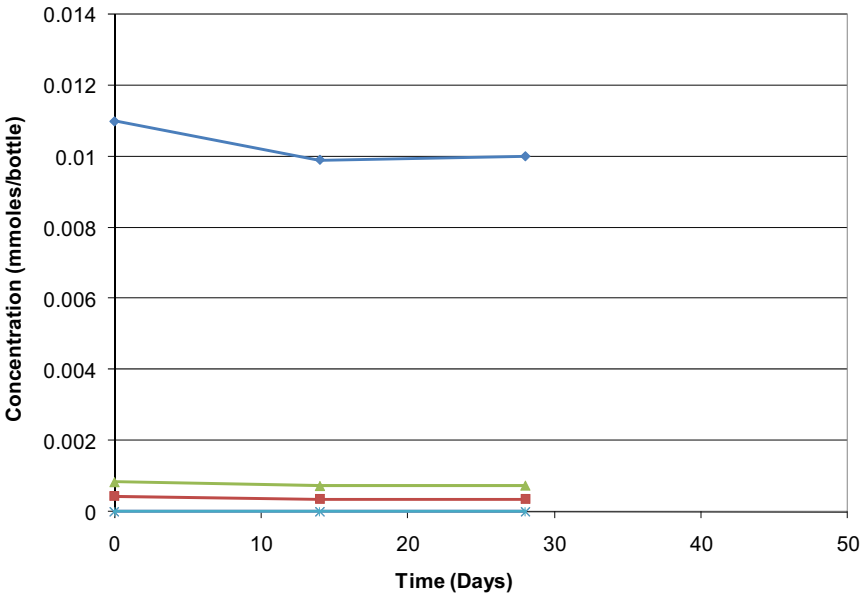
PCE = tetrachloroethene
TCE = trichloroethene
ug/m3 = micrograms per cubic meter
Soil Gas Cleanup Standards are 1,400 and 4,100 ug/m^3 for PCE and TCE, respectively, and are from the California Regional Water Quality Control Board Order No. R2-2008-0032.

SVE Influent PCE and TCE Concentrations
Hopyard Cleaners, Pleasanton, California

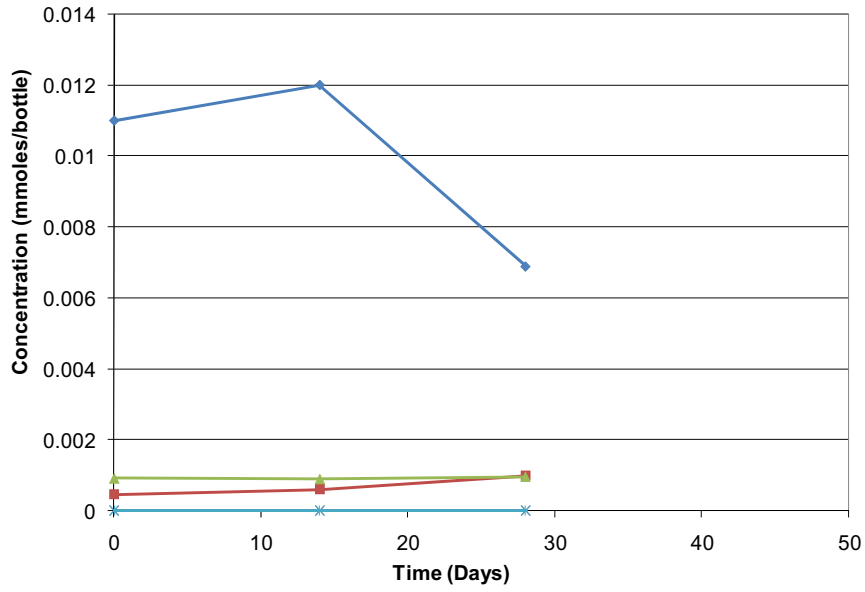
April 2009	Figure: **14**	Geosyntec consultants

CONTROLS

Anaerobic Sterile Control

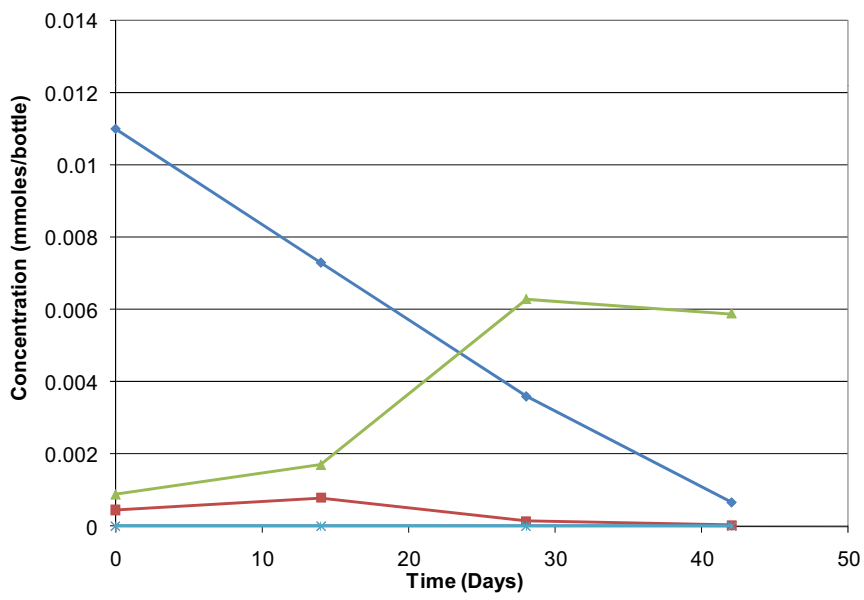


Anaerobic Active Control

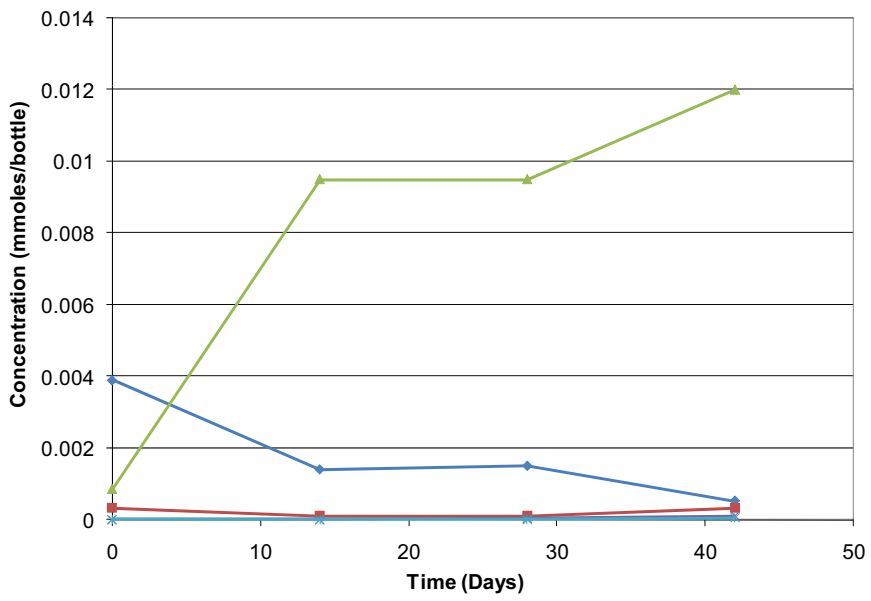


DONOR AMENDMENT

Lactate

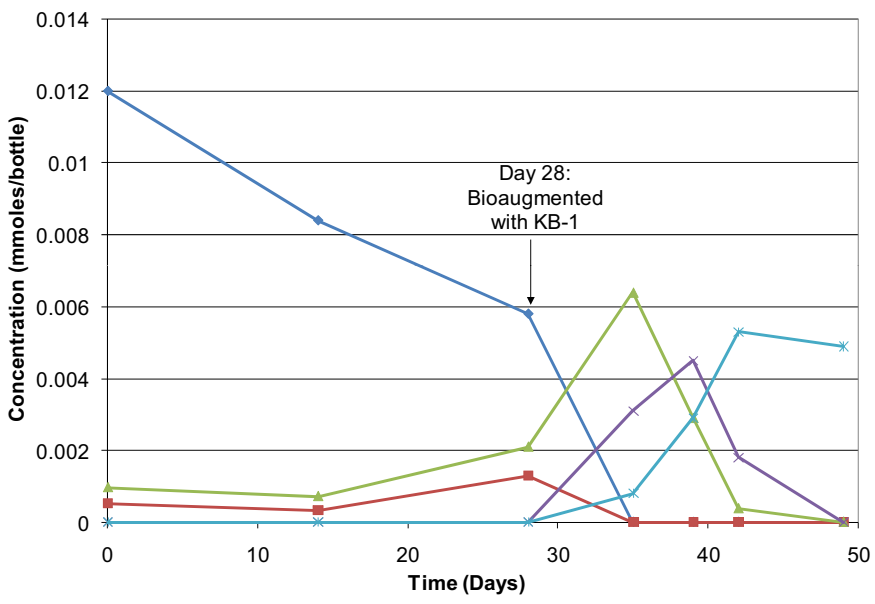


EVO (Newman Zone®)

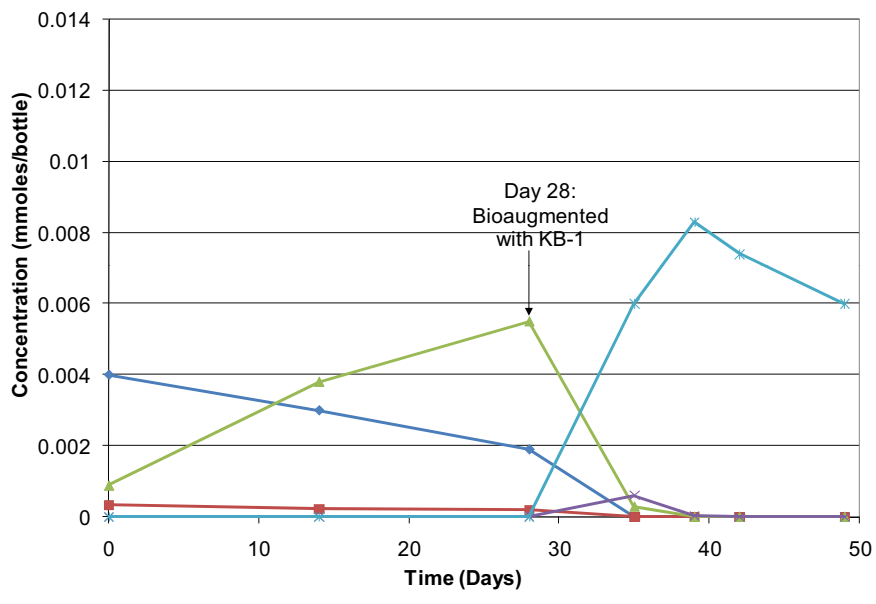


BIOAUGMENTED DONOR AMENDMENT

Lactate & KB-1®



EVO (Newman Zone®) & KB-1®



PCE TCE cis-1,2-DCE VC Ethene

PCE = tetrachloroethene
TCE = trichloroethene
cis-1,2-DCE = cis-1,2-dichloroethene
VC = vinyl chloride

Preliminary EISB Treatability Study Results
Hopyard Cleaners, Pleasanton, California

April 2009	Figure: **15**	Geosyntec consultants

APPENDIX A

Environmental Sampling Services Field Report

Environmental Sampling Services

February 3, 2009

Ms. Melissa Asher
Senior Staff Engineer
GeoSyntec Consultants
475-14th Street, Suite 450
Oakland, California 94612

SUBJECT: January 2009 Quarterly Groundwater Monitoring Event for Hopyard Cleaners, Pleasanton, California

Dear Ms. Asher,

Please find enclosed the Field Activity Report for the quarterly groundwater monitoring event at 2771 Hopyard Road that occurred January 26, 2009.

If you have any questions or concerns regarding this Field Activity Report, please do not hesitate to call me.

Sincerely,
Environmental Sampling Services, LLC

Jacqueline Lee
Manager

Enclosure

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FIELD ACTIVITY REPORT
FOR

JANUARY 2009
QUARTERLY GROUNDWATER
MONITORING EVENT

HOPYARD CLEANERS
2771 HOPYARD ROAD
PLEASANTON, CALIFORNIA

Prepared for: GeoSyntec Consultants
475-14th Street, Suite 450
Oakland, California 94612

Date Prepared: February 2, 2009

Environmental
Sampling Services

FIELD ACTIVITY REPORT
FOR

JANUARY 2009
QUARTERLY GROUNDWATER
MONITORING EVENT

HOPYARD CLEANERS
2771 HOPYARD ROAD
PLEASANTON, CALIFORNIA

Task: Quarterly Groundwater Sampling Event
ESS Personnel: Jacqueline Lee and Stephen Penman
Geosyntec Personnel: Melissa Asher
Date of Activities: January 26, 2009

Decontamination Procedures

All downhole equipment was cleaned with Liqui-Nox® laboratory-grade soap, potable water, and rinsed with distilled water prior to use and between each monitoring well.

Groundwater Level Measurements

Depth to groundwater for seven monitoring wells were measured and recorded following atmospheric equilibration of approximately thirty minutes. All readings were performed with a Solinst® Water Level Meter, Serial Number 49914, and referenced to the surveyor's mark or north rim at the top of PVC well casing (Table 1). Three successive readings that agreed to within one-hundredth of a foot determined depth to groundwater.

Field Equipment and Calibration

pH, Specific Conductance, Temperature, Dissolved Oxygen, and Oxidation Reduction Potential (ORP) were monitored with a YSI® Multi-parameter meter equipped with an in-line flow through cell. Turbidity readings were measured with a HF Scientific® Turbidity meter.

Equipment calibration was performed in accordance with the instrument's calibration and operating procedures. Calibration was performed prior to any monitoring activities (see Daily Equipment Calibration Sheet).

Solution standards: pH 4, 7, and 10, Specific Conductance @ 1,000 uS/cm, and Zobell for ORP were used for calibration purposes. Dissolved Oxygen was calibrated to air. Turbidity was checked against a 0.02 NTU standard. All equipment calibrated and functioned properly during monitoring activities.

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Passive Diffusion Bag (PDB) Sampling

Seven monitoring wells contained Passive Diffusion bags (PDBS). Samples for Volatile Organic Compounds were collected from each PDB.

During sample collection, all 40-ml VOA sample containers were filled while minimizing aeration or degassing. Each sample container was inverted and tapped lightly to check for air bubbles. The absence of air bubbles indicated a successful seal.

Low-Flow Well Purging & Sampling Procedures

A peristaltic pump and new pump tubing was used to purge and sample MW-1 through MW-3. Each monitoring well was purged at a rate no greater than 500-ml per minute until water quality parameters stabilized for three consecutive readings.

Each well was purged following procedures recommended by the United States Environmental Protection Agency Low Flow (Minimal Drawdown) Ground-Water Sampling Procedures, dated April 1996. Each well was purged at a rate no greater than 500-ml per minute until water quality parameters stabilized.

During low-flow purging activities, pH, Specific Conductance (uS), Temperature (Celsius), Dissolved Oxygen (mg/L), Oxidation/Reduction Potential (mV), and physical characteristics such as pumping water level, color, and odor (see Water Quality Sample Log Sheets) were monitored and recorded (see Water Quality Log Sheets).

EPA stabilization guidelines for low-flow sampling were used. Stabilization was achieved after the water quality parameters stabilized for three successive readings. The following criteria were used: ± 0.1 for pH, ± 3 % for Specific Conductivity, ± 10% for Dissolved Oxygen, and ± 10 mV for ORP.

Three criteria were used to determine Turbidity stabilization:

- 0-10 NTUs, no criterion
- 10-50 NTUs, ± 5 NTUs
- more than 50 NTUs, ± 10%

Groundwater samples were collected immediately following stabilization of water quality parameters by disconnecting the tubing from the flow through chamber.

Low flow sampling procedures was used to collect samples for Anions, Gene-Trac Analyses, and Feasibility Analysis.

Sample Handling

All sample labels were completed with waterproof ink and affixed to sample containers.

All sample containers were wiped dry, sealed in Ziploc® bags, and placed a chilled cooler for storage and shipment to the laboratory.

Following completion of groundwater sampling, seven new PDBs were installed. PDB was attached to the middle position for MW-5, MW-6, and MW-7.

Laboratories

TestAmerica of Pleasanton, California provided Trip Blank, sample containers with appropriate preservative, and conducted VOC and Anions (Nitrate, Nitrite, Chloride, and Sulfate) analyses.
SiREM Laboratory of Ontario, Canada provided sample containers with appropriate preservative for Initial VOCs and Feasibility analyses. Gene-Trac ample containers were provided by TestAmerica.

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SiREM Laboratory of Ontario, Canada provided sample containers with appropriate preservative for Initial VOCs and Feasibility analyses. Gene-Trac ample containers were provided by TestAmerica.

Sample Containers

Each VOC sample set was contained in three, 40-ml VOA clear glass containers preserved with hydrochloric acid.

Each Anions sample was contained in a non-preserved 500-ml plastic container.

Each Gene-Trac sample was contained in a non-preserved, one-liter plastic container with minimum headspace.

The Feasibility Study sample was contained in two, non-preserved, 4-liter plastic containers with minimum headspace.

Quality Assurance /Quality Control Samples

All QA/QC samples were submitted to TestAmerica and SiREM for analysis.

One Trip Blank set was stored in the cooler with TestAmerica samples throughout the sampling event.

One blind PDB duplicate set was collected from MW-2 and labeled "MW-DUP @ 08:00". Due to the limited volume in the PDB, a total of four VOAs were filled for both the primary and duplicate sample set. The Anion and Gene-Trac Duplicate was also labeled "MW-DUP" with "14:30" as its fictitious sample time.

One equipment blank was requested but not collected by ESS.

No other QA/QC samples were requested.

Chain of Custody (COC) Form

All sample handling was conducted under standard chain of custody procedures. The COC included: sampler's name and signature, sample identification, sample date and time, and analysis request section.

Shipment of Samples

Samples for TestAmerica were relinquished January 26, 2009. Samples designated for SiREM was relinquished to Geosyntec for shipment.

Storage of Investigative Derived Wastewater (IDW)

Approximately 30 gallons of purged groundwater and decontamination water generated from this sampling event were stored an existing, labeled 55-gallon drum. The drum is stored inside the treatment system enclosure.

Comments

SiREM inadvertently omitted the one-liter plastic containers for Gene-Trac Method analyses. The Gene-Trac containers were obtained from TestAmerica.

ESS inadvertently did not collect the equipment blank.

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With the exception of the above omission, the January 2009 monitoring event was performed as requested by Geosyntec.

Environmental Sampling Services, LLC

Jacqueline Lee
Manager

Attachments:
Table 1: Summary of Groundwater Monitoring Event
Water Sample Log Sheets
Equipment Calibration Sheet
Chain of Custodies

Environmental Sampling Services

WATER QUALITY SAMPLE LOG SHEET | WELL IDENTIFICATION: **MW-1** DATE: 1/26/09

Project Name: Hopyard Cleaners Pleasanton, CA Project Task: Quarterly Monitoring Project/Task No. WR0574
Project Manager: Melissa Asher - Geosyntec Cons. Lab: STL San Francisco Weather Conditions: clear & cool
Well Description: (2") 3.5" 4" 5" 6" Other:____ Well Type: (PVC) Stainless Steel Other: ____
Is Well Secured? (Yes) / No Bolt Size: 9/16" Type of lock / Lock number: Master
Observations / Comments: set pump intake @ 25.27 ft.(BTOC) Screen Interval: 20' to 30'
Purge Method: NA Teflon / PE Disposable Bailer Centrifugal Pump (Peristaltic Pump) Other: ____
Pump Lines: NA (New) / Cleaned / Dedicated Bailer Line: (NA) New / Cleaned / Dedicated
Method of Cleaning Pump: (NA) Alconox Liqui-nox Tap Water DI Rinse Other: ____
Method of Cleaning Bailer: (NA) Alconox Liqui-nox Tap Water DI Rinse Other: ____
Sampling Method: (PDBS) and Disp. Teflon Bailer Disp. PE Bailer (Peristaltic Pump) Other: ____
YSI Muti-Parameter Meter/Probe Serial No.: (556 MPS - 05F1258AH) / 600XL 319340R - 00C1522
Equipment Calibration: See Daily Equipment Calibration Sheet
Method to Measure Water Level: Slope Indicator Serial No.: (25083) / 25742 P.I.D. Reading: NA ppm
Water Level at Start (DTW): 16.73 (BTOC) Water Level Prior To Sampling: 16.86 (BTOC)
TD = 30.27' - 16.73 (DTW) = 13.54 (ft.of water) x "K" = 2.2 (Gals./CV) x NA (No. of CV) = NA (Gals.)
("K"= 0.163 (2" well)) "K" = 0.50 (3.5" well) "K" = .653 (4" well) "K" = 1.02 (5" well) "k" = 1.46 (6" well)

FIELD WATER QUALITY PARAMETERS

Date	Time	Discharge (Liters)	pH +/- 0.1	Temp. (°C)	Specific Conductance mS (uS) +/- 3%	Turbidity (NTU's) +/- 10	Redox (mV) +/- 10	Dissolved Oxygen (mg/L) +/- 10%	Water Level (BTOC)	Color
1/26/09	11:03	Initial	7.06	18.28	1177	16.4	99.3	1.75	16.83	slightly Cloudy
1/26/09	11:06	0.5	7.00	18.95	1167	8.21	57.8	0.55	16.84	Clear
	11:09	1.0	7.00	19.42	1163	5.79	37.1	0.42	16.85	"
	11:11	1.5	6.99	19.92	1158	3.91	36.5	0.30	16.86	"
	11:14	2.0	6.99	20.16	1161	3.06	52.6	0.20	16.86	"
	11:16	2.5	6.98	20.26	1161	2.93	56.6	0.16	16.86	"
	11:18	3.0	6.98	20.28	1163	2.38	61.1	0.15	16.86	"
	11:21	3.5	6.98	20.36	1164	2.19	63.5	0.15	16.86	"
		4.0								

Total Discharge: 3.9 Liters Casing Volumes Removed: NA
Method of disposal of discharged water: (55 Gallon Drum(s)) Poly Tank Treatment System Other: ____
Date/Time Sampled: 1/26/09 @ 11:23 Analysis: VOCs (8260B) - 3 VOAs w/HCl
Anions (300.0) - 1 500ml Poly n/p; Dhc/VCr by Gene-Trac analysis - 1 Liter Poly n/p
QA/QC: None @ ____ Duplicate MS/MSD Equipment Rinseate Field Blank Lab Split
Comments: PDBS collected@ 9:33 (3 VOAs w/HCl) Wtr level prior to sampling VOCs: 16.71 (#99914)

Recorded by: (Stephen Penman) / (Jacki Lee) Signature: [signature] Page 1 of 1

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WATER QUALITY SAMPLE LOG SHEET	WELL IDENTIFICATION: MW-2 DATE: 1/26/09

Project Name: Hopyard Cleaners Pleasanton, CA Project Task: Quarterly Monitoring Project/Task No. WR0574
Project Manager: Melissa Asher - Geosyntec Cons. Lab: STL San Francisco Weather Conditions: Clear & Cool
Well Description: (2") 3.5" 4" 5" 6" Other:____ Well Type: (PVC) Stainless Steel Other: ____
Is Well Secured? (Yes) / No Bolt Size: 9/16" Type of lock / Lock number: Master
Observations / Comments: set pump intake @ 25.31 ft.(BTOC) Screen Interval: 20' to 30'
Purge Method: NA Teflon / PE Disposable Bailer Centrifugal Pump (Peristaltic Pump) Other: ____
Pump Lines: NA (New) Cleaned / Dedicated Bailer Line: (NA) New / Cleaned / Dedicated
Method of Cleaning Pump: (NA) Alconox Liqui-nox Tap Water DI Rinse Other: ____
Method of Cleaning Bailer: NA Alconox Liqui-nox Tap Water DI Rinse Other: ____
Sampling Method: (PDBS and Disp. Teflon Bailer Disp. PE Bailer (Peristaltic Pump) Other: ____
YSI Muti-Parameter Meter/Probe Serial No.: (556 MPS - 05F1258AH) / 600XL 319340R - 00C1522
Equipment Calibration: See Daily Equipment Calibration Sheet
Method to Measure Water Level: Slope Indicator Serial No.: (25083) / 25742 P.I.D. Reading: NA ppm
Water Level at Start (DTW): 16.19 (BTOC) Water Level Prior To Sampling: 16.34 (BTOC)
TD = 30.31' - 16.19 (DTW) = 14.12 (ft.of water) x "K" = 2.3 (Gals./CV) x NA (No. of CV) = NA (Gals.)
("K"= 0.163 (2" well)) "K" = 0.50 (3.5" well) "K" = .653 (4" well) "K" = 1.02 (5" well) "k" = 1.46 (6" well)

FIELD WATER QUALITY PARAMETERS

Date	Time	Discharge (Liters)	pH +/- 0.1	Temp. (°C)	Specific Conductance mS (uS) +/- 3%	Turbidity (NTU's) +/- 10	Redox (mV) +/- 10	Dissolved Oxygen (mg/L) +/- 10%	Water Level (BTOC)	Color
1/26/09	13:32	Initial	7.04	18.90	1495	42.3	110.7	2.45	16.33	slight cloudy gray
	13:35	0.5	6.95	19.11	1495	38.0	119.2	0.53	16.34	"
	13:37	1.0	6.92	19.20	1496	31.8	122.1	0.41	16.34	"
	13:39	1.5	6.91	19.29	1496	27.7	121.0	0.31	16.34	"
	13:41	2.0	6.91	19.37	1495	19.6	120.6	0.34	16.34	"
	13:43	2.5	6.91	19.47	1494	9.92	119.2	0.25	16.34	Clear
	13:45	3.0	6.91	19.50	1493	7.64	117.9	0.20	16.34	"
	13:47	3.5	6.91	19.56	1490	6.96	116.7	0.18	16.34	"
↓	13:49	4.0	6.91	19.54	1492	4.95	116.2	0.17	16.34	"

Total Discharge: 6.4 Liters Casing Volumes Removed: NA
Method of disposal of discharged water: (55 Gallon Drum(s)) Poly Tank Treatment System Other: ____
Date/Time Sampled: 1/26/09 @ 14:00 Analysis: VOCs (8260B) - 3 VOAs w/HCl
Anions (300.0) - 1 500ml Poly n/p; Dhc/VCr by Gene-Trac analysis - 1 Liter poly w/p ; Feasibility Study 8 Liter poly + 2 VOAs
QA/QC: MW-DUP @ 14:30 (Duplicate) MS/MSD Equipment Rinseate Field Blank Lab Split
Comments: PDBs collected @ 9:50 + "MW-DUP (10:50)" 2 VOAs w/ HCl per sample. Wtr level = 16.17 w/Solinst #49914.
Recorded by: (Stephen Penman) / (Jacki Lee) Signature: [signature]

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WATER QUALITY SAMPLE LOG SHEET					WELL IDENTIFICATION: MW-2 Continued Page 2 of 2					
Project Name: Hopyard Cleaners, Pleasanton, CA					Project No.: WR0574					
FIELD WATER QUALITY PARAMETERS CONTINUED										
Date	Time	Discharge (Liters)	pH ± 0.1	Temp. (°C)	Specific Conductance mS (uS) ± 3%	Turbidity (NTUs) ±10 NTU's	Redox (mV) ± 10mv	Dissolved Oxygen (mg/L) ± 10%	Water Level (BTOC)	Color
1/26/09	13:53	4.5	6.91	19.46	1488	4.86	116.7	0.14	16.34	clear
	13:55	5.0	6.91	19.48	1489	4.73	117.0	0.12	16.34	"
	13:57	5.5	6.91	19.40	1490	4.61	117.6	0.12	16.34	"
	13:59	6.0	6.91	19.35	1490	3.69	118.2	0.12	16.34	"
		6.5								
		7.0								
		7.5								
		8.0								
		8.5								
		9.0								
		9.5								
		10.0								
		10.5								
		11.0								
		11.5								
		12.0								
		12.5								
		13.0								
		13.5								
		14.0								

Total Discharge: 6.4 Liters Casing Volumes Removed: NA

Comments:

Recorded by: Stephen Penman / Jacki Lee Signature:

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WATER QUALITY SAMPLE LOG SHEET | WELL IDENTIFICATION: **MW-3** DATE: 1/26/09

Project Name: Hopyard Cleaners Pleasanton, CA Project Task: Quarterly Monitoring Project/Task No. WR0574
Project Manager: Melissa Asher - Geosyntec Cons. Lab: STL San Francisco Weather Conditions: Clear & cold
Well Description: (2") 3.5" 4" 5" 6" Other:____ Well Type: (PVC) Stainless Steel Other: ____
Is Well Secured? (Yes) / No Bolt Size: 9/16" Type of lock / Lock number: Master
Observations / Comments: set pump intake @ 25.29 ft.(BTOC) Screen Interval: 20' to 30'
Purge Method: NA Teflon / PE Disposable Bailer Centrifugal Pump (Peristaltic Pump) Other: ____
Pump Lines: NA (New) / Cleaned / Dedicated Bailer Line: (NA) New / Cleaned / Dedicated
Method of Cleaning Pump: (NA) Alconox Liqui-nox Tap Water DI Rinse Other: ____
Method of Cleaning Bailer: (NA) Alconox Liqui-nox Tap Water DI Rinse Other: ____
Sampling Method: (PDBS) and Disp. Teflon Bailer Disp. PE Bailer (Peristaltic Pump) Other: ____
YSI Muti-Parameter Meter/Probe Serial No.: (556 MPS - 05F1258AH) / 600XL 319340R - 00C1522
Equipment Calibration: See Daily Equipment Calibration Sheet
Method to Measure Water Level: Slope Indicator Serial No.: (25083) / 25742 P.I.D. Reading: NA ppm
Water Level at Start (DTW): 17.14 (BTOC) Water Level Prior To Sampling: 17.37 (BTOC)
TD = 30.29' - 17.14 (DTW) = 13.15 (ft.of water) x "K" = 2.1 (Gals./CV) x NA (No. of CV) = NA (Gals.)
("K"= 0.163 (2" well) "K" = 0.50 (3.5" well) "K" = .653 (4" well) "K" = 1.02 (5" well) "k" = 1.46 (6" well)

FIELD WATER QUALITY PARAMETERS

Date	Time	Discharge (Liters)	pH +/- 0.1	Temp. (°C)	Specific Conductance mS (uS) +/- 3%	Turbidity (NTU's) +/- 10	Redox (mV) +/- 10	Dissolved Oxygen (mg/L) +/- 10%	Water Level (BTOC)	Color
1/26/09	09:41	Initial	6.73	15.80	1627	4.38	180.7	1.76	17.33	Clear
	09:45	0.5	6.93	16.37	1638	4.01	169.8	0.63	17.34	"
	09:48	1.0	6.88	16.89	1635	2.30	162.6	0.50	17.36	"
	09:51	1.5	6.88	17.32	1636	1.94	157.7	0.27	17.36	"
	09:54	2.0	6.87	17.56	1634	1.85	155.2	0.24	17.37	"
	09:57	2.5	6.83	17.77	1633	1.81	153.0	0.24	17.37	"
	10:00	3.0	6.83	17.93	1633	1.74	150.6	0.24	17.37	"
		3.5								
		4.0								

Total Discharge: 3.4 Liters Casing Volumes Removed: NA
Method of disposal of discharged water: (55 Gallon Drum(s)) Poly Tank Treatment System Other: ____
Date/Time Sampled: 1/26/09 @ 10:02 Analysis: VOCs (8260B) - 3 VOAs w/HCl
Anions (300.0) - 1 500ml Poly n/p; Dhc/VCr by Gene-Trac analysis - 1 Liter Poly n/p
QA/QC: None @ ——— Duplicate MS/MSD Equipment Rinseate Field Blank Lab Split
Comments: PDBs collected @ 9:15 (3 VOAs w/HCl). Wtr level prior to sampling = 17.10 (#49914)

Recorded by: (Stephen Penman) / (Jacki Lee) Signature: [signature]

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WATER QUALITY SAMPLE LOG SHEET | WELL IDENTIFICATION: **MW-4** DATE: 1/26/09

Project Name: Hopyard Cleaners Pleasanton, CA Project Task: Quarterly Monitoring Project/Task No. WR0574
Project Manager: Melissa Asher - Geosyntec Cons. Lab: STL San Francisco Weather Conditions: Sunny, cold
Well Description: (2") 3.5" 4" 5" 6" Other:____ Well Type: (PVC) Stainless Steel Other: _____
Is Well Secured? (Yes) No Bolt Size: 9/16" Type of lock / Lock number: Master
Observations / Comments: set pump intake @ NA ft.(BTOC) Screen Interval: 20' to 30'
Purge Method: (NA) Teflon / PE Disposable Bailer Centrifugal Pump Peristaltic Pump Other: _____
Pump Lines: (NA) New / Cleaned / Dedicated Bailer Line: (NA) New / Cleaned / Dedicated
Method of Cleaning Pump: (NA) Alconox Liqui-nox Tap Water DI Rinse Other: _____
Method of Cleaning Bailer: (NA) Alconox Liqui-nox Tap Water DI Rinse Other: D
Sampling Method: (PDBS) Disp. Teflon Bailer Disp. PE Bailer Peristaltic Pump Other: _____
YSI Muti-Parameter Meter/Probe Serial No.: 556 MPS - 05F1258AH / 600XL 319340R - 00C1522
Equipment Calibration: See Daily Equipment Calibration Sheet
Method to Measure Water Level: ~~Slope~~ Solinst Indicator Serial No.: 25083 / ~~25742-q~~ (49914) P.I.D. Reading: NA ppm
Water Level at Start (DTW): 17.86 @ 8:43 (BTOC) Water Level Prior To Sampling: 17.86 @ 10:50 (BTOC)
TD = ~~30.29~~ 34.86 q - 17.86 (DTW) = ~~12.43~~ 16.70 ft.of water) x "K" = ~~2.03~~ 2.72 (Gals./CV) x NA (No. of CV) = NA (Gals.)
"K"= 0.163 (2" well) "K" = 0.50 (3.5" well) "K" = .653 (4" well) "K" = 1.02 (5" well) "k" = 1.46 (6" well)

FIELD WATER QUALITY PARAMETERS

Date	Time	Discharge (Liters)	pH +/- 0.1	Temp. (°C)	Specific Conductance mS uS +/- 3%	Turbidity (NTU's) +/- 10	Redox (mV) +/- 10	Dissolved Oxygen (mg/L) +/- 10%	Water Level (BTOC)	Color
1/26/09	NA	Initial	NA	NA	NA	NA	NA	NA	NA	NA
↓	↓	0.5	↓	↓	↓	↓	↓	↓	↓	↓
		1.0								
		1.5								
		2.0								
		2.5								
		3.0								
		3.5								
↓	↓	4.0	↓	↓	↓	↓	↓	↓	↓	↓

Total Discharge: ~~0~~ Liters Casing Volumes Removed: NA
Method of disposal of discharged water: (55 Gallon Drums) Poly Tank Treatment System Other: _____
Date/Time Sampled: 1/26/09 @ 10:52 Analysis: VOCs (8260B) - 3 VOAs w/HCl

QA/QC: None @ — Duplicate MS/MSD Equipment Rinseate Field Blank Lab Split
Comments: Had to pump out surface water from well annulus.

Recorded by: Stephen Penman / (Jacki Lee) Signature: [signature] Page 1 of 1

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Environmental Sampling Services

WATER QUALITY SAMPLE LOG SHEET

WELL IDENTIFICATION: **MW-5** DATE: 1/26/09

Project Name: Hopyard Cleaners Pleasanton, CA Project Task: Quarterly Monitoring Project/Task No. WR0574

Project Manager: Melissa Asher - Geosyntec Cons. Lab: STL San Francisco Weather Conditions: Sunny, cold

Well Description: (2") 3.5" (4") 5" 6" Other: ____ Well Type: (PVC) Stainless Steel Other: ____

Is Well Secured? (Yes) No Bolt Size: ~~9/16~~ 15/16" Type of lock / Lock number: Master

Observations / Comments: set pump intake @ NA ft.(BTOC) Screen Interval: 20' to 30'

Purge Method: (NA) Teflon / PE Disposable Bailer Centrifugal Pump Peristaltic Pump Other: ____

Pump Lines: (NA) New / Cleaned / Dedicated Bailer Line: (NA) New / Cleaned / Dedicated

Method of Cleaning Pump: (NA) Alconox Liqui-nox Tap Water DI Rinse Other: ____

Method of Cleaning Bailer: (NA) Alconox Liqui-nox Tap Water DI Rinse Other: ____

Sampling Method: (PDBS) Disp. Teflon Bailer Disp. PE Bailer Peristaltic Pump Other: ____

YSI Muti-Parameter Meter/Probe Serial No.: 556 MPS - 05F1258AH / 600XL 319340R - 00C1522

Equipment Calibration: See Daily Equipment Calibration Sheet

Method to Measure Water Level: ~~Slope~~ Solinst (499147) Indicator Serial No.: 25083 / ~~25742~~ P.I.D. Reading: NA ppm

Water Level at Start (DTW): 30.61 @ 8:38 (BTOC) Water Level Prior To Sampling: 30.61 @ 10:10 (BTOC)

TD = ~~30.29~~ 59.98 (2) - 30.61 (DTW) = 29.35 (ft.of water) x "K" = 4.78 (Gals./CV) x NA (No. of CV) = NA (Gals.)

("K"= 0.163 (2" well)) "K" = 0.50 (3.5" well) "K" = .653 (4" well) "K" = 1.02 (5" well) "k" = 1.46 (6" well)

FIELD WATER QUALITY PARAMETERS

Date	Time	Discharge (Liters)	pH +/- 0.1	Temp. (°C)	Specific Conductance mS uS +/- 3%	Turbidity (NTU's) +/- 10	Redox (mV) +/- 10	Dissolved Oxygen (mg/L) +/- 10%	Water Level (BTOC)	Color
1/26/09	NA	Initial	NA	NA	NA	NA	NA	NA	NA	NA
↓	↓	0.5	↓	↓	↓	↓	↓	↓	↓	↓
		1.0								
		1.5								
		2.0								
		2.5								
		3.0								
		3.5								
↓	↓	4.0	↓	↓	↓	↓	↓	↓	↓	↓

Total Discharge: 0 Liters Casing Volumes Removed: NA

Method of disposal of discharged water: (55 Gallon Drum(s)) Poly Tank Treatment System Other: ____

Date/Time Sampled: 1/26/09 @ 10:15 Analysis: VOCs (8260B) - 3 VOAs w/HCl

QA/QC: None @ — Duplicate MS/MSD Equipment Rinseate Field Blank Lab Split

Comments: ____

Recorded by: Stephen Penman / (Jacki Lee) Signature: ____

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WATER QUALITY SAMPLE LOG SHEET	WELL IDENTIFICATION: MW-6 DATE: 1/26/09

Project Name: Hopyard Cleaners Pleasanton, CA Project Task: Quarterly Monitoring Project/Task No. WR0574
Project Manager: Melissa Asher - Geosyntec Cons. Lab: STL San Francisco Weather Conditions: Warming up
Well Description: (2") 3.5" 4" 5" 6" Other:____ Well Type: (PVC) Stainless Steel Other: _____
Is Well Secured? (Yes) / No Bolt Size: 9/16" Type of lock / Lock number: Master
Observations / Comments: set pump intake @ NA ft.(BTOC) Screen Interval: 20' to 30'
Purge Method: (NA) Teflon / PE Disposable Bailer Centrifugal Pump Peristaltic Pump Other: _____
Pump Lines: (NA) New / Cleaned / Dedicated Bailer Line: (NA) New / Cleaned / Dedicated
Method of Cleaning Pump: (NA) Alconox Liqui-nox Tap Water DI Rinse Other: _____
Method of Cleaning Bailer: (NA) Alconox Liqui-nox Tap Water DI Rinse Other: _____
Sampling Method: (PDBS) Disp. Teflon Bailer Disp. PE Bailer Peristaltic Pump Other: _____
YSI Muti-Parameter Meter/Probe Serial No.: 556 MPS - 05F1258AH / 600XL 319340R - 00C1522
Equipment Calibration: See Daily Equipment Calibration Sheet
Method to Measure Water Level: ~~Slope~~ Solinst Indicator Serial No.: 25083 / ~~25742~~ 49914 P.I.D. Reading: NA ppm
Water Level at Start (DTW): 28.10 @ 8:55 (BTOC) Water Level Prior To Sampling: 28.10 @ 11:17 (BTOC)
TD = ~~30.25~~ NM - _____ (DTW) = _____ (ft.of water) x "K" = _____ (Gals./CV) x NA (No. of CV) = NA (Gals.)
"K"= 0.163 (2" well) "K" = 0.50 (3.5" well) "K" = .653 (4" well) "K" = 1.02 (5" well) "k" = 1.46 (6" well)

FIELD WATER QUALITY PARAMETERS

Date	Time	Discharge (Liters)	pH +/- 0.1	Temp. (°C)	Specific Conductance mS uS +/- 3%	Turbidity (NTU's) +/- 10	Redox (mV) +/- 10	Dissolved Oxygen (mg/L) +/- 10%	Water Level (BTOC)	Color
1/26/09	NA	Initial	NA	NA	NA	NA	NA	NA	NA	NA
		0.5								
		1.0								
		1.5								
		2.0								
		2.5								
		3.0								
		3.5								
↓	↓	4.0	↓	↓	↓	↓	↓	↓	↓	↓

Total Discharge: 0 Liters Casing Volumes Removed: NA
Method of disposal of discharged water: (55 Gallon Drum(s)) Poly Tank Treatment System Other: _____
Date/Time Sampled: 1/26/09 @ 11:20 Analysis: VOCs (8260B) - 3 VOAs w/HCl

QA/QC: None @ — Duplicate MS/MSD Equipment Rinseate Field Blank Lab Split
Comments: NM: was not measured.

Recorded by: Stephen Penman / (Jacki Lee) Signature: [signature] Page 1 of 1

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WATER QUALITY SAMPLE LOG SHEET	WELL IDENTIFICATION: MW-7 DATE: 1/26/09

Project Name: Hopyard Cleaners Pleasanton, CA Project Task: Quarterly Monitoring Project/Task No. WR0574

Project Manager: Melissa Asher - Geosyntec Cons. Lab: STL San Francisco Weather Conditions: Sunny, low 60's°F

Well Description: (2") 3.5" 4" 5" 6" Other: ____ Well Type: (PVC) Stainless Steel Other: ____

Is Well Secured? Yes / No Bolt Size: ~~9/16~~ 3/4" Type of lock / Lock number: Master

Observations / Comments: set pump intake @ NA ft.(BTOC) Screen Interval: 20' to 30'

Purge Method: (NA) Teflon / PE Disposable Bailer Centrifugal Pump Peristaltic Pump Other: ____

Pump Lines: (NA) New / Cleaned / Dedicated Bailer Line: (NA) New / Cleaned / Dedicated

Method of Cleaning Pump: (NA) Alconox Liqui-nox Tap Water DI Rinse Other: ____

Method of Cleaning Bailer: (NA) Alconox Liqui-nox Tap Water DI Rinse Other: ____

Sampling Method: (PDBS) Disp. Teflon Bailer Disp. PE Bailer Peristaltic Pump Other: ____

YSI Muti-Parameter Meter/Probe Serial No.: 556 MPS - 05F1258AH / 600XL 319340R - 00C1522

Equipment Calibration: See Daily Equipment Calibration Sheet

Method to Measure Water Level: ~~Slope~~ Solinst Indicator Serial No.: 25083 / ~~26742~~ (49914) P.I.D. Reading: NA ppm

Water Level at Start (DTW): 28.19 @ 9:00 (BTOC) Water Level Prior To Sampling: 28.19 @ 11:40 (BTOC)

TD = ~~30.20~~ NM @ 9 - ____ (DTW) = ____ (ft.of water) x "K" = ____ (Gals./CV) x NA (No. of CV) = NA (Gals.)

"K"= 0.163 (2" well) "K" = 0.50 (3.5" well) "K" = .653 (4" well) "K" = 1.02 (5" well) "k" = 1.46 (6" well)

FIELD WATER QUALITY PARAMETERS

Date	Time	Discharge (Liters)	pH +/- 0.1	Temp. (°C)	Specific Conductance mS uS +/- 3%	Turbidity (NTU's) +/- 10	Redox (mV) +/- 10	Dissolved Oxygen (mg/L) +/- 10%	Water Level (BTOC)	Color
1/26/09	NA	Initial	NA	NA	NA	NA	NA	NA	NA	NA
↓	↓	0.5	↓	↓	↓	↓	↓	↓	↓	↓
		1.0								
		1.5								
		2.0								
		2.5								
		3.0								
		3.5								
		4.0								

Total Discharge: Ø Liters Casing Volumes Removed: NA

Method of disposal of discharged water: (55 Gallon Drum(s)) Poly Tank Treatment System Other: ____

Date/Time Sampled: 1/26/09 @ 11:45 Analysis: VOCs (8260B) - 3 VOAs w/HCl

QA/QC: None @ — Duplicate MS/MSD Equipment Rinseate Field Blank Lab Split

Comments: NM: Was not measured.

Recorded by: Stephen Penman / (Jacki Lee) Signature: [signature] Page 1 of 1

Environmental Sampling Services

Table 1: January 2009 Quarterly Groundwater Monitoring Event
Project Name: Hopyard Cleaners
Project Location: 2771 Hopyard Road, Pleasanton, California

Well/Sample Identification	Date of Measurement	Time of Measurement	Depth to Groundwater (Ft., TOC)	Well Depth (Ft., TOC)	Sample Date	PDB Sample Time	Anion, Gene-Trac & Feasibilty Sample Time	QA/QC Type	QA/QC Sample Identification
MW-1	1/26/2009	8:31	16.71	30.27	1/26/2009	9:33	11:23	None	NA
MW-2	1/26/2009	8:33	16.17	30.31	1/26/2009	9:50	14:00	Duplicate	MW-DUP
MW-3	1/26/2009	8:27	17.10	30.29	1/26/2009	9:15	10:02	None	NA
MW-4	1/26/2009	8:43	17.86	34.56	1/26/2009	10:52	NA	None	NA
MW-5	1/26/2009	8:38	30.61	59.96	1/26/2009	10:15	NA	None	NA
MW-6	1/26/2009	8:55	28.10	NM	1/26/2009	11:20	NA	None	NA
MW-7	1/26/2009	9:00	28.19	NM	1/26/2009	11:45	NA	None	NA

Legend:

TOC = Top of Well Casing
NA = Not Applicable
NM = Not Measured

Environmental Sampling Services

SITE NAME: Hopyard Cleaners
SITE LOCATION: Pleasanton, CA
TASK: January 2009 Quarterly Groundwater Monitoring Event

DAILY EQUIPMENT CALIBRATION SHEET

DATE	TIME	Instrument Serial Number	Probe Serial Number	Dissolved Oxygen [%]	pH 4	pH 7	pH 10	Specific Conductance 1,000 uS/cm	ORP mV	TURBIDITY NTU's
1/26/08	9:23	556 MPS	05F1258AH	100	4.00	7.00	10.01	1,000	236.9	0.02

CHAIN OF CUSTODY RECORD

Page 1 of 2

Environmental Sampling Services

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Log Code: ESSM www.envsampling.com

TURN AROUND TIME ☐ 24 Hours ☐ 48 Hours ☐ 1 Week ☑ Normal Other:

LABORATORY: TestAmerica-Pleasanton
Lab Code:

Report To: Angela Liang & Melissa Asher **Telephone:** (510) 285-2700
Company: Geosyntec Consultants **Fax:** (510) 836-3036
Address: 475-14th Street, Suite 450 **Project Name:** Hopyard Cleaner
Oakland, CA 94612 **Project Number:** WRO574
E-Mail: aliang@geosyntec.com & masher@geosyntec.com
Sampler(s): Jacqueline Lee ☑ **Sampler's Signature:**
Stephen Penman ☑ **Sampler's Signature:**
GeoTracker No.: NA
Reporting Requirement: Hard Copy : Yes ☑ No ☐
EDD File: Yes ☑ No ☐ Electronic (EDF) : Yes ☐ No ☑

SAMPLE ID	FIELD POINT NAME	Sample Date	Sample Time	Number of Containers	Type of Container[1]	Matrix: Groundwater	Soil	Soil Vapor	Water	Other	Preservative: Ice	HCl	HNO_3	H_2SO_4	VOCs (8260B)	ANIONS: Nitrate, Nitrite, Chloride, Sulfate	Field Filtered (FF)	Comments
Trip Blank		1/26/09	7:30	2	1				X		X	X			X			
MW-3		1/26/09	9:15	3	1	X					X	X			X			
MW-1		1/26/09	9:33	3	1	X					X	X			X			
MW-2		1/26/09	9:50	2	1	X					X	X			X			
MW-3		1/26/09	10:02	~~3~~ 1	1	X					X	X			X	X		
MW-5		1/26/09	10:15	3	1	X					X	X			X			
MW-DUP		1/26/09	10:50	2	1	X					X	X			X			
MW-4		1/26/09	10:52	3	1	X					X	X			X			
MW-6		1/26/09	11:20	3	1	X					X	X			X			
MW-1		1/26/09	11:23	1	3	X					X					X		
MW-7		1/26/09	11:45	3	1	X					X	X			X			

Relinquished By:	Date:	Time:	Received By:
	1/26/09	15:45	
Relinquished By:	Date:	Time:	Received By:
Relinquished By:	Date:	Time:	Received By:

[1] = Sample Container Type: 1 =VOA 2=Glass 3=Plastic 4=Summa Canister

QUESTIONS REGARDING COC, CALL ESS

1.3°C

Please email COC for confirmation (masher@geosyntec.com)

SAMPLE RECEIPT
☐ Intact ☐ Cold
☒ On Ice ☐ Ambient
Preservative Correct?
☐ Yes ☐ No ☐ NA

CHAIN OF CUSTODY RECORD

Environmental Sampling Services
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Martinez, California 94553-6105
Tel: (925) 372-8108 Fax: (925) 372-6705
Log Code: ESSM www.envsampling.com

TURN AROUND TIME Other:

LABORATORY: TestAmerica-Pleasanton
Lab Code:

☐ 24 Hours	☐ 48 Hours	☐ 1 Week	☑ Normal

Report To: Angela Liang & Melissa Asher **Telephone:** (510) 285-2700
Company: Geosyntec Consultants **Fax:** (510) 836-3036
Address: 475-14th Street, Suite 450 **Project Name:** Hopyard Cleaner
Oakland, CA 94612 **Project Number:** WRO574
E-Mail: aliang@geosyntec.com & masher@geosyntec.com
Sampler(s): Jacqueline Lee ☑ **Sampler's Signature:**
Stephen Penman ☑ **Sampler's Signature:**
GeoTracker No.: NA
Reporting Requirement: Hard Copy : Yes ☑ No ☐
EDD File: Yes ☑ No ☐ Electronic (EDF) : Yes ☐ No ☑

SAMPLE ID	FIELD POINT NAME	Sample Date	Sample Time	Number of Containers	Type of Container[1]	Matrix: Groundwater	Soil	Soil Vapor	Water	Other	Preservative: Ice	HCl	HNO_3	H_2SO_4	Analysis Request: VOCs (8260B)	ANIONS: Nitrate, Nitrite, Chloride, Sulfate	Field Filtered (FF)	Comments
MW-2		1/26/09	14:00	1	3	X					X					X		
MW-DUP		1/26/09	14:30	1	3	X					X					X		

Relinquished By:	Date:	Time:	Received By:
	1/26/09	15:45	
Relinquished By:	Date:	Time:	Received By:
Relinquished By:	Date:	Time:	Received By:

1 = Sample Container Type: 1 =VOA 2=Glass 3=Plastic 4=Summa Canister

QUESTIONS REGARDING COC, CALL ESS

Please email COC for confirmation ! masher@geosyntec.com

SAMPLE RECEIPT
☐ Intact ☐ Cold
☐ On Ice ☐ Ambient
Preservative Correct?
☐ Yes ☐ No ☐ NA

CHAIN OF CUSTODY RECORD

Page 1 of 1

Environmental Sampling Services

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Martinez, California 94553-6105
Tel: (925) 372-8108 Fax: (925) 372-6705
Log Code: ESSM www.envsampling.com

TURN AROUND TIME — Other:

☐ 24 Hours	☐ 48 Hours	☐ 1 Week	☑ Normal

LABORATORY: SiREM-Ontario, Canada
Lab Code: S-1515

Report To: Angela Liang & Melissa Asher Telephone: (510) 285-2700
Company: Geosyntec Consultants Fax: (510) 836-3036
Address: 475-14th Street, Suite 450 Project Name: Hopyard Cleaner
Oakland, CA 94612 Project Number: WRO574
E-Mail: aliang@geosyntec.com & masher@geosyntec.com
Sampler(s): Jacqueline Lee ☑ Sampler's Signature:
Stephen Penman ☑ Sampler's Signature:
GeoTracker No.: NA
Reporting Requirement: Hard Copy: Yes ☑ No ☐
EDD File: Yes ☑ No ☐ Electronic (EDF): Yes ☐ No ☑

	SAMPLE ID	FIELD POINT NAME	Sample Date	Sample Time	Number of Containers	Type of Container[1]	Matrix: Groundwater	Soil	Soil Vapor	Water	Other	Preservative: Ice	HCl	HNO_3	H_2SO_4	GENE-TRAC METHOD 1:Quantitative GENE-TRAC-DHC*	GENE-TRAC METHOD 2: GENE-TRAC-VC*	Treatability study (FTSB)	Field Filtered (FF)	Comments
1	MW-3		1/26/09	10:02	1	3	X					X				X	X			
2	MW-1		1/26/09	11:23	1	3	X					X				X	X			
3	MW-2		1/26/09	14:00	6	1,3	X					X				X	X	X		
4	MW-DUP		1/26/09	14:30	2	3	X					X				X	X			

Relinquished By:	Date:	Time:	Received By:
	1/26/09	15:17	
Relinquished By:	Date:	Time:	Received By:
	1/27/09	10:05	FedEx
Relinquished By:	Date:	Time:	Received By:
			1/28/09 1:35 pm

1 = Sample Container Type: 1 =VOA 2=Glass 3=Plastic 4=Summa Canister

QUESTIONS REGARDING COC, CALL ESS
DHC = Dehalococcoides, VC=Vinyl Chloride

Please email COC for confirmation! masher@geosyntec.com

SAMPLE RECEIPT
☐ Intact ☐ Cold
☐ On Ice ☐ Ambient
Preservative Correct?
☐ Yes ☐ No ☐ NA

APPENDIX B

Groundwater and SVE Monitoring Laboratory Analytical Reports

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

Job Number: 720-17838-1

Job Description: Hopyard Cleaners

For:
Geosyntec Consultants, Inc..
475 14th Street, Suite 450
Oakland, CA 94612

Attention: Ms. Melissa Asher

Approved for release.
Dimple Sharma
Project Manager I
1/30/2009 4:57 PM

Designee for
Melissa Brewer
Project Manager I
melissa.brewer@testamericainc.com
01/30/2009

cc: Ms. Angela Liang

TestAmerica Laboratories, Inc.
TestAmerica San Francisco 1220 Quarry Lane, Pleasanton, CA 94566
Tel (925) 484-1919 Fax (925) 600-3002 www.testamericainc.com

Comments
No additional comments.

Receipt
All samples were received in good condition within temperature requirements.

GC/MS VOA
No analytical or quality issues were noted.

EXECUTIVE SUMMARY - Detections

Client: Geosyntec Consultants, Inc.. Job Number: 720-17838-1

Lab Sample ID / Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
720-17838-2	**MW-3**				
cis-1,2-Dichloroethene		4.6	0.50	ug/L	8260B
Tetrachloroethene		42	0.50	ug/L	8260B
Trichloroethene		4.7	0.50	ug/L	8260B
720-17838-3	**MW-1**				
cis-1,2-Dichloroethene		240	20	ug/L	8260B
Tetrachloroethene		1700	20	ug/L	8260B
Trichloroethene		320	20	ug/L	8260B
720-17838-4	**MW-2**				
cis-1,2-Dichloroethene		760	100	ug/L	8260B
Tetrachloroethene		12000	100	ug/L	8260B
Trichloroethene		720	100	ug/L	8260B
720-17838-6	**MW-5**				
Tetrachloroethene		37	0.50	ug/L	8260B
720-17838-7	**MW-DUP**				
cis-1,2-Dichloroethene		770	100	ug/L	8260B
Tetrachloroethene		12000	100	ug/L	8260B
Trichloroethene		730	100	ug/L	8260B
720-17838-8	**MW-4**				
cis-1,2-Dichloroethene		4.3	0.50	ug/L	8260B
Trichloroethene		4.9	0.50	ug/L	8260B
720-17838-11	**MW-7**				
Tetrachloroethene		9.9	0.50	ug/L	8260B

METHOD SUMMARY

Client: Geosyntec Consultants, Inc.. Job Number: 720-17838-1

Description	Lab Location	Method	Preparation Method
Matrix: Water			
Volatile Organic Compounds (GC/MS)	TAL SF	SW846 8260B	
Purge and Trap	TAL SF		SW846 5030B
EPA 300.0		EPA 300.0	

Lab References:

= TestAmerica Morgan Hill

TAL SF = TestAmerica San Francisco

Method References:

EPA = US Environmental Protection Agency

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

SAMPLE SUMMARY

Client: Geosyntec Consultants, Inc.. Job Number: 720-17838-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
720-17838-1	TRIP BLANK	Water	01/26/2009 0730	01/26/2009 1545
720-17838-2	MW-3	Water	01/26/2009 0915	01/26/2009 1545
720-17838-3	MW-1	Water	01/26/2009 0933	01/26/2009 1545
720-17838-4	MW-2	Water	01/26/2009 0950	01/26/2009 1545
720-17838-5	MW-3	Water	01/26/2009 1002	01/26/2009 1545
720-17838-6	MW-5	Water	01/26/2009 1015	01/26/2009 1545
720-17838-7	MW-DUP	Water	01/26/2009 1050	01/26/2009 1545
720-17838-8	MW-4	Water	01/26/2009 1052	01/26/2009 1545
720-17838-9	MW-6	Water	01/26/2009 1120	01/26/2009 1545
720-17838-10	MW-1	Water	01/26/2009 1123	01/26/2009 1545
720-17838-11	MW-7	Water	01/26/2009 1145	01/26/2009 1545
720-17838-12	MW-2	Water	01/26/2009 1400	01/26/2009 1545
720-17838-13	MW-DUP	Water	01/26/2009 1430	01/26/2009 1545

Client: Geosyntec Consultants, Inc.. Job Number: 720-17838-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 720-17838-1 Date Sampled: 01/26/2009 0730
Client Matrix: Water Date Received: 01/26/2009 1545

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B Analysis Batch: 720-46316 Instrument ID: Varian 3900G
Preparation: 5030B Lab File ID: e:\data\200901\012909\SA-
Dilution: 1.0 Initial Weight/Volume: 40 mL
Date Analyzed: 01/29/2009 1324 Final Weight/Volume: 40 mL
Date Prepared: 01/29/2009 1324

Analyte	Result (ug/L)	Qualifier	RL
Methyl tert-butyl ether	ND		5.0
Acetone	ND		50
Benzene	ND		0.50
Dichlorobromomethane	ND		0.50
Bromobenzene	ND		1.0
Chlorobromomethane	ND		1.0
Bromoform	ND		1.0
Bromomethane	ND		1.0
2-Butanone (MEK)	ND		50
n-Butylbenzene	ND		1.0
sec-Butylbenzene	ND		1.0
tert-Butylbenzene	ND		1.0
Carbon disulfide	ND		5.0
Carbon tetrachloride	ND		0.50
Chlorobenzene	ND		0.50
Chloroethane	ND		1.0
Chloroform	ND		1.0
Chloromethane	ND		1.0
2-Chlorotoluene	ND		0.50
4-Chlorotoluene	ND		0.50
Chlorodibromomethane	ND		0.50
1,2-Dichlorobenzene	ND		0.50
1,3-Dichlorobenzene	ND		0.50
1,4-Dichlorobenzene	ND		0.50
1,3-Dichloropropane	ND		1.0
1,1-Dichloropropene	ND		0.50
1,2-Dibromo-3-Chloropropane	ND		1.0
Ethylene Dibromide	ND		0.50
Dibromomethane	ND		0.50
Dichlorodifluoromethane	ND		0.50
1,1-Dichloroethane	ND		0.50
1,2-Dichloroethane	ND		0.50
1,1-Dichloroethene	ND		0.50
cis-1,2-Dichloroethene	ND		0.50
trans-1,2-Dichloroethene	ND		0.50
1,2-Dichloropropane	ND		0.50
cis-1,3-Dichloropropene	ND		0.50
trans-1,3-Dichloropropene	ND		0.50
Ethylbenzene	ND		0.50
Hexachlorobutadiene	ND		1.0
2-Hexanone	ND		50
Isopropylbenzene	ND		0.50
4-Isopropyltoluene	ND		1.0
Methylene Chloride	ND		5.0

Client: Geosyntec Consultants, Inc.. Job Number: 720-17838-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 720-17838-1 Date Sampled: 01/26/2009 0730
Client Matrix: Water Date Received: 01/26/2009 1545

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B Analysis Batch: 720-46316 Instrument ID: Varian 3900G
Preparation: 5030B Lab File ID: e:\data\200901\012909\SA-
Dilution: 1.0 Initial Weight/Volume: 40 mL
Date Analyzed: 01/29/2009 1324 Final Weight/Volume: 40 mL
Date Prepared: 01/29/2009 1324

Analyte	Result (ug/L)	Qualifier	RL
4-Methyl-2-pentanone (MIBK)	ND		50
Naphthalene	ND		1.0
N-Propylbenzene	ND		1.0
Styrene	ND		0.50
1,1,1,2-Tetrachloroethane	ND		0.50
1,1,2,2-Tetrachloroethane	ND		0.50
Tetrachloroethene	ND		0.50
Toluene	ND		0.50
1,2,3-Trichlorobenzene	ND		1.0
1,2,4-Trichlorobenzene	ND		1.0
1,1,1-Trichloroethane	ND		0.50
1,1,2-Trichloroethane	ND		0.50
Trichloroethene	ND		0.50
Trichlorofluoromethane	ND		1.0
1,2,3-Trichloropropane	ND		0.50
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50
1,2,4-Trimethylbenzene	ND		0.50
1,3,5-Trimethylbenzene	ND		0.50
Vinyl acetate	ND		50
Vinyl chloride	ND		0.50
Xylenes, Total	ND		1.0
2,2-Dichloropropane	ND		0.50

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	99	74 - 131
1,2-Dichloroethane-d4 (Surr)	100	76 - 132
Toluene-d8 (Surr)	98	82 - 120

Client: Geosyntec Consultants, Inc.. Job Number: 720-17838-1

Client Sample ID: MW-3

Lab Sample ID: 720-17838-2 Date Sampled: 01/26/2009 0915
Client Matrix: Water Date Received: 01/26/2009 1545

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B Analysis Batch: 720-46316 Instrument ID: Varian 3900G
Preparation: 5030B Lab File ID: e:\data\200901\012909\SA-
Dilution: 1.0 Initial Weight/Volume: 40 mL
Date Analyzed: 01/29/2009 1538 Final Weight/Volume: 40 mL
Date Prepared: 01/29/2009 1538

Analyte	Result (ug/L)	Qualifier	RL
Methyl tert-butyl ether	ND		5.0
Acetone	ND		50
Benzene	ND		0.50
Dichlorobromomethane	ND		0.50
Bromobenzene	ND		1.0
Chlorobromomethane	ND		1.0
Bromoform	ND		1.0
Bromomethane	ND		1.0
2-Butanone (MEK)	ND		50
n-Butylbenzene	ND		1.0
sec-Butylbenzene	ND		1.0
tert-Butylbenzene	ND		1.0
Carbon disulfide	ND		5.0
Carbon tetrachloride	ND		0.50
Chlorobenzene	ND		0.50
Chloroethane	ND		1.0
Chloroform	ND		1.0
Chloromethane	ND		1.0
2-Chlorotoluene	ND		0.50
4-Chlorotoluene	ND		0.50
Chlorodibromomethane	ND		0.50
1,2-Dichlorobenzene	ND		0.50
1,3-Dichlorobenzene	ND		0.50
1,4-Dichlorobenzene	ND		0.50
1,3-Dichloropropane	ND		1.0
1,1-Dichloropropene	ND		0.50
1,2-Dibromo-3-Chloropropane	ND		1.0
Ethylene Dibromide	ND		0.50
Dibromomethane	ND		0.50
Dichlorodifluoromethane	ND		0.50
1,1-Dichloroethane	ND		0.50
1,2-Dichloroethane	ND		0.50
1,1-Dichloroethene	ND		0.50
cis-1,2-Dichloroethene	4.6		0.50
trans-1,2-Dichloroethene	ND		0.50
1,2-Dichloropropane	ND		0.50
cis-1,3-Dichloropropene	ND		0.50
trans-1,3-Dichloropropene	ND		0.50
Ethylbenzene	ND		0.50
Hexachlorobutadiene	ND		1.0
2-Hexanone	ND		50
Isopropylbenzene	ND		0.50
4-Isopropyltoluene	ND		1.0
Methylene Chloride	ND		5.0

Client: Geosyntec Consultants, Inc.. Job Number: 720-17838-1

Client Sample ID: MW-3

Lab Sample ID: 720-17838-2 Date Sampled: 01/26/2009 0915
Client Matrix: Water Date Received: 01/26/2009 1545

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B Analysis Batch: 720-46316 Instrument ID: Varian 3900G
Preparation: 5030B Lab File ID: e:\data\200901\012909\SA-
Dilution: 1.0 Initial Weight/Volume: 40 mL
Date Analyzed: 01/29/2009 1538 Final Weight/Volume: 40 mL
Date Prepared: 01/29/2009 1538

Analyte	Result (ug/L)	Qualifier	RL
4-Methyl-2-pentanone (MIBK)	ND		50
Naphthalene	ND		1.0
N-Propylbenzene	ND		1.0
Styrene	ND		0.50
1,1,1,2-Tetrachloroethane	ND		0.50
1,1,2,2-Tetrachloroethane	ND		0.50
Tetrachloroethene	42		0.50
Toluene	ND		0.50
1,2,3-Trichlorobenzene	ND		1.0
1,2,4-Trichlorobenzene	ND		1.0
1,1,1-Trichloroethane	ND		0.50
1,1,2-Trichloroethane	ND		0.50
Trichloroethene	4.7		0.50
Trichlorofluoromethane	ND		1.0
1,2,3-Trichloropropane	ND		0.50
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50
1,2,4-Trimethylbenzene	ND		0.50
1,3,5-Trimethylbenzene	ND		0.50
Vinyl acetate	ND		50
Vinyl chloride	ND		0.50
Xylenes, Total	ND		1.0
2,2-Dichloropropane	ND		0.50

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	103	74 - 131
1,2-Dichloroethane-d4 (Surr)	96	76 - 132
Toluene-d8 (Surr)	97	82 - 120

Client: Geosyntec Consultants, Inc.. Job Number: 720-17838-1

Client Sample ID: MW-1

Lab Sample ID: 720-17838-3 Date Sampled: 01/26/2009 0933
Client Matrix: Water Date Received: 01/26/2009 1545

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B Analysis Batch: 720-46316 Instrument ID: Varian 3900G
Preparation: 5030B Lab File ID: e:\data\200901\012909\SA-
Dilution: 40 Initial Weight/Volume: 40 mL
Date Analyzed: 01/29/2009 1721 Final Weight/Volume: 40 mL
Date Prepared: 01/29/2009 1721

Analyte	Result (ug/L)	Qualifier	RL
Methyl tert-butyl ether	ND		200
Acetone	ND		2000
Benzene	ND		20
Dichlorobromomethane	ND		20
Bromobenzene	ND		40
Chlorobromomethane	ND		40
Bromoform	ND		40
Bromomethane	ND		40
2-Butanone (MEK)	ND		2000
n-Butylbenzene	ND		40
sec-Butylbenzene	ND		40
tert-Butylbenzene	ND		40
Carbon disulfide	ND		200
Carbon tetrachloride	ND		20
Chlorobenzene	ND		20
Chloroethane	ND		40
Chloroform	ND		40
Chloromethane	ND		40
2-Chlorotoluene	ND		20
4-Chlorotoluene	ND		20
Chlorodibromomethane	ND		20
1,2-Dichlorobenzene	ND		20
1,3-Dichlorobenzene	ND		20
1,4-Dichlorobenzene	ND		20
1,3-Dichloropropane	ND		40
1,1-Dichloropropene	ND		20
1,2-Dibromo-3-Chloropropane	ND		40
Ethylene Dibromide	ND		20
Dibromomethane	ND		20
Dichlorodifluoromethane	ND		20
1,1-Dichloroethane	ND		20
1,2-Dichloroethane	ND		20
1,1-Dichloroethene	ND		20
cis-1,2-Dichloroethene	240		20
trans-1,2-Dichloroethene	ND		20
1,2-Dichloropropane	ND		20
cis-1,3-Dichloropropene	ND		20
trans-1,3-Dichloropropene	ND		20
Ethylbenzene	ND		20
Hexachlorobutadiene	ND		40
2-Hexanone	ND		2000
Isopropylbenzene	ND		20
4-Isopropyltoluene	ND		40
Methylene Chloride	ND		200

Client: Geosyntec Consultants, Inc.. Job Number: 720-17838-1

Client Sample ID: MW-1

Lab Sample ID: 720-17838-3 Date Sampled: 01/26/2009 0933
Client Matrix: Water Date Received: 01/26/2009 1545

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B Analysis Batch: 720-46316 Instrument ID: Varian 3900G
Preparation: 5030B Lab File ID: e:\data\200901\012909\SA-
Dilution: 40 Initial Weight/Volume: 40 mL
Date Analyzed: 01/29/2009 1721 Final Weight/Volume: 40 mL
Date Prepared: 01/29/2009 1721

Analyte	Result (ug/L)	Qualifier	RL
4-Methyl-2-pentanone (MIBK)	ND		2000
Naphthalene	ND		40
N-Propylbenzene	ND		40
Styrene	ND		20
1,1,1,2-Tetrachloroethane	ND		20
1,1,2,2-Tetrachloroethane	ND		20
Tetrachloroethene	1700		20
Toluene	ND		20
1,2,3-Trichlorobenzene	ND		40
1,2,4-Trichlorobenzene	ND		40
1,1,1-Trichloroethane	ND		20
1,1,2-Trichloroethane	ND		20
Trichloroethene	320		20
Trichlorofluoromethane	ND		40
1,2,3-Trichloropropane	ND		20
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		20
1,2,4-Trimethylbenzene	ND		20
1,3,5-Trimethylbenzene	ND		20
Vinyl acetate	ND		2000
Vinyl chloride	ND		20
Xylenes, Total	ND		40
2,2-Dichloropropane	ND		20

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	102	74 - 131
1,2-Dichloroethane-d4 (Surr)	108	76 - 132
Toluene-d8 (Surr)	98	82 - 120

Client: Geosyntec Consultants, Inc.. Job Number: 720-17838-1

Client Sample ID: MW-2

Lab Sample ID: 720-17838-4 Date Sampled: 01/26/2009 0950
Client Matrix: Water Date Received: 01/26/2009 1545

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B Analysis Batch: 720-46316 Instrument ID: Varian 3900G
Preparation: 5030B Lab File ID: e:\data\200901\012909\SA-
Dilution: 200 Initial Weight/Volume: 40 mL
Date Analyzed: 01/29/2009 1754 Final Weight/Volume: 40 mL
Date Prepared: 01/29/2009 1754

Analyte	Result (ug/L)	Qualifier	RL
Methyl tert-butyl ether	ND		1000
Acetone	ND		10000
Benzene	ND		100
Dichlorobromomethane	ND		100
Bromobenzene	ND		200
Chlorobromomethane	ND		200
Bromoform	ND		200
Bromomethane	ND		200
2-Butanone (MEK)	ND		10000
n-Butylbenzene	ND		200
sec-Butylbenzene	ND		200
tert-Butylbenzene	ND		200
Carbon disulfide	ND		1000
Carbon tetrachloride	ND		100
Chlorobenzene	ND		100
Chloroethane	ND		200
Chloroform	ND		200
Chloromethane	ND		200
2-Chlorotoluene	ND		100
4-Chlorotoluene	ND		100
Chlorodibromomethane	ND		100
1,2-Dichlorobenzene	ND		100
1,3-Dichlorobenzene	ND		100
1,4-Dichlorobenzene	ND		100
1,3-Dichloropropane	ND		200
1,1-Dichloropropene	ND		100
1,2-Dibromo-3-Chloropropane	ND		200
Ethylene Dibromide	ND		100
Dibromomethane	ND		100
Dichlorodifluoromethane	ND		100
1,1-Dichloroethane	ND		100
1,2-Dichloroethane	ND		100
1,1-Dichloroethene	ND		100
cis-1,2-Dichloroethene	760		100
trans-1,2-Dichloroethene	ND		100
1,2-Dichloropropane	ND		100
cis-1,3-Dichloropropene	ND		100
trans-1,3-Dichloropropene	ND		100
Ethylbenzene	ND		100
Hexachlorobutadiene	ND		200
2-Hexanone	ND		10000
Isopropylbenzene	ND		100
4-Isopropyltoluene	ND		200
Methylene Chloride	ND		1000

Client: Geosyntec Consultants, Inc.. Job Number: 720-17838-1

Client Sample ID: MW-2

Lab Sample ID: 720-17838-4 Date Sampled: 01/26/2009 0950
Client Matrix: Water Date Received: 01/26/2009 1545

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B Analysis Batch: 720-46316 Instrument ID: Varian 3900G
Preparation: 5030B Lab File ID: e:\data\200901\012909\SA-
Dilution: 200 Initial Weight/Volume: 40 mL
Date Analyzed: 01/29/2009 1754 Final Weight/Volume: 40 mL
Date Prepared: 01/29/2009 1754

Analyte	Result (ug/L)	Qualifier	RL
4-Methyl-2-pentanone (MIBK)	ND		10000
Naphthalene	ND		200
N-Propylbenzene	ND		200
Styrene	ND		100
1,1,1,2-Tetrachloroethane	ND		100
1,1,2,2-Tetrachloroethane	ND		100
Tetrachloroethene	12000		100
Toluene	ND		100
1,2,3-Trichlorobenzene	ND		200
1,2,4-Trichlorobenzene	ND		200
1,1,1-Trichloroethane	ND		100
1,1,2-Trichloroethane	ND		100
Trichloroethene	720		100
Trichlorofluoromethane	ND		200
1,2,3-Trichloropropane	ND		100
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		100
1,2,4-Trimethylbenzene	ND		100
1,3,5-Trimethylbenzene	ND		100
Vinyl acetate	ND		10000
Vinyl chloride	ND		100
Xylenes, Total	ND		200
2,2-Dichloropropane	ND		100

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	95	74 - 131
1,2-Dichloroethane-d4 (Surr)	109	76 - 132
Toluene-d8 (Surr)	95	82 - 120

Client: Geosyntec Consultants, Inc.. Job Number: 720-17838-1

Client Sample ID: MW-5

Lab Sample ID: 720-17838-6 Date Sampled: 01/26/2009 1015
Client Matrix: Water Date Received: 01/26/2009 1545

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B Analysis Batch: 720-46316 Instrument ID: Varian 3900G
Preparation: 5030B Lab File ID: e:\data\200901\012909\SA-
Dilution: 1.0 Initial Weight/Volume: 40 mL
Date Analyzed: 01/29/2009 1612 Final Weight/Volume: 40 mL
Date Prepared: 01/29/2009 1612

Analyte	Result (ug/L)	Qualifier	RL
Methyl tert-butyl ether	ND		5.0
Acetone	ND		50
Benzene	ND		0.50
Dichlorobromomethane	ND		0.50
Bromobenzene	ND		1.0
Chlorobromomethane	ND		1.0
Bromoform	ND		1.0
Bromomethane	ND		1.0
2-Butanone (MEK)	ND		50
n-Butylbenzene	ND		1.0
sec-Butylbenzene	ND		1.0
tert-Butylbenzene	ND		1.0
Carbon disulfide	ND		5.0
Carbon tetrachloride	ND		0.50
Chlorobenzene	ND		0.50
Chloroethane	ND		1.0
Chloroform	ND		1.0
Chloromethane	ND		1.0
2-Chlorotoluene	ND		0.50
4-Chlorotoluene	ND		0.50
Chlorodibromomethane	ND		0.50
1,2-Dichlorobenzene	ND		0.50
1,3-Dichlorobenzene	ND		0.50
1,4-Dichlorobenzene	ND		0.50
1,3-Dichloropropane	ND		1.0
1,1-Dichloropropene	ND		0.50
1,2-Dibromo-3-Chloropropane	ND		1.0
Ethylene Dibromide	ND		0.50
Dibromomethane	ND		0.50
Dichlorodifluoromethane	ND		0.50
1,1-Dichloroethane	ND		0.50
1,2-Dichloroethane	ND		0.50
1,1-Dichloroethene	ND		0.50
cis-1,2-Dichloroethene	ND		0.50
trans-1,2-Dichloroethene	ND		0.50
1,2-Dichloropropane	ND		0.50
cis-1,3-Dichloropropene	ND		0.50
trans-1,3-Dichloropropene	ND		0.50
Ethylbenzene	ND		0.50
Hexachlorobutadiene	ND		1.0
2-Hexanone	ND		50
Isopropylbenzene	ND		0.50
4-Isopropyltoluene	ND		1.0
Methylene Chloride	ND		5.0

Client: Geosyntec Consultants, Inc.. Job Number: 720-17838-1

Client Sample ID: MW-5

Lab Sample ID: 720-17838-6 Date Sampled: 01/26/2009 1015
Client Matrix: Water Date Received: 01/26/2009 1545

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B Analysis Batch: 720-46316 Instrument ID: Varian 3900G
Preparation: 5030B Lab File ID: e:\data\200901\012909\SA-
Dilution: 1.0 Initial Weight/Volume: 40 mL
Date Analyzed: 01/29/2009 1612 Final Weight/Volume: 40 mL
Date Prepared: 01/29/2009 1612

Analyte	Result (ug/L)	Qualifier	RL
4-Methyl-2-pentanone (MIBK)	ND		50
Naphthalene	ND		1.0
N-Propylbenzene	ND		1.0
Styrene	ND		0.50
1,1,1,2-Tetrachloroethane	ND		0.50
1,1,2,2-Tetrachloroethane	ND		0.50
Tetrachloroethene	37		0.50
Toluene	ND		0.50
1,2,3-Trichlorobenzene	ND		1.0
1,2,4-Trichlorobenzene	ND		1.0
1,1,1-Trichloroethane	ND		0.50
1,1,2-Trichloroethane	ND		0.50
Trichloroethene	ND		0.50
Trichlorofluoromethane	ND		1.0
1,2,3-Trichloropropane	ND		0.50
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50
1,2,4-Trimethylbenzene	ND		0.50
1,3,5-Trimethylbenzene	ND		0.50
Vinyl acetate	ND		50
Vinyl chloride	ND		0.50
Xylenes, Total	ND		1.0
2,2-Dichloropropane	ND		0.50

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	100	74 - 131
1,2-Dichloroethane-d4 (Surr)	103	76 - 132
Toluene-d8 (Surr)	95	82 - 120

Client: Geosyntec Consultants, Inc.. Job Number: 720-17838-1

Client Sample ID: MW-DUP

Lab Sample ID: 720-17838-7 Date Sampled: 01/26/2009 1050
Client Matrix: Water Date Received: 01/26/2009 1545

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B Analysis Batch: 720-46316 Instrument ID: Varian 3900G
Preparation: 5030B Lab File ID: e:\data\200901\012909\SA-
Dilution: 200 Initial Weight/Volume: 40 mL
Date Analyzed: 01/29/2009 1828 Final Weight/Volume: 40 mL
Date Prepared: 01/29/2009 1828

Analyte	Result (ug/L)	Qualifier	RL
Methyl tert-butyl ether	ND		1000
Acetone	ND		10000
Benzene	ND		100
Dichlorobromomethane	ND		100
Bromobenzene	ND		200
Chlorobromomethane	ND		200
Bromoform	ND		200
Bromomethane	ND		200
2-Butanone (MEK)	ND		10000
n-Butylbenzene	ND		200
sec-Butylbenzene	ND		200
tert-Butylbenzene	ND		200
Carbon disulfide	ND		1000
Carbon tetrachloride	ND		100
Chlorobenzene	ND		100
Chloroethane	ND		200
Chloroform	ND		200
Chloromethane	ND		200
2-Chlorotoluene	ND		100
4-Chlorotoluene	ND		100
Chlorodibromomethane	ND		100
1,2-Dichlorobenzene	ND		100
1,3-Dichlorobenzene	ND		100
1,4-Dichlorobenzene	ND		100
1,3-Dichloropropane	ND		200
1,1-Dichloropropene	ND		100
1,2-Dibromo-3-Chloropropane	ND		200
Ethylene Dibromide	ND		100
Dibromomethane	ND		100
Dichlorodifluoromethane	ND		100
1,1-Dichloroethane	ND		100
1,2-Dichloroethane	ND		100
1,1-Dichloroethene	ND		100
cis-1,2-Dichloroethene	770		100
trans-1,2-Dichloroethene	ND		100
1,2-Dichloropropane	ND		100
cis-1,3-Dichloropropene	ND		100
trans-1,3-Dichloropropene	ND		100
Ethylbenzene	ND		100
Hexachlorobutadiene	ND		200
2-Hexanone	ND		10000
Isopropylbenzene	ND		100
4-Isopropyltoluene	ND		200
Methylene Chloride	ND		1000

Client: Geosyntec Consultants, Inc.. Job Number: 720-17838-1

Client Sample ID: MW-DUP

Lab Sample ID: 720-17838-7 Date Sampled: 01/26/2009 1050
Client Matrix: Water Date Received: 01/26/2009 1545

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B Analysis Batch: 720-46316 Instrument ID: Varian 3900G
Preparation: 5030B Lab File ID: e:\data\200901\012909\SA-
Dilution: 200 Initial Weight/Volume: 40 mL
Date Analyzed: 01/29/2009 1828 Final Weight/Volume: 40 mL
Date Prepared: 01/29/2009 1828

Analyte	Result (ug/L)	Qualifier	RL
4-Methyl-2-pentanone (MIBK)	ND		10000
Naphthalene	ND		200
N-Propylbenzene	ND		200
Styrene	ND		100
1,1,1,2-Tetrachloroethane	ND		100
1,1,2,2-Tetrachloroethane	ND		100
Tetrachloroethene	12000		100
Toluene	ND		100
1,2,3-Trichlorobenzene	ND		200
1,2,4-Trichlorobenzene	ND		200
1,1,1-Trichloroethane	ND		100
1,1,2-Trichloroethane	ND		100
Trichloroethene	730		100
Trichlorofluoromethane	ND		200
1,2,3-Trichloropropane	ND		100
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		100
1,2,4-Trimethylbenzene	ND		100
1,3,5-Trimethylbenzene	ND		100
Vinyl acetate	ND		10000
Vinyl chloride	ND		100
Xylenes, Total	ND		200
2,2-Dichloropropane	ND		100

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	104	74 - 131
1,2-Dichloroethane-d4 (Surr)	101	76 - 132
Toluene-d8 (Surr)	96	82 - 120

Client: Geosyntec Consultants, Inc.. Job Number: 720-17838-1

Client Sample ID: MW-4

Lab Sample ID: 720-17838-8 Date Sampled: 01/26/2009 1052
Client Matrix: Water Date Received: 01/26/2009 1545

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B Analysis Batch: 720-46316 Instrument ID: Varian 3900G
Preparation: 5030B Lab File ID: e:\data\200901\012909\SA-
Dilution: 1.0 Initial Weight/Volume: 40 mL
Date Analyzed: 01/29/2009 1645 Final Weight/Volume: 40 mL
Date Prepared: 01/29/2009 1645

Analyte	Result (ug/L)	Qualifier	RL
Methyl tert-butyl ether	ND		5.0
Acetone	ND		50
Benzene	ND		0.50
Dichlorobromomethane	ND		0.50
Bromobenzene	ND		1.0
Chlorobromomethane	ND		1.0
Bromoform	ND		1.0
Bromomethane	ND		1.0
2-Butanone (MEK)	ND		50
n-Butylbenzene	ND		1.0
sec-Butylbenzene	ND		1.0
tert-Butylbenzene	ND		1.0
Carbon disulfide	ND		5.0
Carbon tetrachloride	ND		0.50
Chlorobenzene	ND		0.50
Chloroethane	ND		1.0
Chloroform	ND		1.0
Chloromethane	ND		1.0
2-Chlorotoluene	ND		0.50
4-Chlorotoluene	ND		0.50
Chlorodibromomethane	ND		0.50
1,2-Dichlorobenzene	ND		0.50
1,3-Dichlorobenzene	ND		0.50
1,4-Dichlorobenzene	ND		0.50
1,3-Dichloropropane	ND		1.0
1,1-Dichloropropene	ND		0.50
1,2-Dibromo-3-Chloropropane	ND		1.0
Ethylene Dibromide	ND		0.50
Dibromomethane	ND		0.50
Dichlorodifluoromethane	ND		0.50
1,1-Dichloroethane	ND		0.50
1,2-Dichloroethane	ND		0.50
1,1-Dichloroethene	ND		0.50
cis-1,2-Dichloroethene	4.3		0.50
trans-1,2-Dichloroethene	ND		0.50
1,2-Dichloropropane	ND		0.50
cis-1,3-Dichloropropene	ND		0.50
trans-1,3-Dichloropropene	ND		0.50
Ethylbenzene	ND		0.50
Hexachlorobutadiene	ND		1.0
2-Hexanone	ND		50
Isopropylbenzene	ND		0.50
4-Isopropyltoluene	ND		1.0
Methylene Chloride	ND		5.0

Client: Geosyntec Consultants, Inc.. Job Number: 720-17838-1

Client Sample ID: MW-4

Lab Sample ID: 720-17838-8 Date Sampled: 01/26/2009 1052
Client Matrix: Water Date Received: 01/26/2009 1545

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B Analysis Batch: 720-46316 Instrument ID: Varian 3900G
Preparation: 5030B Lab File ID: e:\data\200901\012909\SA-
Dilution: 1.0 Initial Weight/Volume: 40 mL
Date Analyzed: 01/29/2009 1645 Final Weight/Volume: 40 mL
Date Prepared: 01/29/2009 1645

Analyte	Result (ug/L)	Qualifier	RL
4-Methyl-2-pentanone (MIBK)	ND		50
Naphthalene	ND		1.0
N-Propylbenzene	ND		1.0
Styrene	ND		0.50
1,1,1,2-Tetrachloroethane	ND		0.50
1,1,2,2-Tetrachloroethane	ND		0.50
Tetrachloroethene	ND		0.50
Toluene	ND		0.50
1,2,3-Trichlorobenzene	ND		1.0
1,2,4-Trichlorobenzene	ND		1.0
1,1,1-Trichloroethane	ND		0.50
1,1,2-Trichloroethane	ND		0.50
Trichloroethene	4.9		0.50
Trichlorofluoromethane	ND		1.0
1,2,3-Trichloropropane	ND		0.50
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50
1,2,4-Trimethylbenzene	ND		0.50
1,3,5-Trimethylbenzene	ND		0.50
Vinyl acetate	ND		50
Vinyl chloride	ND		0.50
Xylenes, Total	ND		1.0
2,2-Dichloropropane	ND		0.50

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	101	74 - 131
1,2-Dichloroethane-d4 (Surr)	103	76 - 132
Toluene-d8 (Surr)	102	82 - 120

Client: Geosyntec Consultants, Inc.. Job Number: 720-17838-1

Client Sample ID: MW-6

Lab Sample ID: 720-17838-9 Date Sampled: 01/26/2009 1120
Client Matrix: Water Date Received: 01/26/2009 1545

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B Analysis Batch: 720-46397 Instrument ID: Varian 3900F
Preparation: 5030B Lab File ID: e:\200901\013009\SA-WA
Dilution: 1.0 Initial Weight/Volume: 40 mL
Date Analyzed: 01/30/2009 1426 Final Weight/Volume: 40 mL
Date Prepared: 01/30/2009 1426

Analyte	Result (ug/L)	Qualifier	RL
Methyl tert-butyl ether	ND		5.0
Acetone	ND		50
Benzene	ND		0.50
Dichlorobromomethane	ND		0.50
Bromobenzene	ND		1.0
Chlorobromomethane	ND		1.0
Bromoform	ND		1.0
Bromomethane	ND		1.0
2-Butanone (MEK)	ND		50
n-Butylbenzene	ND		1.0
sec-Butylbenzene	ND		1.0
tert-Butylbenzene	ND		1.0
Carbon disulfide	ND		5.0
Carbon tetrachloride	ND		0.50
Chlorobenzene	ND		0.50
Chloroethane	ND		1.0
Chloroform	ND		1.0
Chloromethane	ND		1.0
2-Chlorotoluene	ND		0.50
4-Chlorotoluene	ND		0.50
Chlorodibromomethane	ND		0.50
1,2-Dichlorobenzene	ND		0.50
1,3-Dichlorobenzene	ND		0.50
1,4-Dichlorobenzene	ND		0.50
1,3-Dichloropropane	ND		1.0
1,1-Dichloropropene	ND		0.50
1,2-Dibromo-3-Chloropropane	ND		1.0
Ethylene Dibromide	ND		0.50
Dibromomethane	ND		0.50
Dichlorodifluoromethane	ND		0.50
1,1-Dichloroethane	ND		0.50
1,2-Dichloroethane	ND		0.50
1,1-Dichloroethene	ND		0.50
cis-1,2-Dichloroethene	ND		0.50
trans-1,2-Dichloroethene	ND		0.50
1,2-Dichloropropane	ND		0.50
cis-1,3-Dichloropropene	ND		0.50
trans-1,3-Dichloropropene	ND		0.50
Ethylbenzene	ND		0.50
Hexachlorobutadiene	ND		1.0
2-Hexanone	ND		50
Isopropylbenzene	ND		0.50
4-Isopropyltoluene	ND		1.0
Methylene Chloride	ND		5.0

Client: Geosyntec Consultants, Inc.. Job Number: 720-17838-1

Client Sample ID: MW-6

Lab Sample ID: 720-17838-9 Date Sampled: 01/26/2009 1120
Client Matrix: Water Date Received: 01/26/2009 1545

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B Analysis Batch: 720-46397 Instrument ID: Varian 3900F
Preparation: 5030B Lab File ID: e:\200901\013009\SA-WA
Dilution: 1.0 Initial Weight/Volume: 40 mL
Date Analyzed: 01/30/2009 1426 Final Weight/Volume: 40 mL
Date Prepared: 01/30/2009 1426

Analyte	Result (ug/L)	Qualifier	RL
4-Methyl-2-pentanone (MIBK)	ND		50
Naphthalene	ND		1.0
N-Propylbenzene	ND		1.0
Styrene	ND		0.50
1,1,1,2-Tetrachloroethane	ND		0.50
1,1,2,2-Tetrachloroethane	ND		0.50
Tetrachloroethene	ND		0.50
Toluene	ND		0.50
1,2,3-Trichlorobenzene	ND		1.0
1,2,4-Trichlorobenzene	ND		1.0
1,1,1-Trichloroethane	ND		0.50
1,1,2-Trichloroethane	ND		0.50
Trichloroethene	ND		0.50
Trichlorofluoromethane	ND		1.0
1,2,3-Trichloropropane	ND		0.50
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50
1,2,4-Trimethylbenzene	ND		0.50
1,3,5-Trimethylbenzene	ND		0.50
Vinyl acetate	ND		50
Vinyl chloride	ND		0.50
Xylenes, Total	ND		1.0
2,2-Dichloropropane	ND		0.50

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	104	74 - 131
1,2-Dichloroethane-d4 (Surr)	103	76 - 132
Toluene-d8 (Surr)	104	82 - 120

Client: Geosyntec Consultants, Inc.. Job Number: 720-17838-1

Client Sample ID: MW-7

Lab Sample ID: 720-17838-11 Date Sampled: 01/26/2009 1145
Client Matrix: Water Date Received: 01/26/2009 1545

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B Analysis Batch: 720-46397 Instrument ID: Varian 3900F
Preparation: 5030B Lab File ID: e:\200901\013009\SA-WA
Dilution: 1.0 Initial Weight/Volume: 40 mL
Date Analyzed: 01/30/2009 1459 Final Weight/Volume: 40 mL
Date Prepared: 01/30/2009 1459

Analyte	Result (ug/L)	Qualifier	RL
Methyl tert-butyl ether	ND		5.0
Acetone	ND		50
Benzene	ND		0.50
Dichlorobromomethane	ND		0.50
Bromobenzene	ND		1.0
Chlorobromomethane	ND		1.0
Bromoform	ND		1.0
Bromomethane	ND		1.0
2-Butanone (MEK)	ND		50
n-Butylbenzene	ND		1.0
sec-Butylbenzene	ND		1.0
tert-Butylbenzene	ND		1.0
Carbon disulfide	ND		5.0
Carbon tetrachloride	ND		0.50
Chlorobenzene	ND		0.50
Chloroethane	ND		1.0
Chloroform	ND		1.0
Chloromethane	ND		1.0
2-Chlorotoluene	ND		0.50
4-Chlorotoluene	ND		0.50
Chlorodibromomethane	ND		0.50
1,2-Dichlorobenzene	ND		0.50
1,3-Dichlorobenzene	ND		0.50
1,4-Dichlorobenzene	ND		0.50
1,3-Dichloropropane	ND		1.0
1,1-Dichloropropene	ND		0.50
1,2-Dibromo-3-Chloropropane	ND		1.0
Ethylene Dibromide	ND		0.50
Dibromomethane	ND		0.50
Dichlorodifluoromethane	ND		0.50
1,1-Dichloroethane	ND		0.50
1,2-Dichloroethane	ND		0.50
1,1-Dichloroethene	ND		0.50
cis-1,2-Dichloroethene	ND		0.50
trans-1,2-Dichloroethene	ND		0.50
1,2-Dichloropropane	ND		0.50
cis-1,3-Dichloropropene	ND		0.50
trans-1,3-Dichloropropene	ND		0.50
Ethylbenzene	ND		0.50
Hexachlorobutadiene	ND		1.0
2-Hexanone	ND		50
Isopropylbenzene	ND		0.50
4-Isopropyltoluene	ND		1.0
Methylene Chloride	ND		5.0

Client: Geosyntec Consultants, Inc.. Job Number: 720-17838-1

Client Sample ID: MW-7

Lab Sample ID: 720-17838-11 Date Sampled: 01/26/2009 1145
Client Matrix: Water Date Received: 01/26/2009 1545

8260B Volatile Organic Compounds (GC/MS)

Method: 8260B Analysis Batch: 720-46397 Instrument ID: Varian 3900F
Preparation: 5030B Lab File ID: e:\200901\013009\SA-WA
Dilution: 1.0 Initial Weight/Volume: 40 mL
Date Analyzed: 01/30/2009 1459 Final Weight/Volume: 40 mL
Date Prepared: 01/30/2009 1459

Analyte	Result (ug/L)	Qualifier	RL
4-Methyl-2-pentanone (MIBK)	ND		50
Naphthalene	ND		1.0
N-Propylbenzene	ND		1.0
Styrene	ND		0.50
1,1,1,2-Tetrachloroethane	ND		0.50
1,1,2,2-Tetrachloroethane	ND		0.50
Tetrachloroethene	9.9		0.50
Toluene	ND		0.50
1,2,3-Trichlorobenzene	ND		1.0
1,2,4-Trichlorobenzene	ND		1.0
1,1,1-Trichloroethane	ND		0.50
1,1,2-Trichloroethane	ND		0.50
Trichloroethene	ND		0.50
Trichlorofluoromethane	ND		1.0
1,2,3-Trichloropropane	ND		0.50
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50
1,2,4-Trimethylbenzene	ND		0.50
1,3,5-Trimethylbenzene	ND		0.50
Vinyl acetate	ND		50
Vinyl chloride	ND		0.50
Xylenes, Total	ND		1.0
2,2-Dichloropropane	ND		0.50

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	102	74 - 131
1,2-Dichloroethane-d4 (Surr)	97	76 - 132
Toluene-d8 (Surr)	99	82 - 120

DATA REPORTING QUALIFIERS

Lab Section	Qualifier	Description

Client: Geosyntec Consultants, Inc.. Job Number: 720-17838-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
GC/MS VOA					
Analysis Batch:720-46316					
LCS 720-46316/2	Lab Control Spike	T	Water	8260B	
LCSD 720-46316/1	Lab Control Spike Duplicate	T	Water	8260B	
MB 720-46316/3	Method Blank	T	Water	8260B	
720-17838-1	TRIP BLANK	T	Water	8260B	
720-17838-2	MW-3	T	Water	8260B	
720-17838-3	MW-1	T	Water	8260B	
720-17838-4	MW-2	T	Water	8260B	
720-17838-6	MW-5	T	Water	8260B	
720-17838-7	MW-DUP	T	Water	8260B	
720-17838-8	MW-4	T	Water	8260B	
Analysis Batch:720-46397					
LCS 720-46397/2	Lab Control Spike	T	Water	8260B	
LCSD 720-46397/1	Lab Control Spike Duplicate	T	Water	8260B	
MB 720-46397/3	Method Blank	T	Water	8260B	
720-17838-9	MW-6	T	Water	8260B	
720-17838-11	MW-7	T	Water	8260B	

Report Basis
T = Total

Client: Geosyntec Consultants, Inc.. Job Number: 720-17838-1

Method Blank - Batch: 720-46316

Method: 8260B
Preparation: 5030B

Lab Sample ID: MB 720-46316/3
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 01/29/2009 0855
Date Prepared: 01/29/2009 0855

Analysis Batch: 720-46316
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian 3900G
Lab File ID: e:\data\200901\012909\MB
Initial Weight/Volume: 40 mL
Final Weight/Volume: 40 mL

Analyte	Result	Qual	RL
Methyl tert-butyl ether	ND		5.0
Acetone	ND		50
Benzene	ND		0.50
Dichlorobromomethane	ND		0.50
Bromobenzene	ND		1.0
Chlorobromomethane	ND		1.0
Bromoform	ND		1.0
Bromomethane	ND		1.0
2-Butanone (MEK)	ND		50
n-Butylbenzene	ND		1.0
sec-Butylbenzene	ND		1.0
tert-Butylbenzene	ND		1.0
Carbon disulfide	ND		5.0
Carbon tetrachloride	ND		0.50
Chlorobenzene	ND		0.50
Chloroethane	ND		1.0
Chloroform	ND		1.0
Chloromethane	ND		1.0
2-Chlorotoluene	ND		0.50
4-Chlorotoluene	ND		0.50
Chlorodibromomethane	ND		0.50
1,2-Dichlorobenzene	ND		0.50
1,3-Dichlorobenzene	ND		0.50
1,4-Dichlorobenzene	ND		0.50
1,3-Dichloropropane	ND		1.0
1,1-Dichloropropene	ND		0.50
1,2-Dibromo-3-Chloropropane	ND		1.0
Ethylene Dibromide	ND		0.50
Dibromomethane	ND		0.50
Dichlorodifluoromethane	ND		0.50
1,1-Dichloroethane	ND		0.50
1,2-Dichloroethane	ND		0.50
1,1-Dichloroethene	ND		0.50
cis-1,2-Dichloroethene	ND		0.50
trans-1,2-Dichloroethene	ND		0.50
1,2-Dichloropropane	ND		0.50
cis-1,3-Dichloropropene	ND		0.50
trans-1,3-Dichloropropene	ND		0.50
Ethylbenzene	ND		0.50
Hexachlorobutadiene	ND		1.0
2-Hexanone	ND		50

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Geosyntec Consultants, Inc.. Job Number: 720-17838-1

Method Blank - Batch: 720-46316

Method: 8260B
Preparation: 5030B

Lab Sample ID: MB 720-46316/3
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 01/29/2009 0855
Date Prepared: 01/29/2009 0855

Analysis Batch: 720-46316
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian 3900G
Lab File ID: e:\data\200901\012909\MB
Initial Weight/Volume: 40 mL
Final Weight/Volume: 40 mL

Analyte	Result	Qual	RL
Isopropylbenzene	ND		0.50
4-Isopropyltoluene	ND		1.0
Methylene Chloride	ND		5.0
4-Methyl-2-pentanone (MIBK)	ND		50
Naphthalene	ND		1.0
N-Propylbenzene	ND		1.0
Styrene	ND		0.50
1,1,1,2-Tetrachloroethane	ND		0.50
1,1,2,2-Tetrachloroethane	ND		0.50
Tetrachloroethene	ND		0.50
Toluene	ND		0.50
1,2,3-Trichlorobenzene	ND		1.0
1,2,4-Trichlorobenzene	ND		1.0
1,1,1-Trichloroethane	ND		0.50
1,1,2-Trichloroethane	ND		0.50
Trichloroethene	ND		0.50
Trichlorofluoromethane	ND		1.0
1,2,3-Trichloropropane	ND		0.50
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50
1,2,4-Trimethylbenzene	ND		0.50
1,3,5-Trimethylbenzene	ND		0.50
Vinyl acetate	ND		50
Vinyl chloride	ND		0.50
Xylenes, Total	ND		1.0
2,2-Dichloropropane	ND		0.50

Surrogate	% Rec	Acceptance Limits
4-Bromofluorobenzene	99	74 - 131
1,2-Dichloroethane-d4 (Surr)	103	76 - 132
Toluene-d8 (Surr)	98	82 - 120

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Geosyntec Consultants, Inc.. Job Number: 720-17838-1

Lab Control Spike/
Lab Control Spike Duplicate Recovery Report - Batch: 720-46316

Method: 8260B
Preparation: 5030B

LCS Lab Sample ID: LCS 720-46316/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 01/29/2009 0748
Date Prepared: 01/29/2009 0748

Analysis Batch: 720-46316
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian 3900G
Lab File ID: e:\data\200901\012909\LS·
Initial Weight/Volume: 40 mL
Final Weight/Volume: 40 mL

LCSD Lab Sample ID: LCSD 720-46316/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 01/29/2009 0822
Date Prepared: 01/29/2009 0822

Analysis Batch: 720-46316
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian 3900G
Lab File ID: e:\data\200901\012909\LD-V
Initial Weight/Volume: 40 mL
Final Weight/Volume: 40 mL

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Benzene	87	81	70 - 130	6	20		
Chlorobenzene	104	109	70 - 130	4	20		
1,1-Dichloroethene	107	102	70 - 130	5	20		
Toluene	98	93	70 - 130	5	20		
Trichloroethene	82	87	70 - 130	6	20		

Surrogate	LCS % Rec	LCSD % Rec	Acceptance Limits
4-Bromofluorobenzene	94	104	74 - 131
1,2-Dichloroethane-d4 (Surr)	105	109	76 - 132
Toluene-d8 (Surr)	97	93	82 - 120

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Geosyntec Consultants, Inc.. Job Number: 720-17838-1

Method Blank - Batch: 720-46397

Method: 8260B
Preparation: 5030B

Lab Sample ID: MB 720-46397/3
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 01/30/2009 1319
Date Prepared: 01/30/2009 1319

Analysis Batch: 720-46397
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian 3900F
Lab File ID: e:\200901\013009\MB-WA
Initial Weight/Volume: 40 mL
Final Weight/Volume: 40 mL

Analyte	Result	Qual	RL
Methyl tert-butyl ether	ND		5.0
Acetone	ND		50
Benzene	ND		0.50
Dichlorobromomethane	ND		0.50
Bromobenzene	ND		1.0
Chlorobromomethane	ND		1.0
Bromoform	ND		1.0
Bromomethane	ND		1.0
2-Butanone (MEK)	ND		50
n-Butylbenzene	ND		1.0
sec-Butylbenzene	ND		1.0
tert-Butylbenzene	ND		1.0
Carbon disulfide	ND		5.0
Carbon tetrachloride	ND		0.50
Chlorobenzene	ND		0.50
Chloroethane	ND		1.0
Chloroform	ND		1.0
Chloromethane	ND		1.0
2-Chlorotoluene	ND		0.50
4-Chlorotoluene	ND		0.50
Chlorodibromomethane	ND		0.50
1,2-Dichlorobenzene	ND		0.50
1,3-Dichlorobenzene	ND		0.50
1,4-Dichlorobenzene	ND		0.50
1,3-Dichloropropane	ND		1.0
1,1-Dichloropropene	ND		0.50
1,2-Dibromo-3-Chloropropane	ND		1.0
Ethylene Dibromide	ND		0.50
Dibromomethane	ND		0.50
Dichlorodifluoromethane	ND		0.50
1,1-Dichloroethane	ND		0.50
1,2-Dichloroethane	ND		0.50
1,1-Dichloroethene	ND		0.50
cis-1,2-Dichloroethene	ND		0.50
trans-1,2-Dichloroethene	ND		0.50
1,2-Dichloropropane	ND		0.50
cis-1,3-Dichloropropene	ND		0.50
trans-1,3-Dichloropropene	ND		0.50
Ethylbenzene	ND		0.50
Hexachlorobutadiene	ND		1.0
2-Hexanone	ND		50

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Geosyntec Consultants, Inc.. Job Number: 720-17838-1

Method Blank - Batch: 720-46397

Method: 8260B
Preparation: 5030B

Lab Sample ID: MB 720-46397/3
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 01/30/2009 1319
Date Prepared: 01/30/2009 1319

Analysis Batch: 720-46397
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian 3900F
Lab File ID: e:\200901\013009\MB-WA
Initial Weight/Volume: 40 mL
Final Weight/Volume: 40 mL

Analyte	Result	Qual	RL
Isopropylbenzene	ND		0.50
4-Isopropyltoluene	ND		1.0
Methylene Chloride	ND		5.0
4-Methyl-2-pentanone (MIBK)	ND		50
Naphthalene	ND		1.0
N-Propylbenzene	ND		1.0
Styrene	ND		0.50
1,1,1,2-Tetrachloroethane	ND		0.50
1,1,2,2-Tetrachloroethane	ND		0.50
Tetrachloroethene	ND		0.50
Toluene	ND		0.50
1,2,3-Trichlorobenzene	ND		1.0
1,2,4-Trichlorobenzene	ND		1.0
1,1,1-Trichloroethane	ND		0.50
1,1,2-Trichloroethane	ND		0.50
Trichloroethene	ND		0.50
Trichlorofluoromethane	ND		1.0
1,2,3-Trichloropropane	ND		0.50
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50
1,2,4-Trimethylbenzene	ND		0.50
1,3,5-Trimethylbenzene	ND		0.50
Vinyl acetate	ND		50
Vinyl chloride	ND		0.50
Xylenes, Total	ND		1.0
2,2-Dichloropropane	ND		0.50

Surrogate	% Rec	Acceptance Limits
4-Bromofluorobenzene	104	74 - 131
1,2-Dichloroethane-d4 (Surr)	99	76 - 132
Toluene-d8 (Surr)	107	82 - 120

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Geosyntec Consultants, Inc.. Job Number: 720-17838-1

Lab Control Spike/
Lab Control Spike Duplicate Recovery Report - Batch: 720-46397

Method: 8260B
Preparation: 5030B

LCS Lab Sample ID: LCS 720-46397/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 01/30/2009 1213
Date Prepared: 01/30/2009 1213

Analysis Batch: 720-46397
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian 3900F
Lab File ID: e:\200901\013009\LS-WA
Initial Weight/Volume: 40 mL
Final Weight/Volume: 40 mL

LCSD Lab Sample ID: LCSD 720-46397/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 01/30/2009 1246
Date Prepared: 01/30/2009 1246

Analysis Batch: 720-46397
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian 3900F
Lab File ID: e:\200901\013009\LD-WA
Initial Weight/Volume: 40 mL
Final Weight/Volume: 40 mL

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Benzene	113	111	70 - 130	2	20		
Chlorobenzene	110	116	70 - 130	5	20		
1,1-Dichloroethene	105	103	70 - 130	2	20		
Toluene	92	101	70 - 130	9	20		
Trichloroethene	97	95	70 - 130	2	20		

Surrogate	LCS % Rec	LCSD % Rec	Acceptance Limits
4-Bromofluorobenzene	92	109	74 - 131
1,2-Dichloroethane-d4 (Surr)	95	104	76 - 132
Toluene-d8 (Surr)	95	104	82 - 120

Calculations are performed before rounding to avoid round-off errors in calculated results.

720-17838

114336

Environmental Sampling Services

6680 Alhambra Ave., #102
Martinez, California 94553-6105
Tel: (925) 372-8108 Fax: (925) 372-6705
Log Code: ESSM www.envsampling.com

CHAIN OF CUSTODY RECORD

TURN AROUND TIME: ☐ 24 Hours ☐ 48 Hours ☐ 1 Week ☑ Normal Other:

LABORATORY: TestAmerica-Pleasanton
Lab Code:

Report To: Angela Liang & Melissa Asher Telephone: (510) 285-2700
Company: Geosyntec Consultants Fax: (510) 836-3036
Address: 475-14th Street, Suite 450 Project Name: Hopyard Cleaner
Oakland, CA 94612 Project Number: WRO574
E-Mail: aliang@geosyntec.com & masher@geosyntec.com
Sampler(s): Jacqueline Lee ☑ Sampler's Signature:
Stephen Penman ☑ Sampler's Signature:
GeoTracker No.: NA
Reporting Requirement: Hard Copy: Yes ☑ No ☐
EDD File: Yes ☑ No ☐ Electronic (EDF): Yes ☐ No ☑

	SAMPLE ID	FIELD POINT NAME	Sample Date	Sample Time	Number of Containers	Type of Container[1]	Matrix: Groundwater	Soil	Soil Vapor	Water	Other	Preservative: Ice	HCl	HNO_3	H_2SO_4	Analysis Request: VOCs (8260B)	ANIONS: Nitrate, Nitrite, Chloride, Sulfate	Field Filtered (FF)	Comments
1.	Trip Blank		1/26/09	7:30	2	1				X		X	X			X			
2	MW-3		1/26/09	9:15	3	1	X					X	X			X			
3	MW-1		1/26/09	9:33	3	1	X					X	X			X			
4	MW-2		1/26/09	9:50	2	1	X					X	X			X			
5	MW-3		1/26/09	10:02	~~3~~ 1	1	X					X	~~X~~			~~X~~ X	X		
6	MW-5		1/26/09	10:15	3	1	X					X	X			X			
7	MW-DUP		1/26/09	10:50	2	1	X					X	X			X			
8	MW-4		1/26/09	10:52	3	1	X					X	X			X			
9	MW-6		1/26/09	11:20	3	1	X					X	X			X			
10	MW-1		1/26/09	11:23	1	3	X					X					X		
11	MW-7		1/26/09	11:45	3	1	X					X	X			X			

Relinquished By:	Date:	Time:	Received By:
	1/26/09	15:45	
Relinquished By:	Date:	Time:	Received By:
Relinquished By:	Date:	Time:	Received By:

1 = Sample Container Type: 1 =VOA 2=Glass 3=Plastic 4=Summa Canister

QUESTIONS REGARDING COC, CALL ESS

1.3°C

Please email COC for confirmation to masher@geosyntec.com

SAMPLE RECEIPT

☐ Intact ☐ Cold
☒ On Ice ☐ Ambient
Preservative Correct?
☐ Yes ☐ No ☐ NA

720-17838

114336

Environmental Sampling Services

6680 Alhambra Ave., #102
Martinez, California 94553-6105
Tel: (925) 372-8108 Fax: (925) 372-6705
Log Code: ESSM www.envsampling.com

CHAIN OF CUSTODY RECORD

TURN AROUND TIME — Other:

LABORATORY: TestAmerica-Pleasanton
Lab Code:

☐ 24 Hours	☐ 48 Hours	☐ 1 Week	☑ Normal

Report To: Angela Liang & Melissa Asher Telephone: (510) 285-2700
Company: Geosyntec Consultants Fax: (510) 836-3036
Address: 475-14th Street, Suite 450 Project Name: Hopyard Cleaner
Oakland, CA 94612 Project Number: WRO574
E-Mail: aliang@geosyntec.com & masher@geosyntec.com
Sampler(s): Jacqueline Lee ☑ Sampler's Signature:
Stephen Penman ☑ Sampler's Signature:
GeoTracker No.: NA
Reporting Requirement: Hard Copy: Yes ☑ No ☐
EDD File: Yes ☑ No ☐ Electronic (EDF): Yes ☐ No ☑

Analysis Request | **Comments**

	SAMPLE ID	FIELD POINT NAME	Sample Date	Sample Time	Number of Containers	Type of Container[1]	Matrix: Groundwater	Soil	Soil Vapor	Water	Other	Preservative: Ice	HCl	HNO_3	H_2SO_4	VOCs (8260B)	ANIONS: Nitrate, Nitrite, Chloride, Sulfate	Field Filtered (FF)	Comments
12	MW-2		1/26/09	14:00	1	3	X					X					X		
13	MW-DUP		1/26/09	14:30	1	3	X					X					X		

Relinquished By:	Date:	Time:	Received By:
	1/26/09	15:45	
Relinquished By:	Date:	Time:	Received By:
Relinquished By:	Date:	Time:	Received By:

1 = Sample Container Type: 1 =VOA 2=Glass 3=Plastic 4=Summa Canister

QUESTIONS REGARDING COC, CALL ESS

Please email COC for confirmation! masher@geosyntec.com

SAMPLE RECEIPT
☐ Intact ☐ Cold
☐ On Ice ☐ Ambient
Preservative Correct?
☐ Yes ☐ No ☐ NA

Login Sample Receipt Check List

Client: Geosyntec Consultants, Inc..

Job Number: 720-17838-1

Login Number: 17838

List Source: TestAmerica San Francisco

Creator: Bullock, Tracy

List Number: 1

Question	T / F/ NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is 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	
There are no discrepancies between the sample IDs on the containers 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	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

885 Jarvis Drive
Morgan Hill, CA 95037
(408) 776-9600
FAX (408) 782-6308
www.testamericainc.com

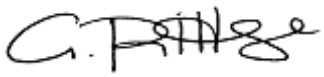
Friday, January 30, 2009 2:54:14PM

Melissa Brewer
TestAmerica San Francisco
1220 Quarry Lane
Pleasanton, CA 94566-4756

RE: Work Sharing Agreement
Work Order: MSA0515

Enclosed are the results of analyses for samples received by the laboratory on 01/26/09 18:40. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Angel Pitts
Project Manager

CA ELAP Certificate # 2705

The Chain(s) of Custody, 2 pages, are included and are an integral part of this report.

For Volatile Analysis a trip blank is required to be provided. If trip blank results are not included in the report, then either the trip blank was not submitted or requested to be analyzed.

The reported results were obtained in compliance with the 2003 NELAC standards unless otherwise noted.

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FAX (408) 782-6308
www.testamericainc.com

TestAmerica San Francisco	Project:	Work Sharing Agreement	MSA0515
1220 Quarry Lane	Project Number:	720-17838	**Reported:**
Pleasanton CA, 94566-4756	Project Manager:	Melissa Brewer	01/30/09 14:53

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-3	MSA0515-01	Water	01/26/09 10:02	01/26/09 18:40
MW-1	MSA0515-02	Water	01/26/09 11:23	01/26/09 18:40
MW-2	MSA0515-03	Water	01/26/09 14:00	01/26/09 18:40
MW-DUP	MSA0515-04	Water	01/26/09 14:30	01/26/09 18:40

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TestAmerica San Francisco	Project: Work Sharing Agreement	MSA0515
1220 Quarry Lane	Project Number: 720-17838	**Reported:**
Pleasanton CA, 94566-4756	Project Manager: Melissa Brewer	01/30/09 14:53

Anions by EPA Method 300.0

TestAmerica Morgan Hill

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-3 (MSA0515-01) Water Sampled: 01/26/09 10:02 Received: 01/26/09 18:40									
Chloride	**120**	10	mg/l	10	9A27013	01/27/09	01/27/09	EPA 300.0	
Nitrate as NO3	**13**	0.50	"	1	"	"	01/27/09 08:52	"	
Nitrite as NO2	ND	0.50	"	"	"	"	"	"	
Sulfate as SO4	**140**	5.0	"	10	"	"	01/27/09	"	
MW-1 (MSA0515-02) Water Sampled: 01/26/09 11:23 Received: 01/26/09 18:40									
Chloride	**83**	10	mg/l	10	9A27013	01/27/09	01/27/09	EPA 300.0	
Nitrate as NO3	ND	0.50	"	1	"	"	01/27/09 09:56	"	
Nitrite as NO2	ND	0.50	"	"	"	"	"	"	
Sulfate as SO4	**130**	5.0	"	10	"	"	01/27/09	"	
MW-2 (MSA0515-03) Water Sampled: 01/26/09 14:00 Received: 01/26/09 18:40									
Chloride	**110**	10	mg/l	10	9A27013	01/27/09	01/27/09	EPA 300.0	
Nitrate as NO3	**3.9**	0.50	"	1	"	"	01/27/09 10:17	"	
Nitrite as NO2	ND	0.50	"	"	"	"	"	"	
Sulfate as SO4	**140**	5.0	"	10	"	"	01/27/09	"	
MW-DUP (MSA0515-04) Water Sampled: 01/26/09 14:30 Received: 01/26/09 18:40									
Chloride	**110**	10	mg/l	10	9A27013	01/27/09	01/27/09	EPA 300.0	
Nitrate as NO3	**3.9**	0.50	"	1	"	"	01/27/09 10:59	"	
Nitrite as NO2	ND	0.50	"	"	"	"	"	"	
Sulfate as SO4	**140**	5.0	"	10	"	"	01/27/09	"	

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TestAmerica San Francisco	Project: Work Sharing Agreement	MSA0515
1220 Quarry Lane	Project Number: 720-17838	**Reported:**
Pleasanton CA, 94566-4756	Project Manager: Melissa Brewer	01/30/09 14:53

Anions by EPA Method 300.0 - Quality Control

TestAmerica Morgan Hill

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 9A27013 - General Preparation / EPA 300.0										
Blank (9A27013-BLK1)				Prepared & Analyzed: 01/27/09						
Chloride	ND	1.0	mg/l							
Nitrate as NO3	ND	0.50	"							
Nitrite as NO2	ND	0.50	"							
Sulfate as SO4	ND	0.50	"							
Laboratory Control Sample (9A27013-BS1)				Prepared & Analyzed: 01/27/09						
Sulfate as SO4	10.6	0.50	mg/l	10.0		106	90-110			
Chloride	10.4	1.0	"	10.0		104	90-110			
Nitrate as NO3	10.3	0.50	"	10.0		103	90-110			
Nitrite as NO2	5.19	0.50	"	5.00		104	90-110			
Matrix Spike (9A27013-MS1)	**Source: MSA0515-01**			Prepared & Analyzed: 01/27/09						
Nitrate as NO3	20.9	5.0	mg/l	10.0	13.5	74	80-120			M2
Nitrite as NO2	3.10	0.50	"	5.00	ND	62	80-120			M2
Chloride	115	10	"	10.0	117	0	80-120			M2
Sulfate as SO4	139	5.0	"	10.0	144	0	80-120			M2
Matrix Spike Dup (9A27013-MSD1)	**Source: MSA0515-01**			Prepared & Analyzed: 01/27/09						
Chloride	116	10	mg/l	10.0	117	0	80-120	0.4	20	M2
Nitrate as NO3	21.2	5.0	"	10.0	13.5	77	80-120	2	20	M2
Nitrite as NO2	3.23	0.50	"	5.00	ND	65	80-120	4	20	M2
Sulfate as SO4	138	5.0	"	10.0	144	0	80-120	0.8	20	M2

TestAmerica
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Morgan Hill, CA 95037
(408) 776-9600
FAX (408) 782-6308
www.testamericainc.com

TestAmerica San Francisco	Project:	Work Sharing Agreement	MSA0515
1220 Quarry Lane	Project Number:	720-17838	**Reported:**
Pleasanton CA, 94566-4756	Project Manager:	Melissa Brewer	01/30/09 14:53

Notes and Definitions

M2	The MS and/or MSD were below the acceptance limits due to sample matrix interference. See Blank Spike (LCS).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

~~MSA0523~~ AB MSA0515

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TESTAMERICA San Francisco Chain of Custody
1220 Quarry Lane • Pleasanton CA 94566-4756
Phone: (925) 484-1919 • Fax: (925) 600-3002

SUB TO: MH

Reference #: 720-17838

P/U Date 1/26/09 Page 1 of 1

Report To

Attn: MELISSA BREWER
Company: TEST AMERICA
Address: SF
Phone: Email:
Bill To: Sampled By:
Attn: Phone:

Analysis Request

	Sample ID	Date	Time	Matrix	Preserv.	TPH EPA - ☐ 8015/8021 ☐ 8260B ☐ Gas w/ ☐ BTEX ☐ MTBE	Purgeable Aromatics BTEX EPA - ☐ 8021 ☐ 8260B	TEPH EPA 8015M* ☐ Silica Gel ☐ Diesel ☐ Motor Oil ☐ Other	Fuel Tests EPA 8260B: ☐ Gas ☐ BTEX ☐ Five Oxygenates ☐ DCA, EDB ☐ Ethanol	Purgeable Halocarbons (HVOCs) EPA 8021 by 8260B	Volatile Organics GC/MS (VOCs) ☐ EPA 8260B ☐ 624	Semivolatiles GC/MS ☐ EPA 8270 ☐ 625	Oil and Grease ☐ Petroleum (EPA 1664) ☐ Total	Pesticides ☐ EPA 8081 ☐ 608 PCBs ☐ EPA 8082 ☐ 608	PNAs by ☐ 8270 ☐ 8310	CAM17 Metals (EPA 6010/7470/7471)	Metals: ☐ Lead ☐ LUFT ☐ RCRA ☐ Other:	Low Level Metals by EPA 200.8/6020 (ICP-MS):	W.E.T (STLC) ☐ TCLP ☐	Hexavalent Chromium ☐ pH (24h hold time for H_2O) ☐	Spec Cond. ☐ Alkalinity ☐ TSS ☐ TDS ☐	Anions: ☒ Cl ☒ SO_4 ☒ NO_3 ☐ F ☐ Br ☒ NO_2 ☐ PO_4				
01	MW-3	1/26/09	10:02	W	NONE																	X				1
02	MW-1	↓	11:23	↓	↓																	X				1
03	MW-2	↓	14:00	↓	↓																	X				1
04	MW-DUP	↓	14:30	↓	↓																	X				1

Page 40 of 41

Project Info.
Project Name: HOPYARD CLEANERS
Project#:
PO#: 720-17838
Credit Card#:

Sample Receipt
# of Containers: 4-poly 500ml
Head Space:
Temp:
Conforms to record:

1) Relinquished by:	2) Relinquished by:	3) Relinquished by:
Signature: [signature] Time: 1740	Signature: [signature] Time: 1900	Signature: Time:
Printed Name: T. Bullock Date: 1/26/09	Printed Name: Ed Martinez Date: 1-26-09	Printed Name: Date:
Company: TASF	Company: TAMH	Company:

1) Received by:	2) Received by:	3) Received by:
Signature: Ed Martinez Time: ~~1740~~ 1840 EM	Signature: [signature] Time: 1840	Signature: Time:
Printed Name: Ed Martinez Date: 1-26-09	Printed Name: A Garil Date: 1/26/09	Printed Name: Date:
Company: TAMH	Company: TAMH	Company:

TAT	5 Day	72h	48h	24h	Other:

Report: ☐ Routine ☐ Level 3 ☐ Level 4 ☐ EDD ☐ State Tank Fund EDF ☐ Global ID ______

Special Instructions / Comments:
GEOSYNTEC

...s and Conditions on reverse
...ica SF reports 8015M ... industry norm). Default for 8015B is

Rev 06/04

TEST AMERICA SAMPLE RECEIPT LOG

CLIENT NAME: TASF
REC. BY (PRINT) ~~AG~~ AG
WORKORDER: ~~MSA0523~~ MSA0515
Logged in 1/27/09 PH

DATE REC'D AT LAB: 1/26/09
TIME REC'D AT LAB: 1840
DATE LOGGED IN: ~~1/28/09~~ 1/27/09

For Regulatory Purposes?
___ DRINKING WATER
___ WASTE WATER
X OTHER

CIRCLE THE APPROPRIATE RESPONSE	LAB SAMPLE #	CLIENT ID	CONTAINER DESCRIPTION	PRESER VATIVE	pH**	SAMPLE MATRIX	DATE SAMPLED	Temp. >6°C	REMARKS: CONDITION
1. Custody Seal(s) Present / Absent; Intact / Broken*									
2. Chain-of-Custody Present / Absent*									
3. Traffic Reports or Packing List: Present / Absent									
4. Airbill / Sticker - Present / Absent; Tracking #									
5. Sample Condition: Intact/Leaking*/Broken*									
6. Samples labeled Yes / No*									
7. Sample ID's listed on COC Yes / No*									
8. Does information on COC and sample labels agree? Yes / No*									
9. Sample received within hold time: Yes / No*									
10. Adequate sample volume received Yes / No*									
11. Proper preservatives used Yes / No*									
12. Trip Blank / Temp Blank Received? (circle which if yes) Yes / No									
13. Thermometer Used : IR-1 / IR-3 / Backup									
14. Cooler RT*** CF*** CT***									
1: 3.8, -1.0, 2.8									
2									
3									
4									
5									
15. Is/Are corrected temp 0-6°C? Yes / No*									
**Exception (if any): ~~Metals~~ / Perchlorate / W/in 24hrs of sampling-on ice / Problem COC									

500ml poly / unp. (1) per S: AG 1/26/09
See COC

*IF CIRCLED, CONTACT PROJECT MANAGER AND ATTACH RECORD OF RESOLUTION
**CHECK SAMPLE PREP LOG IF NOT INDICATED
*** Read Temperature/Correction Factor/Corrected Temperature

SAMPLERECEIPTLOG
Revision 12 (08/07/08)

AN ENVIRONMENTAL ANALYTICAL LABORATORY

3/30/2009

Ms. Angela Liang
GeoSyntec Consultants
475 14th Street
Suite 400
Oakland CA 94612

Project Name: Hopyard
Project #: WR0574/SVE
Workorder #: 0903353

Dear Ms. Angela Liang

The following report includes the data for the above referenced project for sample(s) received on 3/13/2009 at Air Toxics Ltd.

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

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

Regards,

Kyle Vagadori
Project Manager

WORK ORDER #: 0903353

Work Order Summary

CLIENT:	Ms. Angela Liang GeoSyntec Consultants 475 14th Street Suite 400 Oakland, CA 94612	**BILL TO:**	Ms. Angela Liang GeoSyntec Consultants 475 14th Street Suite 400 Oakland, CA 94612
PHONE:	510-836-3034	**P.O. #**	WR0574
FAX:	510-836-3036	**PROJECT #**	WR0574/SVE Hopyard
DATE RECEIVED:	03/13/2009	**CONTACT:**	Kyle Vagadori
DATE COMPLETED:	03/27/2009		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	SVE-Infl	Modified TO-15	3.8 "Hg	15 psi
02A	Lab Blank	Modified TO-15	NA	NA
03A	CCV	Modified TO-15	NA	NA
04A	LCS	Modified TO-15	NA	NA

CERTIFIED BY: Linda D. Fruman DATE: 03/30/09

Laboratory Director

Certfication numbers: CA NELAP - 02110CA, LA NELAP/LELAP- AI 30763, NJ NELAP - CA004
NY NELAP - 11291, UT NELAP - 9166389892, AZ Licensure AZ0719
Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,
Accreditation number: E87680, Effective date: 07/01/08, Expiration date: 06/30/09
Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
Modified TO-15
GeoSyntec Consultants
Workorder# 0903353

One 1 Liter Summa Canister sample was received on March 13, 2009. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the full scan mode. The method involves concentrating up to 0.2 liters of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the ATL modifications.

Requirement	***TO-15***	***ATL Modifications***
Daily CCV	</= 30% Difference	</= 30% Difference; Compounds exceeding this criterion and associated data are flagged and narrated.
Sample collection media	Summa canister	ATL recommends use of summa canisters to insure data defensibility, but will report results from Tedlar bags at client request
Method Detection Limit	Follow 40CFR Pt.136 App. B	The MDL met all relevant requirements in Method TO-15 (statistical MDL less than the LOQ). The concentration of the spiked replicate may have exceeded 10X the calculated MDL in some cases

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

There were no analytical discrepancies.

Definition of Data Qualifying Flags

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

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

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

UJ- Non-detected compound associated with low bias in the CCV
N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:
a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

AN ENVIRONMENTAL ANALYTICAL LABORATORY

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

Client Sample ID: SVE-Infl

Lab ID#: 0903353-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Acetone	6.2	7.9	15	19
2-Butanone (Methyl Ethyl Ketone)	1.5	2.6	4.5	7.5
Tetrahydrofuran	1.5	2.9	4.5	8.6
Trichloroethene	1.5	6.8	8.3	36
Tetrachloroethene	1.5	250	10	1700

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: SVE-Infl

Lab ID#: 0903353-01A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**y032029**	**Date of Collection: 3/12/09 9:12:00 AM**	
Dil. Factor:	**3.08**	**Date of Analysis: 3/21/09 05:12 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.5	Not Detected	7.6	Not Detected
Freon 114	1.5	Not Detected	11	Not Detected
Chloromethane	6.2	Not Detected	13	Not Detected
Vinyl Chloride	1.5	Not Detected	3.9	Not Detected
1,3-Butadiene	1.5	Not Detected	3.4	Not Detected
Bromomethane	1.5	Not Detected	6.0	Not Detected
Chloroethane	1.5	Not Detected	4.1	Not Detected
Freon 11	1.5	Not Detected	8.6	Not Detected
Ethanol	6.2	Not Detected	12	Not Detected
Freon 113	1.5	Not Detected	12	Not Detected
1,1-Dichloroethene	1.5	Not Detected	6.1	Not Detected
Acetone	6.2	7.9	15	19
2-Propanol	6.2	Not Detected	15	Not Detected
Carbon Disulfide	1.5	Not Detected	4.8	Not Detected
3-Chloropropene	6.2	Not Detected	19	Not Detected
Methylene Chloride	1.5	Not Detected	5.4	Not Detected
Methyl tert-butyl ether	1.5	Not Detected	5.6	Not Detected
trans-1,2-Dichloroethene	1.5	Not Detected	6.1	Not Detected
Hexane	1.5	Not Detected	5.4	Not Detected
1,1-Dichloroethane	1.5	Not Detected	6.2	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1.5	2.6	4.5	7.5
cis-1,2-Dichloroethene	1.5	Not Detected	6.1	Not Detected
Tetrahydrofuran	1.5	2.9	4.5	8.6
Chloroform	1.5	Not Detected	7.5	Not Detected
1,1,1-Trichloroethane	1.5	Not Detected	8.4	Not Detected
Cyclohexane	1.5	Not Detected	5.3	Not Detected
Carbon Tetrachloride	1.5	Not Detected	9.7	Not Detected
2,2,4-Trimethylpentane	1.5	Not Detected	7.2	Not Detected
Benzene	1.5	Not Detected	4.9	Not Detected
1,2-Dichloroethane	1.5	Not Detected	6.2	Not Detected
Heptane	1.5	Not Detected	6.3	Not Detected
Trichloroethene	1.5	6.8	8.3	36
1,2-Dichloropropane	1.5	Not Detected	7.1	Not Detected
1,4-Dioxane	6.2	Not Detected	22	Not Detected
Bromodichloromethane	1.5	Not Detected	10	Not Detected
cis-1,3-Dichloropropene	1.5	Not Detected	7.0	Not Detected
4-Methyl-2-pentanone	1.5	Not Detected	6.3	Not Detected
Toluene	1.5	Not Detected	5.8	Not Detected
trans-1,3-Dichloropropene	1.5	Not Detected	7.0	Not Detected

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: SVE-Infl

Lab ID#: 0903353-01A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**y032029**	**Date of Collection: 3/12/09 9:12:00 AM**	
Dil. Factor:	**3.08**	**Date of Analysis: 3/21/09 05:12 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,2-Trichloroethane	1.5	Not Detected	8.4	Not Detected
Tetrachloroethene	1.5	250	10	1700
2-Hexanone	6.2	Not Detected	25	Not Detected
Dibromochloromethane	1.5	Not Detected	13	Not Detected
1,2-Dibromoethane (EDB)	1.5	Not Detected	12	Not Detected
Chlorobenzene	1.5	Not Detected	7.1	Not Detected
Ethyl Benzene	1.5	Not Detected	6.7	Not Detected
m,p-Xylene	1.5	Not Detected	6.7	Not Detected
o-Xylene	1.5	Not Detected	6.7	Not Detected
Styrene	1.5	Not Detected	6.6	Not Detected
Bromoform	1.5	Not Detected	16	Not Detected
Cumene	1.5	Not Detected	7.6	Not Detected
1,1,2,2-Tetrachloroethane	1.5	Not Detected	10	Not Detected
Propylbenzene	1.5	Not Detected	7.6	Not Detected
4-Ethyltoluene	1.5	Not Detected	7.6	Not Detected
1,3,5-Trimethylbenzene	1.5	Not Detected	7.6	Not Detected
1,2,4-Trimethylbenzene	1.5	Not Detected	7.6	Not Detected
1,3-Dichlorobenzene	1.5	Not Detected	9.2	Not Detected
1,4-Dichlorobenzene	1.5	Not Detected	9.2	Not Detected
alpha-Chlorotoluene	1.5	Not Detected	8.0	Not Detected
1,2-Dichlorobenzene	1.5	Not Detected	9.2	Not Detected
1,2,4-Trichlorobenzene	6.2	Not Detected	46	Not Detected
Hexachlorobutadiene	6.2	Not Detected	66	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	104	70-130
4-Bromofluorobenzene	95	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: Lab Blank

Lab ID#: 0903353-02A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**y032005**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/20/09 10:40 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.50	Not Detected	2.5	Not Detected
Freon 114	0.50	Not Detected	3.5	Not Detected
Chloromethane	2.0	Not Detected	4.1	Not Detected
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,3-Butadiene	0.50	Not Detected	1.1	Not Detected
Bromomethane	0.50	Not Detected	1.9	Not Detected
Chloroethane	0.50	Not Detected	1.3	Not Detected
Freon 11	0.50	Not Detected	2.8	Not Detected
Ethanol	2.0	Not Detected	3.8	Not Detected
Freon 113	0.50	Not Detected	3.8	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Acetone	2.0	Not Detected	4.8	Not Detected
2-Propanol	2.0	Not Detected	4.9	Not Detected
Carbon Disulfide	0.50	Not Detected	1.6	Not Detected
3-Chloropropene	2.0	Not Detected	6.3	Not Detected
Methylene Chloride	0.50	Not Detected	1.7	Not Detected
Methyl tert-butyl ether	0.50	Not Detected	1.8	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Hexane	0.50	Not Detected	1.8	Not Detected
1,1-Dichloroethane	0.50	Not Detected	2.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.50	Not Detected	1.5	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Tetrahydrofuran	0.50	Not Detected	1.5	Not Detected
Chloroform	0.50	Not Detected	2.4	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Cyclohexane	0.50	Not Detected	1.7	Not Detected
Carbon Tetrachloride	0.50	Not Detected	3.1	Not Detected
2,2,4-Trimethylpentane	0.50	Not Detected	2.3	Not Detected
Benzene	0.50	Not Detected	1.6	Not Detected
1,2-Dichloroethane	0.50	Not Detected	2.0	Not Detected
Heptane	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
1,2-Dichloropropane	0.50	Not Detected	2.3	Not Detected
1,4-Dioxane	2.0	Not Detected	7.2	Not Detected
Bromodichloromethane	0.50	Not Detected	3.4	Not Detected
cis-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
4-Methyl-2-pentanone	0.50	Not Detected	2.0	Not Detected
Toluene	0.50	Not Detected	1.9	Not Detected
trans-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: Lab Blank

Lab ID#: 0903353-02A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**y032005**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/20/09 10:40 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected
2-Hexanone	2.0	Not Detected	8.2	Not Detected
Dibromochloromethane	0.50	Not Detected	4.2	Not Detected
1,2-Dibromoethane (EDB)	0.50	Not Detected	3.8	Not Detected
Chlorobenzene	0.50	Not Detected	2.3	Not Detected
Ethyl Benzene	0.50	Not Detected	2.2	Not Detected
m,p-Xylene	0.50	Not Detected	2.2	Not Detected
o-Xylene	0.50	Not Detected	2.2	Not Detected
Styrene	0.50	Not Detected	2.1	Not Detected
Bromoform	0.50	Not Detected	5.2	Not Detected
Cumene	0.50	Not Detected	2.4	Not Detected
1,1,2,2-Tetrachloroethane	0.50	Not Detected	3.4	Not Detected
Propylbenzene	0.50	Not Detected	2.4	Not Detected
4-Ethyltoluene	0.50	Not Detected	2.4	Not Detected
1,3,5-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,2,4-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,3-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,4-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
alpha-Chlorotoluene	0.50	Not Detected	2.6	Not Detected
1,2-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,2,4-Trichlorobenzene	2.0	Not Detected	15	Not Detected
Hexachlorobutadiene	2.0	Not Detected	21	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	109	70-130
4-Bromofluorobenzene	98	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: CCV

Lab ID#: 0903353-03A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**y032003**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/20/09 09:12 AM**	

Compound	%Recovery
Freon 12	96
Freon 114	98
Chloromethane	99
Vinyl Chloride	95
1,3-Butadiene	104
Bromomethane	112
Chloroethane	102
Freon 11	98
Ethanol	102
Freon 113	98
1,1-Dichloroethene	95
Acetone	99
2-Propanol	104
Carbon Disulfide	106
3-Chloropropene	112
Methylene Chloride	100
Methyl tert-butyl ether	88
trans-1,2-Dichloroethene	100
Hexane	97
1,1-Dichloroethane	105
2-Butanone (Methyl Ethyl Ketone)	108
cis-1,2-Dichloroethene	104
Tetrahydrofuran	103
Chloroform	102
1,1,1-Trichloroethane	112
Cyclohexane	101
Carbon Tetrachloride	107
2,2,4-Trimethylpentane	101
Benzene	102
1,2-Dichloroethane	102
Heptane	102
Trichloroethene	102
1,2-Dichloropropane	102
1,4-Dioxane	103
Bromodichloromethane	105
cis-1,3-Dichloropropene	110
4-Methyl-2-pentanone	109
Toluene	104
trans-1,3-Dichloropropene	112

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: CCV

Lab ID#: 0903353-03A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**y032003**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/20/09 09:12 AM**	

Compound	%Recovery
1,1,2-Trichloroethane	102
Tetrachloroethene	103
2-Hexanone	103
Dibromochloromethane	110
1,2-Dibromoethane (EDB)	108
Chlorobenzene	103
Ethyl Benzene	103
m,p-Xylene	102
o-Xylene	104
Styrene	117
Bromoform	114
Cumene	107
1,1,2,2-Tetrachloroethane	107
Propylbenzene	105
4-Ethyltoluene	106
1,3,5-Trimethylbenzene	112
1,2,4-Trimethylbenzene	112
1,3-Dichlorobenzene	109
1,4-Dichlorobenzene	111
alpha-Chlorotoluene	120
1,2-Dichlorobenzene	110
1,2,4-Trichlorobenzene	105
Hexachlorobutadiene	100

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	100	70-130
4-Bromofluorobenzene	103	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: LCS

Lab ID#: 0903353-04A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**y032004**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/20/09 09:53 AM**	

Compound	%Recovery
Freon 12	94
Freon 114	97
Chloromethane	92
Vinyl Chloride	94
1,3-Butadiene	99
Bromomethane	86
Chloroethane	80
Freon 11	99
Ethanol	79
Freon 113	109
1,1-Dichloroethene	105
Acetone	115
2-Propanol	106
Carbon Disulfide	105
3-Chloropropene	110
Methylene Chloride	107
Methyl tert-butyl ether	93
trans-1,2-Dichloroethene	103
Hexane	101
1,1-Dichloroethane	112
2-Butanone (Methyl Ethyl Ketone)	114
cis-1,2-Dichloroethene	113
Tetrahydrofuran	105
Chloroform	108
1,1,1-Trichloroethane	118
Cyclohexane	106
Carbon Tetrachloride	111
2,2,4-Trimethylpentane	104
Benzene	106
1,2-Dichloroethane	107
Heptane	106
Trichloroethene	106
1,2-Dichloropropane	104
1,4-Dioxane	102
Bromodichloromethane	110
cis-1,3-Dichloropropene	112
4-Methyl-2-pentanone	113
Toluene	113
trans-1,3-Dichloropropene	113

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: LCS

Lab ID#: 0903353-04A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**y032004**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/20/09 09:53 AM**	

Compound	%Recovery
1,1,2-Trichloroethane	104
Tetrachloroethene	105
2-Hexanone	98
Dibromochloromethane	113
1,2-Dibromoethane (EDB)	107
Chlorobenzene	105
Ethyl Benzene	103
m,p-Xylene	102
o-Xylene	106
Styrene	115
Bromoform	118
Cumene	112
1,1,2,2-Tetrachloroethane	110
Propylbenzene	108
4-Ethyltoluene	108
1,3,5-Trimethylbenzene	109
1,2,4-Trimethylbenzene	110
1,3-Dichlorobenzene	110
1,4-Dichlorobenzene	109
alpha-Chlorotoluene	120
1,2-Dichlorobenzene	109
1,2,4-Trichlorobenzene	102
Hexachlorobutadiene	97

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130
1,2-Dichloroethane-d4	100	70-130
4-Bromofluorobenzene	101	70-130

Air Toxics LTD.

CHAIN-OF-CUSTODY RECORD

Sample Transportation Notice
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180 BLUE RAVINE ROAD, SUITE B
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Project Manager: Angela Liang
Collected by: (Print and Sign) M. Asher Melissa Asher
Company: Geosyntec Consultants Email: aliang@geosyntec.com
Address: 475 14th St. Suite 400 City: Oakland State: CA Zip: 94612
Phone: 510-985-2700 Fax: 510-836-3036

Project Info:
P.O. #: WR0574
Project #: WR0574/SVE
Project Name: Hayward

Turn Around Time:
☒ Normal
☐ Rush
_____ specify

Lab Use Only
Pressurized by:
Date:
Pressurization Gas: N_2 He

Lab I.D.	Field Sample I.D. (Location)	Can #	Date of Collection	Time of Collection	Analyses Requested	Canister Pressure/Vacuum Initial	Final	Receipt	Final (psi)
01A	SVE-INF1	36518	3/13/09	9:12	TO-15	-25	-5		

Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time
Melissa Asher	3/13/09 1230	Fedex	
		Monica Gregson AIR	3/13/09 900

Notes:

Lab Use Only	Shipper Name	Air Bill #	Temp (°C)	Condition	Custody Seals Intact?	Work Order #
	Fed Ex	797412607122	NA	Good	Yes No None	0903353

Form 288 rev.1

APPENDIX C

EISB Gene-Trac Laboratory Analytical Report

www.siremlab.com
130 Research Lane, Suite 2
Guelph, Ontario N1G 5G3
Phone (519) 822-2265
Fax (519) 822-3151

Certificate of Analysis: Quantitative Gene-Trac *Dehalococcoides* Assay

Customer: Angela Liang & Melissa Asher, Geosyntec Consultants
SiREM Reference: S-1515
Project: Hopyard Cleaners
Report Issued: 18-Feb-09
Customer Reference: WR0574
Data Files: QPCR-0443

Table 1: Test Results

Customer Sample ID	SiREM Sample ID	Sample Collection Date	Sample Matrix	Percent Dhc [A]	*Dehalococcoides* Enumeration [B]
MW-3	DHC-4790	26-Jan-09	Groundwater	0.004-0.01%	1×10^5/liter
MW-1	DHC-4791	26-Jan-09	Groundwater	0.008-0.03%	2×10^5/liter
MW-2	DHC-4792	26-Jan-09	Groundwater	0.005-0.02%	2×10^5/liter
MW-DUP	DHC-4793	26-Jan-09	Groundwater	0.007-0.02%	2×10^5/liter

Notes:

[A] Percent *Dehalococcoides* (Dhc) in microbial population. This value is calculated by dividing the number of Dhc 16S ribosomal ribonucleic acid (rRNA) gene copies by the total number of bacteria as estimated by the mass of DNA extracted from the sample.

[B] Based on quantification of Dhc 16S rRNA gene copies. Dhc are generally reported to contain one 16S rRNA gene copy per cell; therefore, this number is often interpreted to represent the number of Dhc cells present in the sample.

Analyst: J. Wilkinson
Jennifer Wilkinson
Biotechnology Technologist

Approved: Ximena Druar
Ximena Druar, B.Sc.
Molecular Biology Coordinator

www.siremlab.com
130 Research Lane, Suite 2
Guelph, Ontario N1G 5G3
Phone (519) 822-2265
Fax (519) 822-3151

Certificate of Analysis: Gene-Trac-VC, Vinyl Chloride Reductase (*vcrA*) Assay

Customer: Angela Liang & Melissa Asher, Geosyntec

Project: Hopyard Cleaners

Customer Reference: WR0574

SiREM Reference: S-1515

Report Issued: 19-Feb-09

Data Files: VC-QPCR-0179
VC-QPCR check-gel-0202

Table 1: Test Results

Customer Sample ID	SiREM Sample ID	Sample Collection Date	Sample Matrix	Percent *vcrA* [A]	Vinyl Chloride Reductase (*vcrA*) Gene Copies
MW-3	VCR-1155	26-Jan-09	Groundwater	NA[(1)]	Detected[(2)]
MW-1	VCR-1156	26-Jan-09	Groundwater	NA[(1)]	Detected[(2)]
MW-2	VCR-1157	26-Jan-09	Groundwater	NA[(1)]	Inconclusive[(3)]
MW-DUP	VCR-1158	26-Jan-09	Groundwater	0.0009-0.003%	3 x 10^4/liter

Notes:

[A] Percent *vcrA* in microbial population. This value is calculated by dividing the number of vinyl chloride reductase A (*vcrA)* gene copies quantified by the total number of bacteria estimated to be in the sample based on the mass of DNA extracted from the sample. Range represents normal variation in enumeration of *vcrA*.

[1]Not applicable as *vcrA* detected but not quantifiable.

[2]Detected but not quantifiable. The sample specific quantitation limit is 2 x 10^4/liter.

[3]Inconclusive results may indicate extremely low concentrations of *vcrA* DNA at or below the sample specific quantitation limit (1 x 10^4/liter), however, test results were insufficient to assign a conclusive positive result for this sample.

Analyst: J. Wilkinson
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Biotechnology Technologist

Approved: Ximena Druar
Ximena Druar, B.Sc.
Molecular Biology Coordinator

Table 2: Detailed Test Parameters, Gene-Trac Test Reference S-1515

Customer Sample ID	MW-3	MW-1	MW-2	MW-DUP
SiREM Sample ID	DHC-4790	DHC-4791	DHC-4792	DHC-4793
Date Received	28-Jan-09	24-Oct-08	24-Oct-08	24-Oct-08
Sample Temperature	1.4 ˚C	1.4 ˚C	1.4 ˚C	1.4 ˚C
Volume Used for DNA Extraction	100 mL	100 mL	100 mL	100 mL
DNA Extraction Date	18-Feb-09	18-Feb-09	18-Feb-09	18-Feb-09
DNA Concentration in Sample (extractable)	7043 ng/L	5213 ng/L	6405 ng/L	6353 ng/L
PCR Amplifiable DNA	Detected	Detected	Detected	Detected
Dhc qPCR Analysis Date	18-Feb-09	18-Feb-09	18-Feb-09	18-Feb-09
vcrA qPCR Analysis Date	18-Feb-09	18-Feb-09	18-Feb-09	18-Feb-09
qPCR Controls (see Table 3 & 4)	Passed	Passed	Passed	Passed
Comments	- -	- -	- -	- -

Notes:

Refer to Table 3 for detailed results of controls.
ND = not detected
°C = degrees Celsius
PCR = polymerase chain reaction
qPCR = quantitative PCR
Dhc = *Dehalococcoides*
ng/L = nanograms per liter
mL = milliliters
DNA = Deoxyribonucleic acid

Table 3: Gene-Trac-DHC Experimental Control Results, Gene-Trac Test Reference S-1515

Laboratory Control	Analysis Date	Control Description	Spiked Dhc 16S rRNA Gene Copies per Liter	Recovered Dhc 16S rRNA Gene Copies per Liter	Comments
Positive Control Low Concentration	18-Feb-09	qPCR with KB1 genomic DNA (CSLD-0085)	1.7×10^6	2.2×10^6	- -
Positive Control High Concentration	18-Feb-09	qPCR with KB1 genomic DNA (CSHD-0085)	2.2×10^8	2.4×10^8	- -
DNA Extraction Blank	18-Feb-09	DNA extraction sterile water (DB-0921)	0	8.6×10^2	See Note 1
Negative Control	18-Feb-09	Tris Reagent Blank (TBD-0045)	0	ND	- -

Notes:

[1] Deemed acceptable as test results for relevant samples are greater than 2 orders of magnitude above DNA Extraction Blank test result.

Dhc = *Dehalococcoides*

DNA = Deoxyribonucleic acid

NA = not applicable

ND = not detected

qPCR = quantitative PCR

16S rRNA = 16S ribosomal ribonucleic acid

Table 4: Gene-Trac-VC Experimental Control Results, Gene-Trac Test Reference S-1515

Laboratory Control	Analysis Date	Control Description	Spiked *vcrA* reductase Gene Copies per Liter	Recovered *vcrA* reductase Gene Copies per Liter	Comments
Positive Control Low Concentration	18-Feb-09	qPCR with KB1 genomic DNA (CSLV-0047)	1.1×10^6	1.5×10^6	- -
Positive Control High Concentration	18-Feb-09	qPCR with KB1 genomic DNA (CSHV-0047)	1.6×10^8	1.4×10^8	- -
DNA Extraction Blank	18-Feb-09	DNA extraction sterile water (DB-0921)	0	ND	- -
Negative Control	18-Feb-09	Tris Reagent Blank (TBV-0018)	0	ND	- -

Notes:

NA = not applicable

ND = not detected

[1] Within defined limits of +/- 50%

qPCR = quantitative PCR

Dhc = *Dehalococcoides*

DNA = Deoxyribonucleic acid

16S rRNA = 16S ribosomal ribonucleic acid

vcrA = vinyl chloride reductase

CHAIN OF CUSTODY RECORD

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Environmental Sampling Services

6680 Alhambra Ave., #102
Martinez, California 94553-6105
Tel: (925) 372-8108 Fax: (925) 372-6705
Log Code: ESSM www.envsampling.com

TURN AROUND TIME — Other:

☐ 24 Hours	☐ 48 Hours	☐ 1 Week	☑ Normal

LABORATORY: SiREM-Ontario, Canada
Lab Code: S-1515

Report To: Angela Liang & Melissa Asher Telephone: (510) 285-2700
Company: Geosyntec Consultants Fax: (510) 836-3036
Address: 475-14th Street, Suite 450 Project Name: Hopyard Cleaner
Oakland, CA 94612 Project Number: WRO574
E-Mail: aliang@geosyntec.com & masher@geosyntec.com
Sampler(s): Jacqueline Lee ☑ Sampler's Signature:
Stephen Penman ☑ Sampler's Signature:
GeoTracker No.: NA
Reporting Requirement: Hard Copy: Yes ☑ No ☐
EDD File: Yes ☑ No ☐ Electronic (EDF): Yes ☐ No ☑

	SAMPLE ID	FIELD POINT NAME	Sample Date	Sample Time	Number of Containers	Type of Container[1]	Matrix: Groundwater	Soil	Soil Vapor	Water	Other	Preservative: Ice	HCl	HNO_3	H_2SO_4	GENE-TRAC METHOD 1:Quantitative GENE-TRAC-DHC*	GENE-TRAC METHOD 2: GENE-TRAC-VC*	Treatability study (FTSB)	Field Filtered (FF)	Comments
1	MW-3		1/26/09	10:02	1	3	X					X				X	X			
2	MW-1		1/26/09	11:23	1	3	X					X				X	X			
3	MW-2		1/26/09	14:00	6	1,3	X					X				X	X	X		
4	MW-DUP		1/26/09	14:30	2	3	X					X				X	X			

Relinquished By:	Date:	Time:	Received By:
	1/26/09	15:17	
Relinquished By:	Date:	Time:	Received By:
	1/27/09	10:05	FedEx
Relinquished By:	Date:	Time:	Received By:
			1/28/09 1:35 pm

1 = Sample Container Type: 1 =VOA 2=Glass 3=Plastic 4=Summa Canister

QUESTIONS REGARDING COC, CALL ESS
DHC = Dehalococcoides, VC=Vinyl Chloride

Please email COC for confirmation! masher@geosyntec.com

SAMPLE RECEIPT
☐ Intact ☐ Cold
☐ On Ice ☐ Ambient
Preservative Correct?
☐ Yes ☐ No ☐ NA

SiREM
Site Recovery & Management
130 Research Lane, Suite 2
Guelph, Ontario N1G 5G3
Phone: (519) 822-2265
Fax: (519) 822-3151
www.siremlab.com

Interpretation of Quantitative Gene-Trac *Dehalococcoides* Test Results

1) Background:

Dehalococcoides group organisms (*Dhc*) are the only known microorganisms capable of complete dechlorination of chloroethenes (i.e., tetrachloroethene, trichloroethene, *cis*-dichloroethene, vinyl chloride to non-toxic ethene. The detection of the *Dhc* 16S ribosomal ribonucleic acid (rRNA) gene has been correlated with the complete biological dechlorination of chlorinated ethenes to ethene at contaminated sites (Hendrickson et. al., 2002, *Applied and Environmental Microbiology*, 68: 485-495). The Quantitative Gene-Trac *Dehalococcoides* test is a quantitative polymerase chain reaction (PCR) test used to determine the concentration of the *Dhc* 16S rRNA gene in soil and groundwater samples.

2) Interpretation of Test Results:

The Quantitative Gene-Trac test reports two types of results, *"Dehalococcoides* 16S rRNA Gene Copies" is a raw value whereas **"**% *Dehalococcoides* in Microbial Population*"* is the raw value expressed as percentage of total microbial population. A detailed explanation of the two types of results is provided below.

a) *Dehalococcoides* 16S rRNA Gene Copies

This value is the direct number of *Dhc* 16S rRNA gene copies detected in the sample. Results may be reported either per liter (for groundwater) or per gram (for soil). This number is generally interpreted as equivalent to the number of viable *Dhc* present in the sample when certain reasonable assumptions are made, including that the DNA quantified belongs to viable *Dhc* (i.e., not from dead *Dhc*) and that each *Dhc* cell contains only one 16S rRNA gene. Guidelines for relating this value to observable dechlorination impacts for groundwater samples are provided below.

- **Values of 10^3 gene copies per liter or lower,** indicate the sample contains low concentrations of *Dhc* organisms which may indicate that site conditions are sub-optimal for high rates of dechlorination. Increases in *Dhc* concentrations at the site may be possible if conditions are modified (e.g., electron donor addition).

- **Values of 10^4-10^6 gene copies per liter,** indicates the sample contains moderate concentrations of *Dhc* which may, or may not, be associated with observable dechlorination impacts (i.e., ethene).

- **Values at or above 10^7 gene copies per liter,** indicate the samples contains high concentrations of *Dhc* which is often associated with high rates of dechlorination and the production of ethene. Test results exceeding 10^9 gene copies/liter are rarely observed.

b) % *Dehalococcoides* in Microbial Population (% *Dhc*)

This value presents the percentage of *Dhc* (% *Dhc*) relative to other microorganisms in the sample based on the formulas below. % *Dhc* is a measure of the predominance of *Dhc and,* in general, the higher this percentage the better.

$$\%\ Dhc = \frac{Number\ Dhc}{Number\ Dhc + Number\ other\ Bacteria}$$

Where:

$$Number\ other\ Bacteria = \frac{Total\ DNA\ in\ sample\ (ng) - DNA\ attributed\ to\ Dhc\ (ng)}{4.0\ x\ 10^{-6}\ ng\ DNA\ per\ bacterial\ cell}$$

The number of non-*Dhc* bacteria is estimated by assuming each non-*Dhc* bacterium contains 4.0 x 10^{-6} nanograms (ng) of DNA (Paul and Clark. 1996. *Soil Microbiology and Biochemistry*). Because the total mass of DNA in a sample is determined (by fluorometry) the total number of bacteria present can be estimated. For perspective, the % *Dhc* can range from very low fractions of percentages, in samples that have low numbers of *Dhc* and high numbers of other bacteria (incompletely colonized by *Dhc*), to greater than 50% in *Dhc* enriched cultures such as KB-1™ (fully colonized by *Dhc*).

In addition to determining the predominance of *Dhc*, this value is also used for interpretation of *Dhc* counts from different sampling locations or the same location over time, because it is normalized to total bacteria. In particular, the % *Dhc* value can be used to correct *Dhc* counts where samples are biased low due to non-representative sampling of biomass (bacteria). Example 1 below illustrates a scenario where the % *Dhc* value improves the interpretation of data where one sampling event was biased.

Example 1, use of % Dhc Value to interpret raw data

Example 1 presents results from monitoring well MW-1 sampled in April, May and June. Based on the raw *Dhc* counts alone (*Dehalococcoides* 16S rRNA Gene Copies) it might be assumed that the number of *Dhc* decreased 10-fold between April and May; however, based on the percentage of *Dhc* it is clear that the proportion of *Dhc* actually increased from April to May and that the low count is probably a case of sampling variability (biased low). The higher raw count and the higher percentage of *Dhc* in June confirms the trend of increasing *Dhc* concentrations over time.

Sample	***Dehalococcoides* 16S rRNA Gene Copies**	**% *Dhc***	**Interpretation Based on % *Dhc***
MW-1–April	1.0 x 10^5/Liter	0.1%	*Dhc* is a low proportion of total microbial population
MW-1–May	1.0 x 10^4/Liter	1%	*Dhc* predominance increased 10-fold from April, low count from low biomass sampled, non-biased sample would be [(1.0/0.1) x 1.0 x10^5] = 10^6 /Liter
MW-1 June	1.0 x 10^7/Liter	10%	*Dhc* predominance moderate and has increased 100-fold from April

3) Explanation of Notes

Quantitation limit: The quantitation limit of Gene-Trac test is 2,150 *Dhc* 16S rRNA gene copies per liter. Note, the specific quantitation limit for each test varies depending on the volume of sample used in the DNA extraction process. For example, if only a ½ liter of water was used the quantitation limit would increase two-fold to 4300 gene copies per liter. The specific quantitation limit is provided only where *Dhc* is not detected.

Value is an estimated quantity between the quantitation limit and detection limit: This is applicable in situations where *Dhc* DNA is detected above the detection limit, but below the quantitation limit, of the standard curve. In such cases an estimated value is provided which is based on extrapolation of the standard curve.

Sample inhibited testing: Each Quantitative Gene-Trac test includes a quantification of the amount of DNA extracted from the sample and a second test to determine if the extracted DNA is suitable for *Dhc* testing (PCR with a universal Bacteria primer). If a sample is determined to contain DNA and PCR with universal primers is negative, it suggests that the extracted DNA inhibited the PCR. Inhibition may be caused by compounds present in the original groundwater sample (e.g., humic acids). Where inhibition occurs there is an increased likelihood of false negatives since *Dhc* DNA, if present, may not be detected.

DNA not extracted from the sample: If DNA is not detected in the sample then "DNA not extracted from the sample" is reported. This is commonly due to samples that contain little or no biomass (bacteria). In some cases sampling may not capture bacteria (e.g., when attached bacteria are not dislodged from the aquifer matrix).

4) Converting Standard Gene-Trac to *Dhc* 16S rRNA Gene Copies/Liter

Quantitative Gene-Trac provides quantitative results in *Dhc* 16S rRNA Gene Copies/Liter, whereas standard Gene-Trac provides semi-quantitative results using a plus scale. Based on parallel analysis of standard versus Quantitative Gene-Trac estimates of the number of *Dhc* gene copies for each + score in the standard test were determined. Note, the conversion factors do not apply in all cases and are meant to be used as a rule of thumb for relating standard Gene-Trac results to Quantitative-Gene-Trac.

Estimated 16S rRNA Gene Copies/Liter for Standard Gene-Trac Intensity Scores

Standard Gene-Trac Intensity Score	Approximate Range of 16S rRNA Gene Copies/Liter
+	10^3-10^5
++	10^4-10^6
+++	10^5-10^7
++++	10^6-10^8