2013 OPERATIONS, MAINTENANCE & MONITORING ANNUAL REPORT

DEL AMO WASTE PITS
LOS ANGELES, CALIFORNIA

PREPARED FOR:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

PREPARED ON BEHALF OF:

THE DEL AMO RESPONDENTS

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AO	Administrative Order
Annual Report	2013 OM&M Annual Report
ASTM	American Society of Testing and Materials
C_1	Carbon Vessel 1
Cap Gas System	Cap Gas Collection and Treatment System
CO_2	carbon dioxide
COC	constituents of concern
CPT	Cone Penetro Meter Test
DTSC	Department of Toxic Substances Control
kg	kilograms
lbs	pounds
LEL	lower explosive limit
mcl	maximum contaminant level
msl	mean sea level
ND	non-detect
O_2	oxygen
OM&M	Operations, Maintenance and Monitoring
OM&M Manual	Operations, Maintenance and Monitoring Manual
PID	photo ionization detector
Phase III Redesign	Draft 90% Phase Redesign
PLC	programmable logic controller
PME	Performance Monitoring Event
PME ROF	Draft Performance Monitoring Event Report of Findings
ppm	parts per million
RAO	Remedial Action Objectives
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
RSPS	ROD-Specified Performance Standard
SCAQMD	South Coast Air Quality Management District
scf	standard cubic feet
scfm	standard cubic feet per minute
SVE/IBT	Soil Vapor Extraction/Insitu Biodegradation Technology
SVOCs	semi-volatile organic compound
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound
WT	water table
Waste Pits OU	Del Amo Waste Pits Operable Unit

1.0 INTRODUCTION

This 2013 Operations, Maintenance, and Monitoring (OM&M) Annual Report (Annual Report) has been prepared by C2 REM on behalf of the Del Amo Respondents to summarize the OM&M activities conducted at the Del Amo Waste Pits Operable Unit (Waste Pits OU) site located in Torrance, California, pursuant to requirements in the *Administrative Order (AO) for Remedial Action, Docket No. 99-08, Del Amo Waste Pits Operable Unit, Torrance, California,* United States Environmental Protection Agency (USEPA,1999), and the *Operations, Maintenance and Monitoring Manual, Del Amo Waste Pits Operable Unit, Torrance, California,* (C2 REM, 2012) (OM&M Manual).

This Annual Report provides a summation of the OM&M activities conducted from January through December 2013 at the Waste Pits OU during the 14th year of operation of the Phase I remedy (e.g., multi-layer cap, soil vapor monitoring probes) and the 7th year of operation of the Phase II remedy (i.e., Soil Vapor Extraction/In-Situ Biodegradation Technology System [SVE/IBT System]). The current SVE/IBT system design was re-evaluated during this period and a new plan, the *Draft 90% Phase III Redesign* (Phase III Redesign) (C2 REM, 2013a) was submitted to USEPA on June 4, 2013 and is awaiting comment and approval (see Section 3.3).

This Annual Report includes discussions on:

- OM&M activities for the Cap Gas Collection and Treatment System (Cap Gas System) and SVE/IBT System;
- OM&M activities for groundwater monitoring and analysis;
- Inspections (pursuant to both quarterly requirements and post rain) of the cover system, drainage systems, Cap Gas System, SVE/IBT System and general physical site characteristics; and,
- Summaries of maintenance and repairs.

2.0 SITE HISTORY

The Waste Pits OU includes Lots 36 and 37 of the Los Angeles County Assessor's Map of Tract 4671 and is bounded by Vermont Avenue to the east and approximately equivalent to Budlong Avenue (if extended to the north) (see Figure 1.0). The northern boundary of the property is a Los Angeles Department of Water and Power easement, and the southern boundary is Del Amo Boulevard. One major petroleum/petrochemical pipeline corridor is located within the property near the southern boundary of the Site oriented from east to west.

The Waste Pits OU includes two adjoining parcels of land (Lots 36 and 37), which previously contained six small rectangular pits (2-series pits) and three large rectangular impoundments (1-series pits) (see Figure 2.0). Both the 1-series and the 2-series pits were used for the disposal of wastes and/or waste liquids during operation of a synthetic rubber manufacturing facility which ceased operations in 1972. The 2-series pits were located on the western side of Lot 36 and the 1-series pits, 1-B and 1-C, were located on the eastern

side of Lot 36. Immediately east of Lot 36 is Lot 37, which contains a former large, rectangular impoundment designated as Pit 1-A. Impacted soils from Pit 1-A were excavated in four phases from 1982 – 1984 to a depth of 6 feet below ground surface (bgs) at the east side of the pit and to a depth of 25 feet bgs at the west side of the pit. This excavation process was completed under the direction of the California Department of Health Services (now Department of Toxic Substances Control [DTSC]).

As outlined in the *Remedial Design Work Plan, Del Amo Pits Operable Unit, Torrance, California*, (Dames and Moore, 1998), the USEPA provided oversight for the construction and installation of the Phase I remedy including installation of the SVE wells (a component of the Phase II remedy). The Phase I remedy, which was performed on the 1-series and 2-series pits, consisted of a Resource Conservation and Recovery Act (RCRA)-equivalent multi-layer cap, soil vapor monitoring probes, a Cap Gas System, security fences, deed restrictions, and surface and subsurface drainage features and operated under the *Operational, Maintenance and Monitoring Manual for the Del Amo Waste Pits Operable Unit* (Parsons, 1999). During 2006, the treatment technology for site vapor was selected, designed, and installed. The Phase II remedy, which is the SVE/IBT System, was placed into optimization testing and full-time operation on August 7, 2006. The SVE/IBT System has been analyzed through early 2013 and based on the conclusions presented in the *Draft Performance Monitoring Event Report of Findings* (PME ROF) (C2 REM, 2013b) the Phase III Redesign was submitted to USEPA on June 4, 2013 for approval.

3.0 SYSTEMS OPERATION AND MONITORING

3.1 CAP GAS SYSTEM OVERVIEW

The Cap Gas System utilizes a series of perforated pipes within the sand layer of the multi-layer cap to capture vapors that may accumulate beneath the cap through extraction via a blower into two reactivated carbon vessels for treatment. Cap Gas System monitoring activities in 2013 were conducted pursuant to the requirements, approved by the USEPA, presented in the report entitled *Cap Gas Collection and Treatment Baseline Monitoring and Long-term Monitoring Recommendations Report, Del Amo Waste Pits Operable Unit, Los Angeles County, California*, (C2 REM, 2000). These monitoring activities were conducted to assess the efficiency of the Cap Gas System in the collection and treatment of fugitive soil vapor emissions from the sand layer within the cap (see Figure 3.0).

The Cap Gas System operates for 4 hours a day (10:00 am - 2:00 pm), 5 days a week (Monday - Friday). The Cap Gas System is controlled by a programmable logic controller (PLC) unit, with capability to control and monitor the system and allows for to remote start and stop operation. In an effort to assess the efficiency and performance of the carbon units of the Cap Gas System, biweekly monitoring was conducted from four sample locations: 1) system influent, 2) effluent of the lead carbon vessel, 3) effluent of the secondary carbon vessel, and 4) system effluent.

3.2 CAP GAS SYSTEM FIELD MONITORING RESULTS

A site-dedicated photo ionization detector (PID) (calibrated to 5 parts per million volume [ppmv] benzene) was used to measure total volatile organic compound (VOC) concentrations at each of the four sample locations. As indicated in Table 1.0, influent sample concentrations ranging from 0.0 ppmv to 3.0 ppmv, and system effluent concentrations ranging from 0.0 ppmv to 0.9 ppmv were recorded during 2013 (see Figure 4.0). The average VOC concentration at the influent in 2013 was 0.56 ppmv. The field forms used to record results of the Cap Gas System monitoring events are presented in Appendix A.

As outlined in the OM&M Manual and the USEPA-approved carbon bed change-out protocol, when VOC concentrations at the effluent of the Cap Gas System are greater than 5 ppmv and/or when the lead vessel efficiency (in relation to the system influent) falls within Zone 2 for two consecutive monitoring events or Zone 3, carbon shall be replaced to ensure the System is operating within compliance (see Figure 5.0). Based upon this protocol, the lead and/or secondary carbon canisters were not changed out during 2013. Low influent concentrations in the Cap Gas System during 2013 equated to very little carbon usage and based upon the protocol, operational compliance was met.

3.2.1 CAP GAS SYSTEM LABORATORY CONFIRMATION SAMPLING

C2 REM, with the approval of the USEPA (December 4, 2002), modified the scope and frequency of the annual confirmation sampling event for the Cap Gas System from an annual program to once every 5 years. In addition, South Coast Air Quality Management District (SCAQMD) Method 25.1 has been eliminated from the required list of analyses for collected Cap Gas System samples due to the lack of relevant information obtained from the method, as well as the redundancy of using both SCAQMD Method 25.1 and USEPA Method 8260B (the latter of which provides an adequately detailed analysis of site constituents of concern [COC] and other related compounds).

A confirmation sampling event of the Cap Gas System was last conducted on September 11, 2010 and concluded that the correlation between the PID data and laboratory data is 99.9%; therefore, ensuring the effectiveness of field monitoring. The next confirmation sampling event will be conducted during the second quarter of 2015 (to coincide with the 3rd 5-year review) and thereafter in 2020.

3.3 SVE/IBT SYSTEM OVERVIEW

The SVE/IBT System was placed into optimization testing and full-time operation on August 7, 2006. The SVE/IBT System monitoring activities in 2013 were conducted pursuant to the requirements as approved by the USEPA and as presented in the report entitled *SVE/IBT Operations, Maintenance and Monitoring Manual* (C2 REM, 2006a). Additional information regarding the design, construction, and performance of the SVE/IBT System can be found in the following documents:

- *Remedial Design Work Plan Addendum,* C2 REM 2005a

- *SVE/IBT Pre-Final Design Report Addendum*, C2 REM 2005b
- *Process Hazard Analysis Report* ,Webb, Murray, & Associates 2005
- *SVE/IBT Operations, Maintenance, & Monitoring Manual*, C2 REM 2006a
- *SVE/IBT Final Design Report*, C2 REM 2006b
- *SVE/IBT Construction Quality Assurance Plan*, C2 REM 2006c
- *SVE/IBT Remedial Action Workplan*, C2 REM 2006d
- *Draft Performance Monitoring Event Report of Findings*, C2 REM 2013c
- *Draft 90% Phase III Redesign*, C2 REM 2013b

As stated within the PME ROF, the current SVE/IBT system design is no longer appropriate to address residual conditions due to SVE well screen intervals being impacted by rising groundwater. Re-evaluation of all parameters of the current system configuration and operation has been conducted and the Phase III Redesign was submitted to USEPA on June 4, 2013 and is awaiting comment and approval. On December 20, 2012, USEPA approved the continuation of the PME through the T180 event but rejected the request for a T360 event, and instead directed that normal system operations resume following the T180 event. Based on this directive, the SVE/IBT System will continue to operate in its current mode until approval of the Phase III Redesign is granted by USEPA.

The SVE/IBT System utilizes the extraction/monitoring well network installed during the Phase I remedy to extract vapors at the outer edges of the Waste Pits OU and inject re-circulated vapors along with generated oxygen (O_2) to allow for enhanced vadose zone biodegradation in order to comply with the *Record of Decision* (ROD) (USEPA, 1997). The intent of the ROD cleanup goal is to prevent the migration of contaminants, primarily benzene, from the Waste Pits OU such that they do not contribute more than a 0.5% increase in contaminant concentration of the existing impacted groundwater underlying the Waste Pits OU.

The SVE/IBT System final design includes extraction of soil vapors at eight SVE wells (1, 2, 5, 6, 7, 10, 11, and 12), treatment of a portion of the extracted vapors through granular activated carbon (GAC) adsorption, then amendment of the remaining soil vapor volume with generated oxygen and re-injection at four SVE wells (3, 4, 8, and 9) to enhance the natural aerobic degradation observed within the vadose zone.

The SVE/IBT System normally operates 8 hours per day (8:00 am – 4:00 pm), 5 days per week (Monday – Friday). The SVE/IBT System is controlled via a PLC unit with capabilities to automatically monitor and control operation, provide alarm/shutdown capability, and the means to remotely start and stop system operation. The results of both the pre-system and short-term operations are presented in the *Summary of SVE/IBT Pre-System Startup Operations Technical Memorandum,* (C2 REM, 2007) and the *Summary of SVE/IBT 3-Month Short-Term Operations Technical Memorandum,* (C2 REM, 2006e).

On November 8, 2006, short-term operations ended and the SVE/IBT System has been in long-term OM&M operation since then. The results from the 7th year long-term OM&M period for the SVE/IBT System are presented in this Annual Report. Benzene is not the only constituent detected at the Waste Pits OU; however, it is detected at concentrations in

excess of other constituents of concern (e.g. monthly laboratory results for benzene at the inlet of the SVE/IBT System averaged 12,079 ppmv versus the ethylbenzene average of 525 ppmv and the toluene average of 48 ppm during this period). Therefore, given that the current SVE/IBT System performance parameters are chemical specific, benzene was selected for discussion purposes. A summary of laboratory data collected from the SVE/IBT System is provided in Table 2.0.

Information related to the SVE/IBT System collected during this period includes field monitoring results (see Appendix A), field reports (see Appendix B), SVE/IBT System laboratory data results (see Appendix C), and in-line sensor data (see Appendix D), which are discussed in detail in the following subsections.

3.3.1 SVE/IBT SYSTEM OM&M ACTIVITIES

The 7th year of the long-term OM&M activities began in 2013 and included bi-weekly field monitoring, monthly laboratory sampling of the SVE/IBT System, monthly perimeter well monitoring, and quarterly full-scale field monitoring of perimeter, cluster, vacuum performance, and SVE wells (see Appendix A for all field monitoring results and Figure 6.0 for all well locations).

From January 1 through February 3, 2013, the SVE/IBT System remained in non-operation to evaluate the USEPA-approved PME activities through the T180 event, which are discussed in the PME ROF. The SVE/IBT System start-up was initiated on February 4th, and 5th, and as directed by USEPA, the SVE/IBT System normal operations fully resumed on February 6, 2013 and operated in this mode through the rest of 2013.

The SVE/IBT System was monitored at the following four stations (see Figure 7.0):

- Station 1 - Influent: (the combined flow of the nine extraction wells);
- Station 2 - Post Ambient Air: the diversion loop (to the granulated activated carbon beds) just after the ambient air intake;
- Station 3 - Carbon Vessel 1 (C_1): at the effluent of the primary carbon vessel; and,
- Station 4 - Effluent: the effluent stack.

These four measurement points were monitored for VOCs, O_2, carbon dioxide (CO_2), and flow rate using hand-held monitoring equipment. Along with the field monitoring, laboratory samples were obtained at the four sample stations once a month and analyzed for VOCs using USEPA Method 8260B and for fixed gases (i.e., O_2, CO_2, nitrogen, carbon monoxide, and methane) using American Society of Testing and Materials (ASTM) Method 1946 (see Table 2.0 and Appendix C). Corresponding in-line measurements from the PLC unit were also recorded where applicable. The SVE/IBT System in-line sensors record the following parameters: O_2, flow rate, % lower explosive limit (LEL), temperature, relative humidity, and benzene (ppm). Figure 7.0 shows the location of each in-line sensor and its average reading during normal operations in 2013.

Full-scale field monitoring was conducted quarterly and its scope included taking readings from all the Site's soil vapor monitoring locations (perimeter, vacuum performance, cluster, and SVE wells [see Figure 6.0]). Furthermore, perimeter wells were monitored monthly (wells A, B, C, D, and H) and quarterly (wells E, F, G, I, J, K, L) for VOCs, O_2, and CO_2 to confirm that soil vapors do not migrate beyond the cap boundaries (see Figure 6.0).[1] The procedures for monitoring all wells included measuring well pressure (inches of water), purging the appropriate well volume and analyzing vapors from each well for VOCs, O_2, LEL, and CO_2 with a PID calibrated to benzene and a multi-gas instrument (i.e., RKI) (see Appendix A).

3.3.1.1 SVE/IBT System Monitoring Results

Based on laboratory results, the benzene concentrations at the SVE/IBT System influent ranged from 6,400 ppmv to 20,000 ppmv with an average of 12,079 ppmv. The benzene concentrations detected at the post ambient air location ranged from 1600 ppmv to 3200 ppmv. The benzene concentrations at the outlet of C_1 ranged from non-detect (ND) (<0.005 ppmv) to 3,300 ppmv. The benzene concentrations at the effluent were ND (<0.005 ppmv) to 0.0083 ppmv (see Table 2.0). Benzene concentrations at Stations 1-4 demonstrated that the SVE/IBT System was effective in controlling LEL conditions and maintaining acceptable emission limits (i.e., less than 50 ppm) (see Figure 8.0). O_2 concentration at the influent ranged from 10.3% to 14.0% with an average of 11.4%. CO_2 concentration at the influent ranged from 8.5% to 17.8% with an average of 15.1%. The O2 generator was operated concurrently with the SVE/IBT System operation during 2013.

3.3.1.2 Cluster Well Monitoring Results

The primary function of the cluster wells is to assist in determining vertical soil vapor concentration profiles and evaluate the effectiveness of the SVE/IBT System. The field data collected from the cluster wells during this operation period is presented in Table 3.0. O_2 concentrations ranged from 0% to 22.7% with an average of 16.8%. CO_2 concentrations ranged from 0% to 30.4% with an average of 3.7%. VOC concentrations ranged from 0 ppm to greater than 15,000 ppm (Note: PID range is 0-15,000 ppm). Several sampling events were conducted over the duration of the PME activities to evaluate the vertical profile of the cluster wells and more details pertaining to these results and analysis can be found in the PME ROF.

3.3.1.3 Vacuum Performance Well Monitoring Results

The primary function of the vacuum performance wells is to measure the pressure response to extraction throughout the targeted zone of remediation (+10 ft. mean sea level [msl] layer). The field data collected from the vacuum performance wells during this operation period is presented in Table 4.0. O_2 concentrations ranged from 0% to 20.9% with an average of 12.4%. CO_2 concentrations ranged from 0% to 26.0% with an average of 6.1%.

[1] Pursuant to USEPA request (August 15, 2008), monthly monitoring of perimeter wells A, B, C, D, and H began in August 2008.

VOC concentrations ranged from 0 ppm to greater than 15,000 ppm (Note: PID range is 0-15,000 ppm).

Based on a review of the 2013 monitoring data for the vacuum performance wells, negative pressure was observed at these wells during quarterly sampling events with the exceptions of Wells C' and N'. The positive pressure detected at these two locations is most likely due to their close proximity to injection wells.

Additionally, the vacuum performance wells were used to assess the radius of influence of the SVE/IBT System. The nature of the SVE/IBT System (i.e., air re-circulation) makes this observation difficult in Sub-Areas 1 and 2 (where the active remedy is targeted) due to the close proximity of the extraction and injection wells.

3.3.1.4 SVE Well Monitoring Results

The field data collected from the SVE wells during this operational period is presented in Table 5.0. O_2 concentrations ranged from 0% to 21.6% with an average of 6.4%. CO_2 concentrations ranged from 1.8% to 40.0% with an average of 16.0%. VOC concentrations ranged from 0 ppm to greater than 15,000 ppm (Note: No average was conducted as PID range is 0-15,000 ppm and some wells were greater than the upper range).

3.3.1.5 PERIMETER WELL MONITORING RESULTS

The primary function of the perimeter wells is to monitor any potential lateral migration of COC's beyond the RCRA-equivalent cap. The field data collected from the perimeter wells during this operational period is presented in Table 6.0. O_2 concentrations ranged from 14.4% to 20.9% with an average of 19.3%. CO_2 concentrations ranged from 0% to 4.4% with an average of 1.4%. VOC concentrations measured with a PID ranged from 0 ppm to 1.6 ppm with an average of 0.1 ppm.

The continued low concentrations of VOCs detected at the perimeter wells indicate adequate control of the injected air volume, proper performance of the cover system, and demonstrates that contaminated soil vapors are not migrating beyond the cap boundaries (see Figure 9.0).

3.3.2 SVE/IBT SYSTEM OPERATION SUMMARY

In 2013, the SVE/IBT System operated for 1,636 hours out of 1,896 possible hours (assuming 8 hours/day, Monday-Friday). The continuous operation of the O_2 generator concurrent with the SVE/IBT System operation, coupled with minimal increase in O_2 concentrations at the SVE/IBT influent, provide strong indications of a sustained microbial population removing benzene through biodegradation. Downtime during this period is attributed to carbon change-outs, monitoring, and routine system maintenance (see Table 7.0). In addition to this downtime, the system did not operate during completion of the PME activities (192 hours).

The overall operation efficiency during this period was 86%. Total estimated operating parameters are as follows:

- Injected re-circulated air volume - approximately 2,296,242 standard cubic feet (scf) at an average flow rate of 23.4 standard cubic feet per minute (scfm);
- Generated O_2 gas injected - approximately 441,585 scf at an average flow rate of 4.5 scfm and 91% purity;
- Extracted air volume - approximately 3,159,786 scf at an average flow rate of 32.2 scfm; and,
- Treated air volume - approximately 863,544 scf at an average flow rate of 8.8 scfm.

Following the system start-up, the SVE/IBT System operated in a manner consistent with design parameters and has effectively removed approximately 6,798kg (14,956 lbs) total of benzene through degradation (5,838 kg [12,844 lbs]) and adsorption (959 kg [2,111 lbs]). Table 8.0 provides the parameters and calculations used to estimate the total mass of benzene removed through degradation and adsorption. Based on in-line sensor treatment rate data, the SVE/IBT System is adsorbing approximately 4.7 kg/day (10.3 lbs/day) of benzene through the carbon beds (based upon the operational hours stated above), and is degrading approximately 17.7 kg/day (39.0 lbs/day) of benzene *insitu* as measured by O_2 utilization (based upon continual [24 hrs/day] degradation).

Fresh and spent carbon weights are recorded before and after each SVE/IBT System carbon change-out. Based on these weight comparisons, approximately 3,641 kg (8,011 lbs) of Site constituents and SVE/IBT System condensate were absorbed to both the primary and secondary vessels. There were nine carbon change-outs conducted during 2013 (including one carbon change-out on 1/6/2014, resulting from system operation from 11/23/2013 – 12/30/2013). An average of 405 kg (890 lbs) of Site constituents were adsorbed per carbon change-out (see Table 9.0). All carbon was transported offsite to a certified carbon reactivation facility (see Appendix E).

Since the startup of the SVE/IBT System on August 6, 2006, a total of approximately 57,263 kg (125,978 lbs) of benzene have been removed from the Waste Pits OU (approximately 43,153 kg [94,936 lbs] through degradation and approximately 14,110 kg [31,042 lbs] through adsorption to carbon) (see Figure 10.0).

4.0 GROUNDWATER MONITORING

4.1 INTRODUCTION

Annual groundwater monitoring, including gauging and sampling of eleven Site groundwater monitoring wells, was conducted in accordance with the recommendations contained within the *Second Five Year Review Report* (USEPA, 2010). The Groundwater monitoring event occurred on September 11, 2013.

The monitoring event was conducted pursuant to requirements in the *Administrative Order (AO) for Remedial Action, Docket No. 99-08, Del Amo Waste Pits Operable Unit,*

Torrance, California (USEPA, 1999) and the *Operations, Maintenance and Monitoring Manual for the Del Amo Waste Pits Operable Unit, Torrance, California*, (C2 REM, 2013c) (OM&M Manual).

4.2 BACKGROUND

Nineteen groundwater monitoring locations around the Del Amo Waste Pits area were utilized to provide means of monitoring the Water Table (WT) Aquifer which assisted in developing Site RAOs in 1998. Groundwater data collected in 1998 were used to calculate the baseline average groundwater concentration in each of the four sub-areas. Of these 19 groundwater monitoring wells, some were one-time Cone Penetrometer Test (CPT) locations and others have been abandoned, leaving 11 wells remaining. These 11 existing wells are used for gauging and sampling during monitoring events (see Figure 11.0).

Groundwater monitoring was conducted in connection with the Del Amo and Montrose Chemical Superfund groundwater operable units from 1994 through 2000 and again in 2004 and 2006. Not all of the 11 groundwater monitoring wells associated with the Site were gauged and sampled in each of the referenced events. The historical records of these events are summarized in the *Combined 2006 Baseline Monitoring / TCE and Benzene Plumes Data Acquisition Report* (URS, 2007) and the *Groundwater Monitoring Report, Dual Site Groundwater Operable Unit* (URS, 2012).

4.3 OBJECTIVES

The primary objective for sampling the subject 11 groundwater monitoring wells is to verify that the specified performance standard for the Site is being achieved (i.e., COCs from the Waste Pits OU shall not cause an incremental groundwater contribution in excess of 0.5% of the existing groundwater COC concentration).

The Second Five Year Review Report issued on September 22, 2010, further identifies the necessity of finalizing or revising the methodology for measuring progress toward achieving the soil cleanup standard. The 2013 annual groundwater sampling provides relevant data needed to develop the finalization/revision of the RAOs for this Site.

4.4 METHODOLOGY

Groundwater gauging, sample collection and handling of purged/redevelopment water was conducted in accordance with the Groundwater Sampling and Analysis Plan appended to the Waste Pits OM&M Manual (C2 REM, 2008) and as amended via email to USEPA on February 10, 2011 and approved on February 18, 2011. Prior to initiation of monitoring well gauging and sample collection, the well seals were removed to allow the well to acclimate to atmospheric conditions. Upon completing this step, each of the monitoring wells were gauged for 1) total well depth, 2) depth to water and, 3) field analyzed for pH, temperature, turbidity, dissolved oxygen, and conductivity (see Table 10.0).

Groundwater samples were placed into laboratory supplied sample containers then placed in a cooler and chilled to a temperature of approximately 4°C for shipment to a laboratory for chemical analysis. Each laboratory-provided container was labeled with the following information: location, ID number, date, time, sampling personnel, and analyses required. This information was also entered on a chain-of-custody form. At the end of the sampling efforts, groundwater samples were forwarded to CalScience Analytical Laboratories, Inc., along with chain-of-custody forms, for the analysis of semi-volatile organic compounds (SVOCs) by USEPA Test Method 8270C and volatile organic compounds (VOCs) by USEPA Test Method 8260B.

4.5 GROUNDWATER ELEVATIONS

Groundwater gauging of the 11 existing Site wells in 2013 demonstrates that groundwater elevations have declined in the past three years (2011-2013). This can be explained by the recent drought condition in Southern California. In a long-term observation, groundwater elevations have an overall rising trend in relationship to previous levels, generally 1.0 to 1.5 feet since the 2006 sampling event (see Figure 12.0). This rising is due to an overall reduction of regional pumping for both potable and agricultural uses. The *Groundwater Monitoring Report* (URS, 2012), states, "the gradient is generally southwesterly, but is highly variable, including local areas of mounding in the vicinity of the waste pits area and near the southeast corner of the plant site". Based on the 2013 groundwater data collected, the gradient in the vicinity of the Waste Pits is relatively flat but generally follows the regional gradient (See Figure 13.0). Some of the deeper soil-vapor monitoring points (-10' msl), as well as the deeper intervals of the SVE wells, are at or near the saturated zone and are influenced by vapor off-gassing from groundwater.

4.6 GROUNDWATER QUALITY

Analytical laboratory results and field data sheets are presented in Appendices I and G, respectively; and a tabular summary of results is presented in Table 11.0 and 12.0.

VOCs are the primary COCs for the Site with benzene being the primary constituent. Review of analytical laboratory results indicates that the highest benzene concentrations were reported for samples collected from monitoring wells XMW-29, PZL0019, and PZL0020. Benzene concentrations are significantly lower in samples collected from monitoring wells PZL0022, PZL0024, PZL0025, SWL0008, and SWL0051 (located south of the Site and historically down-gradient) (see Figure 14.0), with four of the five samples below laboratory detection limits (<0.5 μg/L), which is below the California maximum contaminant level (MCL) of 1 μg/L.

To further assess benzene concentration trends, a non-parametric statistical analysis was performed (Mann-Kendall analysis), which identified either an increasing trend, no trend/stable, or a decreasing trend.

Presented below is a summary of the Mann-Kendall trends, based on the sampling events conducted from 1994 – 2013 (this statistical analysis is presented in Appendix I):

Well	Mann-Kendall Trend
PZL0018	No Trend
PZL0019	No Trend
PZL0020	Decreasing
PZL0022	No Trend – Results Below Detection Limits
PZL0024	Decreasing – Results Below Detection Limits
PZL0025	Decreasing – Results Below Detection Limits

Well	Mann-Kendall Trend
SWL0008	Decreasing
SWL0044	Decreasing
SWL0051	Decreasing – Results Below Detection Limits
XMW29	No Trend
XP02	No Trend

Based on review of the analytical laboratory results and the Mann-Kendall analysis, the benzene concentration in the groundwater samples collected from monitoring wells PZL0018, PZL0019, PZL0022, XMW29, and XP02, had no trends. The benzene concentration in the groundwater samples collected from monitoring wells PZL0020, PZL024, PZL0025, SWL0008, SWL0044, and SWL0051 had decreasing trends and there were no wells identified with increasing trends.

Benzene was detected at PZL0018, PZL0019, PZL0020, SWL0008, SWL044, XMW29, and XP02. Benzene concentration at PZL0018 was 61µg/L and the concentration has significantly decreased since the last concentration increase that occurred sometime after the 2000 sampling event. Benzene concentrations at PZL0019 and PZL0020 have remained consistent although PZL0020 had a decreasing trend. Benzene concentration at XMW29 was 5,100 µg/L, and the concentrations for this well have fluctuated from 1994 to 2000 and have a decreasing trend from 2004 to 2013. Benzene concentration at SWL0008 was 77 µg/L and the concentration for this well has fluctuated from 1994 to 2004 and has a decreasing trend from 2004 to 2013. Benzene concentrations were non-detect to low concentration at PZL0022, PZL0024, PZL0025, SWL0044, SWL0051 and XP02. Benzene concentrations at PZL0022, SWL0051, and XP02 have remained low or non-detect over time. Benzene concentrations at PZL0024 remained consistent from 1994 to 2000 but the recent concentrations at this well show a significant decrease and remained non-detect. Benzene concentrations at PZL0025 remained consistent from 1994 to 1997, but the recent concentrations at this well show a significant decrease and remained non-detect. Benzene concentrations at SWL0044 remained consistent from 1995 to 2006, but the recent concentrations at this well show a significant decrease and remained low.

Other VOCs detected at concentration above National MCL were ethylbenzene and trichloroethene (TCE). Ethylbenzene was detected at PZL0019 and PZL0020 where benzene was concurrently detected at high concentrations. Ethylbenzene concentrations were 5,300 µg/l at PZL0019 and 13,000 µg/l at PZL0020. TCE was detected at SWL0008 and XMW29, with concentrations of 5.5 µg/l and 7.7 µg/l respectively (see Table 11.0).

SVOCs concentrations were generally low and consistent with historic levels, with naphthalene being the only SVOC that is present in concentrations above the California Notification Level and those occurrences are within or immediately adjacent to the Site (see Table 12.0).

4.7 GROUNDWATER AVERAGE AND PERFORMANCE STANDARDS

In accordance with the OM&M Manual, Appendix G, Attachment 1 (C2 REM, 2012), protocols for calculating an average groundwater concentration and developing performance standards (including Soil Remediation Goals [SRG] and Soil Remediation Contingency Standards) were developed for each of the four sub-areas. The ROD-Specified Performance Standard (RSPS) for each sub-area was calculated using the average groundwater concentration and other input parameters selected to be representative of the specific site conditions. Finally, the Soil Remediation Contingency Standard and SRG were calculated using the average groundwater concentration and the RSPS. In addition, Appendix I also includes example calculations of the initial values of these parameters prior to the SVE/IBT operation. The average groundwater concentrations and performance standards will be periodically updated with data collected from groundwater sampling.

4.7.1 AVERAGE GROUNDWATER CONCENTRATION

Groundwater monitoring results were used to calculate an average groundwater concentration and a vapor concentration equivalent to groundwater for each sub-area. Groundwater concentrations in each sub-area were estimated using the method of kriging utilizing the SURFER program (Golden Software Inc.). Analytical results from the 11 existing groundwater wells were used and each sub-area was divided into a grid of square cells measuring 2-feet on each side and kriged to obtain concentrations for each cell (see Figure 15.0). An average groundwater concentration was calculated in each of the 4 sub-areas. The calculated average concentrations are 136,800 µg/l, 298,600 µg/l, 92,500 µg/l, and 12 µg/l in sub-areas 1 through 4, respectively (see Table 13.0).

Additionally, the groundwater data was supplemented with additional historical data collected from abandoned locations, using data collected in 1993 and 1998. The data from 11 existing wells and 8 historical wells was kriged and an average groundwater concentration was calculated in each of the 4 sub-areas as described above (see Figure 16.0). The calculated average concentrations are 128,100 µg/l, 355,700 µg/l, 354,000 µg/l, and 128,100 µg/l in sub-areas 1 through 4, respectively (see Table 13.0).

4.7.2 PRFORMANCE STANDARDS

A soil remediation goal (SRG) for each sub-area was calculated in accordance with the protocols described in the OM&M Manual Appendix G, Attachment 1 (C2 REM, 2012). The SRG is defined as the geometric mean of the RSPS and soil vapor concentration that is in equilibrium with the groundwater concentration. The calculated SRG, using only the 11 existing wells is 690 ppmv, 1,500 ppmv, 470 ppmv, and 0.06 ppmv in sub-areas 1 through

4, respectively (see Table 13.0 and Appendix J). The calculated SRG, using the data collected from the 8 abandoned wells in addition to the 11 existing wells is 650 ppmv, 1,800 ppmv, 1,800 ppmv, and 650 ppmv in sub-areas 1 through 4, respectively (see Table 13.0 and Appendix J).

5.0 INSPECTIONS

Quarterly inspections were conducted in accordance with the OM&M Manual (Section 4.0) on March 20, 2013; June 5, 2013; August 21, 2013; and December 18, 2013, for the cover system, the Cap Gas System, the SVE/IBT System, surface and subsurface water drainage systems, security fences, and access roads.

Additionally, all SVE well heads, connected and not connected to the SVE/IBT System, were inspected and monitored for leaks utilizing a PID calibrated to benzene. These inspections are conducted quarterly and will continue at this frequency throughout the SVE/IBT System's operations (see OM&M Manual, Section 6.2.1).

No post-rain or post-seismic inspections were warranted in 2013. The OM&M Manual established the criteria necessitating such inspections in order to identify any matters of concern and/or areas in need of repair following a qualifying rain or seismic event. Post-rain inspection events are conducted following periods of heavy rainfall, defined as 1 inch or greater within a 24-hour period. Further, post-seismic inspection events are conducted based upon an earthquake's magnitude and the epicenter's distance from the Site. The completed inspection forms used during quarterly, post-rain, and post-seismic inspection events are presented in Appendix F.

5.1 SUMMARY OF COVER SYSTEM INSPECTION EVENTS

During the cover system inspection events, no unusual or significant settlement, erosion, sediment build-up, slope instability, or shifting were observed. A few areas exhibited some evidence of burrowing animals and a few areas of vegetation stress, which were tended to during routine site maintenance and/or through ongoing monitoring/observation. The temporary above-ground irrigation system, which was installed in July of 2007 to assist with maintaining the cover system vegetation, continues to be routinely operated to help minimize excessive vegetation die-back during drought periods. The results of the cover system inspection events are presented in Table 14.0. In addition, the cover system is subject to monument elevation measurements to monitor and track historical ground movement and settlement. The most recent monument survey was conducted in March of 2010. The next survey event is scheduled for the 1st Quarter of 2015.

5.2 SUMMARY OF CAP GAS SYSTEM INSPECTIONS

Inspection of the Cap Gas System included observations of the above-ground components including: air intake and outlet collection headers, inlet and outlet valves, hoses and fittings, two 55-gallon carbon canisters, an extraction blower, sampling ports, and a moisture separator canister. The Cap Gas System inspection events did not reveal any

significant issues in 2013, outside of routine remedial maintenance, and the results are presented in Table 15.0.

5.3 SUMMARY OF SURFACE AND SUBSURFACE DRAINAGE INSPECTIONS

The concrete-lined drainage swales, catch basins, and drainage culverts were visually inspected to identify the presence of cracks, plugging, ponding, sediment or vegetation build-up, separation, and/or structural failure (see Tables 16.0 and 17.0). The results of the surface and subsurface drainage inspection events did not reveal any significant issues and minor repairs were made during routine site maintenance.

5.4 SUMMARY OF SECURITY FENCE AND ACCESS ROAD INSPECTIONS

Visual inspections of the security fence, gates, and signage were performed to identify breaks, vandalism, settlement damage, loose tension, and corrosion. The security fence inspection events did not reveal any significant issues, outside of minor routine maintenance, and the results are presented in Table 18.0. The gravel access road was inspected to identify dispersion of gravel and/or vegetation overgrowth. The access road inspection events did not reveal any significant issues, outside of minor routine maintenance, and the results are presented in Table 19.0.

5.5 SUMMARY OF SVE/IBT INSPECTIONS

Inspections of the SVE/IBT System included visual assessments of system conditions as well as mechanical assessments on an as-needed basis (see Table 20.0). Visual inspections were conducted on above-ground components and included the following:

- SVE wellheads;
- Ball valves;
- Sampling ports;
- Piping and Fittings;
- Carbon absorber vessels;
- Blowers A & B;
- O_2 generator;
- System in-line sensors; and,
- PLC unit, instrumentation, and data recorders.

No significant repairs were made to the SVE/IBT System in 2013. Periodic calibration and maintenance were performed on the in-line sensors throughout the year. Sensors that needed repair were returned to the manufacturer and re-installed following corrective measures.

6.0 ROUTINE MAINTENANCE

Routine observations and corrective actions were conducted in 2013 to: 1) ensure that the integrity of the containment system is maintained; 2) reduce the probability of

malfunction; 3) provide a mechanism for early detection of system failures; 4) repair identified system failures; and, 5) ensure the efficient management of OM&M activities (see Appendix B for field daily reports). Repairs of failed and non-functional components of the Phase I and Phase II remedies are conducted pursuant to Section 10.0 of the OM&M Manual.

6.1 COVER SYSTEM

Routine maintenance of the cover system included control of weeds and debris, vegetation (turf height), and burrowing animals. Regularly scheduled mowing of the grass (California mix) on the cap and the surrounding areas has maintained the required turf height (less than 1 foot) and helped control potential fire outbreaks by eliminating the build-up of dry grass thatch. The occurrence of burrowing animals is regulated in order to prevent damage to the cover system. Stressed vegetation has been addressed with the installation of an above-ground irrigation system which is routinely maintained and operated.

6.2 GAS COLLECTION AND TREATMENT SYSTEM

Weekly visual observations were conducted of the Cap Gas System's above-ground components and system enclosure to identify potential maintenance requirements and/or repairs. Further, the Cap Gas System was routinely accessed via the PLC unit to ensure that the mechanical components of the blower and control unit were properly operating to reduce the probability of malfunction.

6.3 SURFACE AND SUBSURFACE DRAINAGE SYSTEMS

As part of the scheduled landscape and maintenance of the site cover system, the surface and subsurface drainage systems were routinely inspected for any cracking, settlement, and/or debris build-up. The surface drainage swales and catch basins were regularly cleared of vegetative debris and/or sediment build-up. Minor caulking repairs were made to v-ditch joints periodically when signs of weathering were observed; however, no additional maintenance or repair of the surface and subsurface drainage systems was required in 2013.

6.4 SECURITY AND PERIMETER FENCE

Breaks, vandalism, and general signs of deterioration of the perimeter fencing are repaired as part of routine maintenance. Signage and locks were replaced periodically when found missing or damaged as well.

6.5 ACCESS ROAD

The gravel access road was routinely inspected for the dispersion of gravel and/or vegetation overgrowth. The access road was heavily used during the injection well construction on Lot 37 (discussed in Section 6) and restored to good condition by the Contractor following the completion of construction activities. The access road was

regularly cleared of encroaching vegetative material during scheduled landscape maintenance activities. The existing gravel access road was well-maintained and no significant repairs were required in 2013.

6.6 SVE/IBT SYSTEM

SVE/IBT components that require routine maintenance and monitoring to ensure proper functioning include the following inline meters: five O_2, five LEL, five flow/temperature, three temperature, one relative humidity, one pressure sensor, two air-moisture separator level switches, and one effluent PID. Also included as part of the SVE/IBT components are one O_2 generator, two blowers, and four automated motor-actuated valves. Daily visual confirmation of the functioning and trends of each component is conducted through accessing the PLC unit remotely to ensure that these components are properly operating to reduce the probability of malfunction. Weekly onsite visual observations of the SVE/IBT System's above-ground components and system enclosure were conducted to identify potential maintenance requirements and/or repairs and to monitor sub-contractor activities.

Routine maintenance items conducted on the SVE/IBT System in 2013 included replacement of sample ports, replacement of portions of the piping insulation, change-out of carbon, calibration/maintenance of in-line meters, greasing of the O_2 generator blower, and changing of the O_2 generator belts. Additionally, bi-weekly SVE/IBT field monitoring was conducted to compare the readings with the in-line meters to assess any significant deviations. Lastly, routine calibration of the O_2, LEL, and effluent PID meters was performed to ensure ideal gas ranges are present in each meter.

6.7 ONSITE TRAILERS AND STORAGE BIN

The onsite trailer and storage bin are routinely inspected for damage and incidents of vandalism. In an effort to further deter individuals from approaching onsite structures and to protect integral remedial system components, new cameras, motion detection sensors, and an alarm system were installed in 2009. Continuous monitoring with the motion detectors and surveillance cameras occurs during non-working hours and the cameras can be assessed remotely to observe Site status. No incidents of vandalism were observed on the property during 2013.

7.0 NON-ROUTINE MAINTENANCE

Although not outlined in the revised 2013 OM&M Manual, an annual pressure test is performed on the SVE/IBT System conveyance piping to assist in the early identification of possible repair issues with limited system operation interruption. This activity checks for pressure irregularities within an individual pipe segment to indicate potential pipe, joint, or O-ring degradation. When a pressure irregularity is encountered, identification and repair of the subject area is conducted. The quantity of repairs has increased over the last several years, which is an early indication that replacement of the conveyance piping will be necessary in the near future.

Montrose continued work on the injection well/pipeline project in connection with the Montrose/Del Amo Joint Groundwater Operable Unit in March of 2013. The project, Torrance Groundwater Remediation System (TGRS), included the installation of groundwater injection wells on Lot 37 within the eastern portion of the Del Amo Waste Pits boundary. The work included the installation of 2 groundwater injection wells, utility service, above ground mechanical/electrical improvements, and injection water pipelines. Construction activities continued through late November of 2013 with Montrose's contractor access through the site security gate on Vermont Ave. and the main access road.

8.0 WASTE DISPOSAL

In 2013, the Site generated waste only from purged groundwater which also contained decontamination water. Waste generated on-Site was handled, stored, transported, and disposed of in a manner consistent with current USEPA regulations. Additionally, containerized waste was properly characterized, labeled, and then picked up from the Site within required time frames by the Site's designated primary licensed waste hauler, American Integrated Services (AIS). Waste generated at the Site was properly manifested using an appropriate hazardous waste manifest form to track the waste from the point of generation to the point of final disposition. Lastly, waste was shipped to an authorized waste disposal facility. See Table 21.0 for a summary of the Site-generated waste in 2013.

9.0 CONCLUSIONS AND RECOMMENDATIONS

Following the 14th year of operation of the Phase I remedy (e.g., multilayer cap, Cap Gas System, soil vapor monitoring probes) and the 7th year of operation of the Phase II remedy (i.e., SVE/IBT System), the Del Amo Waste Pits OU remedies continue to function and remain protective in a manner consistent with the ROD. Provided below are conclusions and recommendations developed based on the results presented herein:

- The cover system and the other associated systems have adequately functioned during 2013, and the required inspection and monitoring frequencies are sufficient in assessing all remedy components.

- The SVE/IBT System and associated components continued to remove on-site COC mass through biodegradation and absorption to carbon. 17.7 kg (38.9 lbs) of benzene per calendar day and adsorbing approximately 4.7 kg (10.3 lbs) of benzene per operational day. To date, the SVE/IBT System has removed approximately 57,263 kg (125,978 lbs) of benzene from the Waste Pits OU (approximately 43,153 kg [94,936 lbs] through degradation and approximately 14,110 kg [31,042 lbs] through adsorption to carbon).

- As stated within the PME ROF (C2 REM, 2013), the current SVE/IBT system design is no longer appropriate to address residual conditions due to SVE well screen intervals being impacted by rising groundwater.

- Re-evaluation of all parameters of the current system configuration and operation was conducted and a new plan (Phase III Redesign) was submitted to the USEPA on June 4, 2013 and is awaiting comment and approval.
- Prior to approval of the Phase III Redesign, the SVE/IBT System will continue to operate in its current mode.

- The frequencies of field monitoring of the GCTS System, SVE/IBT System, lab sample collection, perimeter well monitoring, and full scale monitoring of cluster, vacuum performance, and SVE wells appear appropriate and will continue on the current schedule with no modifications being proposed.

- The continued low concentrations of VOCs detected at the perimeter wells indicate good control of the injected air volume, the cover system is performing as designed, and the contaminated soil vapors are not migrating beyond the cap boundaries.

- Review of the groundwater laboratory results indicates that the highest benzene concentrations were reported for samples collected from monitoring wells XMW-29, PZL0019, and PZL0020. Benzene concentrations are significantly lower in samples collected from monitoring wells PZL0022, PZL0024, PZL0025, SWL0008, and SWL0051 (located south of the Site and historically down-gradient) (see Figure 14.0), with four of the five samples below laboratory detection limits (<0.5 μg/L), which is below the California maximum contaminant level (MCL) of 1 μg/L.

- Mann-Kendall analysis indicated six decreasing trends and five no trends in the 11 monitoring wells included within the groundwater monitoring program. In addition, four wells exhibited analytical laboratory results below detection limits.

- Overall, the groundwater results and trend analysis are supportive of the following: 1) indicating that natural attenuation is occurring, 2) the dissolved phase VOC plume is not expanding, and 3) that the operable unit is not contributing to the degradation of underlying groundwater.

- The performance standards presented in this report are consistent with the performance standards calculated in the PME ROF due to no significant changes between the 2013 groundwater results and the 2011-2012 groundwater results. Therefore, the PME ROF concluded that the RAOs have been satisfied for sub areas 3 and 4 of the Site while the ROD goals and objectives have been satisfied for a majority of the Site.

- Regularly scheduled maintenance and inspection activities have assisted in the early identification of possible repair issues with limited system operation interruption. Issues requiring action were quickly identified, assessed, and rectified in 2013. The Phase I and II remedy components will continue to be closely

monitored in 2014 during routine and non-routine inspections. Continued inspections and monitoring activities for 2014 shall be conducted in accordance with the schedule provided in Table 22.0.

- Based on the content and the limited change in conveyed information, during this reporting period, C2 REM is recommending that the monthly reporting be adjusted to quarterly reporting. C2REM is proposing this modification on behalf of the Del Amo Respondents pursuant to Section XXII entitled Modifications of the AO for Remedial Action.

10.0 REFERENCES

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Table 1.0
2013 Cap Gas System Monitoring Results
Del Amo Waste Pits OU

Date	VOCs (ppm)				Temperature (°F)		Flow (scfm)		Lead Vessel Efficiency	System Efficiency
	Influent	Effluent Lead Carbon Vessel	Effluent Secondary Carbon Vessel	Effluent	Influent	Effluent	Influent	Effluent		
1/31/2013	0.1	0.1	0.1	0.1	75	110	143	172	0.0%	0.0%
2/13/2013	0.2	0.1	0.1	0.0	75	110	149	175	50.0%	100.0%
2/28/2013	0.1	0.1	0.0	0.0	76	110	149	179	0.0%	100.0%
3/13/2013	0.1	0.1	0.1	0.0	75	120	144	168	0.0%	100.0%
3/27/2013	0.0	0.0	0.0	0.0	74	115	136	172	NA	NA
4/10/2013	0.1	0.1	0.1	0.0	70	125	140	165	0.0%	100.0%
4/24/2013	0.0	0.0	0.0	0.0	76	118	148	173	NA	NA
5/15/2013	0.3	0.2	0.2	0.0	79	134	135	157	33.3%	100.0%
5/29/2013	0.2	0.2	0.1	0.1	85	132	137	156	0.0%	50.0%
6/12/2013	2.0	2.9	2.6	0.0	75	122	147	173	0.0%	100.0%
6/26/2013	3.0	2.3	1.8	0.8	91	130	141	161	23.3%	73.3%
7/11/2013	2.0	0.0	0.0	0.0	80	120	137	166	100.0%	100.0%
7/24/2013	0.3	0.3	0.2	0.1	82	132	136	178	0.0%	66.7%
8/7/2013	0.2	0.2	0.1	0.0	82	130	130	153	0.0%	100.0%
8/14/2013	0.2	0.3	0.1	0.1	86.5	134	134	143	0.0%	50.0%
8/28/2013	2.3	1.6	1.2	0.9	94	135	136	156	30.4%	60.9%
9/6/2013	0.5	0.2	0.0	0.0	130	145	96	150	60.0%	100.0%
9/12/2013	0.3	0.2	0.2	0.1	85	136	132	154	33.3%	66.7%
9/18/2013	0.7	1.0	0.7	0.1	82.1	145	147	148	0.0%	85.7%
9/25/2013	0.3	0.2	0.2	0.1	81	125	137	158	33.3%	66.7%
10/9/2013	0.4	0.2	0.0	0.0	76	118	142	170	50.0%	100.0%
10/23/2013	0.3	0.2	0.2	0.1	69	120	146	174	33.3%	66.7%
11/6/2013	0.4	0.3	0.3	0.2	90	125	148	162	25.0%	50.0%
11/20/2013	0.1	0.0	0.0	0.1	68	112	71	25	100.0%	0.0%
12/4/2013	0.5	0.3	0.3	0.2	77	105	137.5	170	40.0%	60.0%
12/18/2013	0.0	0.0	0.0	0.0	83	110	133.5	171	NA	NA

NR: Not Recorded
NA: Not Available to calculate vessel efficiencies as inlet concentration was 0.
ND: Non-Detected

Table 2.0
2013 SVE-IBT Laboratory Results
Del Amo Waste Pits OU

Date	Sample ID	Benzene (ppmv)	Carbon Dioxide (%)	Oxygen (%)	Nitrogen (%)	STATION
2/28/2013	Inlet	18000 (19000)	12.1 (8.52)	10.9 (14)	73.4 (74.5)	1
3/28/2013	Inlet	0.058* (14000)	ND<0.5 (15.2)	21.6 (11.6)	78.3 (73.2)	1
4/24/2013	Inlet	6400 (6800)	15.9 (16.9)	11.1 (10.5)	73 (72.6)	1
5/29/2013	Inlet	20000 (19000)	16.9 (16.8)	10.4 (10.3)	67.9 (67.9)	1
6/26/2013	Inlet	9500 (11000)	14.5 (16.9)	11.8 (10.4)	68.6 (67.8)	1
7/24/2013	Inlet	11000 (9300)	16.8 (16)	10.4 (10.9)	68.2 (68.4)	1
8/28/2013	Inlet	9800	13.4	11.9	69.2	1
9/25/2013	Inlet	9200 (13000)	13.2 (16.6)	12.4 (10.3)	69.4 (68)	1
10/23/2013	Inlet	13000 (12000)	15.8 (13.6)	11.9 (13.2)	70 (71)	1
12/4/2013	Inlet	9000	17.8	10.4	70.6	1
12/18/2013	Inlet	12000 (7500)	15.2 (14.8)	12.4 (12.7)	72.4 (72.5)	1
2/28/2013	Post Ambient Air	1600	1.12	20.7	78.2	2
3/28/2013	Post Ambient Air	1900	2.74	19.8	77.4	2
4/24/2013	Post Ambient Air	1700	2.48	20.1	77.5	2
5/29/2013	Post Ambient Air	3200	3.06	19.8	77.1	2
6/26/2013	Post Ambient Air	1700	ND<0.5	20.7	79.3	2
7/24/2013	Post Ambient Air	3000	3.27	19.7	77	2
8/28/2013	Post Ambient Air	2500	3.57	19.4	77	2
9/25/2013	Post Ambient Air	ND<0.0074*	ND<0.5	21.7	78.3	2
10/23/2013	Post Ambient Air	2500	3.47	19.6	76.9	2
12/4/2013	Post Ambient Air	1600	4.51	18.9	76.6	2
12/18/2013	Post Ambient Air	550*	0.676	21.2	78.1	2
2/28/2013	Carbon 1	870	1.33	20.6	78.1	3
3/28/2013	Carbon 1	ND<0.0067	ND<0.5	21.6	78.2	3
4/24/2013	Carbon 1	910	2.27	20.2	77.5	3
5/29/2013	Carbon 1	3300	3.03	19.8	77.2	3
6/26/2013	Carbon 1	1900	ND<0.5	20.4	79.6	3
7/24/2013	Carbon 1	170	3.47	19.6	76.9	3
8/28/2013	Carbon 1	380	3.53	19.5	77	3
9/25/2013	Carbon 1	0.0082	3.99	19.2	76.8	3
10/23/2013	Carbon 1	0.018	3.49	19.6	76.9	3
12/4/2013	Carbon 1	ND<0.0067	ND<0.5	21.7	78.3	3
12/18/2013	Carbon 1	2500	3.78	19.4	76.8	3
2/28/2013	Effluent	ND<0.005	0.592	21.1	78.3	4
3/28/2013	Effluent	ND<0.005	2.53	20	77.5	4
4/24/2013	Effluent	ND<0.005	2.4	20.1	77.5	4
5/29/2013	Effluent	0.0083	2.94	19.8	77.3	4
6/26/2013	Effluent	0.0019	ND<0.5	20.3	79.7	4
7/24/2013	Effluent	ND<0.005	3.33	19.6	77.1	4
8/28/2013	Effluent	ND<0.005	3.15	19.7	77.2	4
9/25/2013	Effluent	ND<0.0072	4.05	19.2	76.7	4
10/23/2013	Effluent	ND<0.005	3.53	19.6	76.9	4
12/4/2013	Effluent	ND<0.005	4.62	18.9	76.5	4
12/18/2013	Effluent	ND<0.005	4.71	18.8	76.4	4

ND: Analyte not detected at or above the reporting limit.
( ): Dupicate sample result.
* 0.058 ppmv at the inlet on March 28, ND<0.0074 ppmv and 550 ppmv at the post ambient air on September 25 and December 18 are identified as outliers and these values are excluded to calculate annual average.

Table 3.0
2013 Cluster Well Field Results
Del Amo Waste Pits OU

Date	Well ID	Pressure (in. water)	Oxygen (%)	Carbon Dioxide (%)	VOCs (ppm)
1/21/2013	A"1	0	14.3	1.8	0
5/8/2013	A"1	-0.04	20.4	0.8	0
8/20/2013	A"1	-0.07	20.2	1	0
12/11/2013	A"1	-0.1	20.9	0.4	0.5
1/21/2013	A"2	0	18.1	0.8	1.5
5/8/2013	A"2	-0.02	20.9	0	1.8
8/20/2013	A"2	-0.05	20.9	0	0
12/11/2013	A"2	-0.08	20.9	0	0.5
1/21/2013	A"3	-0.05	15.7	1.6	335
5/8/2013	A"3	-0.1	20.9	0	0.9
8/20/2013	A"3	-0.07	20.9	0	0
12/11/2013	A"3	0	18.9	1.4	117
1/21/2013	B"1	-0.14	17.6	3.8	>DL(1)
5/8/2013	B"1	0.2	8.7	17.2	>DL(1)
8/20/2013	B"1	0.22	7.2	30.4	>DL(1)
12/11/2013	B"1	-0.02	11.3	21	>DL(1)
1/21/2013	B"2	-0.1	14.8	4.8	>DL(1)
5/8/2013	B"2	-0.1	22.7	10.8	>DL(1)
8/20/2013	B"2	-0.2	20.9	18.6	>DL(1)
12/11/2013	B"2	-0.32	19.4	1.4	>DL(1)
1/21/2013	B"3	-0.1	15.5	4.8	>DL(1)
5/8/2013	B"3	0	18.2	9.8	>DL(1)
8/20/2013	B"3	-0.04	16.1	3.6	>DL(1)
12/11/2013	B"3	-0.16	19.6	1.4	>DL(1)
1/21/2013	C"1	-0.08	14.1	5.4	>DL(1)

(1)">DL": >15,000 ppm detection limit of field photo ionization device (PID)

Table 3.0
2013 Cluster Well Field Results
Del Amo Waste Pits OU

Date	Well ID	Pressure (in. water)	Oxygen (%)	Carbon Dioxide (%)	VOCs (ppm)
5/8/2013	C"1	-0.16	20.5	0	51
8/20/2013	C"1	-0.59	19.1	0.4	350
12/11/2013	C"1	0	20.7	0	10
1/21/2013	C"2	-0.04	5.2	11.8	>DL(1)
5/8/2013	C"2	-0.44	19.1	1.2	20
8/20/2013	C"2	-0.47	16.5	3	>DL(1)
12/11/2013	C"2	-0.8	19.1	0.6	20.2
1/21/2013	C"3	0	4.3	17.2	>DL(1)
5/8/2013	C"3	-0.4	20.3	0.2	33
8/20/2013	C"3	-0.38	19.6	1	252
12/11/2013	C"3	-0.34	20.5	0	11.7
1/21/2013	D"1	0	2.6	11.8	>DL(1)
5/8/2013	D"1	-0.86	13.4	3.8	>DL(1)
8/20/2013	D"1	-0.91	0	15.4	>DL(1)
12/11/2013	D"1	-0.82	12.9	11.2	>DL(1)
1/21/2013	D"2	-0.12	8.1	3.8	>DL(1)
5/8/2013	D"2	-0.44	15.2	2.2	>DL(1)
8/20/2013	D"2	-0.46	18.8	0.8	>DL(1)
12/11/2013	D"2	-0.28	15.2	2.4	>DL(1)
1/21/2013	D"3	-0.08	0.4	10.8	>DL(1)
5/8/2013	D"3	-0.7	17.6	1.6	>DL(1)
8/20/2013	D"3	-0.77	6.9	9.2	249
12/11/2013	D"3	-0.7	19.9	0	61
1/21/2013	E"1	0	19.2	1.6	4.1
5/8/2013	E"1	-0.08	20.7	0	0

(1)">DL": >15,000 ppm detection limit of field photo ionization device (PID)

Table 3.0
2013 Cluster Well Field Results
Del Amo Waste Pits OU

Date	Well ID	Pressure (in. water)	Oxygen (%)	Carbon Dioxide (%)	VOCs (ppm)
8/20/2013	E"1	-0.07	20.9	0	0.1
12/11/2013	E"1	0	20.9	0	0
1/21/2013	E"2	0	17.7	0.6	0
5/8/2013	E"2	-0.02	20	0.8	0
8/20/2013	E"2	-0.03	20.5	0.8	0.1
12/11/2013	E"2	0	20.9	0	0
1/21/2013	E"3	0.06	20.9	0	1
5/8/2013	E"3	-0.06	20.6	0	0
8/20/2013	E"3	-0.16	20.9	0	0.1
12/11/2013	E"3	-0.04	20.9	0	0
1/21/2013	F"1	-0.08	18.1	1.6	0.2
5/8/2013	F"1	-0.06	20.9	0	0.5
8/20/2013	F"1	-0.1	20.9	0	0.1
12/11/2013	F"1	0	20.9	0	1.3
1/21/2013	F"2	-0.08	14.5	4.2	1.5
5/8/2013	F"2	-0.06	19.1	1	3.7
8/20/2013	F"2	-0.05	20.9	0	7.7
12/11/2013	F"2	0	19.9	0.6	1.4
1/21/2013	F"3	-0.08	20.9	0	2
5/8/2013	F"3	-0.2	20.2	0.4	6.8
8/20/2013	F"3	-0.05	20.9	0	1.3
12/11/2013	F"3	0	20.8	0.2	5
1/21/2013	G"1	-0.06	19.6	0.6	0
5/8/2013	G"1	-0.06	20.4	0.2	0
8/20/2013	G"1	-0.05	14.6	4.2	0.1
12/11/2013	G"1	-0.06	18.5	1.8	0
1/21/2013	G"2	-0.05	19.6	0.6	0
5/8/2013	G"2	-0.04	20.2	0.2	0

(1)">DL": >15,000 ppm detection limit of field photo ionization device (PID)

Table 3.0
2013 Cluster Well Field Results
Del Amo Waste Pits OU

Date	Well ID	Pressure (in. water)	Oxygen (%)	Carbon Dioxide (%)	VOCs (ppm)
8/20/2013	G"2	-0.02	20.1	0.6	0
12/11/2013	G"2	-0.02	20.9	0	0
1/21/2013	G"3	-0.06	20.9	0	0
5/8/2013	G"3	-0.06	20.4	0	0
8/20/2013	G"3	-0.05	20.7	0.6	0
12/11/2013	G"3	-0.04	20.9	0	0
1/21/2013	H"1	-0.06	20.9	0	0.1
5/8/2013	H"1	0	20.6	0	0
8/20/2013	H"1	0	20.9	0	0.2
12/11/2013	H"1	0	20.9	0	0
1/21/2013	H"2	-0.02	20.8	0.4	0
5/8/2013	H"2	-0.02	20.6	0	0
8/20/2013	H"2	0	20.9	0.4	0.1
12/11/2013	H"2	-0.02	19.1	1.6	0
1/21/2013	H"3	-0.08	13.4	4.6	0
5/8/2013	H"3	-0.04	14.9	3.6	0
8/20/2013	H"3	0	9.2	8	0.2
12/11/2013	H"3	-0.02	9.4	9	0
1/21/2013	I"1	-0.04	4.1	11.2	370
5/8/2013	I"1	-0.06	17.1	2.2	64
8/20/2013	I"1	-0.1	18.2	1.4	42.8
12/11/2013	I"1	0	0	13.4	>DL[(1)]
1/21/2013	I"2	-0.02	20.9	0	0.5
5/8/2013	I"2	0	20.9	0.2	14.2
8/20/2013	I"2	-0.05	20.9	0	1
12/11/2013	I"2	0	16.2	2.4	8.8
1/21/2013	I"3	-0.04	15.6	3.2	1.2
5/8/2013	I"3	-0.04	20.9	0	2.5

(1)">DL": >15,000 ppm detection limit of field photo ionization device (PID)

Table 3.0
2013 Cluster Well Field Results
Del Amo Waste Pits OU

Date	Well ID	Pressure (in. water)	Oxygen (%)	Carbon Dioxide (%)	VOCs (ppm)
8/20/2013	I"3	-0.05	19.2	0.8	4
12/11/2013	I"3	-0.02	18.2	1.2	1.3
1/21/2013	J"1	0	19.5	1.2	0.7
5/8/2013	J"1	-0.04	20.9	0	0.7
8/20/2013	J"1	0	20.9	0	1.1
12/11/2013	J"1	-0.04	20.9	0	0
1/21/2013	J"2	0.06	20.9	0	0.2
5/8/2013	J"2	-0.02	20.9	0	1.5
8/20/2013	J"2	0	20.9	0	1.4
12/11/2013	J"2	0	20.9	0	0.1
1/21/2013	J"3	-0.06	7.7	8.4	0.1
5/8/2013	J"3	-0.06	18.2	2.2	0.3
8/20/2013	J"3	-0.05	5.9	11.6	4
12/11/2013	J"3	-0.04	12.1	6	0.6
1/21/2013	K"1	0	16	2.4	0.4
5/8/2013	K"1	-0.1	19.9	1.2	170
8/20/2013	K"1	-0.07	19.6	1.8	3.6
12/11/2013	K"1	-0.06	20.1	0.8	138
1/21/2013	K"2	-0.02	10.7	5.6	0.1
5/8/2013	K"2	-0.1	19.8	0.8	2.4
8/20/2013	K"2	-0.12	11.2	8.8	2.4
12/11/2013	K"2	-0.1	20.9	0	5
1/21/2013	K"3	0	20.9	0	200
5/8/2013	K"3	-0.02	20.5	0.2	160
8/20/2013	K"3	-0.03	20.9	0	21.7
12/11/2013	K"3	0	20.9	0	170
1/21/2013	L"1	-0.04	8.2	12	>DL[(1)]

(1)">DL": >15,000 ppm detection limit of field photo ionization device (PID)

Table 3.0
2013 Cluster Well Field Results
Del Amo Waste Pits OU

Date	Well ID	Pressure (in. water)	Oxygen (%)	Carbon Dioxide (%)	VOCs (ppm)
5/8/2013	L"1	0.3	11.2	9.4	>DL(1)
8/20/2013	L"1	0.41	0	25	>DL(1)
12/11/2013	L"1	0.1	5	18.8	>DL(1)
1/21/2013	L"2	0	17.3	2.8	>DL(1)
5/8/2013	L"2	0.06	16.9	4.8	>DL(1)
8/20/2013	L"2	0.17	13.5	7.8	>DL(1)
12/11/2013	L"2	0.1	18.9	1.2	>DL(1)
1/21/2013	L"3	-0.04	18.6	12.2	>DL(1)
5/8/2013	L"3	0.3	10.6	10.2	>DL(1)
8/20/2013	L"3	0.37	3.6	19.2	>DL(1)
12/11/2013	L"3	0	18.5	1.8	>DL(1)
1/21/2013	M"1	-0.04	1.3	13.6	2.8
5/8/2013	M"1	-0.1	14	7.2	4.8
8/20/2013	M"1	-0.12	12.9	7.6	220
12/11/2013	M"1	-0.12	19.2	0.6	26
1/21/2013	M"2	-0.02	1.5	13	0.4
5/8/2013	M"2	-0.18	13.2	7.8	3.3
8/20/2013	M"2	-0.16	11.4	10.4	23
12/11/2013	M"2	-0.16	20.4	0.2	15
1/21/2013	M"3	-0.02	20.1	1.6	>DL(1)
5/8/2013	M"3	0	20.6	0.2	106
8/20/2013	M"3	-0.02	20.9	0	32
12/11/2013	M"3	0	19.6	1.6	>DL(1)

(1)">DL": >15,000 ppm detection limit of field photo ionization device (PID)

Table 4.0
2013 Vacuum Pressure Performance Well Field Results
Del Amo Waste Pits OU

Date	Well ID	Pressure (in. water)	Oxygen (%)	Carbon Dioxide (%)	VOCs (ppm)
1/21/2013	A'	-0.08	15.5	3.6	>DL(1)
5/8/2013	A'	-0.66	5.6	12.4	>DL(1)
8/20/2013	A'	-0.7	1.3	18.2	>DL(1)
12/11/2013	A'	-0.74	7.4	11.6	>DL(1)
1/21/2013	B'	0	16.7	3	0.1
5/8/2013	B'	0	18.9	1	0.3
8/20/2013	B'	-0.05	17.8	2.4	0.4
12/11/2013	B'	-0.02	14.6	5.4	0
1/21/2013	C'	-0.12	16.1	3.2	>DL(1)
5/8/2013	C'	0.3	13	7	>DL(1)
8/20/2013	C'	0.36	0	26	>DL(1)
12/11/2013	C'	0.2	1.8	22.6	>DL(1)
1/21/2013	D'	0	8	7.8	>DL(1)
5/8/2013	D'	-0.5	20.5	0.2	>DL(1)
8/20/2013	D'	-0.71	0	18.2	>DL(1)
12/11/2013	D'	-0.6	0	15	>DL(1)
1/21/2013	E'	-0.18	8	8.2	0.5
5/8/2013	E'	-0.18	11	6.2	5.2
8/20/2013	E'	-0.15	5.6	9.4	2.9
12/11/2013	E'	-0.08	12.7	5	1.6
1/21/2013	F'	-0.18	10.4	5.6	0.4
5/8/2013	F'	-0.22	11.2	6.4	9.8
8/20/2013	F'	-0.25	15.9	3.6	0.4
12/11/2013	F'	-0.06	17	2.6	1.3
1/21/2013	G'	-0.2	16.2	2.8	0.1

(1)">DL": >15,000 ppm detection limit of field photoionization device (PID)

Table 4.0
2013 Vacuum Pressure Performance Well Field Results
Del Amo Waste Pits OU

Date	Well ID	Pressure (in. water)	Oxygen (%)	Carbon Dioxide (%)	VOCs (ppm)
5/8/2013	G'	-0.1	20.8	0	0
8/20/2013	G'	-0.1	20.9	0	0.1
12/11/2013	G'	-0.02	20.9	0	0
1/21/2013	H'	-0.1	18.1	2.6	0.1
5/8/2013	H'	-0.06	19.9	0.6	0
8/20/2013	H'	0	19.2	1.4	0.2
12/11/2013	H'	-0.02	16.6	3.6	0
1/21/2013	I'	-0.1	4.1	3.2	>DL(1)
5/8/2013	I'	-0.1	7	3	>DL(1)
8/20/2013	I'	-0.05	0	4.2	>DL(1)
12/11/2013	I'	0	1.8	4	>DL(1)
1/21/2013	J'	-0.04	16.8	2.6	1.8
5/8/2013	J'	-0.04	19.4	1.2	34
8/20/2013	J'	-0.05	20.9	0	3.7
12/11/2013	J'	-0.02	19.9	0.2	10.1
1/21/2013	K'	-0.02	11.7	5.8	0.3
5/8/2013	K'	-0.1	18.2	1.8	0.3
8/20/2013	K'	-0.05	7.9	8.2	1.9
12/11/2013	K'	-0.1	11.5	5.8	0.5
1/21/2013	L'	-0.06	12.1	3.4	6
5/8/2013	L'	-0.16	20.9	0	0.5
8/20/2013	L'	-0.15	16.2	4.4	75
12/11/2013	L'	-0.16	20.9	0	0.2

(1)">DL": >15,000 ppm detection limit of field photoionization device (PID)

Table 4.0
2013 Vacuum Pressure Performance Well Field Results
Del Amo Waste Pits OU

Date	Well ID	Pressure (in. water)	Oxygen (%)	Carbon Dioxide (%)	VOCs (ppm)
1/21/2013	M'	-0.05	3.5	9	>DL(1)
5/8/2013	M'	-0.1	14.6	4.4	>DL(1)
8/20/2013	M'	-0.12	4.4	13.8	>DL(1)
12/11/2013	M'	-0.1	8.6	11.2	>DL(1)
1/21/2013	N'	-0.02	13.3	5.6	>DL(1)
5/8/2013	N'	0.02	16	8.4	>DL(1)
8/20/2013	N'	0.11	8.1	23.8	>DL(1)
12/11/2013	N'	0	17.5	3.6	>DL(1)

(1)">DL": >15,000 ppm detection limit of field photoionization device (PID)

Table 5.0
2013 SVE Well Field Monitoring Data Summary
Del Amo Waste Pits OU

Date	Location ID	Pressure (in. water)	Oxygen (%)	Carbon Dioxide (%)	VOCs (ppm)
5/9/2013	SVE 1	-14	12.3	7.2	>DL(1)
8/22/2013	SVE 1	-15	12	6.4	>DL(1)
12/11/2013	SVE 1	-17	12.7	6	>DL(1)
5/9/2013	SVE 2	-4	15.5	13.8	>DL(1)
8/22/2013	SVE 2	-4	12.1	22.8	>DL(1)
12/11/2013	SVE 2	-4	12	23.6	>DL(1)
5/9/2013	SVE 3	2.5	18.4	17.4	>DL(1)
8/22/2013	SVE 3	4	13.2	27.8	>DL(1)
12/11/2013	SVE 3	2	21.6	25.2	>DL(1)
5/9/2013	SVE 4	6	3.3	23.2	>DL(1)
8/22/2013	SVE 4	6	0	32.2	>DL(1)
12/11/2013	SVE 4	4	0	37.8	>DL(1)
5/9/2013	SVE 5	-4	4.4	18.6	>DL(1)
8/22/2013	SVE 5	-5	0	26	>DL(1)
12/11/2013	SVE 5	-4	1.3	26.6	>DL(1)
5/9/2013	SVE 6	-21	13.2	5	>DL(1)
8/22/2013	SVE 6	-24	0	20	>DL(1)
12/11/2013	SVE 6	-22	9.8	7.2	>DL(1)
5/9/2013	SVE 7	-6	9.5	11.4	>DL(1)
8/22/2013	SVE 7	-6	8	11.2	>DL(1)
12/11/2013	SVE 7	-8	0	23	>DL(1)
5/9/2013	SVE 8	5	9.5	14.8	>DL(1)
8/22/2013	SVE 8	6	3.5	24.6	>DL(1)

(1)">DL": >15,000 ppm detection limit of field photo ionization device (PID)

Table 5.0
2013 SVE Well Field Monitoring Data Summary
Del Amo Waste Pits OU

Date	Location ID	Pressure (in. water)	Oxygen (%)	Carbon Dioxide (%)	VOCs (ppm)
12/11/2013	SVE 8	4	6	22.4	>DL(1)
5/9/2013	SVE 9	3	16.4	17.2	>DL(1)
8/22/2013	SVE 9	4	11.6	26.4	>DL(1)
12/11/2013	SVE 9	3	17	25.2	>DL(1)
5/9/2013	SVE 10	-12	10.9	13.2	>DL(1)
8/22/2013	SVE 10	-12	6.9	17.6	>DL(1)
12/11/2013	SVE 10	-12	7.2	17.6	>DL(1)
5/9/2013	SVE 11	-2.5	5.2	20.2	>DL(1)
8/22/2013	SVE 11	-1.75	0	34.8	>DL(1)
12/11/2013	SVE 11	-2	0	40	>DL(1)
5/9/2013	SVE 12	-14	10.5	16	>DL(1)
8/22/2013	SVE 12	-13	5	23	>DL(1)
12/11/2013	SVE 12	-20	4.2	27	>DL(1)
5/9/2013	SVE 13	0	11.3	1.8	>DL(1)
8/22/2013	SVE 13	-0.35	2.1	2.8	>DL(1)
12/11/2013	SVE 13	-0.36	0	3.4	>DL(1)
5/9/2013	SVE 14	-0.2	12	6	136
8/22/2013	SVE 14	-0.2	4	10.4	190
12/11/2013	SVE 14	-0.12	0.4	12.6	95
5/9/2013	SVE 15A	-22	3.6	11.4	>DL(1)
8/22/2013	SVE 15A	0	2.3	12.4	>DL(1)
12/11/2013	SVE 15A	0	0	16	>DL(1)
5/9/2013	SVE 15B	-0.12	2.5	14.6	69

(1)">DL": >15,000 ppm detection limit of field photo ionization device (PID)

Table 5.0
2013 SVE Well Field Monitoring Data Summary
Del Amo Waste Pits OU

Date	Location ID	Pressure (in. water)	Oxygen (%)	Carbon Dioxide (%)	VOCs (ppm)
8/22/2013	SVE 15B	-0.05	0	19	38
12/11/2013	SVE 15B	-0.02	0	20	7.8
5/9/2013	SVE 16	-14	6.8	8.4	>DL(1)
8/22/2013	SVE 16	-0.1	0	16.4	>DL(1)
12/11/2013	SVE 16	0	0	17.2	>DL(1)
5/9/2013	SVE 17	-0.1	5.8	11	13
8/22/2013	SVE 17	0	0	15.8	13
12/11/2013	SVE 17	0	0	16.4	13.3
5/9/2013	SVE 18	-0.08	13	6	1.2
8/22/2013	SVE 18	-0.1	8.4	10.2	2.3
12/11/2013	SVE 18	-0.04	9.4	10	0.3
5/9/2013	SVE 19	-0.1	6.2	10.2	133
8/22/2013	SVE 19	-0.05	0	16.8	250
12/11/2013	SVE 19	-0.02	0	18.2	235
5/9/2013	SVE 20A	NR	6.3	8.6	454
8/22/2013	SVE 20A	-0.1	0	12.8	>DL(1)
12/11/2013	SVE 20A	-0.02	0	16	>DL(1)
5/9/2013	SVE 20B	-34	11.5	5.8	>DL(1)
8/22/2013	SVE 20B	-0.1	9.8	6.8	>DL(1)
12/11/2013	SVE 20B	-0.04	8	8.2	>DL(1)
5/9/2013	SVE 21	-0.1	12	7	52
8/22/2013	SVE 21	-0.1	5.5	11.4	78
12/11/2013	SVE 21	-0.1	7	10.8	67.8

(1)">DL": >15,000 ppm detection limit of field photo ionization device (PID)

Table 6.0
2013 PERIMETER WELL FIELD RESULTS
DEL AMO WASTE PITS OU

Date	Well ID	Pressure (in. water)	Oxygen (%)	Carbon Dioxide (%)	VOCs (ppm)
1/16/2013	A	0	20.4	0.4	0
2/21/2013	A	0	20.9	0.4	0
3/20/2013	A	0	20.6	0.4	0
4/16/2013	A	-0.01	20.6	0.6	0
5/8/2013	A	-0.02	19.8	1.6	0.4
6/26/2013	A	-0.02	20.6	0.2	0.2
7/31/2013	A	-0.05	20.2	0.4	0
8/20/2013	A	-0.02	20.9	0.2	0
9/25/2013	A	0	20.9	0.6	0.6
10/16/2013	A	-0.04	20.9	0	0
11/13/2013	A	0	20.7	0	0
12/11/2013	A	-0.04	20.9	0.6	0.5
1/16/2013	B	-0.05	19.2	1.8	0.6
2/21/2013	B	0	19.3	2.2	0.5
3/20/2013	B	-0.05	18.9	2.2	1.2
4/16/2013	B	-0.02	19	1.8	0.9
5/8/2013	B	0	20.6	0.4	0.1
6/26/2013	B	-0.01	19	2.2	0.5
7/31/2013	B	-0.05	18.9	2.4	0
8/20/2013	B	-0.02	20.4	1.4	0.2
9/25/2013	B	0	20.4	2.4	1.6
10/16/2013	B	-0.04	20.1	1.2	0.7
11/13/2013	B	0	20	1.2	0.2
12/11/2013	B	-0.02	20.9	0.6	0

Table 6.0
2013 PERIMETER WELL FIELD RESULTS
DEL AMO WASTE PITS OU

Date	Well ID	Pressure (in. water)	Oxygen (%)	Carbon Dioxide (%)	VOCs (ppm)
1/16/2013	C	-0.05	19.2	1.8	0.1
2/21/2013	C	0	19	2	0
3/20/2013	C	0	18.2	2.2	0.3
4/16/2013	C	-0.05	18.3	2	0
5/8/2013	C	0	19.4	0.8	0
6/26/2013	C	-0.02	17.3	2.4	0
7/31/2013	C	0	16.6	2.8	0
8/20/2013	C	-0.02	17.7	2	0.2
9/25/2013	C	0	16.3	3	0.3
10/16/2013	C	0	19.6	0.6	0
11/13/2013	C	0.05	18.7	0.8	0
12/11/2013	C	-0.02	19.4	0.8	0.2
1/16/2013	D	-0.02	19.3	1.2	0
2/21/2013	D	0	20.1	1	0
3/20/2013	D	-0.05	19.9	1	0.1
4/16/2013	D	-0.01	19.9	1	0
5/8/2013	D	0	20.1	0.6	0
6/26/2013	D	-0.02	19.2	1.2	0.1
7/31/2013	D	-0.05	20	0.2	0
8/20/2013	D	-0.02	20.4	0.6	0
9/25/2013	D	0	20.9	0.6	0.1
10/16/2013	D	-0.04	20.9	0	0
11/13/2013	D	0	20.4	0.2	0
12/11/2013	D	-0.02	20.9	0	0

Table 6.0
2013 PERIMETER WELL FIELD RESULTS
DEL AMO WASTE PITS OU

Date	Well ID	Pressure (in. water)	Oxygen (%)	Carbon Dioxide (%)	VOCs (ppm)
1/16/2013	E	0.04	14.4	3.4	0
5/8/2013	E	-0.02	16.7	2.8	0
8/20/2013	E	-0.02	15.3	4.2	0
12/11/2013	E	0	19.6	1.4	0
1/16/2013	F	-0.05	17.2	3	0
5/8/2013	F	-0.03	17.9	2.4	0
8/20/2013	F	-0.03	16.8	3.6	0.1
12/11/2013	F	-0.04	19.9	1.2	0
1/16/2013	G	0	18.7	1.6	0
5/8/2013	G	0	19.9	0.6	0
8/20/2013	G	-0.02	18.6	2	0
12/11/2013	G	-0.02	20.9	0.6	0
1/16/2013	H	0	18.4	2.4	0
2/21/2013	H	0	18.8	2	0
3/20/2013	H	0	18.4	2.4	0
4/16/2013	H	-0.05	19	1.2	0
5/8/2013	H	0	19.9	0.8	0
6/26/2013	H	-0.03	18.7	2	0
7/31/2013	H	0	18.7	2	0
8/20/2013	H	0	19	2.2	0
9/25/2013	H	0	20.9	1	0.1
10/16/2013	H	-0.04	20.7	0.4	0
11/13/2013	H	0	20	0.8	0
12/11/2013	H	-0.02	19.4	1.8	0

Table 6.0
2013 PERIMETER WELL FIELD RESULTS
DEL AMO WASTE PITS OU

Date	Well ID	Pressure (in. water)	Oxygen (%)	Carbon Dioxide (%)	VOCs (ppm)
1/16/2013	I	-0.02	19.5	1	0
5/8/2013	I	0	19.7	1	0
8/20/2013	I	-0.02	19.9	1.2	0
12/11/2013	I	-0.02	20.9	0.4	0
1/16/2013	J	-0.02	18.8	1.8	0
5/8/2013	J	0	19.3	1.4	0
8/20/2013	J	-0.02	19	2.2	0
12/11/2013	J	-0.02	20.2	1.2	0
1/16/2013	K	-0.02	19.2	1.4	0
5/8/2013	K	0	19.6	1.2	0
8/20/2013	K	-0.02	19.9	1.2	0
12/11/2013	K	-0.04	20.9	0.2	0
1/16/2013	L	0	17.5	3.2	0
5/8/2013	L	0	18.3	2.4	0.2
8/20/2013	L	0	15.9	4.4	0.1
12/11/2013	L	0	18.7	1.8	0

Table 7.0
2013 SVE/IBT System Operation Efficiency
Del Amo Waste Pits OU

Feb 4, 2013 - Dec 31, 2013	Time (in hours)
Potential Operation Hours *	1896
Actual Hours	1635.5
Down Time	260.5
• Carbon Change-Out	173
• Monitoring/Sampling	48
• System Maintenance	39
Operation Efficiency	86%

* Assuming 8 hours/day, Monday - Friday (Including system startup on Feburuary 4th-5th. System fully resumed normal operation on Feburuary 6, 2013 from Performance Monitorng Event)

Table 8.0
2013 SVE/IBT System Operation Summary
Del Amo Waste Pits OU

Parameter	Original Design	Performance Based on Inline Monitoring Devices
Vapor Injection Rate (CFM)	50	27.9
System Operation Time (hours per day)*	8	8
O2 Injection Rate (CFM)	5	4.5
O2 Percentage (%)	100%	91%
O2 Utilization 1st Order Rate Constant (1/hr) **	0.0021	0.0021
Extracted Vapor Concentration (ppmv)***	15,000	10,150
Extraction Rate (CFM) ****	60	32.2
Treatment Rate (CFM)	15	8.8
Time for Pore Volume (days)	7.09	12.70
Injected O2 Concentration 1st Order	27%	27%
Benzene Degradation (kg/day)	**20**	**17.7**
Benzene Degradation (kg/year)	7,355	5,838
Benzene Removal (kg/day)	**10**	**4.7**
Benzene Removal (kg/year)	3,626	959
Total Benzene Removed/Degraded (kg/day)	**30**	**22**
Total Benzene Removed/Degraded (kg/year)	10,981	6,798
Carbon to Benzene Ratio *****	4:1	6:1
Projected Carbon Required (kg/day)	40	28
Actual Carbon Required (kg/year)	**-**	**16,563**

* Normal operation is 8 hours/day, Monday-Friday, 8:00 am - 4:00 pm.
** 0.0021 of design value was used for oxygen utilization constant.
*** Vapor concentration is an average of the monthly laboratory results without outliers.
**** Extraction rate is derived from the sum of the treatment rate and the recycle rate.
***** Benzene to carbon ratio for the 2013 operation period is based on actual weight adsorbed to carbon (See Table 9.0).

The calculation used for this estimate

Q = (O2 Injection rate + Recycle rate)
$[O_2]$ = (Term1*0.20+Term2*0.91)/{1-Term3*Exp(-k*t_{pv})}
ή = 1-Exp(-k*t_{pv})
f_{bio} = 1-(0.0035/k)

Term1 = (Recycle rate)/Q*(Excess Vapor Extraction rate)/(Treatment rate + Recycle rate)
Term2 =O2 injection rate/Q
Term3 = Recycle rate/(Treatment rate + Recycle rate)
t_{pv} (Time for Pore Volume) = 8505/Q
k = 0.0021

[Benzene] = 12079

Mass Degraded = Q*$[O_2]$* ή* f_{bio}* 5.8864
Mass Treated = Treatment rate *[Benzene]*0.000044148
Mass Total = Mass Degraded + Mass Treated

Table 9.0
2013 SVE/IBT System Carbon Change-Out Summary
Del Amo Waste Pits OU

Date of Change-outs	Operation Period Between Change-outs	Operational Hours Between Change-outs	Fresh Carbon (kg)			Spent Carbon (kg)			Weight Adsorbed (kg)		
			Primary	Secondary	Total	Primary	Secondary	Total	Primary	Secondary	Total
3/21/2013	2/6/2013~3/20/2013	243	924	923	1846	1172	1067	2239	249	144	393
5/2/2013	3/21/2013~5/2/2013	237	924	930	1854	1146	1133	2280	223	203	425
6/10/2013	5/3/2013~6/10/2013	172	923	925	1848	1172	1106	2279	250	181	431
7/11/2013	6/11/2013~7/11/2013	170	900	928	1828	1109	1058	2166	209	130	339
8/14/2013	7/12/2013~8/13/2013	146	914	919	1832	1125	1073	2198	211	155	365
9/17/2013	8/14/2013~9/17/2013	157	913	909	1822	1112	1052	2165	200	143	343
10/21/2013	9/18/2013~10/21/2013	189	932	924	1856	1179	1114	2293	247	190	437
11/22/2013	10/22/2013~11/22/2013	147	912	910	1822	1131	1120	2251	220	210	430
1/6/2014	11/23/2013~12/31/2013	166	927	928	1855	1200	1134	2334	273	206	479
Average		***181***	919	922	1840	1150	1095	2245	231	173	***405***
Total		***1627***	8267	8295	16563	10347	9857	20204	2080	1561	***3641***

Table 10.0
2013 Groundwater Field Monitoring Data Summary
Del Amo Waste Pits OU

Well ID	Temp (°C)	pH	Cond (µMhos)	Turbidity	D.O. (mg/L)	GW Elevation
September 11, 2013						
PZL0018	21.25	6.95	2400	0.1	5.4	-9.88
PZL0019	26.91	6.55	5940	35.2	5.1	-10.04
PZL0020	22.25	6.55	5560	8.7	6.2	-9.51
PZL0022	20.36	6.67	2510	7.1	4.59	-9.62
PZL0024	20.1	6.77	2110	23.4	7	-9.43
PZL0025	21.98	6.71	3210	32.9	5.54	-10.1
SWL0008	20.31	6.91	2270	9.5	3.6	-9.6
SWL0044	22.12	6.84	1970	0.1	0.5	-9.64
SWL0051	20.17	7	2040	16.8	4.39	-9.47
XMW29	24.6	6.8	1920	6.5	0.48	-10.43
XP02	21.88	6.98	1030	4.7	1.72	-10.5

Table 11.0
2013 Groundwater VOCs (USEPA Method 8260B)
Laboratory Data Summary
Del Amo Waste Pits OU

Date	SAMPLE_ID_MOD	1,1-Dichloroethene	1,2-Dichloroethane	Benzene	c-1,2-Dichloroethene	Ethylbenzene	Isopropylbenzene	Naphthalene	n-Butylbenzene	n-Propylbenzene	o-Xylene	p/m-Xylene	sec-Butylbenzene	Tert-Butyl Alcohol (TBA)	tert-Butylbenzene	Tetrachloroethene	Toluene	Trichloroethene	Xylenes (total)
California_MCL		6		1		300	NA	NA	NA	NA			NA	NA		5	150	5	1750
National_MCL		7		5		700	NA	NA	NA	NA			NA	NA		5	1000	5	10000
Notification_Level		NA		NA		NA	770	17	260	260			260	12		NA	NA	NA	NA
9/11/2013	PZL0018	ND<1.0	ND<0.50	61	ND<1.0	1.8	1.1	ND<10	ND<1.0	ND<1.0	1.6	ND<1.0	ND<1.0	ND<10	ND<1.0	1.6	ND<1.0	ND<1.0	1.6
9/11/2013	PZL0019	ND<2500	ND<1200	300000	ND<2500	5300	ND<2500	ND<25000	ND<2500	ND<2500	ND<2500	ND<2500	ND<2500	ND<25000	ND<2500	ND<2500	ND<2500	ND<2500	ND<2500
9/11/2013	PZL0020	ND<2500	ND<1200	400000	ND<2500	13000	ND<2500	ND<25000	ND<2500	ND<2500	ND<2500	ND<2500	ND<2500	ND<25000	ND<2500	ND<2500	ND<2500	ND<2500	ND<2500
9/11/2013	PZL0020-DUP	ND<2500	ND<1200	380000	ND<2500	13000	ND<2500	ND<25000	ND<2500	ND<2500	ND<2500	ND<2500	ND<2500	ND<25000	ND<2500	ND<2500	ND<2500	ND<2500	ND<2500
9/11/2013	PZL0022	ND<1.0	ND<0.50	ND<0.50	ND<1.0	ND<1.0	ND<1.0	ND<10	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<10	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
9/11/2013	PZL0024	ND<1.0	ND<0.50	ND<0.50	ND<1.0	ND<1.0	ND<1.0	ND<10	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<10	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
9/11/2013	PZL0025	ND<1.0	3.1	ND<0.50	ND<1.0	ND<1.0	ND<1.0	ND<10	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<10	1.3	ND<1.0	ND<1.0	ND<1.0	ND<1.0
9/11/2013	SWL0008	ND<1.0	8.6	77	1.1	8.3	49	15	22	85	ND<1.0	2.4	38	60	ND<1.0	ND<1.0	2.7	5.5	2.4
9/11/2013	SWL0044	ND<1.0	ND<0.50	1.1	ND<1.0	ND<1.0	2.3	ND<10	ND<1.0	ND<1.0	ND<1.0	1.2	2.2	ND<10	ND<1.0	ND<1.0	ND<1.0	ND<1.0	1.2
9/11/2013	SWL0044-DUP	ND<1.0	ND<0.50	1.2	ND<1.0	ND<1.0	1.9	ND<10	ND<1.0	ND<1.0	ND<1.0	ND<1.0	1.9	ND<10	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
9/11/2013	SWL0051	ND<1.0	ND<0.50	ND<0.50	ND<1.0	ND<1.0	ND<1.0	ND<10	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<10	ND<1.0	ND<1.0	ND<1.0	7.7	ND<1.0
9/11/2013	XMW29	ND<50	ND<25	5100	ND<50	ND<50	ND<50	ND<500	ND<50	ND<50	ND<50	ND<50	ND<50	ND<500	ND<50	ND<50	ND<50	ND<50	ND<50
9/11/2013	XPO2	1.6	ND<0.50	1.9	ND<1.0	ND<1.0	2.9	ND<10	ND<1.0	ND<1.0	ND<1.0	ND<1.0	2.1	ND<10	ND<1.0	3	ND<1.0	ND<1.0	ND<1.0

unit: ug/L
ND: not detected at the indicated reporting limit
NA: not available

Table 12.0
2013 Groundwater SVOCs (USEPA Method 8270C)
Laboratory Data Summary
Del Amo Waste Pits OU

Date	Well ID	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Phenanthrene	Phenol
	California_MCL	NA	NA	NA	NA	NA
	National_MCL	NA	NA	NA	NA	NA
	Notification_Level	NA	NA	17	NA	NA
9/11/2013	PZL0018	ND<10	ND<10	ND<10	ND<10	ND<10
9/11/2013	PZL0019	ND<10	ND<10	78	ND<10	31
9/11/2013	PZL0020	18	28	240	14	280
9/11/2013	PZL0020-DUP	17	26	230	13	280
9/11/2013	PZL0022	ND<10	ND<10	ND<10	ND<10	ND<10
9/11/2013	PZL0024	ND<10	ND<10	ND<10	ND<10	ND<10
9/11/2013	PZL0025	ND<10	ND<10	ND<10	ND<10	ND<10
9/11/2013	SWL0008	ND<10	ND<10	10	ND<10	ND<10
9/11/2013	SWL0044	ND<10	ND<10	ND<10	ND<10	ND<10
9/11/2013	SWL0044-DUP	ND<10	ND<10	ND<10	ND<10	ND<10
9/11/2013	SWL0051	ND<10	ND<10	ND<10	ND<10	ND<10
9/11/2013	XMW29	ND<10	ND<10	ND<10	ND<10	21
9/11/2013	XPO2	ND<10	ND<10	14	ND<10	ND<10

unit: ug/L
ND: not detected at the indicated reporting limit
NA: not available

Table 13.0
Initial vs. Current Calculated Benzene Concentrations
for SVE Remedial Sub Areas
Del Amo Waste Pits OU

	Sub-Area 1			Sub-Area 2			Sub-Area 3			Sub-Area 4		
	Initial	Current with Historical	Current	Initial	Current with Historical	Current	Initial	Current with Historical	Current	Initial	Current with Historical	Current
Average concentration in groundwater (ug/L)	100,000	128,100	136,800	400,000	355,700	298,600	170,000	354,000	92,500	16,000	128,100	12
Vapor concentration in equilibrium with groundwater parts per million by volume (ppmv)	7,100	9,100	9,800	29,000	25,400	21,300	12,000	25,300	6,600	1,100	9,100	0.9
60% of vapor concentration in equilibrium with groundwater contingency standard (ppmv)	4,300	5,500	5,900	17,000	15,200	12,800	7,200	15,200	4,000	700	5,500	0.5
Soil Remediation Goal vapor concentration (ppmv)	510	650	690	2,000	1800	1500	840	1800	470	78	650	0.06

Initial: Baseline calculations presented in the OM&M Manual (Appendix G, Attachment 1)
Current with Historical: Calculations using the current data (2011-2012) from eleven existing wells and the historical data (1993-1998) from eight abandoned/one-time CPT wells
Current: Calculations using the current data (2011-2012) from eleven existing wells only
Presented values are rounded (See Appendix J, table 1.0 for calculations)

Table 14.0
2013 Cover System Inspection Summary
Del Amo Waste Pits OU

Cover System				
Inspection Date	**March 20, 2013**	**June 5, 2013**	**August 21, 2013**	**December 18, 2013**
Inspection Type	1st Quarter Inspection	2nd Quarter Inspection	3rd Quarter Inspection	4th Quarter Inspection
Inspection Items				
Erosion	4	4	4	4
Stressed Vegetation (Plant Die-Back)	3(*)	2(*)	2(*)	3(*)
Sediment Build-Up	4	4	4	4
Local Subsidence or Loss of Grade	4	4	4	4
Water Ponding	4	4	4	4
Turf Height	4	4	4	4
Burrowing Animals	3(**)	4	4	3(**)
Weeds or Undesirable Vegetation	4	4	4	4
Evidence of Fires or Vandalism	4	4	4	4
Soil Quality Check	4	4	4	4
Unauthorized Traffic	4	4	4	4
Slope Instability or Sloughing	4	4	4	4
Survey Monuments	4	4	4	4
Vertical Cracking	4	4	4	4
Intrusions	4	4	4	4
Evidence of Waste Pit Materials	4	4	4	4

(*) Due to nature of hydroseed "spring mix" onsite, vegetation goes dormant during the summer and fall months but grows much better when first rains of the wet season around November/December. In 2013, rainfall was lacking, which kept growth minimal.
(**) Gophers periodically show activity in certain areas of the Site, which are routinely treated once observed.

Conditions/Remarks Key:

4 = Satisfactory

3 = Slight (Continue Observing)

2 = Moderate (Needs Scheduled Repair)

1 = Poor (Needs Immediate Repair)

Table 15.0
2013 Cap Gas Collection and Treatment System Inspection Summary
Del Amo Waste Pits OU

Cap Gas Collection Treatment System				
Inspection Date	**March 20, 2013**	**June 5, 2013**	**August 21, 2013**	**December 18, 2013**
Inspection Type	1st Quarter Inspection	2nd Quarter Inspection	3rd Quarter Inspection	4th Quarter Inspection
Inspection Items				
Collection System Valves				
Adequate Free Movement	4	4	4	4
Seals-Complete	4	4	4	4
Signs of Rust/Corrosion	3(*)	3(*)	3(*)	3(*)
Condensate Collection				
Air Moisture Separator	4	4	4	4
Carbon Adsorbers-Vessels				
Exterior Damage	4	4	4	4
FRP Grating and Mesh	4	4	4	4
Blower				
General Motor Maintenance	3(**)	3(**)	3(**)	3(**)
Drive Maintenance	3(**)	3(**)	3(**)	3(**)
Bearing Maintenance	3(**)	3(**)	3(**)	3(**)
Lubrication	3(**)	3(**)	3(**)	3(**)
Structural Maintenance	3(**)	3(**)	3(**)	3(**)

(*) Continue observing slight rust of some components of the GCTS
(**) Continue observing and inspecting blower functioning as designed due to age of blower and increased noise

Conditions/Remarks Key:
4 = Satisfactory
3 = Slight (Continue Observing)
2 = Moderate (Needs Scheduled Repair)
1 = Poor (Needs Immediate Repair)

Table 16.0
2013 Surface Water Drainage Inspection Summary
Del Amo Waste Pits OU

Surface Water Drainage				
Inspection Date	**March 20, 2013**	**June 5, 2013**	**August 21, 2013**	**December 18, 2013**
Inspection Type	1st Quarter Inspection	2nd Quarter Inspection	3rd Quarter Inspection	4th Quarter Inspection
Inspection Items				
Washouts or Erosion of Contoured Grade	4	4	4	4
Ponding on Contoured Grade	4	4	4	4
Gullies and Ruts on Contoured Grade	4	4	4	4
Plugging of Drainage Culverts	4	4	4	4
Holes and Cracks in Swales or Catch Basin	4	4	4	4
Sediment Build-Up in Swales or Catch Basins	4	4	4	4
Surface Cracking of Swales/Catch Basins	4	4	4	4
Spalling of Swales/Catch Basins	4	4	4	4
Structural Failure of Swales/Catch Basins	4	4	4	4

Conditions/Remarks Key:

4 = Satisfactory

3 = Slight (Continue Observing)

2 = Moderate (Needs Scheduled Repair)

1 = Poor (Needs Immediate Repair)

Table 17.0
2013 Subsurface Drainage Inspection Summary
Del Amo Waste Pits OU

Subsurface Drainage				
Inspection Date	**March 20, 2013**	**June 5, 2013**	**August 21, 2013**	**December 18, 2013**
Inspection Type	1st Quarter Inspection	2nd Quarter Inspection	3rd Quarter Inspection	4th Quarter Inspection
Inspection Items				
Holes and Cracks in Swales, Catch Basin	4	4	4	4
Plugging of Drainage Inlets	4	4	4	4
Sediment Build-Up or Debris in Catch Basin	4	4	4	4
Structural Failure of Catch Basin	4	4	4	4

Conditions/Remarks Key:

4 = Satisfactory

3 = Slight (Continue Observing)

2 = Moderate (Needs Scheduled Repair)

1 = Poor (Needs Immediate Repair)

Table 18.0
2013 Security Fence Inspection Summary
Del Amo Waste Pits OU

Security Fence				
Inspection Date	**March 20, 2013**	**June 5, 2013**	**August 21, 2013**	**December 18, 2013**
Inspection Type	1st Quarter Inspection	2nd Quarter Inspection	3rd Quarter Inspection	4th Quarter Inspection
Inspection Items				
Perimeter Fence				
Breaks and Holes	4	4	4	4
Settlement Damage	4	4	4	4
Loose Posts/Tension	4	4	4	4
Rust/Corrosion	4	4	4	4
Ruts and Burrows Beneath Fence	4	4	4	4
Vegetation Overgrowth	4	4	4	4
General Signs of Deterioration	4	4	4	4
Vandalism/Animal/ Wind Damage	4	4	4	4
Gates				
Adequate Movement of Hinges and Gates	4	4	4	4
Proper Function of Lock(s)	4	4	4	4

Conditions/Remarks Key:

4 = Satisfactory

3 = Slight (Continue Observing)

2 = Moderate (Needs Scheduled Repair)

1 = Poor (Needs Immediate Repair)

Table 19.0
2013 Access Road Inspection Summary
Del Amo Waste Pits OU

Access Road				
Inspection Date	**March 20, 2013**	**June 5, 2013**	**August 21, 2013**	**December 18, 2013**
Inspection Type	1st Quarter Inspection	2nd Quarter Inspection	3rd Quarter Inspection	4th Quarter Inspection
Inspection Items				
Holes and Cracks	4	4	4	4
Vegetation Overgrowth	4	4	4	4
Settlement	4	4	4	4
Excessive Dispersion of Gravel	4	3(*)	3(*)	4
General Signs of Deterioration	4	4	4	4

(*) Gravel has spilled over into concrete entry way of site. Swept gravel back onto gravel roadway from concrete entry way at the front gate.

Conditions/Remarks Key:

4 = Satisfactory

3 = Slight (Continue Observing)

2 = Moderate (Needs Scheduled Repair)

1 = Poor (Needs Immediate Repair)

Table 20.0
2013 SVE/IBT System Inspection Summary
Del Amo Waste Pits OU

SVE/IBT System Inspection				
Inspection Date	**March 20, 2013**	**June 5, 2013**	**August 21, 2013**	**December 18, 2013**
Inspection Type	1st Quarter Inspection	2nd Quarter Inspection	3rd Quarter Inspection	4th Quarter Inspection
Inspection Items				
Manifold				
Adequate - Free Movement	4	4	4	4
Seals - Complete	4	4	4	4
Visible Damage	4	4	4	4
Sniff for signs of leaks	4	4	4	4
Condensate Collection				
Air Moisture Separator	4	4	4	4
Additional System Components				
Carbon Adsorber Vessels				
Exterior Damage	4	4	4	4
Vessel Configuration (A-B or B-A)	A-B	A-B	A-B	A-B
Blowers				
General Motor Maintenance	4	4	4	4
Drive Maintenance	4	4	4	4
Bearing Maintenance	4	4	4	4
Oxygen Generator				
Signs of Rust/Corrosion	4	4	4	4
Mechanical Functioning	4	4	4	4
Oxygen Purity	4	4	4	4
System Sensors(*)				
Visible Damage	4	4	4	4
Mechanical Functioning	4	3	3	2
SVE Wellheads				
Tee Flanges	4	4	4	4
Valves	4	4	4	4
Sniff for signs of leaks	4	4	4	4

(*) Due to the high benzene concentrations, routine field maintenance and calibration is performed on system meters as well as regular repa

Conditions/Remarks Key:
4 = Satisfactory
3 = Slight (Continue Observing)
2 = Moderate (Needs Scheduled Repair)
1 = Poor (Needs Immediate Repair)

Table 21.0
2013 Generated Waste Summary
Del Amo Waste Pits OU

Waste I.D.	Source	Media	Hazardous or Non-Haz	Waste Code	Volume	Container Type	Date of Generation	Date of Disposal	Transporter
PW-1, PW-2	Groundwater wells	Purged GW (liquid)	Hazardous	135, D018	350 gal.	IBC poly-tanks to Vacuum truck	9/11/2013	11/20/2013	AIS

Table 22.0
2013 Proposed Monitoring and Inspection Activities
Del Amo Waste Pits OU

Event	Frequency	Method of Documentation
Cover System	Quarterly, after heavy rains[(1)], and seismic events[(2)]	Cover System Inspection Form
Cap Gas Collection and Treatment System	Quarterly, after heavy rains[(1)], and seismic events[(2)]	Cap Gas System Inspection Form
Surface Water Drainage System	Quarterly, after heavy rains[(1)], and seismic events[(2)]	Surface Water Drainage Inspection Form
Subsurface Drainage Systems	Quarterly, after heavy rains[(1)], and seismic events[(2)]	Subsurface Drainage Inspection Form
Security Fences	Quarterly, after heavy rains[(1)], and seismic events[(2)]	Security Fence Inspection Form
Access Road	Quarterly, after heavy rains[(1)], and seismic events[(2)]	Access Road Inspection Form
SVE/IBT System	Quarterly, after heavy rains[(1)], and seismic events[(2)]	SVE/IBT System Inspection Form
Groundwater Gauging and Sampling	Annually	Groundwater Monitoring Form
Perimeter Well Monitoring Event (wells A, B, C, D, H)	Monthly	Perimeter Soil Vapor Monitoring Form
Perimeter Well Monitoring Event (wells E, F, G, I, J, K L)	Quarterly	Quarterly Field Monitoring Form
Full Scale Field Monitoring (perimeter, cluster, vacuum performance, SVE)	Quarterly	Quarterly Field Monitoring Form
SVE/IBT System Field Monitoring	Semi-monthly	SVE/IBT System Monitoring Form
SVE/IBT System Lab Sampling	Monthly	Laboratory Analytical Report
Cap Gas Collection and Treatment System Monitoring	Semi-monthly	Cap Gas System Monitoring Form
Cap Gas Collection and Treatment Confirmation Sampling Event	Once every 5 years [(3)]	Laboratory Analytical Report
Monument Survey Event	Once every 5 years [(4)]	Monument Survey Record
Repairs	As Required	Maintenance/Corrective Work Report

[(1)] Defined as precipitation events with intensity exceeding 1.0 inches over a 24-hour period.
[(2)] Defined as seismic event greater than 4.5 and less than or equal to 6.2 miles from the Site.
[(3)] Next scheduled monument survey event to be conducted in the year 2015.
[(4)] Next scheduled Cap Gas confirmation sampling event to be conducted in the year 2015.

SITE VICINITY MAP

Del Amo Waste Pits OU

Figure 1.0

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SITE PROPERTY MAP

Del Amo Waste Pits OU

Figure 2.0

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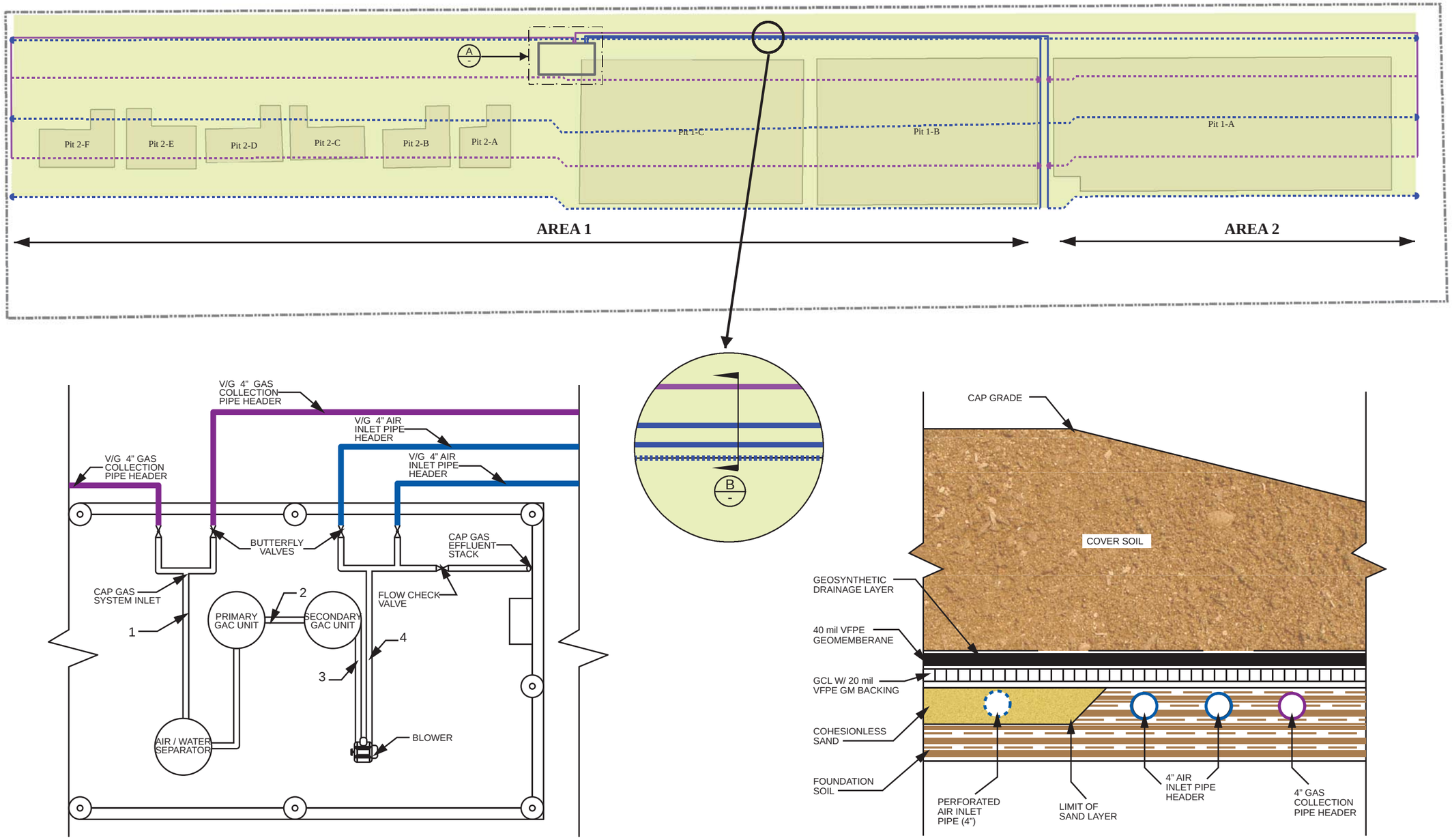

CAP GAS PIPING DIAGRAM (A)
NTS

CAP GAS COLLECTION PIPING CROSS SECTION (B)
NTS - Vertically Exaggerated

Legend:

- 4" Solid Wall Gas Collection Pipe (Header)
- 4" Perforated Gas Collection Pipe
- 4" Solid Wall Air Inlet Pipe (Header)
- 4" Perforated Air Inlet Pipe
- Cap End
- Cap Gas Treatment System Enclosure
- Estimated Extent of Subsurface Impoundment
- Cap
- Del Amo Pits Site

1. System Inluent
2. Effluent of the lead carbon vessel
3. Effluent of the secondary vessel
4. System Effluent

CAP GAS TREATMENT SYSTEM PIPING PLAN

Del Amo Waste Pits OU

Figure 3.0

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Torrance, CA

Figure 4.0
2013 Cap Gas Treatment System Monitoring Results (Influent vs. Effluent)
Del Amo Waste Pits OU

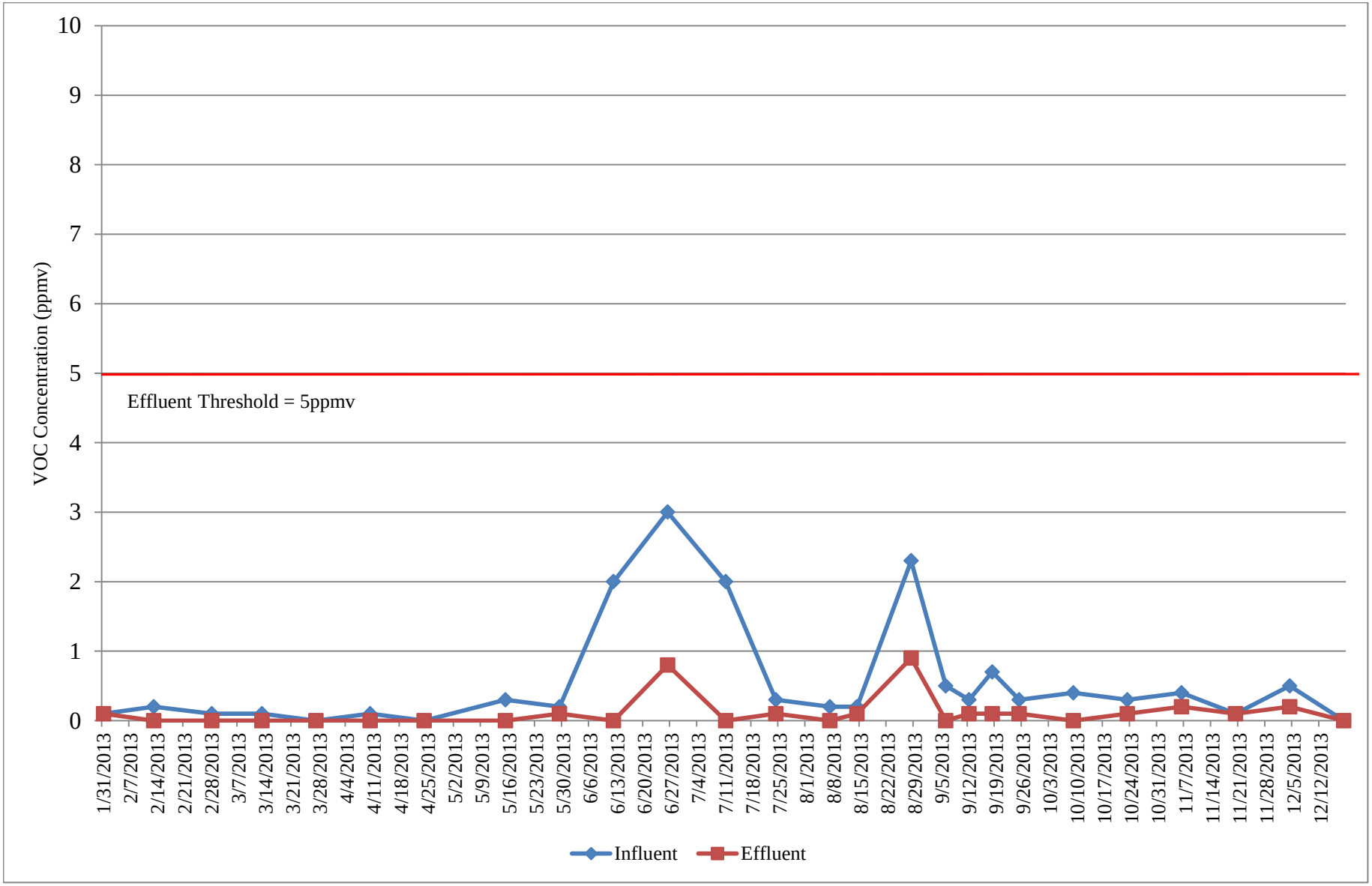
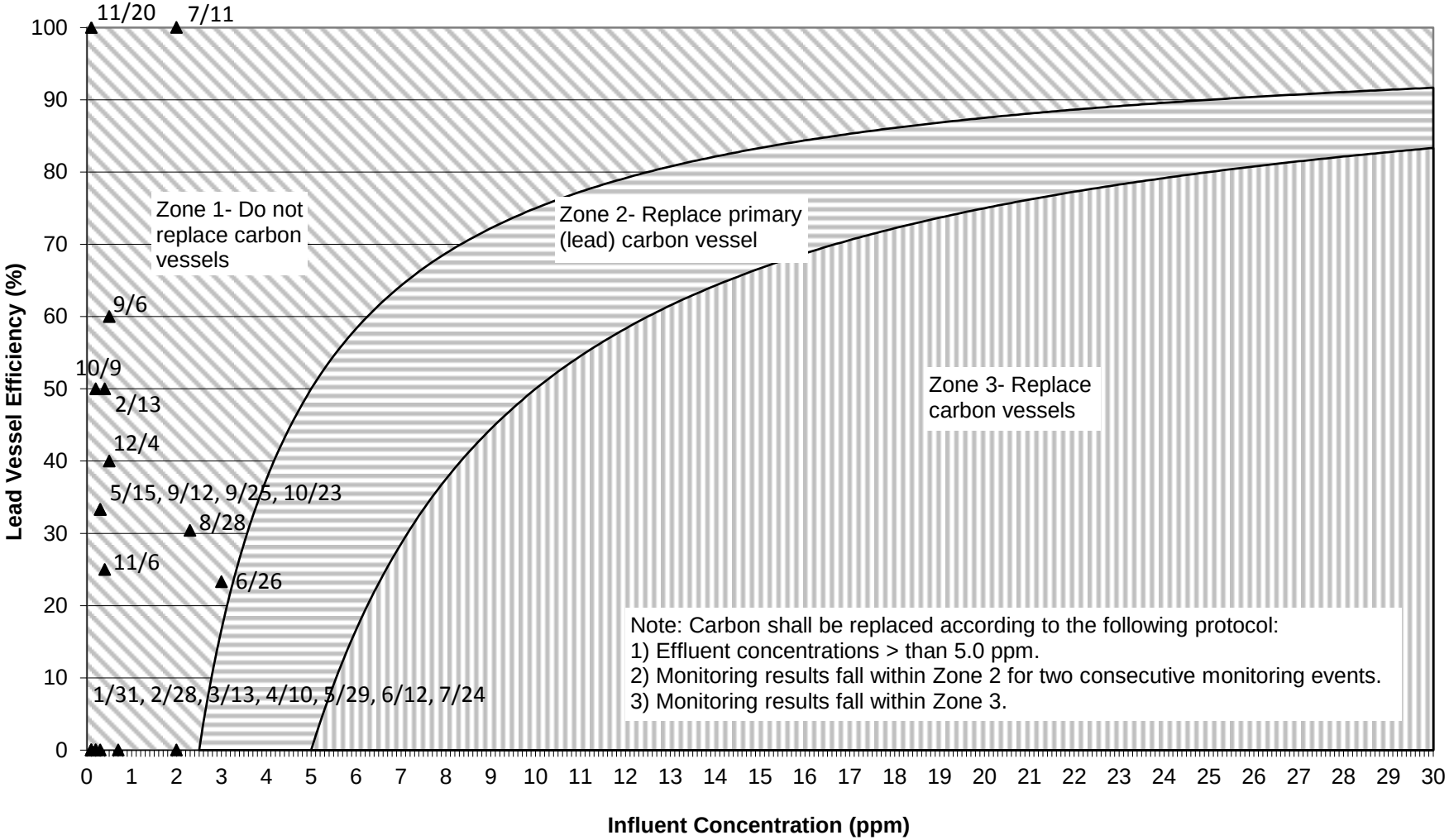
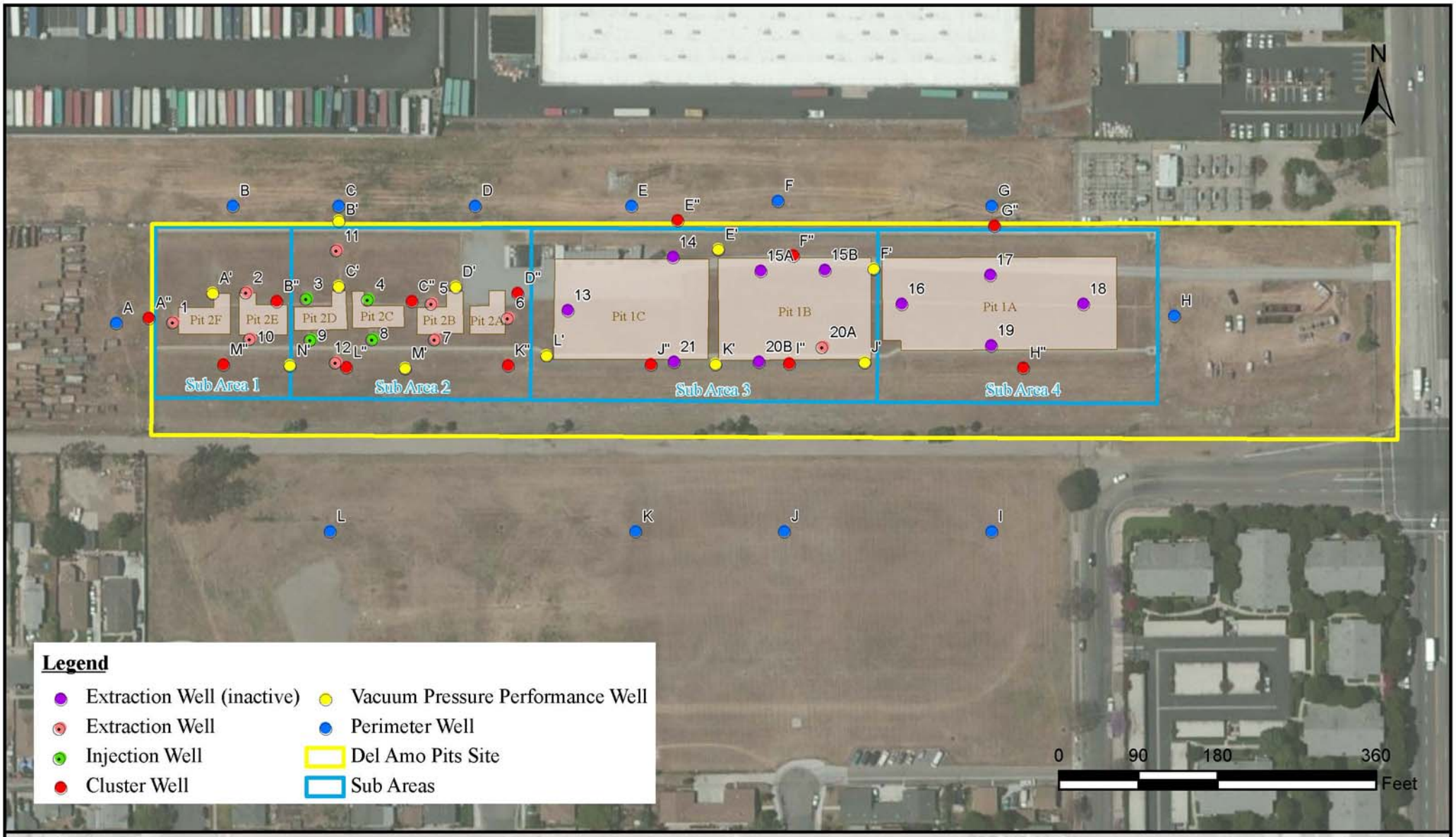


Figure 5.0
2013 Carbon Replacement Protocol
Del Amo Waste Pits





SOIL VAPOR MONITORING WELL LOCATION MAP

Del Amo Waste Pits OU

Figure 6.0

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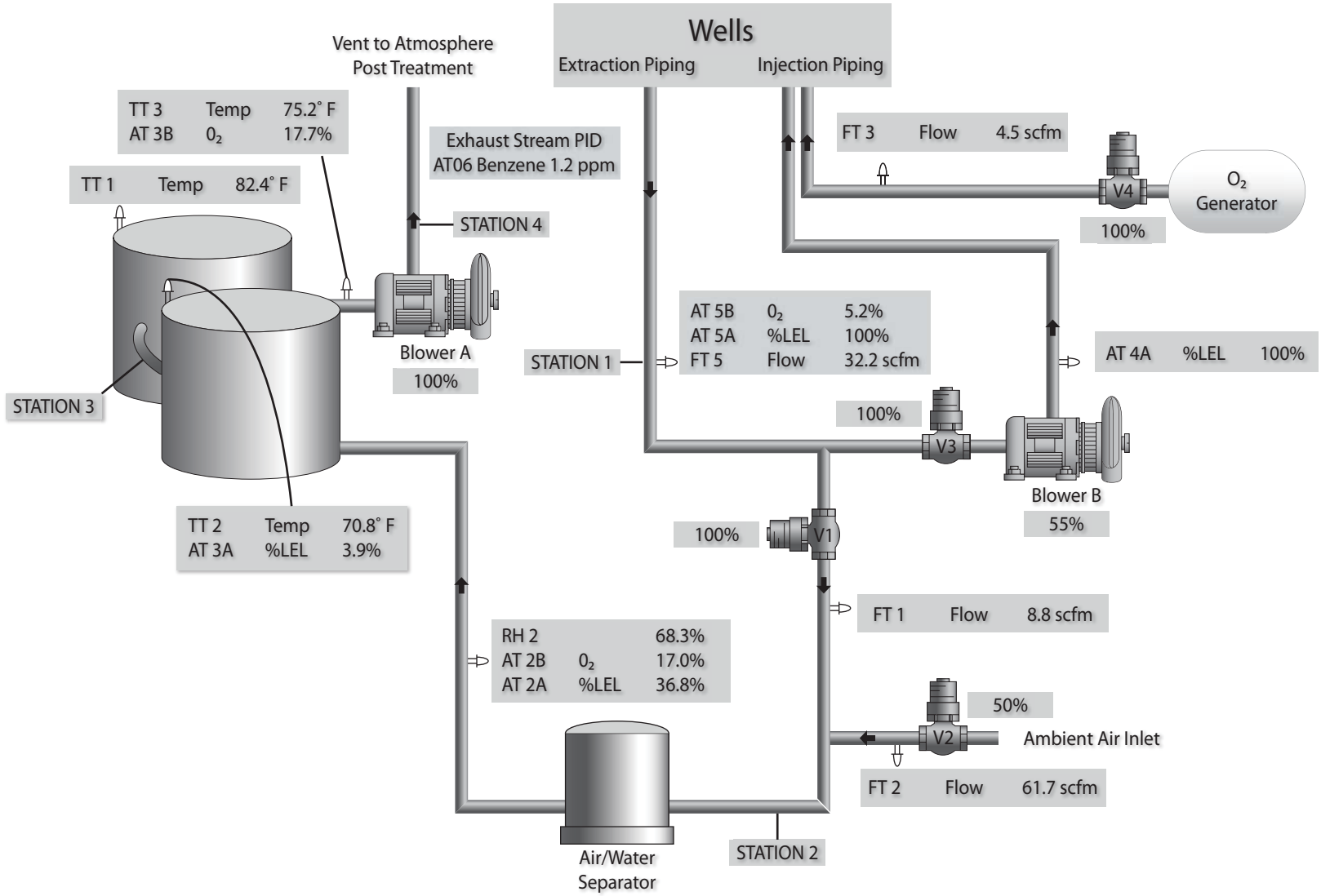

SVE/IBT SYSTEM

February 13, 2013 - December 18, 2013

Del Amo Waste Pits OU

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Figure 7.0

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Figure 8.0
SVE/IBT System 2013 Laboratory Data Summary for Benzene
Del Amo Waste Pits OU

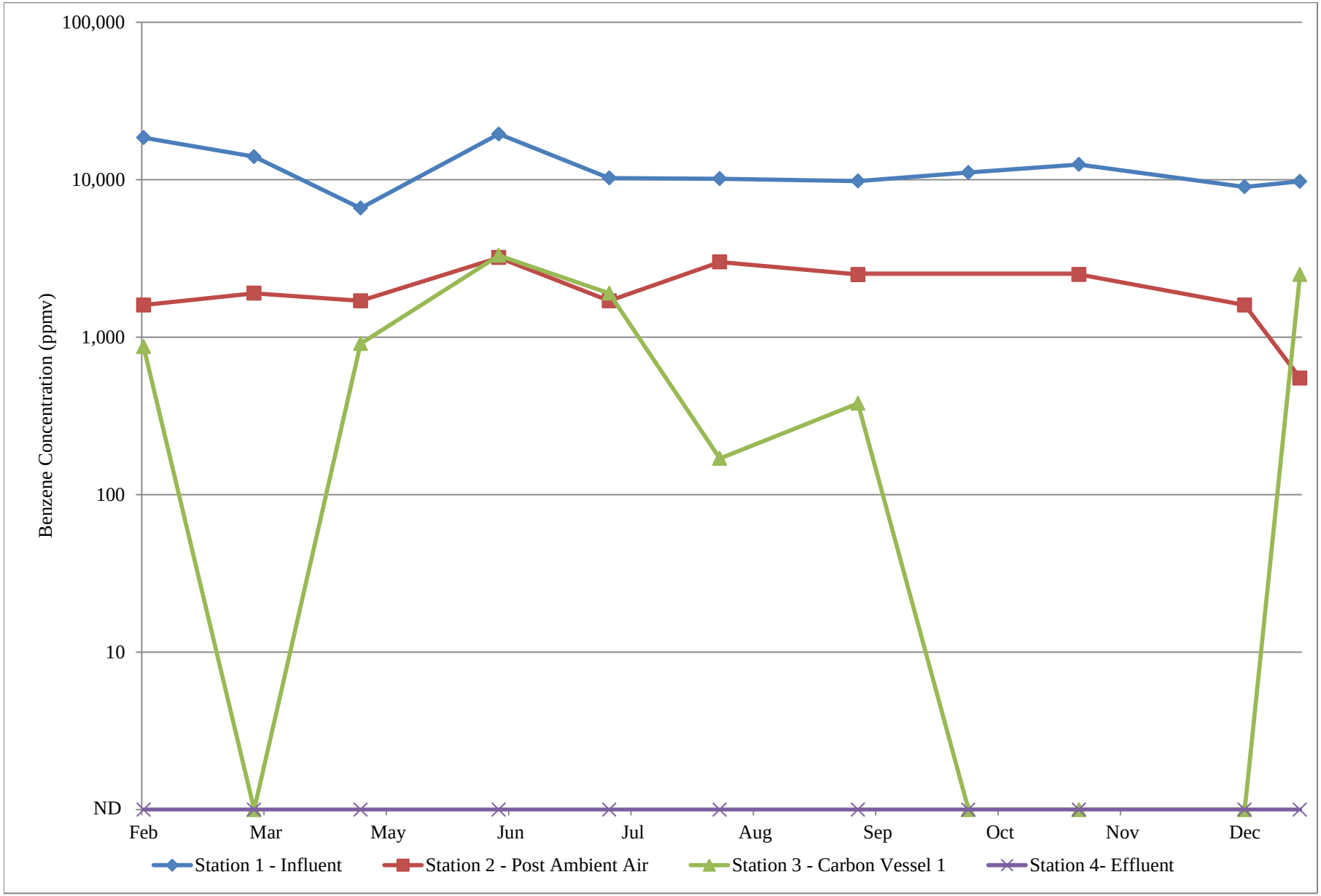


Figure 9.0
2013 Perimeter Well Field Monitoring Results
Del Amo Waste Pits OU

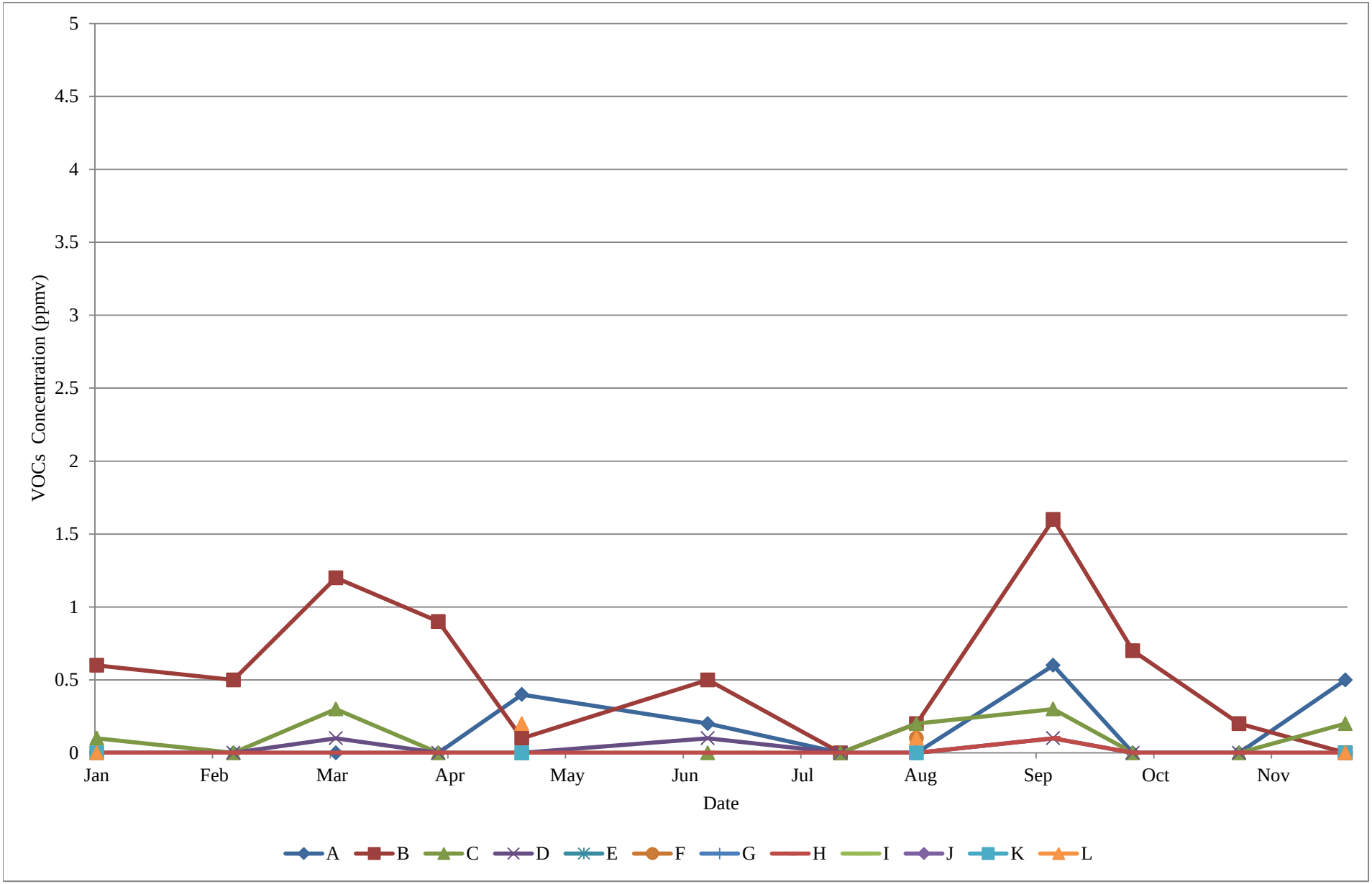
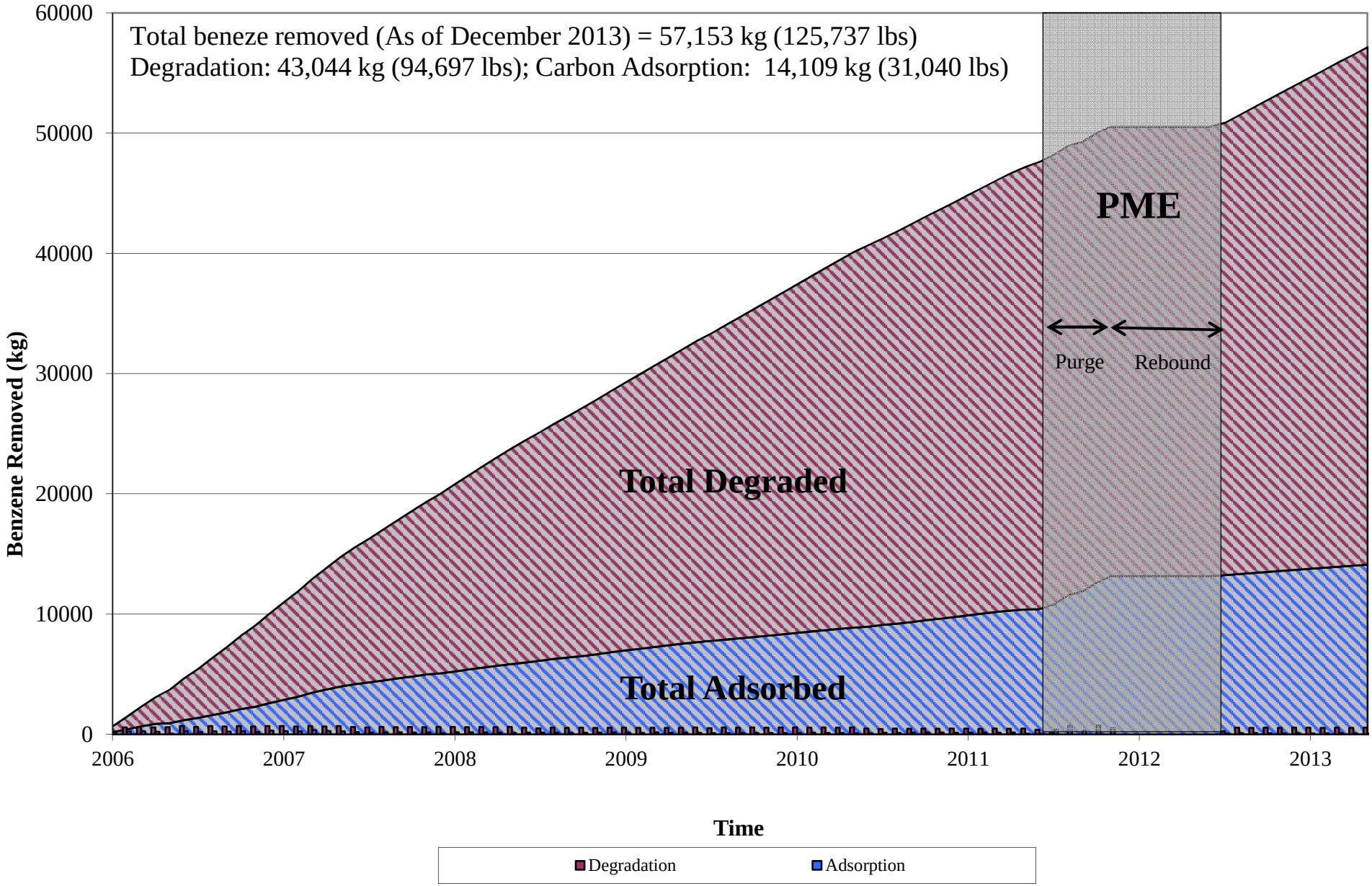
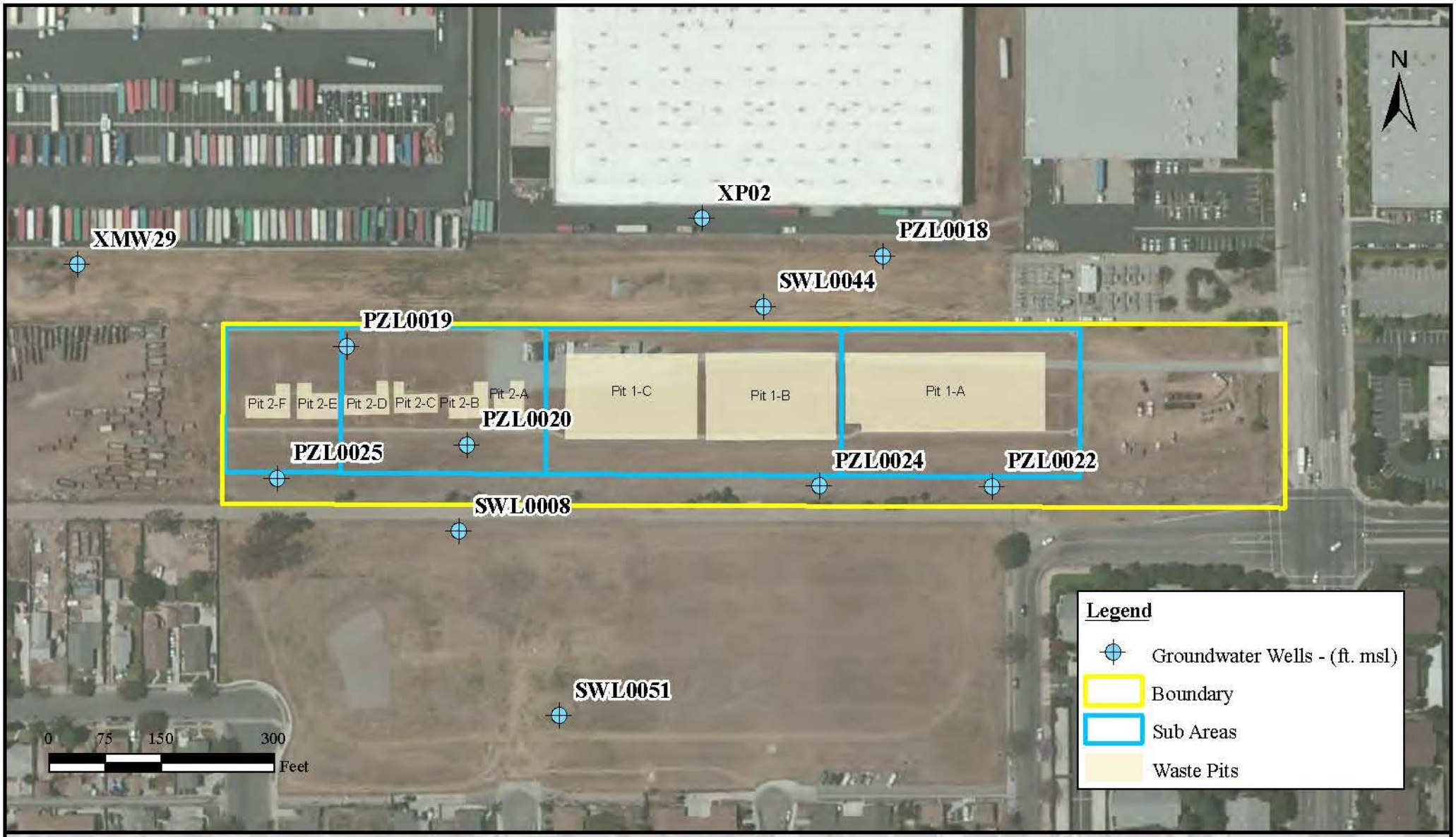


Figure 10.0
SVE/IBT System Operation Total Benzene Removed
Del Amo Waste Pits OU





GROUNDWATER MONITORING WELL LOCATION MAP

Del Amo Waste Pits OU

Figure 11.0

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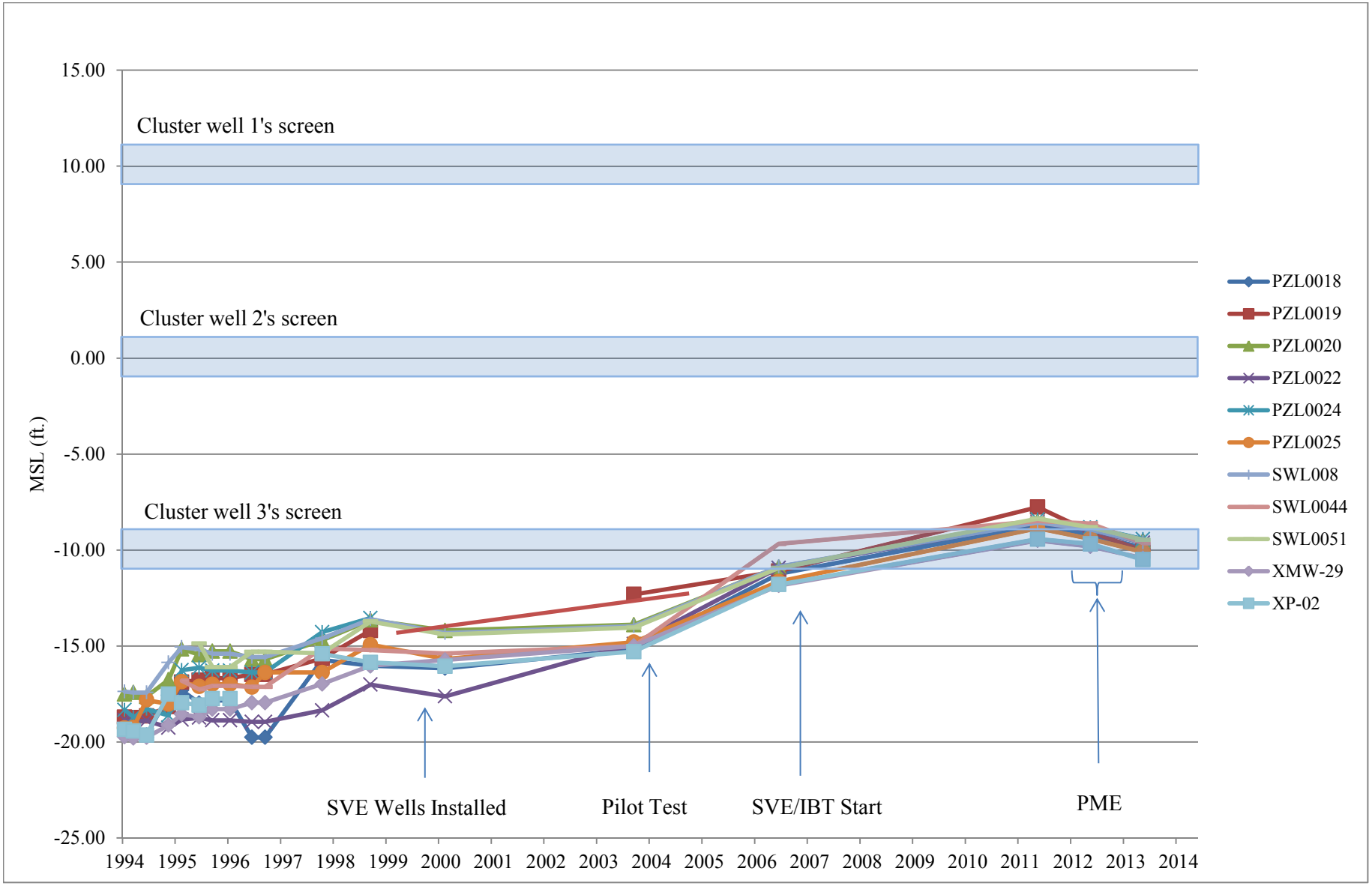
Figure 12.0
Groundwater Elevations (1994-2013)
Del Amo Waste Pits



2013 GROUNDWATER ELEVATIONS

Del Amo Waste Pits OU

Figure 13.0

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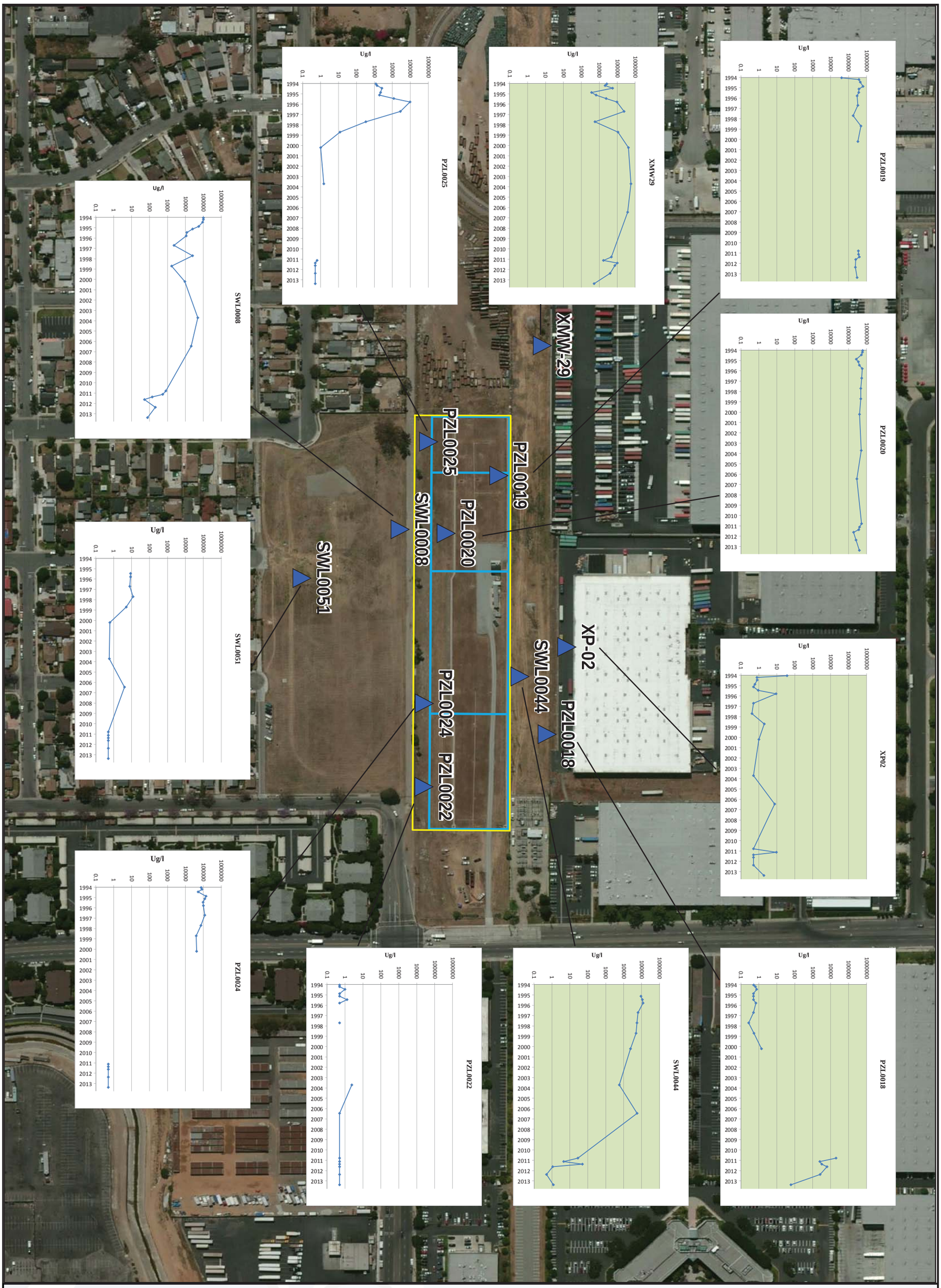

GROUNDWATER BENZENE CONCENTRATIONS
(1994-2013)

Del Amo Waste Pits OU

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Figure 14.0

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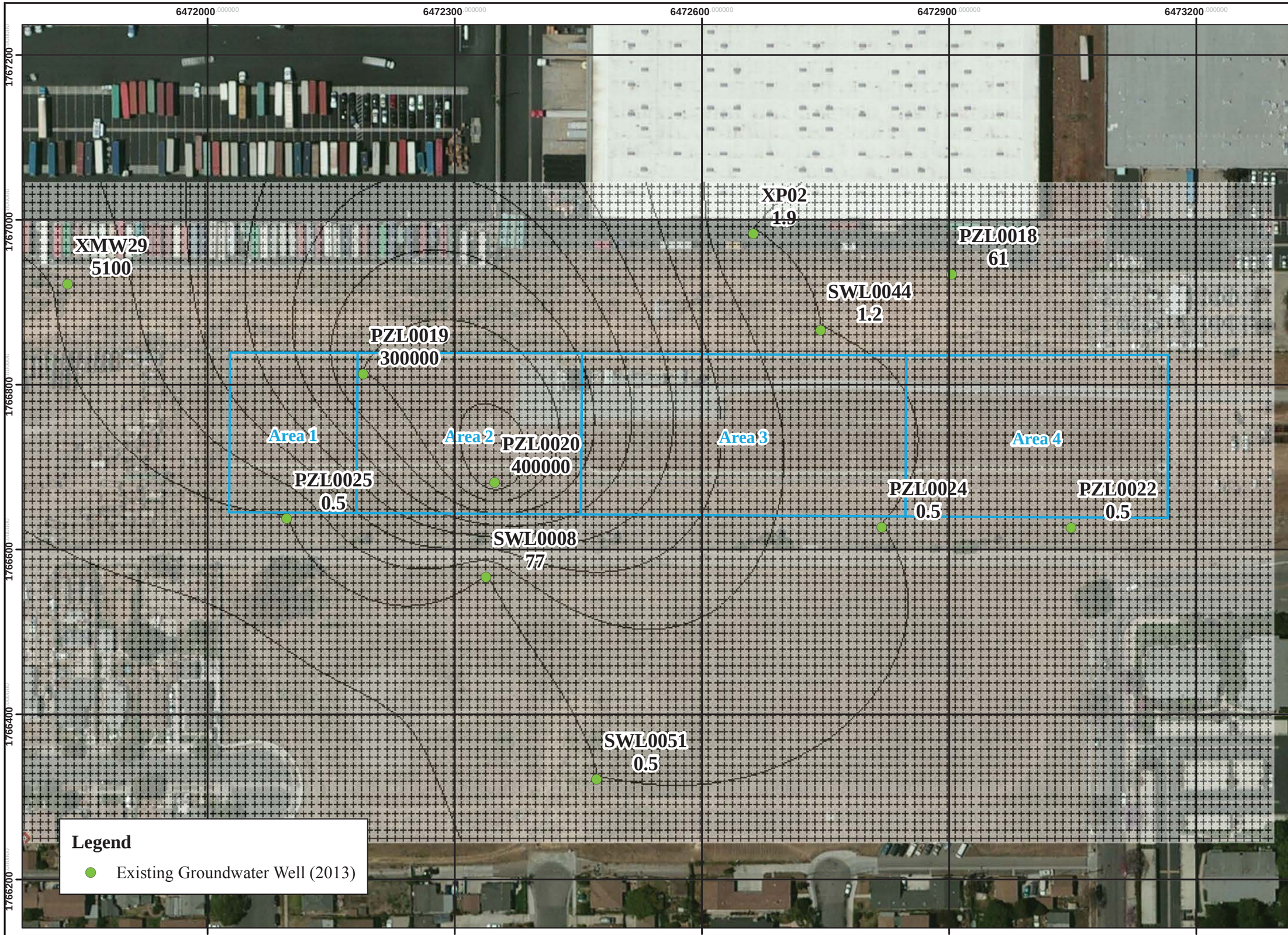

Figure 15.0

Benzene Concentration in Groundwater (µg/l)
11 Existing Groundwater Wells
September 2013
Del Amo Waste Pits OU

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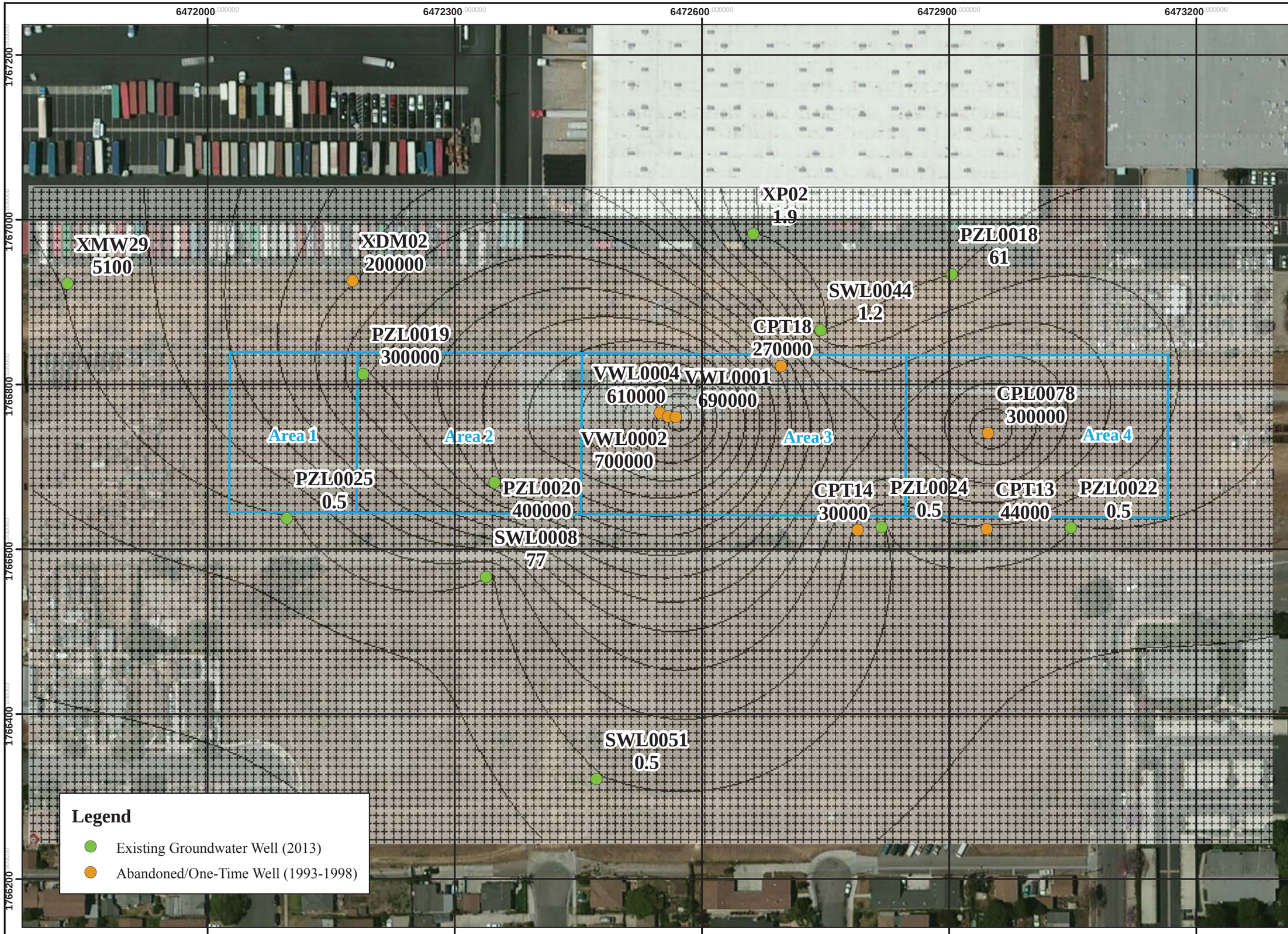

Figure 16.0

Benzene Concentration in Groundwater (µg/l)
11 Existing Groundwater Wells (2013) and
8 Abandoned/One-Time Well (1993-1998)
Del Amo Waste Pits OU

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Torrance, CA

APPENDIX A

FIELD MONITORING RESULTS

Del Amo Waste Pits Superfund Site
Gas Collection and Treatment System
Torrance, California

Completed By: S Mc Cough
Title: PE

Sheet 1 of 1
Date: 1/31/2013
Time: 11 AM

Verified By: I Yusko
Title: PM

Type of Monitoring Devices: PID Velocicalc
Weather Conditions: Sunny 60°

Type of Inspection (check only one):

( ) Daily ( ) Weekly ( ) Monthly ( ) Semi-Monthly
(+) Other Frequency (explain) Follow up.

Vessel Operation:

(✓) Series, Carbon Vessel 1 to Carbon Vessel 2
( ) Parallel
( ) One Carbon Vessel

Sample Ports:		**VOCs (ppm)**
1.	System Inlet	0.1
2.	Outlet of Carbon 1	0.1
3.	Outlet of Carbon 2	0.1
4.	System Effluent	0.1

	Temperature (^{0}F)	**Air Flow (scfm)**	**Humidity (%)**
Influent	75	143	34
Effluent	110	172	20

Comments, Maintenance or Corrective Action (attach additional sheets if required):

Del Amo Waste Pits Superfund Site
Gas Collection and Treatment System
Torrance, California

Completed By: SM
Title: PE

Sheet 1 of 1
Date: 2/13/13
Time: 11:15 AM

Verified By: IY
Title: PM

Type of Monitoring Devices: PID, VELOCICALC
Weather Conditions: CLEAR, SUNNY, 64°F

Type of Inspection (check only one):

( ) Daily ( ) Weekly ( ) Monthly (X) Semi-Monthly
( ) Other Frequency (explain) _____

Vessel Operation:

(X) Series, Carbon Vessel 1 to Carbon Vessel 2
( ) Parallel
( ) One Carbon Vessel

Sample Ports:		**VOCs (ppm)**
1.	System Inlet	0.2
2.	Outlet of Carbon 1	0.1
3.	Outlet of Carbon 2	0.1
4.	System Effluent	0.0

	Temperature (^{0}F)	**Air Flow (scfm)**	**Humidity (%)**
Influent	75	149	28
Effluent	110	175	20

Comments, Maintenance or Corrective Action (attach additional sheets if required):

Del Amo Waste Pits Superfund Site
Gas Collection and Treatment System
Torrance, California

Completed By: Shinta Aizawa
Title: Project Engineer

Sheet 1 of 1
Date: 2/28/13
Time: 9:30

Verified By: Seamus McGeough
Title: Project Engineer

Type of Monitoring Devices: PID, Velocimalc
Weather Conditions: _____

Type of Inspection (check only one):

( ) Daily ( ) Weekly ( ) Monthly ( ) Semi-Monthly
(x) Other Frequency (explain) Bi-weekly.

Vessel Operation:

(X) Series, Carbon Vessel 1 to Carbon Vessel 2
( ) Parallel
( ) One Carbon Vessel

Sample Ports:		**VOCs (ppm)**
1.	System Inlet	0.1
2.	Outlet of Carbon 1	0.1
3.	Outlet of Carbon 2	0
4.	System Effluent	0

	Temperature (^{0}F)	**Air Flow (scfm)**	**Humidity (%)**
Influent	76	149	14.5
Effluent	110	179	16.0

Comments, Maintenance or Corrective Action (attach additional sheets if required):

Del Amo Waste Pits Superfund Site
Gas Collection and Treatment System
Torrance, California

Completed By: S. McGeough
Title: PE

Sheet 1 of 1
Date: 3/13/13
Time: 11:15 AM

Verified By: S. AIZAWA
Title: PE

Type of Monitoring Devices: PID, RKI, VELOCICALC, INLINE TEMP. GAUGES
Weather Conditions: SUNNY, CLEAR, 72°F

Type of Inspection (check only one):

( ) Daily ( ) Weekly ( ) Monthly (X) Semi-Monthly
( ) Other Frequency (explain) _____

Vessel Operation:

(X) Series, Carbon Vessel 1 to Carbon Vessel 2
( ) Parallel
( ) One Carbon Vessel

Sample Ports:

		VOCs (ppm)	O_2	CO_2
1.	System Inlet	0.1	13.0	6.0
2.	Outlet of Carbon 1	0.1		
3.	Outlet of Carbon 2	0.1		
4.	System Effluent	0.0		

	Temperature (°F)	Air Flow (scfm)	Humidity (%)
Influent	75	144	40
Effluent	120	168	15

Comments, Maintenance or Corrective Action (attach additional sheets if required):

Del Amo Waste Pits Superfund Site
Gas Collection and Treatment System
Torrance, California

Completed By: S. AIZAWA
Title: STAFF SCIENTIST, P.E

Sheet 1 of 1
Date: 3/27/2013
Time: 11 AM

Verified By: S. Mc CEOUGH
Title: P.E

Type of Monitoring Devices: PID, Velocicalc.
Weather Conditions: CLOUDY 58°F

Type of Inspection (check only one):

( ) Daily ( ) Weekly ( ) Monthly ( ) Semi-Monthly
(✓) Other Frequency (explain) Bi Weekly.

Vessel Operation:

(✓) Series, Carbon Vessel 1 to Carbon Vessel 2
( ) Parallel
( ) One Carbon Vessel

Sample Ports:		**VOCs (ppm)**
1.	System Inlet	0
2.	Outlet of Carbon 1	0
3.	Outlet of Carbon 2	0
4.	System Effluent	0

	Temperature (^{0}F)	**Air Flow (scfm)**	**Humidity (%)**
Influent	74	136	46%
Effluent	115	172	17%

Comments, Maintenance or Corrective Action (attach additional sheets if required):

Del Amo Waste Pits Superfund Site
Gas Collection and Treatment System
Torrance, California

Completed By: Shinta Aizawa
Title: Project Engineer

Sheet 1 of 1
Date: 4/10/13
Time: 10:30AM

Verified By: Seamus McGough
Title: Project Engineer

Type of Monitoring Devices: PID. Velocicalc.
Weather Conditions: Sunny.

Type of Inspection (check only one):

( ) Daily ( ) Weekly ( ) Monthly ( ) Semi-Monthly
(X) Other Frequency (explain) Bi-weekly.

Vessel Operation:

(X) Series, Carbon Vessel 1 to Carbon Vessel 2
( ) Parallel
( ) One Carbon Vessel

Sample Ports:		**VOCs (ppm)**
1.	System Inlet	0.1
2.	Outlet of Carbon 1	0.1
3.	Outlet of Carbon 2	0.1
4.	System Effluent	0

	Temperature (^{0}F)	**Air Flow (scfm)**	**Humidity (%)**
Influent	70	140	22.5
Effluent	125	165	18.5

Comments, Maintenance or Corrective Action (attach additional sheets if required):

Del Amo Waste Pits Superfund Site
Gas Collection and Treatment System
Torrance, California

Completed By: SM
Title: PE

Sheet 1 of 1
Date: 4-24-13
Time: 11:20

Verified By: IY
Title: PM

Type of Monitoring Devices: PID, VELOCICALC
Weather Conditions: OVERCAST, COOL, 64°F

Type of Inspection (check only one):

( ) Daily ( ) Weekly ( ) Monthly (X) Semi-Monthly
( ) Other Frequency (explain) _____

Vessel Operation:

(X) Series, Carbon Vessel 1 to Carbon Vessel 2
( ) Parallel
( ) One Carbon Vessel

Sample Ports:		**VOCs (ppm)**
1.	System Inlet	0.0
2.	Outlet of Carbon 1	0.0
3.	Outlet of Carbon 2	0.0
4.	System Effluent	0.0

	Temperature (^{0}F)	**Air Flow (scfm)**	**Humidity (%)**
Influent	76	148	54
Effluent	118	173	21

Comments, Maintenance or Corrective Action (attach additional sheets if required):

Add. Inlet Readings

O_2	CO_2	LEL
13.5%	6.2%	0%

Del Amo Waste Pits Superfund Site
Gas Collection and Treatment System
Torrance, California

Completed By: IY
Title: PM

Sheet 1 of 1
Date: 5/15/13
Time: 11:00 AM

Verified By: SA
Title: PE

Type of Monitoring Devices: PID 3000, VELOCICALC
Weather Conditions: CLOUDY, SLIGHT BREEZE, 74°F

Type of Inspection (check only one):

( ) Daily ( ) Weekly ( ) Monthly (X) Semi-Monthly
( ) Other Frequency (explain) _____

Vessel Operation:

(X) Series, Carbon Vessel 1 to Carbon Vessel 2
( ) Parallel
( ) One Carbon Vessel

Sample Ports:		**VOCs (ppm)**
1.	System Inlet	0.3
2.	Outlet of Carbon 1	0.2
3.	Outlet of Carbon 2	0.2
4.	System Effluent	0.0

	Temperature (^{0}F)	**Air Flow (sefm)**	**Humidity (%)**
Influent	79	135	42
Effluent	134	157	20.4

Comments, Maintenance or Corrective Action (attach additional sheets if required):

Del Amo Waste Pits Superfund Site
Gas Collection and Treatment System
Torrance, California

Completed By: Shinta Aizawa
Title: Project Engineer

Sheet 1 of 1
Date: 5/29/13
Time: 11:45

Verified By: Seamus McGeough.
Title: Project Engineer.

Type of Monitoring Devices: PID, Velocicale.
Weather Conditions: Sunny.

Type of Inspection (check only one):

( ) Daily (X) Weekly ( ) Monthly (X) Semi-Monthly
( ) Other Frequency (explain) _____

Vessel Operation:

(X) Series, Carbon Vessel 1 to Carbon Vessel 2
( ) Parallel
( ) One Carbon Vessel

Sample Ports:		**VOCs (ppm)**
1.	System Inlet	0.2
2.	Outlet of Carbon 1	0.2
3.	Outlet of Carbon 2	0.1
4.	System Effluent	0.1

	Temperature (^{0}F)	**Air Flow (scfm)**	**Humidity (%)**
Influent	~~139~~ 85°	137	42
Effluent	132	156	18

Comments, Maintenance or Corrective Action (attach additional sheets if required):

Del Amo Waste Pits Superfund Site
Gas Collection and Treatment System
Torrance, California

Completed By: S. McCLOUGH
Title: PE

Sheet 1 of 1
Date: 6/12/2013
Time: 11.45AM

Verified By: S. AIZAWA
Title: PE Staff Scientist

Type of Monitoring Devices: PID Vecicale
Weather Conditions: CLOUDY 6'S

Type of Inspection (check only one):

( ) Daily ( ) Weekly ( ) Monthly ( ) Semi-Monthly
(✓) Other Frequency (explain) bi Weekly

Vessel Operation:

(✓) Series, Carbon Vessel 1 to Carbon Vessel 2
( ) Parallel
( ) One Carbon Vessel

Sample Ports:		**VOCs (ppm)**
1.	System Inlet	2.0
2.	Outlet of Carbon 1	2.9
3.	Outlet of Carbon 2	2.6
4.	System Effluent	0

	Temperature (^{0}F)	**Air Flow (scfm)**	**Humidity (%)**
Influent	75	~~134~~ 147	69
Effluent	~~134~~ 122	~~173~~ ~~14~~ 173	27

Comments, Maintenance or Corrective Action (attach additional sheets if required):

Del Amo Waste Pits Superfund Site
Gas Collection and Treatment System
Torrance, California

Completed By: SM
Title: PE

Sheet 1 of 1
Date: 6/26/13
Time: 1405

Verified By: IY
Title: PM

Type of Monitoring Devices: PID 2000, VELOCICALC
Weather Conditions: SUNNY, CLEAR

Type of Inspection (check only one):

( ) Daily ( ) Weekly ( ) Monthly (X) Semi-Monthly
( ) Other Frequency (explain) _____

Vessel Operation:

(X) Series, Carbon Vessel 1 to Carbon Vessel 2
( ) Parallel
( ) One Carbon Vessel

Sample Ports:		**VOCs (ppm)**
1.	System Inlet	3.0
2.	Outlet of Carbon 1	2.3
3.	Outlet of Carbon 2	1.8
4.	System Effluent	0.8

	Temperature (^{0}F)	**Air Flow (scfm)**	**Humidity (%)**
Influent	91	141	42
Effluent	130	161	24

Comments, Maintenance or Corrective Action (attach additional sheets if required):

Del Amo Waste Pits Superfund Site
Gas Collection and Treatment System
Torrance, California

Completed By: Shinta Aizawa
Title: Project Engineer.

Sheet 1 of 1
Date: 7/11
Time: 13:00

Verified By: Seamus McGeough
Title: Project Engineer

Type of Monitoring Devices: PID, Velocicalc.
Weather Conditions: Cloudy

Type of Inspection (check only one):

( ) Daily (X) Weekly ( ) Monthly ( ) Semi-Monthly
( ) Other Frequency (explain) _____

Vessel Operation:

(X) Series, Carbon Vessel 1 to Carbon Vessel 2
( ) Parallel
( ) One Carbon Vessel

Sample Ports:		**VOCs (ppm)**
1.	System Inlet	9.0
2.	Outlet of Carbon 1	0
3.	Outlet of Carbon 2	0
4.	System Effluent	0

	Temperature (^{0}F)	**Air Flow (scfm)**	**Humidity (%)**
Influent	80	137	64
Effluent	120	166	30

Comments, Maintenance or Corrective Action (attach additional sheets if required):

Del Amo Waste Pits Superfund Site
Gas Collection and Treatment System
Torrance, California

Completed By: S. AIZAWA
Title: PE

Sheet 1 of 1
Date: 7/24/2013
Time: 10:45

Verified By: S. Mc GOUGH
Title: PE

Type of Monitoring Devices: PID, Velocicalc
Weather Conditions: SUNNY 82°

Type of Inspection (check only one):

( ) Daily ( ) Weekly ( ) Monthly (✓) Semi-Monthly
(✓) Other Frequency (explain) _____

Vessel Operation:

(✓) Series, Carbon Vessel 1 to Carbon Vessel 2
( ) Parallel
( ) One Carbon Vessel

Sample Ports:

		VOCs (ppm)	
1.	System Inlet	3.0	0.3
2.	Outlet of Carbon 1	2.7	0.3
3.	Outlet of Carbon 2	~~2.7~~ 2.1	0.2
4.	System Effluent	1.0	0.1

↑ Record (ok ↑)

	Temperature (°F)	Air Flow (scfm)	Humidity (%)
Influent	82	136	50
Effluent	132	178	20

Comments, Maintenance or Corrective Action (attach additional sheets if required):

Del Amo Waste Pits Superfund Site
Gas Collection and Treatment System
Torrance, California

Completed By: Shinta Aizawa
Title: Project Engineer

Sheet 1 of 1
Date: 8/7/2013
Time: 11:45

Verified By: Seamus McGeagh
Title: Project Engineer

Type of Monitoring Devices: PID, Velocicalc.
Weather Conditions: Sunny.

Type of Inspection (check only one):

( ) Daily ( ) Weekly ( ) Monthly ( ) Semi-Monthly
(+) Other Frequency (explain) Bi-weekly.

Vessel Operation:

(X) Series, Carbon Vessel 1 to Carbon Vessel 2
( ) Parallel
( ) One Carbon Vessel

Sample Ports:		**VOCs (ppm)**
1.	System Inlet	0.2
2.	Outlet of Carbon 1	0.2
3.	Outlet of Carbon 2	0.1
4.	System Effluent	0

	Temperature (^{0}F)	**Air Flow (scfm)**	**Humidity (%)**
Influent	~~78~~82	130	47
Effluent	130	153	20

Comments, Maintenance or Corrective Action (attach additional sheets if required):

Del Amo Waste Pits Superfund Site
Gas Collection and Treatment System
Torrance, California

Completed By: Shinta Aizawa
Title: Project Engineer.

Sheet 1 of 1
Date: 08/14/2013
Time: 10:45

Verified By: Seamus McGough
Title: Project Engineer

Type of Monitoring Devices: PID, Velocicalc.
Weather Conditions: Sunny

Type of Inspection (check only one):

( ) Daily ( ) Weekly ( ) Monthly ( ) Semi-Monthly
(4) Other Frequency (explain) Bi-weekly.

Vessel Operation:

(X) Series, Carbon Vessel 1 to Carbon Vessel 2
( ) Parallel
( ) One Carbon Vessel

Sample Ports:		**VOCs (ppm)**
1.	System Inlet	0.2
2.	Outlet of Carbon 1	0.3
3.	Outlet of Carbon 2	0.1
4.	System Effluent	0.1

	Temperature (^{0}F)	**Air Flow (scfm)**	**Humidity (%)**
Influent	86.5	134	49
Effluent	134	143	22

Comments, Maintenance or Corrective Action (attach additional sheets if required):

Del Amo Waste Pits Superfund Site
Gas Collection and Treatment System
Torrance, California

Completed By: Shinta Aizawa
Title: Project Engineer

Sheet 1 of 1
Date: 8/28/13
Time: 11:15

Verified By: Seamus McGeough
Title: Project Engineer.

Type of Monitoring Devices: PID, Velocicalc.
Weather Conditions: _____

Type of Inspection (check only one):

( ) Daily ( ) Weekly ( ) Monthly ( ) Semi-Monthly
(X) Other Frequency (explain) Bi-weekly.

Vessel Operation:

(X) Series, Carbon Vessel 1 to Carbon Vessel 2
( ) Parallel
( ) One Carbon Vessel

Sample Ports:		**VOCs (ppm)**
1.	System Inlet	2.3
2.	Outlet of Carbon 1	1.6
3.	Outlet of Carbon 2	1.2
4.	System Effluent	0.9

	Temperature (^{0}F)	**Air Flow (scfm)**	**Humidity (%)**
Influent	94	136	34
Effluent	135	156	20

Comments, Maintenance or Corrective Action (attach additional sheets if required):

Del Amo Waste Pits Superfund Site
Gas Collection and Treatment System
Torrance, California

Completed By: Seamus McGrath
Title: Project Engineer.

Sheet 1 of 1
Date: 9/6/2013
Time: 12:00

Verified By: Shinta Aizawa
Title: Project Engineer

Type of Monitoring Devices: PID, Velocicalc.
Weather Conditions: Sunny/Hot

Type of Inspection (check only one):

( ) Daily ( ) Weekly ( ) Monthly ( ) Semi-Monthly
(X) Other Frequency (explain) Bi-weekly (Follow up / Post Carbon Changeout).

Vessel Operation:

(X) Series, Carbon Vessel 1 to Carbon Vessel 2
( ) Parallel
( ) One Carbon Vessel

Sample Ports:		**VOCs (ppm)**
1.	System Inlet	0.5
2.	Outlet of Carbon 1	0.2
3.	Outlet of Carbon 2	0
4.	System Effluent	0

	Temperature (^{0}F)	**Air Flow (scfm)**	**Humidity (%)**
Influent	130	96	37
Effluent	145	150	12.4

Comments, Maintenance or Corrective Action (attach additional sheets if required):

Del Amo Waste Pits Superfund Site
Gas Collection and Treatment System
Torrance, California

Completed By: Clara Tobin
Title: Field Tech

Sheet 1 of 1
Date: 9/12/2013
Time: 10:50AM

Verified By: Seamus McGeough
Title: Project Engineer

Type of Monitoring Devices: PID, Velocicalc.
Weather Conditions: Sunny

Type of Inspection (check only one):

( ) Daily ( ) Weekly ( ) Monthly ( ) Semi-Monthly
(X) Other Frequency (explain) Bi-weekly

Vessel Operation:

(X) Series, Carbon Vessel 1 to Carbon Vessel 2
( ) Parallel
( ) One Carbon Vessel

Sample Ports:		**VOCs (ppm)**
1.	System Inlet	0.3
2.	Outlet of Carbon 1	0.2
3.	Outlet of Carbon 2	0.2
4.	System Effluent	0.1

	Temperature (^{0}F)	**Air Flow (scfm)**	**Humidity (%)**
Influent	~~132~~ 85	132	50
Effluent	136	154	15

Comments, Maintenance or Corrective Action (attach additional sheets if required):

Del Amo Waste Pits Superfund Site
Gas Collection and Treatment System
Torrance, California

Completed By: Clara Tobin
Title: Field Tech

Sheet 1 of 1
Date: 09/18/2013
Time: 13:00

Verified By: Shinta Arzawa
Title: Project Engineer.

Type of Monitoring Devices: PID, Velocicale.
Weather Conditions: Sunny.

Type of Inspection (check only one):

( ) Daily ( ) Weekly ( ) Monthly ( ) Semi-Monthly
(X) Other Frequency (explain) Bi-weekly.

Vessel Operation:

(X) Series, Carbon Vessel 1 to Carbon Vessel 2
( ) Parallel
( ) One Carbon Vessel

Sample Ports:

		VOCs (ppm)		
1.	System Inlet	0.7	*	
2.	Outlet of Carbon 1	1.0		
3.	Outlet of Carbon 2	~~3.3~~ (cross contamination)	0.7	0.4.
4.	System Effluent	0.1		

	Temperature (^{0}F)	Air Flow (scfm)	Humidity (%)
Influent	82.1	147	64
Effluent	145	148	13

Comments, Maintenance or Corrective Action (attach additional sheets if required):

Del Amo Waste Pits Superfund Site
Gas Collection and Treatment System
Torrance, California

Completed By: Shinta Aizawa
Title: Project Engineer

Sheet 1 of 1
Date: 9/25/13
Time: _____

Verified By: Seamus McGeough
Title: Project Engineer

Type of Monitoring Devices: PID, Velocicalc.
Weather Conditions: cloudy.

Type of Inspection (check only one):

( ) Daily ( ) Weekly ( ) Monthly ( ) Semi-Monthly
(X) Other Frequency (explain) Bi-weekly.

Vessel Operation:

(X) Series, Carbon Vessel 1 to Carbon Vessel 2
( ) Parallel
( ) One Carbon Vessel

Sample Ports:		**VOCs (ppm)**
1.	System Inlet	~~0.2~~ 0.3
2.	Outlet of Carbon 1	0.2
3.	Outlet of Carbon 2	0.2
4.	System Effluent	0.1

	Temperature (^{0}F)	**Air Flow (scfm)**	**Humidity (%)**
Influent	81	137	50
Effluent	125	158	18

Comments, Maintenance or Corrective Action (attach additional sheets if required):

Del Amo Waste Pits Superfund Site
Gas Collection and Treatment System
Torrance, California

Completed By: Seamus McGeough
Title: Project Engineer

Sheet 1 of 1
Date: 10/9/13
Time: 11:30AM

Verified By: Shinta Aizawa
Title: Project Engineer

Type of Monitoring Devices: PID, Velocicalc.
Weather Conditions: cloudy

Type of Inspection (check only one):

( ) Daily ( ) Weekly ( ) Monthly ( ) Semi-Monthly
(X) Other Frequency (explain) Bi-weekly.

Vessel Operation:

(X) Series, Carbon Vessel 1 to Carbon Vessel 2
( ) Parallel
( ) One Carbon Vessel

Sample Ports:		**VOCs (ppm)**
1.	System Inlet	0.4
2.	Outlet of Carbon 1	0.2
3.	Outlet of Carbon 2	0
4.	System Effluent	0

	Temperature (^{0}F)	**Air Flow (scfm)**	**Humidity (%)**
Influent	76	142	25
Effluent	118	170	20

Comments, Maintenance or Corrective Action (attach additional sheets if required):

Del Amo Waste Pits Superfund Site
Gas Collection and Treatment System
Torrance, California

Completed By: C T
Title: Field Tech.

Sheet 1 of 1
Date: 10/23/2013
Time: 11AM

Verified By: SM
Title: PE

Type of Monitoring Devices: PID Velaicalc.
Weather Conditions: _____

Type of Inspection (check only one):

( ) Daily ( ) Weekly ( ) Monthly ( ) Semi-Monthly
(✓) Other Frequency (explain) Bi Weekly.

Vessel Operation:

(✓) Series, Carbon Vessel 1 to Carbon Vessel 2
( ) Parallel
( ) One Carbon Vessel

Sample Ports:		**VOCs (ppm)**
1.	System Inlet	0.3
2.	Outlet of Carbon 1	0.2
3.	Outlet of Carbon 2	0.2
4.	System Effluent	0.1

	Temperature (^{0}F)	**Air Flow (scfm)**	**Humidity (%)**
Influent	69	146.	59
Effluent	120.	174	20

Comments, Maintenance or Corrective Action (attach additional sheets if required):

Del Amo Waste Pits Superfund Site
Gas Collection and Treatment System
Torrance, California

Completed By: S. MC GEOUGH
Title: PE

Sheet 1 of 1
Date: 11/6/13
Time: 11AM

Verified By: C TOBIN
Title: Field Tech.

Type of Monitoring Devices: PID Velocicalc
Weather Conditions: SUNNY 80°

Type of Inspection (check only one):

( ) Daily ( ) Weekly ( ) Monthly (✓) Semi-Monthly
( ) Other Frequency (explain) _____

Vessel Operation:

(✓) Series, Carbon Vessel 1 to Carbon Vessel 2
( ) Parallel
( ) One Carbon Vessel

Sample Ports:		**VOCs (ppm)**
1.	System Inlet	0.4
2.	Outlet of Carbon 1	0.3
3.	Outlet of Carbon 2	0.3
4.	System Effluent	0.2

	Temperature (^{0}F)	**Air Flow (scfm)**	**Humidity (%)**
Influent	90°	148	14.6
Effluent	125°	162	20.0

Comments, Maintenance or Corrective Action (attach additional sheets if required):

Del Amo Waste Pits Superfund Site
Gas Collection and Treatment System
Torrance, California

Completed By: Seamus McGeough
Title: Project Engineer

Sheet ____ of ____
Date: 11/20/13
Time: 11:00 am

Verified By: Clara Tobin
Title: Field tech

Type of Monitoring Devices: PID, velocicalc
Weather Conditions: 70°

Type of Inspection (check only one):

( ) Daily ( ) Weekly ( ) Monthly ( ) Semi-Monthly
(✓) Other Frequency (explain) Bi-weekly

Vessel Operation:

( ) Series, Carbon Vessel 1 to Carbon Vessel 2
( ) Parallel
( ) One Carbon Vessel

Sample Ports:		**VOCs (ppm)**
1.	System Inlet	0.1
2.	Outlet of Carbon 1	0
3.	Outlet of Carbon 2	0
4.	System Effluent	0.1

	Temperature (^{0}F)	**Air Flow (scfm)**	**Humidity (%)**
Influent	68	71	165
Effluent	112	25	182

Comments, Maintenance or Corrective Action (attach additional sheets if required):

Del Amo Waste Pits Superfund Site
Gas Collection and Treatment System
Torrance, California

Completed By: Seamus McGeough
Title: Project Engineer

Sheet 1 of 1
Date: 12/4/13
Time: 10:15 AM.

Verified By: Shinta Aizawa
Title: Project Engineer.

Type of Monitoring Devices: PID, Velocicalc.
Weather Conditions: Sunny

Type of Inspection (check only one):

( ) Daily ( ) Weekly ( ) Monthly ( ) Semi-Monthly
(x) Other Frequency (explain) Bi-weekly.

Vessel Operation:

(X) Series, Carbon Vessel 1 to Carbon Vessel 2
( ) Parallel
( ) One Carbon Vessel

Sample Ports:		**VOCs (ppm)**
1.	System Inlet	0.5
2.	Outlet of Carbon 1	0.3
3.	Outlet of Carbon 2	0.3
4.	System Effluent	0.2

	Temperature (^{0}F)	**Air Flow (scfm)**	**Humidity (%)**
Influent	77	137.5	NA
Effluent	105	170.	NA.

Comments, Maintenance or Corrective Action (attach additional sheets if required):

Del Amo Waste Pits Superfund Site
Gas Collection and Treatment System
Torrance, California

Completed By: SM
Title: P.E.

Sheet 1 of 1
Date: 10/18/13
Time: 10:45

Verified By: CT
Title: F.T.

Type of Monitoring Devices: PID, Velocicalc.
Weather Conditions: Sunny

Type of Inspection (check only one):

( ) Daily ( ) Weekly ( ) Monthly ( ) Semi-Monthly
(X) Other Frequency (explain) Bi-weekly

Vessel Operation:

(X) Series, Carbon Vessel 1 to Carbon Vessel 2
( ) Parallel
( ) One Carbon Vessel

Sample Ports:		**VOCs (ppm)**
1.	System Inlet	0
2.	Outlet of Carbon 1	0
3.	Outlet of Carbon 2	0
4.	System Effluent	0

	Temperature (^{0}F)	**Air Flow (scfm)**	**Humidity (%)**
Influent	83	133.5	N/A
Effluent	110	171	N/A

Comments, Maintenance or Corrective Action (attach additional sheets if required):

Del Amo Pits
SVE/IBT Enclosure Monitoring Form
Torrance, CA

Date: 2/13/13
Time: 11:30 AM

Monitored By: SM

Verified By: IY

Station	Magnehelic	RKI Eagle			PID	Velocicalc		
	Pressure (in. H2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOC (ppm)	Flow Rate (scfm)	Humidity (%)	Temperature
Inlet	-28	82	11.5	7.4	OVER	32.6	67	70.1
Post Dilution	-30	10	19.0	2.0	OVER	80	37	67
Carbon Vessel 1	-50	Ø	20.7	0.4	0.2	92	36	72
Effluent	-60 (@C2: before the blower)	Ø	19.0	1.8	Ø	93	Ø	158

Station	In-line Sensors									
	LEL C_6H_6 (%)		Oxygen (%)		VOCs (ppm)		Flow Rate (scfm)		Humidity (%)	
Effluent	NA		AT3B	18	AT06	0.2	NA		NA	
Carbon Vessel 1	AT3A	Ø	NA		NA		NA		NA	
Post Dilution	AT2A	36	AT2B	NA	NA		NA		RH2	57
Inlet	AT5A	104	AT5B	2	NA		FT5	31 (FT1+FT4)	NA	

Station	In-line Sensors		Velocicalc (scfm)
Treatment Rate	FT1	9	8.75
Dilution Rate	FT2	63	

Note:

Del An...its
SVE/IBT Enclosure Monitoring Form
Torrance, CA

Date: 2/28/13
Time: 10:00
Monitored By: Shinta Aizawa
Verified By: Seamus McGeough

Station	Magnehelic Pressure (in. H2O)	RKI Eagle LEL (%)	RKI Eagle Oxygen (%)	RKI Eagle Carbon Dioxide (%)	PID VOC (ppm)	Velocicalc Flow Rate (scfm)	Velocicalc Humidity (%)	Velocicalc Temperature
Inlet	-28	7.0 V	10.6	10.8	Over.	~~33~~ 30.5	33	70.5
Post Dilution	-30	7	19.6	1.8	Over	82	17.3	74.8
Carbon Vessel 1	-52	1	19.6	1.8	over.	80.5	15.1	75.4
Effluent	-60 (@C2: before the blower)	0	20.0	1.2	0	93.5	0.1	157

Station	In-line Sensors LEL C_6H_6 (%)		Oxygen (%)		VOCs (ppm)		Flow Rate (scfm)		Humidity (%)	
Effluent	NA		AT3B	18.1	AT06	0.1	NA		NA	
Carbon Vessel 1	AT3A	2	NA		NA		NA		NA	
Post Dilution	AT2A	35	AT2B	18.6	NA		NA		RH2	43
Inlet	AT5A	104	AT5B	4.8	NA		FT5	30 ~~(FT1+FT4)~~	NA	

Station	In-line Sensors		Velocicalc (scfm)
Treatment Rate	FT1	8	10
Dilution Rate	FT2	64	

Note:

Del Amo Pits
SVE/IBT Enclosure Monitoring Form
Torrance, CA

Date: 3/13/13
Time: 11:40 AM

Monitored By: Shinta Aizawa

Verified By: Seamus McGeough.

Station	Magnehelic	RKI Eagle			PID	Velocicalc		
	Pressure (in. H2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOC (ppm)	Flow Rate (scfm)	Humidity (%)	Temperature
Inlet	-30	11.0 ✓	8.1	15.8	Over	27.5	42	74
Post Dilution	-31	7	19.6	1.6	Over	86	45.8	74
Carbon Vessel 1	-53	7	19.7	1.6	over	83	43.7	75
Effluent	-60 (@C2: before the blower)	0	20	1.4	0	90	1.0	162

Station	In-line Sensors									
	LEL C_6H_6 (%)		Oxygen (%)		VOCs (ppm)		Flow Rate (scfm)		Humidity (%)	
Effluent	NA		AT3B	19.0	AT06	0.1	NA		NA	
Carbon Vessel 1	AT3A	3	NA		NA		NA		NA	
Post Dilution	AT2A	32	AT2B	19.2	NA		NA		RH2	68
Inlet	AT5A	~~5.7~~ 104	AT5B	5.7	NA		FT5	25 ~~(FT1+FT4)~~	NA	

Station	In-line Sensors		Velocicalc (scfm)
Treatment Rate	FT1	6	7.5
Dilution Rate	FT2	65	

Note:

Del Amo Pits
SVE/IBT Enclosure Monitoring Form
Torrance, CA

Date: 3/27/13
Time: 11:30
Monitored By: Shinta Arowa
Verified By: Seamus McGeough

Station	Magnehelic	RKI Eagle			PID	Velocicalc		
	Pressure (In. H2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOC (ppm)	Flow Rate (scfm)	Humidity (%)	Temperature
Inlet	-32	9.0 V	8.9	15.8	Over.	30	45	74.5
Post Dilution	-34	13	18.6	2.6	Over.	71	48	72.3
Carbon Vessel 1	-54	0	18.7	2.6	0	73.5	44.8	74.3
Effluent	-62 (@C2: before the blower)	0	18.9	2.2	0	82	1.1	162

Station	In-line Sensors									
	LEL C_6H_6 (%)		Oxygen (%)		VOCs (ppm)		Flow Rate (scfm)		Humidity (%)	
Effluent	NA		AT3B	18.0	AT06	0.1	NA		NA	
Carbon Vessel 1	AT3A	3	NA		NA		NA		NA	
Post Dilution	AT2A	40	AT2B	17.8	NA		NA		RH2	73
Inlet	AT5A	104	AT5B	6.0	NA		FT5	26	NA	

Station	In-line Sensors		Velocicalc (scfm)
Treatment Rate	FT1	9	12.5
Dilution Rate	FT2	53	

Note:

Del Am...Pits
SVE/IBT Enclosure Monitoring Form
Torrance, CA

Date: 4/10/13
Time:
Monitored By: Shinta Aizawa
Verified By: Seamus McGeough.

Station	Magnehelic	RKI Eagle			PID	Velocicalc		
	Pressure (in. H2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOC (ppm)	Flow Rate (scfm)	Humidity (%)	Temperature
Inlet	-32	8.0 V	9.5	15.6	Over	29.5	21	80
Post Dilution	-34	12	18.3	2.8	Over.	70	14.7	80
Carbon Vessel 1	-55	2	18.6	2.6	Over.	80	~~15~~ 14	80
Effluent	-62 (@C2: before the blower)	0	18.4	2.4	0	80	0.8	165

Station	In-line Sensors									
	LEL C_6H_6 (%)		Oxygen (%)		VOCs (ppm)		Flow Rate (scfm)		Humidity (%)	
Effluent	NA		AT3B	18.0	AT06	0	NA		NA	
Carbon Vessel 1	AT3A	11	NA		NA		NA		NA	
Post Dilution	AT2A	38	AT2B	18.0	NA		NA		RH2	44
Inlet	AT5A	104	AT5B	6.5	NA		FT5	28 ~~(FT1+FT4)~~	NA	

Station	In-line Sensors		Velocicalc (scfm)
Treatment Rate	FT1	10	12
Dilution Rate	FT2	58	

Note:

Del A__ Pits
SVE/IBT Enclosure Monitoring Form
Torrance, CA

Date: 4/24/13

Time:

Monitored By: SA

Verified By: SM/IY

Station	Magnehelic	RKI Eagle			PID	Velocicalc		
	Pressure (in. H2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOC (ppm)	Flow Rate (scfm)	Humidity (%)	Temperature
Inlet	-34	8.5V	8.1	17.0	over	27.4	58	65.6
Post Dilution	-35	10	18.3	2.6	over	74	58	74
Carbon Vessel 1	-55	7	18.6	2.6	over	75	49	76
Effluent	-62 (@C2: before the blower)	0	18.8	2.2	0	88	1.1	169

Station	In-line Sensors									
	LEL C_6H_6 (%)		Oxygen (%)		VOCs (ppm)		Flow Rate (scfm)		Humidity (%)	
Effluent	NA		AT3B	18.2	AT06	0	NA		NA	
Carbon Vessel 1	AT3A	13	NA		NA		NA		NA	
Post Dilution	AT2A	38	AT2B	18.4	NA		NA		RH2	85
Inlet	AT5A	104	AT5B	5.6	NA		FT5	27	NA	

Station	In-line Sensors		Velocicalc (scfm)
Treatment Rate	FT1	9	11.0
Dilution Rate	FT2	57	

Note:

Del Amo Pits
SVE/IBT Enclosure Monitoring Form
Torrance, CA

Date: 5/15/13
Time: 11:30 AM

Monitored By: SA

Verified By: IY

Station	Magnehelic	RKI Eagle			PID	Velocicalc		
	Pressure (in. H2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOC (ppm)	Flow Rate (scfm)	Humidity (%)	Temperature
Inlet	-32	11.5 V	7.9	17.2	OVER	31	44	82
Post Dilution	-34	17	18.6	3.0	OVER	70	46	78
Carbon Vessel 1	-56	Ø	18.6	2.8	0.1	73	43	83
Effluent	-61 (@C2: before the blower)	Ø	18.5	2.8	0.1	86	1.5	175

Station	In-line Sensors									
	LEL C_nH_6 (%)		Oxygen (%)		VOCs (ppm)		Flow Rate (scfm)		Humidity (%)	
Effluent	NA		AT3B	18	AT06	0.1	NA		NA	
Carbon Vessel 1	AT3A	3	NA		NA		NA		NA	
Post Dilution	AT2A	39	AT2B	17	NA		NA		RH2	70
Inlet	AT5A	104	AT5B	5	NA		FT5	32	NA	

Station	In-line Sensors		Velocicalc (scfm)
Treatment Rate	FT1	11	13.5
Dilution Rate	FT2	60	

Note:

Del Amo Pits
SVE/IBT Enclosure Monitoring Form
Torrance, CA

Date: 5/29/13
Time: 13:30

Monitored By: SA/SM

Verified By: SM

Station	Magnehelic	RKI Eagle			PID	Velocicalc		
	Pressure (in. H2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOC (ppm)	Flow Rate (scfm)	Humidity (%)	Temperature
Inlet	-30	11.0 V	8.4	16.4	Over.	28	67	80.3
Post Dilution	-32	18	18.4	3.0	Over.	69	42	80
Carbon Vessel 1	-54	13	18.5	2.8	Over.	71.2	42	82
Effluent	-60 (@C2: before the blower)	0	18.6	2.6	0.3	79.7	3.5	173

Station	In-line Sensors									
	LEL C_6H_6 (%)		Oxygen (%)		VOCs (ppm)		Flow Rate (scfm)		Humidity (%)	
Effluent	NA		AT3B	17.9	AT06	0	NA		NA	
Carbon Vessel 1	AT3A	14	NA		NA		NA		NA	
Post Dilution	AT2A	38	AT2B	17.7	NA		NA		RH2	69
Inlet	AT5A	104	AT5B	NA.	NA		FT5	31	NA	

Station	In-line Sensors		Velocicalc (scfm)
Treatment Rate	FT1	11	12.7
Dilution Rate	FT2	58	

Note:

Del Amo Pits
SVE/IBT Enclosure Monitoring Form
Torrance, CA

Date: 6/12/2013
Time: 9:55 AM

Monitored By: S. AIZAWA

Verified By: S. Mc GEOUGH

Station	Magnehelic	RKI Eagle			PID	Velocicalc		
	Pressure (in. H2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOC (ppm)	Flow Rate (scfm)	Humidity (%)	Temperature
Inlet	-31	8.5V	8.1	16.6	OVER MAX	28.2	63.5	72.2
Post Dilution	-33	16	18.0	3.0	OVER MAX	76.2	67.0	71.8
Carbon Vessel 1	-55	0	18.4	3.0	0.2	71.9	58.0	76.0
Effluent	-61 (@C2: before the blower)	0	18.3	3.0	0	81.0	1.9	162

Station	In-line Sensors									
	LEL C_6H_6 (%)		Oxygen (%)		VOCs (ppm)		Flow Rate (scfm)		Humidity (%)	
Effluent	NA		AT3B	18	AT06	0.1	NA		NA	
Carbon Vessel 1	AT3A	3	NA		NA		NA		NA	
Post Dilution	AT2A	40	AT2B	17	NA		NA		RH2	
Inlet	AT5A	104	AT5B	0	NA		FT5	31	NA	

Station	In-line Sensors		Velocicalc (scfm)
Treatment Rate	FT1	12	13.7
Dilution Rate	FT2	55	

Note:

Del Amc[illegible]s
SVE/IBT Enclosure Monitoring Form
Torrance, CA

Date: 6/26/13
Time: 1410

Monitored By: SM

Verified By: IY

Station	Magnehelic	RKI Eagle			PID	Velocicalc		
	Pressure (in. H2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOC (ppm)	Flow Rate (scfm)	Humidity (%)	Temperature
Inlet	-30	15.0 V	6.3	19.6	OVER 9999 MAX	32	52	82.5
Post Dilution	-32	22	17.7	3.4	OVER 9999 MAX	72	53	82.5
Carbon Vessel 1	-52	14	17.8	3.2	OVER 9999 MAX	76.2	50	84.5
Effluent	-60 (@C2: before the blower)	Ø	17.8	3.2	0.1	83.2	3	184

Station	In-line Sensors									
	LEL C_6H_6 (%)		Oxygen (%)		VOCs (ppm)		Flow Rate (scfm)		Humidity (%)	
Effluent	NA		AT3B	17	AT06	0.2	NA		NA	
Carbon Vessel 1	AT3A	12	NA		NA		NA		NA	
Post Dilution	AT2A	38	AT2B	17	NA		NA		RH2	59
Inlet	AT5A	104	AT5B	NA	NA		FT5	34	NA	

Station	In-line Sensors		Velocicalc (scfm)
Treatment Rate	FT1	11	13
Dilution Rate	FT2	63	

Note: AT5B needs new sensor.

Del Amo Pits
SVE/IBT Enclosure Monitoring Form
Torrance, CA

Date: 7/11/13
Time: 14:00

Monitored By: SA

Verified By: SM

Station	Magnehelic	RKI Eagle			PID	Velocicalc		
	Pressure (in. H2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOC (ppm)	Flow Rate (scfm)	Humidity (%)	Temperature
Inlet	-30	16 V	6.2	20.4	9999 MAX	31	65	77
Post Dilution	32	25	17.6	3.6	9999 MAX	72	64	79
Carbon Vessel 1	54	0	18.2	3.0	0	75	61	81
Effluent	60 (@C2: before the blower)	0	17.6	3.4	0	83	2.9	169

Station	In-line Sensors									
	LEL C_6H_6 (%)		Oxygen (%)		VOCs (ppm)		Flow Rate (scfm)		Humidity (%)	
Effluent	NA		AT3B	17.8	AT06	NA.	NA		NA	
Carbon Vessel 1	AT3A	1	NA		NA		NA		NA	
Post Dilution	AT2A	40	AT2B	17.5	NA		NA		RH2	84
Inlet	AT5A	104	AT5B	NA	NA		FT5	35	NA	

Station	In-line Sensors		Velocicalc (scfm)
Treatment Rate	FT1	12	13.5
Dilution Rate	FT2	60	

Note:

Del Amo
SVE/IBT Enclosure Monitoring Form
Torrance, CA

Date: 7/24/2013
Time: 10:45
Monitored By: Seamus McGeagh
Verified By: Shinta Aizawa

Station	Magnehelic Pressure (in. H2O)	RKI Eagle LEL (%)	RKI Eagle Oxygen (%)	RKI Eagle Carbon Dioxide (%)	PID VOC (ppm)	Velocicalc Flow Rate (scfm)	Velocicalc Humidity (%)	Velocicalc Temperature
Inlet	-30	13.5 V (2)	6.7	19.2	Over	32.5	80	78
Post Dilution	-32	22 (4.6)	17.5	3.6	Over.	78	64	78
Carbon Vessel 1	-54	2 (5.4)	17.6	3.6	195	75	54	81
Effluent	-60 (@C2: before the blower)	0	17.8	3.2	0.1	83.8	2	171

Station	In-line Sensors LEL C_6H_6 (%)		Oxygen (%)		VOCs (ppm)		Flow Rate (scfm)		Humidity (%)	
Effluent	NA		AT3B	NA	AT06	NA	NA		NA	
Carbon Vessel 1	AT3A	3	NA		NA		NA		NA	
Post Dilution	AT2A	38	AT2B	17.2	NA		NA		RH2	81
Inlet	AT5A	104	AT5B	17.8	NA		FT5	35	NA	

Station	In-line Sensors		Velocicalc (scfm)
Treatment Rate	FT1	12	12.5
Dilution Rate	FT2	65	

Note:

Del Amo Pits
SVE/IBT Enclosure Monitoring Form
Torrance, CA

Date: 08/14/2013

Time: _____

Monitored By: Seamus McGeagh

Verified By: Shinta Aizawa

Station	Magnehelic	RKI Eagle			PID	Velocicalc		
	Pressure (in. H2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOC (ppm)	Flow Rate (scfm)	Humidity (%)	Temperature
Inlet	-32	14.0 V (100)	5.6	20.4	Over	132	57	80
Post Dilution	-33	18 (50.4)	17.9	3.4	Over	69	54	81
Carbon Vessel 1	-54	0	18.4	3.0	0.5	77	46	85
Effluent	-61 (@C2: before the blower)	0	17.7	3.2	0.3	81	1.8	177

Station	In-line Sensors									
	LEL C_6H_6 (%)		Oxygen (%)		VOCs (ppm)		Flow Rate (scfm)		Humidity (%)	
Effluent	NA		AT3B	17.7	AT06	0	NA		NA	
Carbon Vessel 1	AT3A	0	NA		NA		NA		NA	
Post Dilution	AT2A	37	AT2B	17.1	NA		NA		RH2	77
Inlet	AT5A	104	AT5B	NA	NA		FT5	34	NA	

Station	In-line Sensors		Velocicalc (scfm)
Treatment Rate	FT1	11	15.5
Dilution Rate	FT2	72	

Note:

Del A... Pits
SVE/IBT Enclosure Monitoring Form
Torrance, CA

Date: 8/28/13
Time: _____
Monitored By: Seamus McGeough Verified By: Shinta Aizawa

Station	Magnehelic	RKI Eagle			PID	Velocicalc		
	Pressure (in. H2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOC (ppm)	Flow Rate (scfm)	Humidity (%)	Temperature
Inlet	-32	14.0 V(100)	5.1	19.8	Over	32.4	41	87
Post Dilution	-32	19 (38)	17.5	3.6	Over	69.5	42	87
Carbon Vessel 1	-52	0	17.6	3.4	347	72	42	89
Effluent	-60 (@C2: before the blower)	0	17.6	3.4	0.1	80	2.0	178

Station	In-line Sensors									
	LEL C_6H_6 (%)		Oxygen (%)		VOCs (ppm)		Flow Rate (scfm)		Humidity (%)	
Effluent	NA		AT3B	NA	AT06	0.2	NA		NA	
Carbon Vessel 1	AT3A	2	NA		NA		NA		NA	
Post Dilution	AT2A	34	AT2B	17.0	NA		NA		RH2	
Inlet	AT5A	104	AT5B	17.3	NA		FT5	34	NA	

Station	In-line Sensors		Velocicalc (scfm)
Treatment Rate	FT1	10	12.1
Dilution Rate	FT2	77	

Note:

Del Amo Pits
SVE/IBT Enclosure Monitoring Form
Torrance, CA

Date: 9/18/2013
Time: 11AM

Monitored By: SA / CT

Verified By: SA

Station	Magnehelic	RKI Eagle			PID	Velocicalc		
	Pressure (in. H2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOC (ppm)	Flow Rate (scfm)	Humidity (%)	Temperature
Inlet	-34	15 V (100)	4.4	21.2	Over	31.5	44	81
Post Dilution	-35	24 (67.2)	17.3	4.2	Over	57.5	49	79.5
Carbon Vessel 1	-56	0	17.4	4.2	0.2	62.5	40	82
Effluent	-62 (@C2: before the blower)	0	17.5	4.0	0.1	77	0.5	174

Station	In-line Sensors									
	LEL C_6H_6 (%)		Oxygen (%)		VOCs (ppm)		Flow Rate (scfm)		Humidity (%)	
Effluent	NA		AT3B	16.7	AT06	0	NA		NA	
Carbon Vessel 1	AT3A	1	NA		NA		NA		NA	
Post Dilution	AT2A	41	AT2B	16.3	NA		NA		RH2	70
Inlet	AT5A	104	AT5B	NA*	NA		FT5	36	NA	

Station	In-line Sensors		Velocicalc (scfm)
Treatment Rate	FT1	11	14
Dilution Rate	FT2	NA*	

Note: * Flow meter @ FT2 shows 205~210 scfm, possibly malfunctioning.
O_2 sensors @ AT4B and AT5B are not working.

DeRamo Pits
SVE/IBT Enclosure Monitoring Form
Torrance, CA

Date: 9/25/13

Time:

Monitored By: Seamus McGeough

Verified By: Shinta Aizawa

Station	Magnehelic	RKI Eagle			PID	Velocicalc		
	Pressure (in. H2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOC (ppm)	Flow Rate (scfm)	Humidity (%)	Temperature
Inlet	-32	(100) 13.5V	6.1	19.4	Over.	35.0	45	73
Post Dilution	-34	(61.6) 22	17.5	3.6	Over.	72.1	58	74.5
Carbon Vessel 1	-56	0	17.6	3.8	0.1	71.2	51	80.3
Effluent	-62 (@C2: before the blower)	0	17.6	3.8	0	79.6	1.5	170

Station	In-line Sensors									
	LEL C_6H_6 (%)		Oxygen (%)		VOCs (ppm)		Flow Rate (scfm)		Humidity (%)	
Effluent	NA		AT3B	17.5	AT06	0	NA		NA	
Carbon Vessel 1	AT3A	0	NA		NA		NA		NA	
Post Dilution	AT2A	37	AT2B	16.4	NA		NA		RH2	76
Inlet	AT5A	104	AT5B	NA	NA		FT5	34	NA	

Station	In-line Sensors		Velocicalc (scfm)
Treatment Rate	FT1	11	14
Dilution Rate	FT2	NA*	

Note: * FT2 ~~not~~ malfunctioning.

Del Amo Pits
SVE/IBT Enclosure Monitoring Form
Torrance, CA

Date: 10/09/13
Time: 11:00 AM
Monitored By: Shinta Aizawa
Verified By: Seamus McGreough.

Station	Magnehelic	RKI Eagle			PID	Velocicalc		
	Pressure (in. H2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOC (ppm)	Flow Rate (scfm)	Humidity (%)	Temperature
Inlet	-30	13.5 V (100)	6.5	19.8	Over.	~~35~~ 35	48	71
Post Dilution	~~-35~~ -32	22 (61.6)	17.6	3.6	Over.	~~NA~~ 72.6	48	72
Carbon Vessel 1	-54	13 (36.4)	17.7	3.6	Over.	72.3	49	72
Effluent	-62 (@C2: before the blower)	0	17.2	3.6	0.2	82.5	1.0	163

Station	In-line Sensors									
	LEL C_6H_6 (%)		Oxygen (%)		VOCs (ppm)		Flow Rate (scfm)		Humidity (%)	
Effluent	NA		AT3B	(7.1) NA	AT06	0	NA		NA	
Carbon Vessel 1	AT3A	10	NA		NA		NA		NA	
Post Dilution	AT2A	35	AT2B	17.3	NA		NA		RH2	70
Inlet	AT5A	104	AT5B	NA	NA		FT5	35	NA	

Station	In-line Sensors		Velocicalc (scfm)
Treatment Rate	FT1	9	12
Dilution Rate	FT2	NA	

Note: AT3B/AT5B In line O2 sensors not reading correct. Need to order sensor cells.
FT2 Flow sensor needs calibration.

Del Amo Pits
SVE/IBT Enclosure Monitoring Form
Torrance, CA

Date: 10/23/2013
Time: 11:30AM

Monitored By: S.M

Verified By: CT.

Station	Magnehelic	RKI Eagle			PID	Velocicalc		
	Pressure (in. H2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOC (ppm)	Flow Rate (scfm)	Humidity (%)	Temperature
Inlet	-32	5.5 ✓ (100)	12.0	11.4	15K over	30.2	54	70°
Post Dilution	-36	11 (100)	18.9	2.2	15K over	73.4	55	73°
Carbon Vessel 1	-56	0	19.1	2.4	0.1	76	54	73°
Effluent (@C2: before the blower)	-61	0	17.8	1.8	0.2	88	1.5	165

Station	In-line Sensors									
	LEL C_6H_6 (%)		Oxygen (%)		VOCs (ppm)		Flow Rate (scfm)		Humidity (%)	
Effluent	NA		AT3B	4%	AT06	0.5	NA		NA	
Carbon Vessel 1	AT3A	1	NA		NA		NA		NA	
Post Dilution	AT2A	34	AT2B	17	NA		NA		RH2	78
Inlet	AT5A	104	AT5B	N/A	NA		FT5	32	NA	

Station	In-line Sensors		Velocicalc (scfm)
Treatment Rate	FT1	6	13.2
Dilution Rate	FT2	225?	

Note:

Del Amo Pits
SVE/IBT Enclosure Monitoring Form
Torrance, CA

Date: 11/6/2013
Time: 11:30am

Monitored By: SM

Verified By: CT

Station	Magnehelic	RKI Eagle			PID	Velocicalc		
	Pressure (In. H2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOC (ppm)	Flow Rate (scfm)	Humidity (%)	Temperature
Inlet	-34	5.0 ✓ (0.0)	12.2	11.2	15K over	34	18	90°
Post Dilution	-36	11 (32.9)	19.1	2.4	15K over	71	[illegible]	83°
Carbon Vessel 1	-56	7 (14.6)	18.9	2.4	15K over	84	20	81°
Effluent	-64 (@C2: before the blower)	0	18.7	2.4	0.2	84	1	174

17

Station	In-line Sensors									
	LEL C_6H_6 (%)		Oxygen (%)		VOCs (ppm)		Flow Rate (scfm)		Humidity (%)	
Effluent	NA		AT3B	6	AT06	0.9	NA		NA	
Carbon Vessel 1	AT3A	10	NA		NA		NA		NA	
Post Dilution	AT2A	34	AT2B	17	NA		NA		RH2	38
Inlet	AT5A	104	AT5B	NA	NA		FT5	32	NA	

Station	In-line Sensors		Velocicalc (scfm)
Treatment Rate	FT1	4	154
Dilution Rate	FT2	225	

Note:

Del A...o Pits
SVE/IBT Enclosure Monitoring Form
Torrance, CA

Date: 11/27/13
Time: 12:30 pm
Monitored By: S. McGeogh
Verified By: C. Tobin

Station	Magnehelic	RKI Eagle			PID	Velocicalc		
	Pressure (in. H2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOC (ppm)	Flow Rate (scfm)	Humidity (%)	Temperature
Inlet	-34	95 (100)	12.6	10.0	15,000 over	33.3	48	62
Post Dilution	-36	11.0 (30.8)	18.9	2.2	15,000 over	74.5	48	64
Carbon Vessel 1	-58	0	19.3	0	0.1	76.4	42	66.6
Effluent	-64 (@C2: before the blower)	0	19.1	0	0.1	81.7	0.9	155

Station	In-line Sensors									
	LEL C_6H_6 (%)		Oxygen (%)		VOCs (ppm)		Flow Rate (scfm)		Humidity (%)	
Effluent	NA		AT3B	1	AT06	2.1	NA		NA	
Carbon Vessel 1	AT3A	2	NA		NA		NA		NA	
Post Dilution	AT2A	38	AT2B	17	NA		NA		RH2	74
Inlet	AT5A	104	AT5B	N/A	NA		FT5	31	NA	

Station	In-line Sensors		Velocicalc (scfm)
Treatment Rate	FT1	3	11.5
Dilution Rate	FT2	N/A	

Note:

Del Amo Pits
SVE/IBT Enclosure Monitoring Form
Torrance, CA

Date: 12/4/2013
Time: _____
Monitored By: Shinta Aizawa
Verified By: Seamus McGeough

Station	Magnehelic Pressure (In. H2O)	RKI Eagle LEL (%)	RKI Eagle Oxygen (%)	RKI Eagle Carbon Dioxide (%)	PID VOC (ppm)	Velocicalc Flow Rate (scfm)	Velocicalc Humidity (%)	Velocicalc Temperature
Inlet	-38	5.0 ✓ (100)	11.8	10.8	Over	30.1	N/A	67.8
Post Dilution	-40	1.3 (364)	18.2	2.6	Over.	68	"	69.0
Carbon Vessel 1	-60	0	18.2	2.8	0.2	78	"	71
Effluent	-66 (@C2: before the blower)	0	18.3	2.6	0.2	72		161

Station	In-line Sensors LEL C_6H_6 (%)		Oxygen (%)		VOCs (ppm)		Flow Rate (scfm)		Humidity (%)	
Effluent	NA		AT3B	1.6 *	AT06	3.6 (0.2)	NA		NA	
Carbon Vessel 1	AT3A	1	NA		NA		NA		NA	
Post Dilution	AT2A	38	AT2B	16.8	NA		NA		RH2	62
Inlet	AT5A	104	AT5B	NA.	NA		FT5	32	NA	

Station	In-line Sensors		Velocicalc (scfm)
Treatment Rate	FT1	4	13.8
Dilution Rate	FT2	225 *	

Note: * sensors malfunctioning AT3B, AT5B. FT2.
Effluent PID calibrated with 50 ppm benzene, and re-monitored result is 0.2 ppm.

Del Amo Pits
SVE/IBT Enclosure Monitoring Form
Torrance, CA

Date: 12/18/13
Time: 11:10

Monitored By: SA

Verified By: SA/CT

Station	Magnehelic	RKI Eagle			PID	Velocicalc		
	Pressure (in. H2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOC (ppm)	Flow Rate (scfm)	Humidity (%)	Temperature
Inlet	-36	9.5 V (100)	7.9	17.8	over	25~29	58	68
Post Dilution	-38	18 (50.4)	17.9	3.6	over	64	58	71
Carbon Vessel 1	-58	11 (30.8)	18.5	3.0	over	67	52	72
Effluent	-64 (@C2: before the blower)	0	16.7	4.8	1.7	75	1.1	170

Station	In-line Sensors									
	LEL C_6H_6 (%)		Oxygen (%)		VOCs (ppm)		Flow Rate (scfm)		Humidity (%)	
Effluent	NA		AT3B	1.8*	AT06	1.0	NA		NA	
Carbon Vessel 1	AT3A	13	NA		NA		NA		NA	
Post Dilution	AT2A	39	AT2B	16.3	NA		NA		RH2	67
Inlet	AT5A	104	AT5B	NA	NA		FT5	32	NA	

Station	In-line Sensors		Velocicalc (scfm)
Treatment Rate	FT1	8	18
Dilution Rate	FT2	NA	

Note: * malfunctioning, reading too low

Performance Monitoring Event
Field Sheet - Cluster Wells
Del Amo Waste Pits

Date: 1/21/13 ~

Sampled by: IY/SM/SA

Sampling Event:

☐ Baseline ☐ Completion of 5 pore volumes ☐ Completion of 10 pore volumes

☐ T_{15} ☐ T_{45} ☐ T_{90} ☒ T_{180}

Well ID	Sub Area	Pressure	VOCs	LEL	O2	CO2	Note
A"1	1	0	0	0	14.3	1.8	
A"2	1	0	1.5	0	18.1	0.8	Pressure = -70
A"3	1	-0.05	335	0	15.7	1.6	Pressure = ~~[illegible]~~ -40
B"1	1	-0.14	over	17	17.6	3.8	
B"2	1	-0.10	Over.	62	14.8	4.8	
B"3	1	-0.10	over	~~2.234~~	~~17~~ ~~16.6~~	~~2.6~~ ~~3.8~~	~~34~~ ~~16.6 O2~~ ~~3.8 CO2~~ LEL 51 O2 15.5 CO2 4.8
C"1	2	-0.08	over	32	14.1	5.4	Pressure stayed -48
C"2	2	-0.04	Over.	22	5.2	11.8	Pressure stayed -16. (not too tight)
C"3	2	0	over.	12.5V	4.3	17.2	Pressure stayed -20.
D"1	2	0	Over.	~~0~~ 11.5V	~~21.2~~ 2.6	~~0.4~~ 11.8	
D"2	2	-0.12	Over	66	8.1	3.8	Very tight pressure = -95
D"3	2	-0.08	Over.	44	0.4	10.8	
E"1	3	0	[illegible] 1.1	0	19.2	1.6	Pressure = -40
E"2	3	0	[illegible] 0	0	17.7	0.6	~~Pressure = -60~~
E"3	3	+0.06	1.0	0	20.9	0	Pressure = -60
F"1	3	-0.08	0.2	0	18.1	1.6	
F"2	3	-0.08	1.5	0	14.5	4.2	Pressure = -30
F"3	3	-0.08	2.0	0	20.9	0	Pressure = -95
I"1	3	-0.04	370	2	4.1	11.2	
I"2	3	-0.02	0.5	0	20.9	0	Pressure = -65
I"3	3	-0.04	1.2	0	15.6	3.2	
J"1	3	0	0.7	0	19.5	1.2	Pressure = -75
J"2	3	+0.06	0.2	0	20.9	0	
J"3	3	-0.06	0.1	0	7.7	8.4	
K"1	2	0	0.4	0	16.0	2.4	Pressure = -35
K"2	2	-0.02	0.1	0	10.7	5.6	
K"3	2	0	200	0	20.9	0	Pressure = -20
L"1	2	-0.04	over	~~10.5V~~	~~11.1~~	~~8.8~~	LEL 15.5V, O2 8.2, CO2 12.0
L"2	2	0	over	40	17.3	2.8	Pressure = -38
L"3	2	-0.04	over	~~74~~ 14.0V	~~15.1~~ 8.6	~~4.6~~ 12.2	
M"1	1	~~2.8~~ -0.04	2.8	0	1.3	13.6	
M"2	1	-0.02	0.4	0	1.5	13.0	
M"3	1	-0.02	over.	4	20.1	1.6	Pressure = -30

Performance Monitoring Event
Field Sheet - Perimeter Monitoring Wells
Del Amo Waste Pits

Date: 1/21/13 ~

Sampled by: LY, SM, SA

Sampling Event:

☐ Baseline ☐ Completion of 5 pore volumes ☐ Completion of 10 pore volumes

☐ T_{15} ☐ T_{45} ☐ T_{90} ☒ T_{180}

Well ID	Sub Area	Pressure	VOCs	LEL	O2	CO2	Note
A'	1	-0.08	Over.	21	15.5	3.6	
B'	2	0	0.1	0	16.7	3.0	
C'	2	-0.12	Over.	7	16.1	3.2	
D'	2	0	over.	10V	8.0	7.8	
E'	3	-0.18	0.5	0	8.0	8.2	Pressure = -15
F'	3	-0.08	0.4	0	10.4	5.6	
J'	3	-0.04	1.8	0	16.8	2.6	Pressure = -20
K'	3	-0.02	0.3	0	11.7	5.8	
L'	3	-0.06	6.0	0	12.1	3.4	
M'	2	-0.05	Over.	12.0V	3.5	9.0	
N'	1	-0.02	over	7.0V	13.3	5.6	

Performance Monitoring Event
Field Sheet - Perimeter Monitoring Wells
Del Amo Waste Pits

Date: 1/16/2013

Sampled by: SA/SM

Sampling Event:

☐ Baseline ☐ Completion of 5 pore volumes ☐ Completion of 10 pore volumes

☐ T_{15} ☐ T_{45} ☐ T_{90} ☒ T-180.

Well ID	Sub Area	Pressure	VOCs	LEL	O2	CO2	Note
A	1	0	0	0	20.4	0.4	
B	1	-0.05	0.6	0	19.2	1.8	
C	2	-0.05	0.1	0	19.2	1.8	
D	2	-0.02	0	0	19.3	1.2	
E	3	+0.04	0	0	14.4	3.4	
F	3	-0.05	0	0	17.2	3.0	
G	4	0	0	0	18.7	1.6	
H	4	0	0	0	18.4	2.4	
I	4	-0.02	0	0	19.5	1.0	
J	3	-0.02	0	0	18.8	1.8	
K	3	-0.02	0	0	19.2	1.4	
L	2	0	0	0	17.5	3.2	

SVE/BT
Vacuum Performance Well Monitoring Form
Del Amo Pits

Date: 1/21/13

Monitored By: LY/SM/SA

Well ID	Pressure (in. H_2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOCs (ppm)	Note
A'						
B'						
C'						
D'						
E'						
F'						
G'	-0.20	0	16.2	2.8	0.1	
H'	-0.10	0	18.1	2.6	0.1	
I'	-0.10	27	4.1	3.2	Over	
J'						
K'						
L'						
M'						
N'						

SVE/IBT
Cluster Well Monitoring Form
Del Amo Pits

Date: 1/21/13

Monitored By: IY/SM/SA

Well ID	Pressure (in. H_2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOCs (ppm)	Note
A"1						
A"2						
A"3						
B"1						
B"2						
B"3						
C"1						
C"2						
C"3						
D"1						
D"2						
D"3						
E"1						
E"2						
E"3						
F"1						
F"2						
F"3						
G"1	-0.06	0	19.6	0.6	0	
G"2	-0.05	0	19.6	0.6	0	
G"3	-0.06	0	20.9	0	0	
H"1	-0.06	0	20.9	0	0.1	
H"2	-0.02	0	20.8	0.4	0	
H"3	-0.08	0	13.4	4.6	0	
I"1						
I"2						
I"3						
J"1						
J"2						
J"3						
K"1						
K"2						
K"3						
L"1						
L"2						
L"3						
M"1						
M"2						
M"3						

SVE/IBT
Vacuum Performance Well Monitoring Form
Del Amo Pits

Date: 5/8 - 5/9

Monitored By: SM, SA, IY

Well ID	Pressure (in. H_2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOCs (ppm)	Note
A'	-0.66	5V	5.6	12.4	Over	
B'	0	0	18.9	1.0	0.3	
C'	+0.30	5V	~~15.7~~	~~4.8~~	Over.	~~B~~ 9.0V / 13.0 O_2 / 7.0 CO_2
D'	-0.50	0	20.5	0.2	Over.	8LEL, 15.2 O_2 2.6 CO_2
E'	-0.18	0	11.0	6.2	5.2	~~8LEL 15.2 O_2 2.6 CO_2~~
F'	-0.22	0	11.2	6.4	9.8	tight.
G'	-0.10	0	20.8	0	0	
H'	-0.06	0	19.9	0.6	0	
I'	-0.10	29	7.0	3.0	Over	
J'	-0.04	0	19.4	1.3	34	tight.
K'	-0.10	0	18.2	1.8	0.3	
L'	-0.16	0	20.9	0	0.5	
M'	-0.10	40	14.6	4.4	Over	
N'	+0.02	10V	16.0	8.4	Over	

SVE/IBT
Perimeter Well Monitoring Form
Del Amo Pits

Date: 5/8/2013

Monitored By: SM/SA

Well ID	Pressure (in. H_2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOCs (ppm)	Note
A	-0.02	0	20.8	0	13	
B	0	0	20.6	0.4	0.1	
C	0	0	19.4	0.8	0	
D	0	0	20.1	0.6	0	
E	-0.02	0	16.7	2.8	0	
F	-0.03	0	17.9	2.4	0	
G	0	0	19.9	0.6	0	
H	0	0	19.9	0.8	0	
I	0	0	19.7	1.0	0	
J	0	0	19.3	1.4	0	
K	0	0	19.6	1.2	0	
L	0	0	18.3	2.4	0.2	

Re-monitor A -0.02 0 ~~20.9~~ 19.8 ~~0.2~~ 1.6 0.4 → used these for A

SVE/IBT
SVE Well Monitoring Form
Del Amo Pits

Date: 5/9-5/10

Monitored By: SA / IY / SM

Well ID	Pressure (in. H_2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOCs (ppm)	Note
1	-14	6.5V	12.3	7.2	Over	-70
2	-4.0	6.0V	15.5	13.8	Over.	-13
3	+2.5	64	18.4	17.4	Over.	-11.
4	+6.0	10.5V	3.3	23.2	Over	-24.
5	-4.0	11.5V	4.4	18.6	Over	-13.
6	-21.0	~~11.5V~~	~~9.5~~	~~11.4~~	over.	~~-21~~ / 6.5V, 13.2 O_2, 5.0 CO_2, -~~50~~ P.
7	-6.0	~~6.5V~~	~~13.2~~	~~5.0~~	Over	~~-50~~ / 11.5V, 9.5 O_2, 11.4 CO_2. -21 P.
8	+5.0	76	9.5	14.8	Over.	-24
9	+3.0	5.5V	16.4	17.2	Over	-10
10	-12	22.5V	10.9	13.2	Over	-44
11	-2.5	55	5.2	20.2	Over	-20
12	-14	25	10.5	16	Over	-85
13	0	~~43~~ ~~20~~	~~15~~ 11.3	1.8	Over	-43P / 43LEL, 11.3 O_2
14	-0.2	1	~~13.9~~	6.0	136	-30 12.0 O_2
15A	0	~~5~~ 7	~~8~~ 5.2	10.2	Over	-21
15B	-0.12	0	2.5	14.6	69	-19
16	-0.10	4	2.7	11.6	396	-15
17	-0.10	0	5.8	11.0	13	-6
18	-0.08	Ø	13.0	6.0	1.2	-10 during purge
19	-0.10	0	6.2	10.2	133	-8
20A	NA	4	6.3	8.6	454	-55
20B	NA.	~~0~~ 6	~~20.9~~	~~0~~	Over	-31 P, 12.5 O_2 / 5.8 CO_2
21	-0.10	2	12.0	7.0	52	-39 P

* 20A - not connected to the system (valve closed)

20B - need repair - repaired by tage.

Used these #'s in the database 2/7/2011
Re-monitor.

20B	7 LEL	11.5 O_2	5.8 CO_2	-34 Pressure during purge,	VOCs over. 300~
√ 15A	8 LEL	3.6 O_2	11.4 CO_2	-22	
√ 16	4 LEL	6.8 O_2	8.4 CO_2	-14.	VOC over. 360~.

SVE/IBT
Cluster Well Monitoring Form
Del Amo Pits

Date: 5/8 - 5/9

Monitored By: SM, SA, IY

Well ID	Pressure (in. H_2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOCs (ppm)	Note
A"1	-0.04	0	20.4	0.8	0	
A"2	-0.02	0	20.9	0	1.8	tight
A"3	-0.10	0	20.9	0	0.9	
B"1	+0.2	7.0V	8.7	17.2	Over.	
B"2	-0.1	22 V	~~21.2~~	~~5.8~~ 10.8	Over.	22.7 O_2
B"3	0	11V	18.2	9.8	Over.	
C"1	-0.16	0	20.5	0	51	
C"2	-0.44	0	19.1	1.2	20	
C"3	-0.40	0	20.3	0.2	33	
D"1	-0.86	23	13.4	3.8	over.	
D"2	-0.44	15	15.2	2.2	over	
D"3	-0.70	3	17.6	1.6	over	
E"1	-0.08	0	20.7	0	0	
E"2	-0.02	0	20.0	0.8	0	
E"3	-0.06	0	20.6	0	0	
F"1	-0.06	0	20.9	0	0.5	
F"2	-0.06	0	19.1	1.0	3.7	tight
F"3	-0.20	0	20.2	0.4	6.8	tight
G"1	-0.06	0	20.4	0.2	0	
G"2	-0.04	0	20.2	0.2	0	
G"3	-0.06	0	20.4	0	0	
H"1	0	0	20.6	0	0	
H"2	-0.02	0	20.6	0	0	
H"3	-0.04	0	14.9	3.6	0	
I"1	-0.06	0	~~20.3~~	~~0.6~~	64	17.1-O_2, 2.2-CO_2.
I"2	0	0	20.9	0.2	14.2	tight.
I"3	-0.04	0	20.9	0	2.5	
J"1	~~-0.10~~ -0.04	0	20.9	0	0.7	
J"2	-0.02	0	20.9	0	1.5	
J"3	-0.06	0	18.2	2.2	0.3	
K"1	-0.10	0	19.9	1.2	170	
K"2	-0.10	0	~~20.9~~	0.8	2.4	19.8 O_2
K"3	-0.02	0	20.5	0.2	160	
L"1	+0.30	10.5V	11.2	9.4	Over	
L"2	+0.06	92	16.9	4.8	over	
L"3	+0.30	14 V	10.0	10.2	Over	
M"1	-0.10	0	14.0	7.2	4.8	
M"2	-0.18	0	13.2	7.8	3.3	
M"3	0	1	20.6	0.2	106	

SVE/IBT
Perimeter Well Monitoring Form
Del Amo Pits

Date: 8/20/2013

Monitored By: SM, IY, CT, SA

Well ID	Pressure (in. H_2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOCs (ppm)	Note
A	-0.02	0	20.9	0.2	0	
B	-0.02	0	20.4	1.4	0.2	
C	-0.02	0	17.7	2.0	0.2	
D	-0.02	0	20.4	0.6	0	
E	-0.02	0	15.3	4.2	0	
F	-0.03	0	16.8	3.6	0.1	
G	-0.02	0	18.6	2.0	0	
H	0	0	19.0	2.2	0	
I	-0.02	0	19.9	1.2	0	
J	-0.02	0	19.0	2.2	0	
K	-0.02	0	19.9	1.2	0	
L	0	0	15.9	4.4	0.1	

SVE/IBT
Vacuum Performance Well Monitoring Form
Del Amo Pits

Date: 8/20/13

Monitored By: Clara Tobin, Shinta Aiwaza

Well ID	Pressure (in. H_2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOCs (ppm)	Note
A'	-0.70	9.0V	1.3	18.2	over	
B'	-0.05	0	17.8	2.4	0.4	
C'	+0.36	74.0V	0	26.0	over	1.5 H_2S
D'	-0.71	100V	0	18.2	over	
E'	-0.15	0	5.6	9.4	2.9	
F'	-0.25	0	15.9	3.6	0.4	
G'	-0.10	0	20.9	0	0.1	
H'	0	0	19.2	1.4	0.2	
I'	-0.05	60	0	4.2	over	
J'	-0.05	0	20.9	0	3.7	
K'	-0.05	0	7.9	8.2	1.9	
L'	-0.15	0	16.2	4.4	75	
M'	-0.12	12.0V	4.4	13.8	Over.	
N'	+0.11	39.0V	8.1	23.8	over	

SVE/IBT
Cluster Well Monitoring Form
Del Amo Pits

Date: 8/20/13

Monitored By: CT, SA, SM, IY

Well ID	Pressure (in. H_2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOCs (ppm)	Note
A"1	-0.07	0	20.2	1.0	0	
A"2	-0.05	0	20.9	0	0	
A"3	-0.07	0	20.9	0	0	
B"1	+0.22	10.0V	7.2	30.4	over	
B"2	-0.20	46.0V	20.9	18.6	over	
B"3	-0.04	30.5V	16.1	3.6	over	
C"1	-0.59	0	19.1	0.4	350	
C"2	-0.47	1	16.5	3.0	over	
C"3	-0.38	0	19.6	1.0	252	
D"1	-0.91	10.5V	0	15.4	over	
D"2	-0.46	12	18.8	0.8	over	
D"3	-0.77	0	6.9	9.2	249	
E"1	-0.07	0	20.9	0	0.1	
E"2	-0.03	8	20.5	0.8	0.1	
E"3	-0.16	0	20.9	0	0.1	
F"1	-0.10	0	20.9	0	0.1	
F"2	-0.05	0	20.9	0	7.7	
F"3	-0.05	0	20.9	0	1.3	
G"1	-0.05	2	14.6	4.2	0.1	
G"2	-0.02	0	20.1	0.6	0	
G"3	-0.05	0	20.7	0.6	0	
H"1	0	0	20.9	0	0.2	
H"2	0	0	20.9	0.4	0.1	
H"3	0	0	9.2	8.0	0.2	
I"1	-0.10	0	18.2	1.4	42.8	
I"2	-0.05	0	20.9	0	1.0	
I"3	-0.05	0	19.2	0.8	4.0	
J"1	0	0	20.9	0	1.1	
J"2	0	0	20.9	0	1.4	
J"3	-0.05	0	5.9	11.6	4.0	
K"1	-0.07	0	19.6	1.8	3.6	
K"2	-0.12	0	11.2	8.8	2.4	
K"3	-0.03	0	20.9	0	21.7	
L"1	+0.41	55.5V	0	25.0	over	
L"2	+0.17	11.0V	13.5	7.8	over	
L"3	+0.37	36.5V	3.6	19.2	over	
M"1	-0.12	0	12.9	7.6	220	
M"2	-0.16	0	11.4	10.4	23	
M"3	-0.02	0	20.9	0	32	

SVE/IBT
SVE Well Monitoring Form
Del Amo Pits

Date: 8/22/13
Monitored By: SA/SM

Well ID	Pressure (in. H_2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOCs (ppm)	Note
1	-15.0	6.0V	12.0	6.4	over	
2	-4.0	10V	12.1	22.8	over	
3	4.0	5.0V	13.2	27.8	over	
4	6.0	16.5V	0	32.2	over	
5	-5.0	20.5V	0	26	over	
6	-24.0	29V	0	20	over	
7	-6.0	12.5V	8.0	11.2	over	
8	6.0	10.5V	3.5	24.6	over	
9	4.0	10.5V	11.6	26.4	over	
10	-12.0	35V	6.9	17.6	over	1.0 H_2S.
11	-1.75	91	0	34.8	over	pressure fluctuating
12	-13.0	40	5.0	23.0	over	
13	-0.35	6V	2.1	2.8	over	
14	-0.20	1	4.0	10.4	190	
15A	0	4	2.3	12.4	over	
15B	-0.05	0	0	19.0	38	
16	-0.10	6	0	16.4	over	
17	0	5	0	15.8	13	
18	-0.10	35	8.4	10.2	2.3	
19	-0.05	0	0	16.8	250	
20A	-0.10	2	0	12.8	over	
20B	-0.10	10	9.8	6.8	over	
21	-0.10	1	5.5	11.4	78	

SVE/IBT
Perimeter Well Monitoring Form
Del Amo Pits

Date: 12/11/13

Monitored By: CT/SA/SM

Well ID	Pressure (in. H_2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOCs (ppm)	Note
A	-0.04	0	20.9	0.6	0.5	
B	-0.02	0	20.9	0.6	0	
C	-0.02	0	19.4	0.8	0.2	
D	-0.02	0	20.9	0	0	
E	0	0	19.6	1.4	0	
F	-0.04	0	19.9	1.2	0	
G	-0.02	0	20.9	0.6	0	
H	-0.02	NA	19.4	1.8	0	
I	-0.02	0	20.9	0.4	0	
J	-0.02	0	20.2	1.2	0	
K	-0.04	0	20.9	0.2	0	
L	0	0	18.7	1.8	0	

SVE/IBT
Vacuum Performance Well Monitoring Form
Del Amo Pits

Date: 12/11/13

Monitored By: CT/SA/SM

Well ID	Pressure (in. H_2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOCs (ppm)	Note
A'	-0.74	NA	~~20.9~~	~~0~~	Over	bag O2-7.4 CO2-11.6
B'	-0.02	0	14.6	5.4	0	
C'	+0.2	NA	1.8	22.6	over	bag 1.5-H2S
D'	-0.6	NA	0	15.0	Over	
E'	-0.08	NA	12.7	5.0	1.6	bag
F'	-0.06	NA	17.0	2.6	1.3	
G'	-0.02	NA	20.9	0	0	
H'	-0.02	NA	16.6	3.6	0	
I'	0	NA	1.8	4.0	over	
J'	-0.02	NA	19.9	0.2	10.1	
K'	~~+0.1~~ 0.1	NA	11.5	5.8	0.5	bag pressure monitored 12/18
L'	-0.16	NA	20.9	0	0.2	
M'	-0.1	NA	8.6	11.2	over	bag
N'	0.	NA	17.5	3.6	Over	bag

SVE/IBT
Cluster Well Monitoring Form
Del Amo Pits

Date: 12/11/13

Monitored By: CT/SA/SM

Well ID	Pressure (In. H_2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOCs (ppm)	Note
A"1	-0.1	0	20.9	0.4	0.5	
A"2	-0.08	0	20.9	0	0.5	
A"3	0	0	18.9	1.4	117	
B"1	-0.02	NA	11.3	21.0	over	bag
B"2	-0.32	NA	19.4	1.4	over	bag
B"3	-0.16	NA	19.6	1.4	over	bag
C"1	0	NA	20.7	0	10.0	bag
C"2	-0.8	NA	19.1	.6	20.2	bag
C"3	-0.34	NA	20.5	0	11.7	bag
D"1	-0.82	NA	12.9	11.2	over	bag
D"2	-0.28	NA	15.2	2.4	over	bag
D"3	-0.70	NA	19.9	0	61	bag
E"1	0	0	20.9	0	0	
E"2	0	0	20.9	0	0	
E"3	-0.04	0	20.9	0	0	
F"1	0	NA	20.9	0	1.3	
F"2	0	NA	19.9	0.6	1.4	
F"3	0	NA	20.8	0.2	5.0	
G"1	-0.06	0	18.5	1.8	0	
G"2	-0.02	0	20.9	0	0	
G"3	-0.04	0	20.9	0	0	
H"1	0	NA	20.9	0	0	
H"2	-0.02	NA	19.1	1.6	0	
H"3	-0.02	NA	9.4	9.0	0	
I"1	0	NA	0	13.4	Over	
I"2	0	NA	16.2	2.4	8.8	
I"3	-0.02	NA	18.2	1.2	1.3	
J"1	-0.04	NA	20.9	0	0	
J"2	0	NA	20.9	0	0.1	
J"3	-0.04	NA	12.1	6.0	0.6	bag
K"1	-0.06	NA	20.1	0.8	138	bag
K"2	-0.1	NA	20.9	0	5.0	bag
K"3	0	NA	20.9	0	170	bag
L"1	+0.1	NA	5.0	18.8	over	bag
L"2	+0.1	NA	18.9	1.2	over	bag
L"3	0	NA	18.5	1.8	over	bag
M"1	-0.12	NA	19.2	0.6	26	bag
M"2	-0.10	NA	20.4	0.2	15.0	bag
M"3	0	NA	19.6	1.6	over	bag

SVE/IBT
SVE Well Monitoring Form
Del Amo Pits

Date: 12/11/13

Monitored By: CT/SA/SM

Well ID	Pressure (in. H_2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOCs (ppm)	Note
1	-17.0	7.0 V	12.7	6.0	Over	
2	-4.0	7.5 V	12.0	23.6	Over	
3	+2.0	6.5 V	23.4	22.2	Over.	*
4	+4.0	15.5 V	0	37.8	Over.	
5	-4.0	16.5 V	1.3	26.6	Over.	
6	-22.0	12.5 V	9.8	7.2	Over	
7	-8.0	31 V	0	23.0	Over	
8	+4.0	~~17~~ 8.0 V	~~20.9~~ 6.0	022.4	Over	
9	+3.0	~~11~~ 12.5 V	17.0	25.2	Over	
10	-12.0	~~23~~ 31.5 V	7.2	17.6	Over	
11	-2.0	56	0	40	Over.	4.0 H_2S.
12	-2.0	~~40~~ 43	4.2	27.0	Over.	
13	-0.36	7.0 V	0	3.4	Over	
14	-0.12	1	0.4	12.6	95	
15A	0	4	0	16.0	Over	
15B	-0.02	0	0	20.0	7.8	
16	0	9	0	17.2	Over.	
17	0	~~NA~~ 0	0	16.4	13.3	
18	-0.04	~~NA~~ 0	9.4	10.0	0.3	
19	-0.02	2	0	18.2	235	
20A	-0.02	4	0	16.0	Over	
20B	-0.04	~~10~~ 14	8.0	8.2	Over	
21	-0.1	2	7.0	10.8	67.8	

	LEL%	O_2	CO_2	VOCs.
* Remonitor SVE3.	6.0 V.	21.6	25.2	Over.

Performance Monitoring Event
Field Sheet - Perimeter Monitoring Wells
Del Amo Waste Pits

Date: 1/16/2013

Sampled by: SA/SM

Sampling Event:

☐ Baseline ☐ Completion of 5 pore volumes ☐ Completion of 10 pore volumes

☐ T_{15} ☐ T_{45} ☐ T_{90} ☒ T-180

Well ID	Sub Area	Pressure	VOCs	LEL	O2	CO2	Note
A	1 1	0	0	0	20.4	0.4	
B	1 1	-0.05	0.6	0	19.2	1.8	
C	2 2	-0.05	0.1	0	19.2	1.8	
D	2 2	-0.02	0	0	19.3	1.2	
E	3 2	+0.04	0	0	14.4	3.4	
F	3 3	-0.05	0	0	17.2	3.0	
G	4 3	0	0	0	18.7	1.6	
H	4 3	0	0	0	18.4	2.4	
I	4 3	-0.02	0	0	19.5	1.0	
J	3 4	-0.02	0	0	18.8	1.8	
K	3 4	-0.02	0	0	19.2	1.4	
L	2 4	0	0	0	17.5	3.2	

V
check Sub Areas

Perimeter Well Monitoring Form

Monitored by: SM / ZY

Date: 2/21/2013

Weather: SUNNY 60°

Well ID	P (in. H20)	LEL methane (%)	O2 (%)	CO2 (%)	VOCs (ppm)
A	0	0	20.9	0.4	0
B	0	0	19.3	2.2	0.5
C	0	0	19.0	2.0	0
D	0	0	20.1	1.0	0
E					
F					
G					
H	0	0	18.8	2.0	0
I					
J					
K					
L					

Note:

SVE/IBT
Perimeter Well Monitoring Form
Del Amo Pits

Date: 3/20/2023

Monitored By: SM, SA

Well ID	Pressure (in. H_2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOCs (ppm)	Note
A	0	0	20.6	0.4	0	
B	-0.05	0	18.9	2.2	~~0.4~~ 1.2	
C	0	0	18.2	2.2	0.3	
D	-0.05	0	19.9	1.0	0.1	
E						
F						
G						
H	0	0	18.4	2.4	0	
I						
J						
K						
L						

SVE/IBT
Perimeter Well Monitoring Form
Del Amo Pits

Date: 4/16/13

Monitored By: SM/IY/SA

Well ID	Pressure (in. H_2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOCs (ppm)	Note
A	-0.01	0	20.6	0.6	0	
B	-0.02	0	19.0	1.8	0.9	
C	-0.05	0	18.3	2.0	0	
D	-0.01	0	19.9	1.0	0	
E						
F						
G						
H	-0.05	0	19.0	1.2	0	
I						
J						
K						
L						

Perimeter Well Monitoring Form

Monitored by: IY / SM

Date: 6/26/13

Weather: SUNNY, CLEAR

Well ID	P (in. H20)	LEL methane (%)	O2 (%)	CO2 (%)	VOCs (ppm)
A	-0.02	Ø	20.6	0.2	0.2
B	-0.01	Ø	19.0	2.2	0.5
C	-0.02	Ø	17.3	2.4	Ø
D	-0.02	Ø	19.2	1.2	0.1
E					
F					
G					
H	-0.03	Ø	18.7	2.0	Ø
I					
J					
K					
L					

Note:

SVE/IBT
Perimeter Well Monitoring Form
Del Amo Pits

Date: 7/30/13

Monitored By: _____

Well ID	Pressure (in. H_2O)	LEL (%)	Oxygen (%)	Carbon Dioxide (%)	VOCs (ppm)	Note
A	-0.05	0	20.2	0.4	0	
B	-0.05	0	18.9	2.4	0	
C	0	0	16.6	2.8	0	
D	-0.05	0	20.0	0.2	0	
E						
F						
G						
H	0	0	18.7	2.0	0	
I						
J						
K						
L						

Perimeter Well Monitoring Form

Monitored by: 09/25/2013

Date: SM/SA

Weather: cloudy /windy,

Well ID	P (In. H20)	LEL methane (%)	O2 (%)	CO2 (%)	VOCs (ppm)
A	0	0	20.9	0.6	0.6
B	0	0	20.4	2.4	1.6
C	0	0	16.3	3.0	0.3
D	0	0	20.9	0.6	0.1
E					
F					
G					
H	0	0	20.9	1.0	0.1
I					
J					
K					
L					

Note:

Perimeter Well Monitoring Form

Monitored by: Shinta / Seamus.
Date: 10/16/2013
Weather: Sunny / Hot.

Well ID	P (In. H20)	LEL methane (%)	O2 (%)	CO2 (%)	VOCs (ppm)
A	-0.04	0	20.9	0	0
B	-0.04	0	20.1	1.2	0.7
C	0	0	19.6	0.6	0
D	-0.04	0	20.9	0	0
E					
F					
G					
H	-0.04	0	20.7	0.4	0
I					
J					
K					
L					

Note:

Perimeter Well Monitoring Form

Monitored by: SM/CT

Date: 11/13/13

Weather:

Well ID	P (in. H20)	LEL methane (%)	O2 (%)	CO2 (%)	VOCs (ppm)
A	0	0	20.7	0	0
B	0	0	20.0	1.2	0.2
C	0.05	0	18.7	0.8	0
D	0	0	20.4	0.2	0
E					
F					
G					
H	0	0	20.0	0.8	0
I					
J					
K					
L					

Note:

APPENDIX B

FIELD DAILY REPORTS
(VIA CD-ROM)

APPENDIX C

SVE/IBT LABORATORY RESULTS
(VIA CD-ROM)

APPENDIX D

IN-LINE SENSOR DATA
(VIA CD ROM)

APPENDIX E

CARBON REACTIVATION REPORT/CERTIFICATION

California Carbon Co., Inc.

2825 E. Grant St., Wilmington, CA 90744 (562)436-1962 Fax: (562)437-1217
e-mail: CCarbon2@aol.com

CERTIFICATE OF REACTIVATION

DATE: April 22, 2014

CUSTOMER: Baker Corporation
5500 Rawlings Ave.
South Gate, CA 90280

CUSTOMER'S REFERENCE: PROFILE # 012-353-B
REF : C2Rem

MATERIAL RECEVIED: January – December 2013
33 Supersacks Non-Hazardous Carbon
Received via customers truck

MATERIAL REACTIVATED: Calendar Year 2013

WE HEREBY CERTIFY THAT THE MATERIAL REFERRED TO IN THIS REACTIVATION REPORT HAS BEEN REACTIVATED TO A MINIMUM OF 60% CTC, TESTED AS PER ASTM D3467, STANDARD TEST METHOD FOR CARBON TETRACHLORIDE ACTIVITY OF ACTIVATED CARBON. THIS IS THE INDUSTRY STANDARD FOR TESTING THE ADSORPTIVE CAPABILITY OF ACTIVATED CARBON. THE ACTIVATED CARBON WAS REACTIVATED AT CALIFORNIA CARBON'S FACILITY IN WILMINGTON, CALIFORNIA, AND PLACED INTO OUR REACTIVATED VAPOR CARBON POOL FOR SALE.

CERTIFIED BY:

Richard Liu
Vice President

APPENDIX F

INSPECTION FORMS

DEL AMO WASTE PITS OU

COVER SYSTEM INSPECTION FORM

Completed By: SM

Title: Pe

Sheet 1 of 11

Date: 3/20/13

Time: 10 AM

Type of Inspection (check only one):

(✓) Quarterly ( ) After Seismic Event[1] ( ) After Heavy Rain[2]

( ) Other (explain) _____

Item Description		Condition/Remarks
1.	Erosion	4
2.	Stressed Vegetation (Plant Die-Back)	3
3.	Sediment Build-Up	4
4.	Local Subsidence or Loss of Grade	4
5.	Water Ponding	4
6.	Turf Height	4
7.	Burrowing Animals	3
8.	Weeds or Undesirable Vegetation	4
9.	Evidence of Fires or Vandalism	4
10.	Soil Quality Check	4
11.	Unauthorized Traffic	4
12.	Slope Instability or Sloughing	4
13.	Survey Monuments	4
14.	Vertical Cracking	4
15.	Intrusions	4
16.	Evidence of Waste Pit Materials	4

DEL AMO WASTE PITS OU

COVER SYSTEM INSPECTION FORM

Sheet 2 of 11
Date: 3/20/2013

Condition/Remarks Key:
4 = Satisfactory
3 = Slight (Continue Observing)
2 = Moderate (Needs Scheduled Maintenance/Repair)
1 = Poor (Needs Immediate Maintenance/Repair)

Recommendations for maintenance or repair (attach additional sheets as needed):

Hydro Seed Dormant. DROUGHT CONDITIONS IN Region.

Coolers ARE Active PERIODICALLY.

(1) Refer to Table 3.3-2 of the OM&M Plan for frequency based on magnitude and distance from the Waste Pits OU.

(2) For heavy rains exceeding 1.0 inches (per USEPA's letter dated December 6, 1999) within a 24-hour period.

DEL AMO WASTE PITS OU

CAP GAS COLLECTION AND TREATMENT INSPECTION FORM

Completed By: SM

Title: PE

Sheet 3 of 11

Date: 3/20/2013

Time: 10 AM

Type of Inspection (check only one):

(✓) Quarterly ( ) After Seismic Event[1] ( ) After Heavy Rain[2]

( ) Other (explain) _____

Collection System Valves	Condition/Remarks
1. Adequate-Free Movement	4
2. Seals - Complete	4
3. Signs of Rust/Corrosion	3
Condensate Collection[3]	
4. Air Moisture Separator	4
Carbon Adsorbers	
5. Vessels	
- Exterior Damage	4
- FRP Grating and Mesh	4
Heavy Equipment	
6. Blower	
- General Motor Maintenance	3
- Drive Maintenance	3
- Bearing Maintenance	3
- Lubrication	3
- Structural Maintenance	3

DEL AMO WASTE PITS OU

CAP GAS COLLECTION AND TREATMENT INSPECTION FORM

Sheet 4 of 11

Date: 3/20/2013

Condition/Remarks Key:

4 = Satisfactory

3 = Slight (Continue Observing)

2 = Moderate (Needs Scheduled Maintenance/Repair)

1 = Poor (Needs Immediate Maintenance/Repair)

Recommendations for maintenance or repair (attach additional sheets as needed):

(1) Refer to Table 3.3-2 of the OM&M Plan for frequency based on magnitude and distance from the site.

(2) For heavy rains exceeding 1.0 inches (per USEPA's letter dated December 6, 1999) within a 24-hour period.

(3) Initial condensate collected from the air moisture separator must be characterized to determine methods of appropriate disposal.

DEL AMO WASTE PITS OU

SURFACE WATER DRAINAGE INSPECTION FORM

Completed By: SM

Title: PE

Sheet 5 of 11

Date: 3/20/2013

Time: 10 AM

Type of Inspection (check only one):

(✓) Quarterly ( ) After Seismic Event[1] ( ) After Heavy Rain[2]

( ) Other (explain)_____

Item Description	Condition*/Remarks
SURFACE-WATER DRAINAGE SYSTEMS	
1. Washouts or Erosion of Contoured Grade	4
2. Ponding on Contoured Grade	4
3. Gullies and Ruts on Contoured Grade	4
4. Plugging of Drainage Culverts	4
5. Holes and Cracks in Swales or Catch Basins	4
6. Sediment Build-Up in Swales or Catch Basin	4
7. Surface Cracking of Swales/Catch Basins	4
8. Spalling of Swales/Catch Basins	4
9. Structural Failure of Swales/Catch Basins	4

Condition/Remarks Key:

4 = Satisfactory

3 = Slight (Continue Observing)

2 = Moderate (Needs Scheduled Maintenance/Repair)

1 = Poor (Needs Immediate Maintenance/Repair)

Recommendations for maintenance or repair (attach additional sheets as needed):

(1) Refer to Table 3.3-2 of the OM&M Plan for frequency based on magnitude and distance from the site.

(2) For heavy rains exceeding 1.0 inches (per USEPA's letter dated December 6, 1999) within a 24 hour period.

DEL AMO WASTE PITS OU

SUBSURFACE WATER DRAINAGE INSPECTION FORM

Completed By: SM

Title: Pe

Sheet 6 of 11

Date: 3/20/2013

Time: 10AM

Type of Inspection (check only one):

(✓) Quarterly ( ) After Seismic Event[1] ( ) After Heavy Rain[2]

( ) Other (explain) _____

Item Description	Condition/Remarks
SUBSURFACE DRAINAGE SYSTEMS	
1. Holes and Cracks in Swales, Catch Basin	4
2. Plugging of Drainage Inlets	4
3. Sediment Build-Up or Debris in Catch Basin	4
4. Structural Failure of Catch Basin	4

Condition/Remarks Key:

4 = Satisfactory

3 = Slight (Continue Observing)

2 = Moderate (Needs Scheduled Maintenance/Repair)

1 = Poor (Needs Immediate Maintenance/Repair)

Recommendations for maintenance or repair (attach additional sheets as needed):

(1) Refer to Table 3.3-2 of the OM&M Plan for frequency based on magnitude and distance from the site.

(2) For heavy rains exceeding 1.0 inches (per USEPA's letter dated December 6, 1999) within a 24 hour period

DEL AMO WASTE PITS OU

SECURITY FENCE INSPECTION FORM

Completed By: SM

Title: Pe

Sheet 7 of 11

Date: 3/20/2013

Time: 10AM

Type of Inspection (check only one):

(✓) Quarterly ( ) After Seismic Event[1] ( ) After Heavy Rain[2]

( ) Other (explain) _____

Item Description	Condition/Remarks
Perimeter Fence	
1. Breaks and Holes	4
2. Settlement Damage	4
3. Loose Posts/Tension	4
4. Rust/Corrosion	4
5. Ruts and Burrows Beneath Fence	4
6. Vegetation Overgrowth	4
7. General Signs of Deterioration	4
8. Vandalism/Animal/Wind Damage	4
Gates	
9. Adequate Movement of Hinges and Gates	4
10. Proper Function of Lock(s)	4

DEL AMO WASTE PITS OU

SECURITY FENCE INSPECTION FORM

Sheet 8 of 11
Date: 3/20/2013

Condition/Remarks Key:

4 = Satisfactory

3 = Slight (Continue Observing)

2 = Moderate (Needs Scheduled Maintenance/Repair)

1 = Poor (Needs Immediate Maintenance/Repair)

Recommendations for maintenance or repair (attach additional sheets as needed):

(1) Refer to Table 3.3-2 of the OM&M Plan for frequency based on magnitude and distance from the Waste Pits OU.

(2) For heavy rains exceeding 1.0 inches (per USEPA's letter dated December 6, 1999) within a 24-hour period.

DEL AMO WASTE PITS OU

ACCESS ROAD INSPECTION FORM

Completed By: SM

Title: PE

Sheet 9 of 11

Date: 3/20/2013

Time: 10 AM

Type of Inspection (check only one):

(✓) Quarterly ( ) After Seismic Event[1] ( ) After Heavy Rain[2]

( ) Other (explain) _____

Item Description	Condition/Remarks
Access Road	
1. Holes and Cracks	4
2. Vegetation Overgrowth	4
3. Settlement	4
4. Excessive Dispersion of Gravel	4
5. General Signs of Deterioration	4

Condition/Remarks Key:

4 = Satisfactory

3 = Slight (Continue Observing)

2 = Moderate (Needs Scheduled Maintenance/Repair)

1 = Poor (Needs Immediate Maintenance/Repair)

Recommendations for maintenance or repair (attach additional sheets as needed):

(1) Refer to Table 3.3-2 of the OM&M Plan for frequency based on magnitude and distance from the site.

(2) For heavy rains exceeding 1.0 inches (per USEPA's letter dated December 6, 1999) within a 24-hour period.

DEL AMO WASTE PITS OU

SVE/IBT SYSTEM INSPECTION FORM

Completed By: SM

Title: P.e

Sheet 10 of 11

Date: 3/20/2013

Time: 10 AM

Type of Inspection (check only one):

(✓) Quarterly ( ) After Seismic Event[1] ( ) After Heavy Rain[2]

( ) Other (explain) _____

		Condition/Remarks
Manifold		
1.	Adequate-Free Movement	4
2.	Seals - Complete	4
3.	Visible Damage	4
4.	Sniff for signs of leaks	4
Condensate Collection[3]		
5.	Air Moisture Separator	4
Additional System Components		
6.	Carbon Adsorber Vessels	
	- Exterior Damage	4
	- Vessel Configuration (A-B or B-A)	A-B
7.	Blowers	
	- General Motor Maintenance	4
	- Drive Maintenance	4
	- Bearing Maintenance	4
8.	Oxygen Generator	
	- Signs of Rust/Corrosion	4
	- Mechanical Functioning	4
	- Oxygen Purity	4

DEL AMO WASTE PITS OU
SVE/IBT SYSTEM INSPECTION FORM

Sheet 11 of 11
Date: 3/20/2013

9.	System Sensors	
	- Visible Damage	4
	- Mechanical Functioning	2
10.	SVE Wellheads[4]	
	- Tee Flanges	4
	- Valves	4
	- Sniff for signs of leaks	4

Condition/Remarks Key:
4 = Satisfactory
3 = Slight (Continue Observing)
2 = Moderate (Needs Scheduled Maintenance/Repair)
1 = Poor (Needs Immediate Maintenance/Repair)

Recommendations for maintenance or repair (attach additional sheets as needed):

(1) Refer to Table 3.3-2 of the OM&M Plan for frequency based on magnitude and distance from the site.
(2) For heavy rains exceeding 1.0 inches (per USEPA's letter dated December 6, 1999) within a 24 hour period.
(3) Condensate collected from (1) moisture separator (2) conveyance piping, and (3) from the carbon absorber vessels must be characterized to determine methods of appropriate disposal.
(4) Tee flanges monitored for leaks using a PID.

DEL AMO WASTE PITS OU

CAP GAS COLLECTION AND TREATMENT INSPECTION FORM

Completed By: JY

Title: PM

Sheet 3 of 11

Date: 6/5/13

Time: 10AM

Type of Inspection (check only one):

(X) Quarterly ( ) After Seismic Event[1] ( ) After Heavy Rain[2]

( ) Other (explain) _____

Collection System Valves	Condition/Remarks
1. Adequate-Free Movement	4
2. Seals - Complete	4
3. Signs of Rust/Corrosion	3
Condensate Collection[3]	
4. Air Moisture Separator	4
Carbon Adsorbers	
5. Vessels	4
- Exterior Damage	4
- FRP Grating and Mesh	4
Heavy Equipment	
6. Blower	
- General Motor Maintenance	3
- Drive Maintenance	3
- Bearing Maintenance	3
- Lubrication	3
- Structural Maintenance	3

DEL AMO WASTE PITS OU

CAP GAS COLLECTION AND TREATMENT INSPECTION FORM

Sheet 4 of 11

Date: 6/5/13

Condition/Remarks Key:

4 = Satisfactory

3 = Slight (Continue Observing)

2 = Moderate (Needs Scheduled Maintenance/Repair)

1 = Poor (Needs Immediate Maintenance/Repair)

Recommendations for maintenance or repair (attach additional sheets as needed):

6. GCTS blower age and heightened noise during ops will continue to be monitored but is still operating well.

(1) Refer to Table 3.3-2 of the OM&M Plan for frequency based on magnitude and distance from the site.

(2) For heavy rains exceeding 1.0 inches (per USEPA's letter dated December 6, 1999) within a 24-hour period.

(3) Initial condensate collected from the air moisture separator must be characterized to determine methods of appropriate disposal.

DEL AMO WASTE PITS OU

SURFACE WATER DRAINAGE INSPECTION FORM

Completed By: IY

Title: PM

Sheet 5 of 11

Date: 6/5/13

Time: 10 AM

Type of Inspection (check only one):

(X) Quarterly ( ) After Seismic Event[1] ( ) After Heavy Rain[2]

( ) Other (explain)_____

Item Description	Condition*/Remarks
SURFACE-WATER DRAINAGE SYSTEMS	
1. Washouts or Erosion of Contoured Grade	4
2. Ponding on Contoured Grade	4
3. Gullies and Ruts on Contoured Grade	4
4. Plugging of Drainage Culverts	4
5. Holes and Cracks in Swales or Catch Basins	4
6. Sediment Build-Up in Swales or Catch Basin	4
7. Surface Cracking of Swales/Catch Basins	4
8. Spalling of Swales/Catch Basins	4
9. Structural Failure of Swales/Catch Basins	4

Condition/Remarks Key:

4 = Satisfactory

3 = Slight (Continue Observing)

2 = Moderate (Needs Scheduled Maintenance/Repair)

1 = Poor (Needs Immediate Maintenance/Repair)

Recommendations for maintenance or repair (attach additional sheets as needed):

NONE AT THIS TIME

(1) Refer to Table 3.3-2 of the OM&M Plan for frequency based on magnitude and distance from the site.

(2) For heavy rains exceeding 1.0 inches (per USEPA's letter dated December 6, 1999) within a 24 hour period.

DEL AMO WASTE PITS OU

SUBSURFACE WATER DRAINAGE INSPECTION FORM

Completed By: IY

Title: PM

Sheet 6 of 11

Date: 6/5/13

Time: 10 AM

Type of Inspection (check only one):

(X) Quarterly ( ) After Seismic Event[1] ( ) After Heavy Rain[2]

( ) Other (explain) _____

Item Description	Condition/Remarks
SUBSURFACE DRAINAGE SYSTEMS	
1. Holes and Cracks in Swales, Catch Basin	4
2. Plugging of Drainage Inlets	4
3. Sediment Build-Up or Debris in Catch Basin	4
4. Structural Failure of Catch Basin	4

Condition/Remarks Key:

4 = Satisfactory

3 = Slight (Continue Observing)

2 = Moderate (Needs Scheduled Maintenance/Repair)

1 = Poor (Needs Immediate Maintenance/Repair)

Recommendations for maintenance or repair (attach additional sheets as needed):

NONE AT THIS TIME

(1) Refer to Table 3.3-2 of the OM&M Plan for frequency based on magnitude and distance from the site.

(2) For heavy rains exceeding 1.0 inches (per USEPA's letter dated December 6, 1999) within a 24 hour period

DEL AMO WASTE PITS OU

SECURITY FENCE INSPECTION FORM

Completed By: TY

Title: PM

Sheet 7 of 11

Date: 6/5/13

Time: 10 AM

Type of Inspection (check only one):

(X) Quarterly ( ) After Seismic Event[1] ( ) After Heavy Rain[2]

( ) Other (explain) _____

Item Description	Condition/Remarks
Perimeter Fence	
1. Breaks and Holes	4
2. Settlement Damage	4
3. Loose Posts/Tension	4
4. Rust/Corrosion	4
5. Ruts and Burrows Beneath Fence	4
6. Vegetation Overgrowth	4
7. General Signs of Deterioration	4
8. Vandalism/Animal/Wind Damage	4
Gates	
9. Adequate Movement of Hinges and Gates	4
10. Proper Function of Lock(s)	4

DEL AMO WASTE PITS OU

SECURITY FENCE INSPECTION FORM

Sheet 8 of 11
Date: 6/15/13

Condition/Remarks Key:
4 = Satisfactory
3 = Slight (Continue Observing)
2 = Moderate (Needs Scheduled Maintenance/Repair)
1 = Poor (Needs Immediate Maintenance/Repair)

Recommendations for maintenance or repair (attach additional sheets as needed):

NONE AT THIS TIME

(1) Refer to Table 3.3-2 of the OM&M Plan for frequency based on magnitude and distance from the Waste Pits OU.

(2) For heavy rains exceeding 1.0 inches (per USEPA's letter dated December 6, 1999) within a 24-hour period.

DEL AMO WASTE PITS OU

ACCESS ROAD INSPECTION FORM

Completed By: IY

Title: PM

Sheet 9 of 11

Date: 6/5/13

Time: 10AM

Type of Inspection (check only one):

(X) Quarterly ( ) After Seismic Event[1] ( ) After Heavy Rain[2]

( ) Other (explain) _____

Item Description	Condition/Remarks
Access Road	
1. Holes and Cracks	4
2. Vegetation Overgrowth	4
3. Settlement	4
4. Excessive Dispersion of Gravel	3
5. General Signs of Deterioration	4

Condition/Remarks Key:

4 = Satisfactory

3 = Slight (Continue Observing)

2 = Moderate (Needs Scheduled Maintenance/Repair)

1 = Poor (Needs Immediate Maintenance/Repair)

Recommendations for maintenance or repair (attach additional sheets as needed):

4. Gravel was swept back onto Site from front vehicular concrete driveway.

(1) Refer to Table 3.3-2 of the OM&M Plan for frequency based on magnitude and distance from the site.

(2) For heavy rains exceeding 1.0 inches (per USEPA's letter dated December 6, 1999) within a 24-hour period.

DEL AMO WASTE PITS OU

SVE/IBT SYSTEM INSPECTION FORM

Completed By: IY

Title: PM

Sheet 10 of 11

Date: 6/5/13

Time: 10AM

Type of Inspection (check only one):

(X) Quarterly ( ) After Seismic Event[1] ( ) After Heavy Rain[2]

( ) Other (explain) _____

Manifold	Condition/Remarks
1. Adequate-Free Movement	4
2. Seals - Complete	4
3. Visible Damage	4
4. Sniff for signs of leaks	4
Condensate Collection[3]	
5. Air Moisture Separator	4
Additional System Components	
6. Carbon Adsorber Vessels	
- Exterior Damage	4
- Vessel Configuration (A-B or B-A)	4
7. Blowers	
- General Motor Maintenance	4
- Drive Maintenance	4
- Bearing Maintenance	4
8. Oxygen Generator	
- Signs of Rust/Corrosion	4
- Mechanical Functioning	4
- Oxygen Purity	4

DEL AMO WASTE PITS OU
SVE/IBT SYSTEM INSPECTION FORM

Sheet 11 of 11
Date: 6/5/13

9.	System Sensors	
	- Visible Damage	4
	- Mechanical Functioning	3
10.	SVE Wellheads[4]	
	- Tee Flanges	4
	- Valves	4
	- Sniff for signs of leaks	4

Condition/Remarks Key:
4 = Satisfactory
3 = Slight (Continue Observing)
2 = Moderate (Needs Scheduled Maintenance/Repair)
1 = Poor (Needs Immediate Maintenance/Repair)

Recommendations for maintenance or repair (attach additional sheets as needed):

9. Routine calibration and observation provides early detection of instrument issues that need manufacturer attention.

(1) Refer to Table 3.3-2 of the OM&M Plan for frequency based on magnitude and distance from the site.
(2) For heavy rains exceeding 1.0 inches (per USEPA's letter dated December 6, 1999) within a 24 hour period.
(3) Condensate collected from (1) moisture separator (2) conveyance piping, and (3) from the carbon absorber vessels must be characterized to determine methods of appropriate disposal.
(4) Tee flanges monitored for leaks using a PID.

DEL AMO WASTE PITS OU

COVER SYSTEM INSPECTION FORM

Completed By: IY

Title: PM

Sheet 1 of 11

Date: 8/21/13

Time: 13:00

Type of Inspection (check only one):

(X) Quarterly ( ) After Seismic Event[1] ( ) After Heavy Rain[2]

( ) Other (explain) _____

Item Description		Condition/Remarks
1.	Erosion	4
2.	Stressed Vegetation (Plant Die-Back)	2
3.	Sediment Build-Up	4
4.	Local Subsidence or Loss of Grade	4
5.	Water Ponding	4
6.	Turf Height	4
7.	Burrowing Animals	4
8.	Weeds or Undesirable Vegetation	4
9.	Evidence of Fires or Vandalism	4
10.	Soil Quality Check	4
11.	Unauthorized Traffic	4
12.	Slope Instability or Sloughing	4
13.	Survey Monuments	4
14.	Vertical Cracking	4
15.	Intrusions	4
16.	Evidence of Waste Pit Materials	4

DEL AMO WASTE PITS OU

COVER SYSTEM INSPECTION FORM

Sheet 2 of 11
Date: 8/21/13

Condition/Remarks Key:
4 = Satisfactory
3 = Slight (Continue Observing)
2 = Moderate (Needs Scheduled Maintenance/Repair)
1 = Poor (Needs Immediate Maintenance/Repair)

Recommendations for maintenance or repair (attach additional sheets as needed):

2. Drier months create die-back in vegetative spring mix but routine watering schedule has helped some with die-back. Should see growth with first rains.

(1) Refer to Table 3.3-2 of the OM&M Plan for frequency based on magnitude and distance from the Waste Pits OU.

(2) For heavy rains exceeding 1.0 inches (per USEPA's letter dated December 6, 1999) within a 24-hour period.

DEL AMO WASTE PITS OU

CAP GAS COLLECTION AND TREATMENT INSPECTION FORM

Completed By: IY

Title: PM

Sheet 3 of 11

Date: 8/21/13

Time: 13:00

Type of Inspection (check only one):

(X) Quarterly ( ) After Seismic Event[1] ( ) After Heavy Rain[2]

( ) Other (explain) _____

Collection System Valves	Condition/Remarks
1. Adequate-Free Movement	4
2. Seals - Complete	4
3. Signs of Rust/Corrosion	3
Condensate Collection[3]	
4. Air Moisture Separator	4
Carbon Adsorbers	
5. Vessels	4
- Exterior Damage	4
- FRP Grating and Mesh	4
Heavy Equipment	
6. Blower	
- General Motor Maintenance	3
- Drive Maintenance	3
- Bearing Maintenance	3
- Lubrication	3
- Structural Maintenance	3

DEL AMO WASTE PITS OU

CAP GAS COLLECTION AND TREATMENT INSPECTION FORM

Sheet 4 of 11

Date: 8/21/13

Condition/Remarks Key:

4 = Satisfactory

3 = Slight (Continue Observing)

2 = Moderate (Needs Scheduled Maintenance/Repair)

1 = Poor (Needs Immediate Maintenance/Repair)

Recommendations for maintenance or repair (attach additional sheets as needed):

3. Rust will be observed regularly to see if it affects system performance.

6. GCTS blower is functioning well despite age.

(1) Refer to Table 3.3-2 of the OM&M Plan for frequency based on magnitude and distance from the site.

(2) For heavy rains exceeding 1.0 inches (per USEPA's letter dated December 6, 1999) within a 24-hour period.

(3) Initial condensate collected from the air moisture separator must be characterized to determine methods of appropriate disposal.

DEL AMO WASTE PITS OU

SURFACE WATER DRAINAGE INSPECTION FORM

Completed By: IY

Title: PM

Sheet 5 of 11

Date: 8/21/13

Time: 13:00

Type of Inspection (check only one):

(X) Quarterly ( ) After Seismic Event[1] ( ) After Heavy Rain[2]

( ) Other (explain)_____

Item Description	Condition*/Remarks
SURFACE-WATER DRAINAGE SYSTEMS	
1. Washouts or Erosion of Contoured Grade	4
2. Ponding on Contoured Grade	4
3. Gullies and Ruts on Contoured Grade	4
4. Plugging of Drainage Culverts	4
5. Holes and Cracks in Swales or Catch Basins	4
6. Sediment Build-Up in Swales or Catch Basin	4
7. Surface Cracking of Swales/Catch Basins	4
8. Spalling of Swales/Catch Basins	4
9. Structural Failure of Swales/Catch Basins	4

Condition/Remarks Key:

4 = Satisfactory

3 = Slight (Continue Observing)

2 = Moderate (Needs Scheduled Maintenance/Repair)

1 = Poor (Needs Immediate Maintenance/Repair)

Recommendations for maintenance or repair (attach additional sheets as needed):

NONE

(1) Refer to Table 3.3-2 of the OM&M Plan for frequency based on magnitude and distance from the site.

(2) For heavy rains exceeding 1.0 inches (per USEPA's letter dated December 6, 1999) within a 24 hour period.

DEL AMO WASTE PITS OU

SUBSURFACE WATER DRAINAGE INSPECTION FORM

Completed By: TY

Title: PM

Sheet 6 of 11

Date: 8/21/13

Time: 13:00

Type of Inspection (check only one):

(X) Quarterly ( ) After Seismic Event[1] ( ) After Heavy Rain[2]

( ) Other (explain) _____

Item Description	Condition/Remarks
SUBSURFACE DRAINAGE SYSTEMS	
1. Holes and Cracks in Swales, Catch Basin	4
2. Plugging of Drainage Inlets	4
3. Sediment Build-Up or Debris in Catch Basin	4
4. Structural Failure of Catch Basin	4

Condition/Remarks Key:

4 = Satisfactory

3 = Slight (Continue Observing)

2 = Moderate (Needs Scheduled Maintenance/Repair)

1 = Poor (Needs Immediate Maintenance/Repair)

Recommendations for maintenance or repair (attach additional sheets as needed):

NONE

(1) Refer to Table 3.3-2 of the OM&M Plan for frequency based on magnitude and distance from the site.

(2) For heavy rains exceeding 1.0 inches (per USEPA's letter dated December 6, 1999) within a 24 hour period

DEL AMO WASTE PITS OU

SECURITY FENCE INSPECTION FORM

Completed By: IY

Title: PM

Sheet 7 of 11

Date: 8/21/13

Time: 13:00

Type of Inspection (check only one):

(X) Quarterly ( ) After Seismic Event[1] ( ) After Heavy Rain[2]

( ) Other (explain) _____

Item Description	Condition/Remarks
Perimeter Fence	
1. Breaks and Holes	4
2. Settlement Damage	4
3. Loose Posts/Tension	4
4. Rust/Corrosion	4
5. Ruts and Burrows Beneath Fence	4
6. Vegetation Overgrowth	4
7. General Signs of Deterioration	4
8. Vandalism/Animal/Wind Damage	4
Gates	
9. Adequate Movement of Hinges and Gates	4
10. Proper Function of Lock(s)	4

DEL AMO WASTE PITS OU

SECURITY FENCE INSPECTION FORM

Sheet 8 of 11
Date: 8/21/13

Condition/Remarks Key:
4 = Satisfactory
3 = Slight (Continue Observing)
2 = Moderate (Needs Scheduled Maintenance/Repair)
1 = Poor (Needs Immediate Maintenance/Repair)

Recommendations for maintenance or repair (attach additional sheets as needed):

NONE

(1) Refer to Table 3.3-2 of the OM&M Plan for frequency based on magnitude and distance from the Waste Pits OU.

(2) For heavy rains exceeding 1.0 inches (per USEPA's letter dated December 6, 1999) within a 24-hour period.

DEL AMO WASTE PITS OU

ACCESS ROAD INSPECTION FORM

Completed By: IY

Title: PM

Sheet 9 of 11

Date: 8/21/13

Time: 13:00

Type of Inspection (check only one):

(X) Quarterly ( ) After Seismic Event[1] ( ) After Heavy Rain[2]

( ) Other (explain) _____

Item Description	Condition/Remarks
Access Road	
1. Holes and Cracks	4
2. Vegetation Overgrowth	4
3. Settlement	4
4. Excessive Dispersion of Gravel	3
5. General Signs of Deterioration	4

Condition/Remarks Key:

4 = Satisfactory

3 = Slight (Continue Observing)

2 = Moderate (Needs Scheduled Maintenance/Repair)

1 = Poor (Needs Immediate Maintenance/Repair)

Recommendations for maintenance or repair (attach additional sheets as needed):

4. Regular sweeping back onto site due to subcontractor traffic from pipeline work on WM property.

(1) Refer to Table 3.3-2 of the OM&M Plan for frequency based on magnitude and distance from the site.

(2) For heavy rains exceeding 1.0 inches (per USEPA's letter dated December 6, 1999) within a 24-hour period.

DEL AMO WASTE PITS OU

SVE/IBT SYSTEM INSPECTION FORM

Completed By: IY

Title: PM

Sheet 10 of 11

Date: 8/21/13

Time: 13:00

Type of Inspection (check only one):

(X) Quarterly ( ) After Seismic Event[1] ( ) After Heavy Rain[2]

( ) Other (explain) _____

Manifold	Condition/Remarks
1. Adequate-Free Movement	4
2. Seals - Complete	4
3. Visible Damage	4
4. Sniff for signs of leaks	4
Condensate Collection[3]	
5. Air Moisture Separator	4
Additional System Components	
6. Carbon Adsorber Vessels	
- Exterior Damage	4
- Vessel Configuration (A-B or B-A)	4
7. Blowers	
- General Motor Maintenance	4
- Drive Maintenance	4
- Bearing Maintenance	4
8. Oxygen Generator	
- Signs of Rust/Corrosion	4
- Mechanical Functioning	4
- Oxygen Purity	4

DEL AMO WASTE PITS OU
SVE/IBT SYSTEM INSPECTION FORM

Sheet 11 of 11
Date: 8/21/13

9.	System Sensors	
	- Visible Damage	4
	- Mechanical Functioning	2
10.	SVE Wellheads[4]	
	- Tee Flanges	4
	- Valves	4
	- Sniff for signs of leaks	4

Condition/Remarks Key:
4 = Satisfactory
3 = Slight (Continue Observing)
2 = Moderate (Needs Scheduled Maintenance/Repair)
1 = Poor (Needs Immediate Maintenance/Repair)

Recommendations for maintenance or repair (attach additional sheets as needed):

9. Some sensors at manufacturer for repair. Once received, will be re-installed and tested for adequate performance.

(1) Refer to Table 3.3-2 of the OM&M Plan for frequency based on magnitude and distance from the site.
(2) For heavy rains exceeding 1.0 inches (per USEPA's letter dated December 6, 1999) within a 24 hour period.
(3) Condensate collected from (1) moisture separator (2) conveyance piping, and (3) from the carbon absorber vessels must be characterized to determine methods of appropriate disposal.
(4) Tee flanges monitored for leaks using a PID.

DEL AMO WASTE PITS OU

COVER SYSTEM INSPECTION FORM

Completed By: SM

Title: PE

Sheet 1 of 11

Date: 12/28/2013

Time: 10 AM.

Type of Inspection (check only one):

(✓) Quarterly ( ) After Seismic Event[1] ( ) After Heavy Rain[2]

( ) Other (explain) _____

Item Description		Condition/Remarks
1.	Erosion	4
2.	Stressed Vegetation (Plant Die-Back)	3
3.	Sediment Build-Up	4
4.	Local Subsidence or Loss of Grade	4
5.	Water Ponding	4
6.	Turf Height	4
7.	Burrowing Animals	3
8.	Weeds or Undesirable Vegetation	4
9.	Evidence of Fires or Vandalism	4
10.	Soil Quality Check	4
11.	Unauthorized Traffic	4
12.	Slope Instability or Sloughing	4
13.	Survey Monuments	4
14.	Vertical Cracking	4
15.	Intrusions	4
16.	Evidence of Waste Pit Materials	4

DEL AMO WASTE PITS OU

COVER SYSTEM INSPECTION FORM

Sheet 2 of 11
Date: 12/18/2013

Condition/Remarks Key:
4 = Satisfactory
3 = Slight (Continue Observing)
2 = Moderate (Needs Scheduled Mainteuance/Repair)
1 = Poor (Needs Immediate Maintenance/Repair)

Recommendations for maintenance or repair (attach additional sheets as needed):

(1) Refer to Table 3.3-2 of the OM&M Plan for frequency based on magnitude and distance from the Waste Pits OU.

(2) For heavy rains exceeding 1.0 inches (per USEPA's letter dated December 6, 1999) within a 24-hour period.

DEL AMO WASTE PITS OU

CAP GAS COLLECTION AND TREATMENT INSPECTION FORM

Completed By: SM

Title: PE

Sheet 3 of 11

Date: 12/18/2013

Time: 10AM

Type of Inspection (check only one):

(✓) Quarterly ( ) After Seismic Event[1] ( ) After Heavy Rain[2]

( ) Other (explain) _____

Collection System Valves	Condition/Remarks
1. Adequate-Free Movement	4
2. Seals - Complete	4
3. Signs of Rust/Corrosion	3
Condensate Collection[3]	
4. Air Moisture Separator	4
Carbon Adsorbers	
5. Vessels	
- Exterior Damage	4
- FRP Grating and Mesh	4
Heavy Equipment	
6. Blower	
- General Motor Maintenance	3
- Drive Maintenance	3
- Bearing Maintenance	3
- Lubrication	3
- Structural Maintenance	3

DEL AMO WASTE PITS OU

CAP GAS COLLECTION AND TREATMENT INSPECTION FORM

Sheet 4 of 11

Date: 12/18/2013

Condition/Remarks Key:

4 = Satisfactory

3 = Slight (Continue Observing)

2 = Moderate (Needs Scheduled Maintenance/Repair)

1 = Poor (Needs Immediate Maintenance/Repair)

Recommendations for maintenance or repair (attach additional sheets as needed):

(1) Refer to Table 3.3-2 of the OM&M Plan for frequency based on magnitude and distance from the site.

(2) For heavy rains exceeding 1.0 inches (per USEPA's letter dated December 6, 1999) within a 24-hour period.

(3) Initial condensate collected from the air moisture separator must be characterized to determine methods of appropriate disposal.

DEL AMO WASTE PITS OU

SURFACE WATER DRAINAGE INSPECTION FORM

Completed By: SM

Title: P.E

Sheet 5 of 11

Date: 12/18/2013

Time: 10 AM

Type of Inspection (check only one):

(✓) Quarterly ( ) After Seismic Event[1] ( ) After Heavy Rain[2]

( ) Other (explain)_____

Item Description	Condition*/Remarks
SURFACE-WATER DRAINAGE SYSTEMS	
1. Washouts or Erosion of Contoured Grade	4
2. Ponding on Contoured Grade	4
3. Gullies and Ruts on Contoured Grade	4
4. Plugging of Drainage Culverts	4
5. Holes and Cracks in Swales or Catch Basins	4
6. Sediment Build-Up in Swales or Catch Basin	4
7. Surface Cracking of Swales/Catch Basins	4
8. Spalling of Swales/Catch Basins	4
9. Structural Failure of Swales/Catch Basins	4

Condition/Remarks Key:

4 = Satisfactory

3 = Slight (Continue Observing)

2 = Moderate (Needs Scheduled Maintenance/Repair)

1 = Poor (Needs Immediate Maintenance/Repair)

Recommendations for maintenance or repair (attach additional sheets as needed):

(1) Refer to Table 3.3-2 of the OM&M Plan for frequency based on magnitude and distance from the site.

(2) For heavy rains exceeding 1.0 inches (per USEPA's letter dated December 6, 1999) within a 24 hour period.

DEL AMO WASTE PITS OU

SUBSURFACE WATER DRAINAGE INSPECTION FORM

Completed By: SM

Title: PE

Sheet 6 of 11

Date: 12/18/2013

Time: 10 AM

Type of Inspection (check only one):

(✓) Quarterly ( ) After Seismic Event[1] ( ) After Heavy Rain[2]

( ) Other (explain) _____

Item Description	Condition/Remarks
SUBSURFACE DRAINAGE SYSTEMS	
1. Holes and Cracks in Swales, Catch Basin	4
2. Plugging of Drainage Inlets	4
3. Sediment Build-Up or Debris in Catch Basin	4
4. Structural Failure of Catch Basin	4

Condition/Remarks Key:

4 = Satisfactory

3 = Slight (Continue Observing)

2 = Moderate (Needs Scheduled Maintenance/Repair)

1 = Poor (Needs Immediate Maintenance/Repair)

Recommendations for maintenance or repair (attach additional sheets as needed):

(1) Refer to Table 3.3-2 of the OM&M Plan for frequency based on magnitude and distance from the site.

(2) For heavy rains exceeding 1.0 inches (per USEPA's letter dated December 6, 1999) within a 24 hour period

DEL AMO WASTE PITS OU

SECURITY FENCE INSPECTION FORM

Completed By: SM

Title: Pce

Sheet 7 of 11

Date: 12/19/2013

Time: 10 AM

Type of Inspection (check only one):

(✓) Quarterly ( ) After Seismic Event[1] ( ) After Heavy Rain[2]

( ) Other (explain) _____

Item Description	Condition/Remarks
Perimeter Fence	
1. Breaks and Holes	4
2. Settlement Damage	4
3. Loose Posts/Tension	4
4. Rust/Corrosion	4
5. Ruts and Burrows Beneath Fence	4
6. Vegetation Overgrowth	4
7. General Signs of Deterioration	4
8. Vandalism/Animal/Wind Damage	4
Gates	
9. Adequate Movement of Hinges and Gates	4
10. Proper Function of Lock(s)	4

DEL AMO WASTE PITS OU

SECURITY FENCE INSPECTION FORM

Sheet 8 of 11
Date: 12/18/2013

Condition/Remarks Key:
4 = Satisfactory
3 = Slight (Continue Observing)
2 = Moderate (Needs Scheduled Maintenance/Repair)
1 = Poor (Needs Immediate Maintenance/Repair)

Recommendations for maintenance or repair (attach additional sheets as needed):

(1) Refer to Table 3.3-2 of the OM&M Plan for frequency based on magnitude and distance from the Waste Pits OU.

(2) For heavy rains exceeding 1.0 inches (per USEPA's letter dated December 6, 1999) within a 24-hour period.

DEL AMO WASTE PITS OU

ACCESS ROAD INSPECTION FORM

Completed By: SM

Title: PE

Sheet 9 of 11

Date: 12/18/2013

Time: 10AM

Type of Inspection (check only one):

(✓) Quarterly ( ) After Seismic Event[1] ( ) After Heavy Rain[2]

( ) Other (explain) _____

Item Description	Condition/Remarks
Access Road	
1. Holes and Cracks	4
2. Vegetation Overgrowth	4
3. Settlement	4
4. Excessive Dispersion of Gravel	4
5. General Signs of Deterioration	4

Condition/Remarks Key:

4 = Satisfactory

3 = Slight (Continue Observing)

2 = Moderate (Needs Scheduled Maintenance/Repair)

1 = Poor (Needs Immediate Maintenance/Repair)

Recommendations for maintenance or repair (attach additional sheets as needed):

(1) Refer to Table 3.3-2 of the OM&M Plan for frequency based on magnitude and distance from the site.

(2) For heavy rains exceeding 1.0 inches (per USEPA's letter dated December 6, 1999) within a 24-hour period.

DEL AMO WASTE PITS OU

SVE/IBT SYSTEM INSPECTION FORM

Completed By: SM

Title: PO

Sheet 10 of 11

Date: 12/18/2013

Time: 10 AM

Type of Inspection (check only one):

(✓) Quarterly ( ) After Seismic Event[1] ( ) After Heavy Rain[2]

( ) Other (explain) _____

Manifold	Condition/Remarks
1. Adequate-Free Movement	4
2. Seals - Complete	4
3. Visible Damage	4
4. Sniff for signs of leaks	4
Condensate Collection[3]	
5. Air Moisture Separator	4
Additional System Components	
6. Carbon Adsorber Vessels	
- Exterior Damage	4
- Vessel Configuration (A-B or B-A)	A - B
7. Blowers	
- General Motor Maintenance	4
- Drive Maintenance	4
- Bearing Maintenance	4
8. Oxygen Generator	
- Signs of Rust/Corrosion	4
- Mechanical Functioning	4
- Oxygen Purity	4

DEL AMO WASTE PITS OU
SVE/IBT SYSTEM INSPECTION FORM

Sheet 11 of 11
Date: 12/18/2013

9.	System Sensors	
	- Visible Damage	4
	- Mechanical Functioning	4
10.	SVE Wellheads[4]	
	- Tee Flanges	4
	- Valves	4
	- Sniff for signs of leaks	4

Condition/Remarks Key:
4 = Satisfactory
3 = Slight (Continue Observing)
2 = Moderate (Needs Scheduled Maintenance/Repair)
1 = Poor (Needs Immediate Maintenance/Repair)

Recommendations for maintenance or repair (attach additional sheets as needed):

(1) Refer to Table 3.3-2 of the OM&M Plan for frequency based on magnitude and distance from the site.
(2) For heavy rains exceeding 1.0 inches (per USEPA's letter dated December 6, 1999) within a 24 hour period.
(3) Condensate collected from (1) moisture separator (2) conveyance piping, and (3) from the carbon absorber vessels must be characterized to determine methods of appropriate disposal.
(4) Tee flanges monitored for leaks using a PID.

APPENDIX G

GROUNDWATER FIELD DATA SHEETS

BBC ENVIRONMENTAL, INC.
3593 Adams Avenue, San Diego, CA 92116

September 12, 2013

Mr. Ian Yusko
C_2REM
2382-B SE Bristol Street
Newport Beach, Ca 92660
Via Email: Mr. Ian Yusko < IYusko@C2rem.com >

RE: TRANSMITTAL OF THE GROUNDWATER SAMPLING FIELD DATA SHEETS FOR THE SEPTEMBER 2013 GROUNDWATER SAMPLING EVENT PERFORMED AT THE DEL AMO WASTE PITS LOCATED IN TORRANCE, CA.

Mr. Yusko:

Please find enclosed the field data sheets from the third quarter 2013 groundwater monitoring and sampling event performed by BBC Environmental, Inc. at the above referenced location on September 11th, 2013.

Should you have any questions with regards to this project, please do not hesitate to contact me directly at (619) 546-7165.

Thank you,
BBC ENVIRONMENTAL, INC.

Stephen Jeltema
Environmental Scientist

Enclosures(2): Groundwater Gauging Sheet dated September 11, 2013
Groundwater Sampling Field Data Sheets dated September 11, 2013

Del Amo Waste Pits
20245 S. Vermont Avenue
Torrance, CA

Date: 9/11/2013
Time: 0800-1315
Technician: SMJ / WBC

Well I.D.	DTP (ft)	DTW (ft)	Previous DTP (ft)	Previous DTW (ft)	Total Depth (ft)	Sampling Time	Well Box Description	Survey Point	Comments
PZL 0018	ND	44.28	ND	43.62	68.0	840	M/D 2-3/4"	BM @ TOC	2" Well Casing
PZL 0019	ND	46.59	ND	50.11	65.4	1330	M/D 2-3/4"	BM @ TOC	2" Well Casing
PZL 0020	ND	46.59	ND	46.02	67.8	1248	E/W 2-15/16"	TOC to N	2" Well Casing
PZL 0022	ND	44.13	ND	43.49	62.0	1058	Monument	BM @ TOC	2" Well Casing
PZL 0024	ND	46.06	ND	45.45	--	1031	Monument	BM @ TOC	
PZL 0025	ND	48.80	ND	48.11	--	1222	Monument	TOC to N	
SWL 0008	ND	42.10	ND	41.43	60.8	944	DWP - Allen Bolts	TOC to N	
SWL 0044	ND	47.54	ND	46.51	67.4	950	Monument	Notch @ TOC	No Lock / No Locking Lid
SWL 0051	ND	37.81	ND	37.15	57.2	845	E/W 2-15/16"	TOC to N	
XMW 29	ND	49.46	ND	48.84	73.2	1335	DWP - Phillips Head	TOC to N	Watch for Aggressive Dogs
XP 02	ND	45.84	ND	45.02	76.4	1130	DWP - Allen Bolts	BM @ TOC	

NOTES: TOC = Top of Casing, BM = Black Mark
Equipment Blank: Collected at End of Day
Duplicate: Dup-1 @ SWL0044; Dup-2 PZL0020

XMW-29 Located North of Powerlines, Approx 40 ft NE of NE Leg of Tower 1033F

GROUNDWATER SAMPLING FIELD DATA SHEET

Client, SS# Del Amo Waste Pits Location 20245 S. Vermont Ave. Torrance, CA Project # Del Amo.4	☐ Monitoring Only ☐ Free Product Pump out Only ☑ Monitoring and Sampling ☐
BBC Personnel Onsite / Times Contractor Personnel / Times	S.Jeltema / W.Craig Ar. 0700 /Dep. 1430 CZREM - Seamus Shinta, Clara Ar. 0650 /Dep. unk Ar. — /Dep. —
Monitoring Times / Order Purging Times / Order Sampling Times / Order	0800-1315 (SWJ) SWL0051, 0008, PZL0024, 0022, 0025, 0020, 0019 See Sheets / (WBR) PZL0018, SWL0014, XP02, XMW29 See Sheets
Monitoring Equipment	☑ Interface Probe (Sol / Her / ORS) ☐ Water Level Meter ☐ Hanna _____(pH/Cond/Temp/ORP) ☐ Orion (Cond) ☒ ~~In-Situ Troll Flow Cell~~ Horiba Multi Parameter ☐ Hach (Turb) ☐ ICM- Dissolved Oxygen Meter _____
Purging Method/ Equipment	☐ Bailer ☑ Pump (Type:Grundfos) ☐ Bladder Pump ☐ Borehole Vol. ☑ Casing Vol. ☐ Low Flow ☐ Non-Purge
Borehole Volume:	BV(Gal) = 0.041 [CD^2 + P (BD^2 – CD^2)](WC) P = Assumed Porosity of 0.25
Casing Volume Multiplier	2" (0.17) 4" (0.65) 6" (1.5)
Purge Volume Readings	☑ Flow Meter ☐ Graduated Container
Decon Method	☑ 3 Stage ☐ Other ( )
Field Duplicate Collected From	
Purge Water Destination	☐ Barrels On-Site (# of ___) ☑ AST On-Site ☐ Sanitary Sewer (Permit #) ☐ Treatment Facility ( )
Notes / Comments	
Total Volume Purged This Event: ~349.6 gallons	
Total Volume Purged (~~2011~~ 2013): ~349.6 gallons	
Well Repair	
Signature [signature]	Date 09-11-13 Page 1 of

GROUNDWATER SAMPLING FIELD DATA SHEET

Client, SS# Del Amo Waste Pits | **Well #** PZL0018 | **Sampled By** SMJ/WBC

Well Information | Well Survey Point: BM @ TOC

Casing Material: PVC | Casing Diameter (in.)(CD): 2"
Constructed Well Depth (ft): 68.0 | Borehole Diameter (in.)(BD): 8"
Measured Well Depth (ft): ND | Casing Vol: 4.3 | Borehole Vol: —
Depth to Product (ft): ND | Actual Purge Volume: 17.2 (Gal)
Depth to Water (ft) (DTW): 44.28 | Product / Water Removed: — / — (Gal)
Water Column (ft) (WC): 23.72 | Color Of Product: —

Well Box Type and Location | ☐ Emco Wheaton ☐ Pomeco ☒ M/D ☐ Vault (____)
☐ DWP (Steel / Alum.) ☐ Alhambra ☐ Monument Box Location: IN ADJ FIELD @ NORTHERN FENCE LINE

Well Box Security | # of Bolts 2 ☐ 7/16" ☐ 1/2" ☐ 9/16" ☐ 5/8" ☒ 3/4" ☐ 5/16" ☐
# of Bolts Broken Off — # of Bolts Missing — ☑ Cap ☐ Lock No Lock

Ext. Seal Condition | ☐ Good ☐ Fair ☐ Poor (____) ☑ Cracked ☐ None

Crown Height | ☐ Good ☐ Fair ☐ Poor (____) ☐ Depressed
☑ None (IN OPEN FIELD) ☐ Not Applicable (Monument Box)

Time	Volume (Gal)	Temp (°C)	pH	Cond (µMhos)	Turb-idity	D.O. (mg/L)	Color/ HC Odor	ORP
0813	ϕ	20.57	7.44	2320	3.3	10.06	CLEAR	120
0818	4.3	20.86	7.04	2350	0.1	7.92	"	54
0823	8.6	21.02	7.00	2340	0.1	7.93	"	37
0829	12.9	21.16	6.97	2370	0.1	6.00	CLEAR	16
0833	15.1	21.27	6.96	2390	0.1	5.67	"	15
0835	17.2	21.25	6.95	2400	0.1	5.40	"	15
0835	Stopped Purging							

Pumping Rate ~0.8 GPM | 80% Recharge 49.02 | Sample Time 0840
Max Drawdown 47.37 | Recovery Depth 47.37 @ 0835 | Field Duplicate Y / N

Notes:
Recovery Rate: FAST
Hz 225 Replaced Cap ☐ Replaced Lock ☐

Signature W. B. Clarke | Date 09-11-13 | Page of

GROUNDWATER SAMPLING FIELD DATA SHEET

Client, SS# Del Amo Waste Pits | **Well #** PZL0019 | **Sampled By** SMJ/WBC

Well Information Well Survey Point BM @ TOC

Casing Material PVC — Casing Diameter (in.)(CD) 2"

Constructed Well Depth (ft) 65.4 — Borehole Diameter (in.)(BD) 8"

Measured Well Depth (ft) — — Casing Vol 32 — Borehole Vol ----------

Depth to Product (ft) ND — Actual Purge Volume 96 (Gal)

Depth to Water (ft) (DTW) 46.59 — Product / Water Removed — / — (Gal)

Water Column (ft) (WC) 18.81 — Color Of Product —

Well Box Type and Location ☐ Emco Wheaton ☐ Pomeco ☒ M/D ☐ Vault (_____)

☐ DWP (Steel / Alum.) ☐ Alhambra ☐ Monument Box Location: _____

Well Box Security # of Bolts 3 ☐ 7/16" ☐ 1/2" ☐ 9/16" ☐ 5/8" ☒ 3/4" ☐ 5/16" ☐ _____

# of Bolts Broken Off Ø # of Bolts Missing Ø ☒ Cap ☐ Lock no lock

Ext. Seal Condition ☒ Good ☐ Fair ☐ Poor (_____) ☐ Cracked ☐ None

Crown Height ☒ Good ☐ Fair ☐ Poor (_____) ☐ Depressed

☐ None (_____) ☐ Not Applicable (Monument Box)

Time	Volume (Gal)	Temp (°C)	pH	Cond (µMhos)	Turb-idity	D.O. (mg/L)	Color/ HC Odor
1316	Ø	24.14	6.47	5890	120	7.64	clear/brown
1319	32	24.87	6.39	6000	(50) 310 ~~[illegible]~~	6.97	" / "
1323	64	26.83	6.56	5930	34.7	5.23	" / "
1326	96	26.91	6.55	5940	35.2	5.10	" / "
1326	96	Stopped Purging					

Pumping Rate 0.9 GPM | 80% Recharge 50.35 | Sample Time 1330

Max Drawdown — | Recovery Depth 47.19 @ 1330 | Field Duplicate Y / (N)

Notes:

Recovery Rate: Fast

Hz 215 / 285 Replaced Cap ☐ Replaced Lock ☐

Signature [signature] | Date 09- 11 -13 | Page of

GROUNDWATER SAMPLING FIELD DATA SHEET

Client, SS# Del Amo Waste Pits | **Well #** PZL0020 | **Sampled By** SMJ/WBC

Well Information | Well Survey Point: BM @ TOC

Casing Material: PVC | Casing Diameter (in.)(CD): 2"
Constructed Well Depth (ft): 68.0 | Borehole Diameter (in.)(BD): 8"
Measured Well Depth (ft): 67.7 | Casing Vol: 36 | Borehole Vol: ——
Depth to Product (ft): ND | Actual Purge Volume: 14.5 (Gal)
Depth to Water (ft) (DTW): 46.59 | Product / Water Removed: — / — (Gal)
Water Column (ft) (WC): 21.11 | Color Of Product: ——

Well Box Type and Location | ☒ Emco Wheaton ☐ Pomeco ☐ M/D ☐ Vault (____)
☐ DWP (Steel / Alum.) ☐ Alhambra ☐ Monument Box Location: ——

Well Box Security | # of Bolts 2 ☐ 7/16" ☐ 1/2" ☐ 9/16" ☐ 5/8" ☐ 3/4" ☒ 15/16" ☐ ——
# of Bolts Broken Off Ø # of Bolts Missing Ø ☒ Cap ☐ Lock no lock

Ext. Seal Condition | ☒ Good ☐ Fair ☐ Poor (____) ☐ Cracked ☐ None

Crown Height | ☒ Good ☐ Fair ☐ Poor (____) ☐ Depressed
☐ None (____) ☐ Not Applicable (Monument Box)

Time	Volume (Gal)	Temp (°C)	pH	Cond (µMhos)	Turb-idity	D.O. (mg/L)	Color/ HC Odor
1237	Ø	22.83	6.63	3480	68.8	8.73	clear/strong
1240	3.6	22.81	6.60	3660	10.3	7.12	" / "
1242	7.2	22.18	6.57	5500	9.6	7.15	" / "
1244	10.8	22.22	6.56	5540	8.4	6.36	" / "
1246	14.5	22.25	6.55	5560	8.7	6.20	" / "
1246	14.5	Stopped Pumping					

Pumping Rate 4.6 GPM | 80% Recharge 5081 | Sample Time 1248
Max Drawdown — | Recovery Depth 46.61 @ 1248 | Field Duplicate (Y) (N)

Notes: Duplicate (Dup-2) Taken
Recovery Rate: Fast
Hz 205 Replaced Cap ☐ Replaced Lock ☐

Signature [signature] | Date 09-11-13 | Page of

GROUNDWATER SAMPLING FIELD DATA SHEET

Client, SS# Del Amo Waste Pits | **Well #** PZL0022 | **Sampled By** SMJ/WBC

Well Information Well Survey Point BM @ TOC

Casing Material PVC
Casing Diameter (in.)(CD) 2"
Constructed Well Depth (ft) 62.0
Borehole Diameter (in.)(BD) 8"
Measured Well Depth (ft) NP
Casing Vol 3.0 Borehole Vol ---
Depth to Product (ft) ND
Actual Purge Volume 9.1 (Gal)
Depth to Water (ft) (DTW) 44.13
Product / Water Removed - / - (Gal)
Water Column (ft) (WC) 17.87
Color Of Product -

Well Box Type and Location ☐ Emco Wheaton ☐ Pomeco ☐ M/D ☐ Vault (_____)
☐ DWP (Steel / Alum.) ☐ Alhambra ☒ Monument Box Location: _____

Well Box Security # of Bolts Ø ☐ 7/16" ☐ 1/2" ☐ 9/16" ☐ 5/8" ☐ 3/4" ☐ 5/16" ☐ ____
# of Bolts Broken Off Ø # of Bolts Missing Ø ☒ Cap ☒ Lock

Ext. Seal Condition ☒ Good ☐ Fair ☐ Poor (_____) ☐ Cracked ☐ None

Crown Height ☒ Good ☐ Fair ☐ Poor (_____) ☐ Depressed
☐ None (_____) ☐ Not Applicable (Monument Box)

Time	Volume (Gal)	Temp (°C)	pH	Cond (µMhos)	Turb-idity	D.O. (mg/L)	Color/ HC Odor
1048	Ø	21.65	6.76	2250	19.2	3.73	clear/none
1050	3.0	21.07	6.75	2430	21.0	5.34	" / "
1052	6.1	20.37	6.69	2500	10.1	4.89	" / "
1055	9.1	20.36	6.67	2510	7.1	4.59	" / "
1055	9.1	Stopped Purging					

Pumping Rate 4.13 GPM | 80% Recharge 47.70 | Sample Time 1058

Max Drawdown — | Recovery Depth 44.23 @ 1058 | Field Duplicate Y / N

Notes: Well in Row of 3 Monuments - Middle
Recovery Rate: Fast
Hz 165 Replaced Cap ☐ Replaced Lock ☐

Signature [signature] | Date 09-11-13 | Page of

GROUNDWATER SAMPLING FIELD DATA SHEET

Client, SS# Del Amo Waste Pits | **Well #** PZL0024 | **Sampled By** SMJ/WBC

Well Information | Well Survey Point BM @ TOC

Casing Material PVC | Casing Diameter (in.)(CD) 4"
Constructed Well Depth (ft) 65.0 | Borehole Diameter (in.)(BD) 10"
Measured Well Depth (ft) 68.2 | Casing Vol 14.4 | Borehole Vol ----------
Depth to Product (ft) ND | Actual Purge Volume 43.2 (Gal)
Depth to Water (ft) (DTW) 46.06 | Product / Water Removed — / — (Gal)
Water Column (ft) (WC) 22.14 | Color Of Product —

Well Box Type and Location ☐ Emco Wheaton ☐ Pomeco ☐ M/D ☐ Vault (_____)
☐ DWP (Steel / Alum.) ☐ Alhambra ☒ Monument Box Location:

Well Box Security # of Bolts Ø ☐ 7/16" ☐ 1/2" ☐ 9/16" ☐ 5/8" ☐ 3/4" ☐ 5/16" ☐
# of Bolts Broken Off Ø # of Bolts Missing Ø ☒ Cap ☒ Lock

Ext. Seal Condition ☒ Good ☐ Fair ☐ Poor (_____) ☐ Cracked ☐ None

Crown Height ☒ Good ☐ Fair ☐ Poor (_____) ☐ Depressed
☐ None (_____) ☐ Not Applicable (Monument Box)

Time	Volume (Gal)	Temp (°C)	pH	Cond (µMhos)	Turb-idity	D.O. (mg/L)	Color/ HC Odor
1006	Ø	19.54	6.93	2130	30.8	10.05	clear/none
1015	14.4	19.81	6.80	2110	25.2	7.37	" / "
1022	28.8	20.05	6.79	2110	23.9	7.12	" / "
1028	43.2	20.10	6.77	2110	23.4	7.00	" / "
1028	43.2	Stopped Purging					

Pumping Rate ~20 GPM | 80% Recharge 50.48 | Sample Time 1031
Max Drawdown — | Recovery Depth 46.71 @ 1031 | Field Duplicate Y / N

Notes: Occasional Ground faults → text ok
Recovery Rate: Fast
Hz 205 1205 Replaced Cap ☐ Replaced Lock ☐

Signature [signature] | Date 09-11-13 | Page of

GROUNDWATER SAMPLING FIELD DATA SHEET

Client, SS# Del Amo Waste Pits | **Well #** PZL0025 | **Sampled By** SMJ/WBC

Well Information	Well Survey Point	BM @ TOC	
Casing Material	PVC	Casing Diameter (in.)(CD)	4"
Constructed Well Depth (ft)	NP	Borehole Diameter (in.)(BD)	10"
Measured Well Depth (ft)	67.5	Casing Vol 12.2	Borehole Vol —
Depth to Product (ft)	ND	Actual Purge Volume	36.5 (Gal)
Depth to Water (ft) (DTW)	48.80	Product / Water Removed	— / — (Gal)
Water Column (ft) (WC)	18.70	Color Of Product	

Well Box Type and Location ☐ Emco Wheaton ☐ Pomeco ☐ M/D ☐ Vault (_____)

☐ DWP (Steel / Alum.) ☐ Alhambra ☒ Monument Box Location: _____

Well Box Security # of Bolts Ø ☐ 7/16" ☐ 1/2" ☐ 9/16" ☐ 5/8" ☐ 3/4" ☐ 5/16" ☐ ____

# of Bolts Broken Off Ø # of Bolts Missing Ø ☑ Cap ☑ Lock

Ext. Seal Condition ☑ Good ☐ Fair ☐ Poor (_____) ☐ Cracked ☐ None

Crown Height ☑ Good ☐ Fair ☐ Poor (_____) ☐ Depressed

☐ None (_____) ☐ Not Applicable (Monument Box)

Time	Volume (Gal)	Temp (°C)	pH	Cond (µMhos)	Turb-idity	D.O. (mg/L)	Color/ HC Odor
~~1147~~ 1155	Ø	22.43	6.98	3750	111	7.34	Gray/Slight
1204	12.2	22.52	7.01	3750	46.5	7.34	Clear/None
1211	24.3	22.16	6.74	3220	36.1	5.92	" / "
1219	36.5	21.98	6.71	3210	32.9	5.54	" / "
1219	36.5	Stopped Purging					
			Sampled w/ Disp. Bailer				

Pumping Rate 4.5 GPM	80% Recharge 52.54	Sample Time 1222
Max Drawdown —	Recovery Depth 51.98 @ 1222	Field Duplicate Y / N

Notes: Used DDC Pump - Pump Not operational - Ground fault
↳ Heavy Deposits on Pump → Impellers good

Recovery Rate: Fast

Hz 285 Replaced Cap ☐ Replaced Lock ☐

Signature	Date 09-11-13	Page of

GROUNDWATER SAMPLING FIELD DATA SHEET

Client, SS# Del Amo Waste Pits | **Well #** SWL0008 | **Sampled By** SMJ/WBC

Well Information Well Survey Point TOC to N

Casing Material PVC — Casing Diameter (in.)(CD) 4"

Constructed Well Depth (ft) NP — Borehole Diameter (in.)(BD) 10"

Measured Well Depth (ft) 60.8 — Casing Vol 12.1 — Borehole Vol ---

Depth to Product (ft) ND — Actual Purge Volume 36.5 (Gal)

Depth to Water (ft) (DTW) 42.10 — Product / Water Removed — / — (Gal)

Water Column (ft) (WC) 18.70 — Color Of Product —

Well Box Type and Location ☐ Emco Wheaton ☐ Pomeco ☐ M/D ☐ Vault (____)

☒ DWP (Steel / Alum.) ☐ Alhambra ☐ Monument Box Location:

Well Box Security # of Bolts 2 ☐ 7/16" ☐ 1/2" ☐ 9/16" ☐ 5/8" ☒ 3/4" ☐ 5/16" ☒ Allen

# of Bolts Broken Off Ø # of Bolts Missing 1 ☒ Cap ☐ Lock no lock - [illegible]

Ext. Seal Condition ☐ Good ☒ Fair ☐ Poor (____) ☐ Cracked ☐ None

Crown Height ☐ Good ☒ Fair ☐ Poor (____) ☐ Depressed

☐ None (____) ☐ Not Applicable (Monument Box)

Time	Volume (Gal)	Temp (°C)	pH	Cond (µMhos)	Turb-idity	D.O. (mg/L)	Color/ HC Odor
0923	Ø	19.81	6.94	2230	12.2	5.73	clear/slight
0929	12.1	19.97	6.89	2260	11.1	5.00	" / "
0936	24.3	20.27	6.90	2280	12.1	3.52	" / "
0941	36.5	20.31	6.91	2270	9.5	3.60	" / "
0941	36.5	Stopped Purging					

Pumping Rate 2.0 GPM | 80% Recharge 45.84 | Sample Time 0944

Max Drawdown — | Recovery Depth 43.12 @ 0944 | Field Duplicate Y / N

Notes: Access granted by AECOM Const. Wkers/Trenching being Performed in Vicinity of Well.

Recovery Rate:

Hz 195 / 205 — Replaced Cap ☐ Replaced Lock ☐

Signature [signature] | Date 09-11-13 | Page of

GROUNDWATER SAMPLING FIELD DATA SHEET

Client, SS# Del Amo Waste Pits | **Well #** SWL0044 | **Sampled By** SMJ/WBC

Well Information | Well Survey Point NOTCH @ TOC

Casing Material PVC | Casing Diameter (in.)(CD) 4"
Constructed Well Depth (ft) 65.5 | Borehole Diameter (in.)(BD) 10"
Measured Well Depth (ft) 67.4 | Casing Vol 12.9 | Borehole Vol ———
Depth to Product (ft) ND | Actual Purge Volume 38.7 (Gal)
Depth to Water (ft) (DTW) 47.54 | Product / Water Removed — / — (Gal)
Water Column (ft) (WC) 19.86 | Color Of Product —

Well Box Type and Location ☐ Emco Wheaton ☐ Pomeco ☐ M/D ☐ Vault (_____)
☐ DWP (Steel / Alum.) ☐ Alhambra ☒ Monument Box Location: _____

Well Box Security # of Bolts ϕ ☐ 7/16" ☐ 1/2" ☐ 9/16" ☐ 5/8" ☐ 3/4" ☐ 5/16" ☐ ____
# of Bolts Broken Off — # of Bolts Missing — ☑ Cap ☑ Lock

Ext. Seal Condition ☐ Good ☑ Fair ☐ Poor (_____) ☐ Cracked ☐ None

Crown Height ☐ Good ☐ Fair ☐ Poor (_____) ☐ Depressed
☐ None (_____) ☑ Not Applicable (Monument Box)

Time	Volume (Gal)	Temp (°C)	pH	Cond (µMhos)	Turb-idity	D.O. (mg/L)	Color/ HC Odor	ORP
0908	ϕ	21.24	6.86	2130	0.3	1.04	CLEAR	40
0921	12.9	21.95	6.85	2000	0.1	0.68	"	-2
0933	25.8	22.08	6.85	1960	0.1	0.56	"	-24
0946	38.7	22.12	6.84	1970	0.1	0.50	"	-29
0946	38.7	Stopped	Purgeable					

Pumping Rate ≈1.1 GPM | 80% Recharge 51.51 | Sample Time 0950
Max Drawdown 47.97 | Recovery Depth 47.97 @ 0946 | Field Duplicate (Y) N

Notes: MS/MSD Collected
Field Dup Collected
Recovery Rate: FAST
Hz 255 Replaced Cap ☐ Replaced Lock ☐

Signature D. B. Cee | Date 09-11-13 | Page of

GROUNDWATER SAMPLING FIELD DATA SHEET

Client, SS# Del Amo Waste Pits | **Well #** SWL0051 | **Sampled By** SMJ/WBC

Well Information | Well Survey Point TOC to N

Casing Material PVC | Casing Diameter (in.)(CD) 4"

Constructed Well Depth (ft) NP | Borehole Diameter (in.)(BD) 10"

Measured Well Depth (ft) 57.2 | Casing Vol 12.6 | Borehole Vol ---

Depth to Product (ft) ND | Actual Purge Volume 37.8 (Gal)

Depth to Water (ft) (DTW) 37.81 | Product / Water Removed — / — (Gal)

Water Column (ft) (WC) 19.39 | Color Of Product —

Well Box Type and Location | ☒ Emco Wheaton ☐ Pomeco ☐ M/D ☐ Vault (_____)

☐ DWP (Steel / Alum.) ☐ Alhambra ☐ Monument Box Location:

Well Box Security | # of Bolts 2 ☐ 7/16" ☐ 1/2" ☐ 9/16" ☐ 5/8" ☐ 3/4" ☒ 15/16" ☐

# of Bolts Broken Off 0 | # of Bolts Missing 0 | ☒ Cap ☐ Lock no lock

Ext. Seal Condition | ☒ Good ☐ Fair ☐ Poor (_____) ☐ Cracked ☐ None

Crown Height | ☒ Good ☐ Fair ☐ Poor (_____) ☐ Depressed

☐ None (_____) ☐ Not Applicable (Monument Box)

Time	Volume (Gal)	Temp (°C)	pH	Cond (µMhos)	Turb-idity	D.O. (mg/L)	Color/ HC Odor
0819	0	19.84	7.18	2040	21.8	0.24	Clear/none
0824	12.6	20.20	7.03	2030	14.9	5.33	" / "
0830	25.2	20.22	7.01	2030	17.3	4.52	" / "
0836	37.8	20.17	7.00	2040	16.8	4.39	" / "
0836	37.8	Stopped Purging					

Pumping Rate 4.2 GPM | 80% Recharge 41.68 | Sample Time 0845

Max Drawdown — | Recovery Depth 41.68 @ 0845 | Field Duplicate Y / (N)

Notes: Red Dye observed on Probe

Recovery Rate: Fast

Hz 225 | Replaced Cap ☐ Replaced Lock ☐

Signature [signature] | Date 09-11-13 | Page of

GROUNDWATER SAMPLING FIELD DATA SHEET

Client, SS# Del Amo Waste Pits | **Well #** XMW-29 | **Sampled By** SMJ/WBC

Well Information Well Survey Point TOC to N

Casing Material PVC — Casing Diameter (in.)(CD) 4"

Constructed Well Depth (ft) 75.0 — Borehole Diameter (in.)(BD) 10"

Measured Well Depth (ft) 73.2 — Casing Vol 15.4 — Borehole Vol ---

Depth to Product (ft) ND — Actual Purge Volume 46.5 (Gal)

Depth to Water (ft) (DTW) 49.46 — Product / Water Removed — / — (Gal)

Water Column (ft) (WC) 23.74 — Color Of Product —

Well Box Type and Location ☐ Emco Wheaton ☐ Pomeco ☐ M/D ☐ Vault (____)

☒ DWP (Steel / Alum.) ☐ Alhambra ☐ Monument Box Location: ADJ to Pump Ind Tower

Well Box Security # of Bolts 2 ☐ 7/16" ☐ 1/2" ☐ 9/16" ☐ 5/8" ☒ 1/4" ☐ 5/16" ☒ Allen

# of Bolts Broken Off — # of Bolts Missing — ☐ Cap ☐ Lock No Cap / No Lock

Ext. Seal Condition ☐ Good ☑ Fair ☐ Poor (____) ☐ Cracked ☐ None

Crown Height ☐ Good ☑ Fair ☐ Poor (____) ☐ Depressed

☐ None (____) ☐ Not Applicable (Monument Box)

Time	Volume (Gal)	Temp (°C)	pH	Cond (µMhos)	Turb-idity	D.O. (mg/L)	Color/ HC Odor	ORP
1235	ϕ	23.69	6.81	1900	1.6	2.39	CLEAR	-82
1249	15.4	24.05	6.84	1970	4.0	1.19	"	-100
1306	30.8	24.86	6.80	1920	11.7	0.57	"	-115
1320	46.2	24.60	6.80	1920	6.5	0.48	"	-110
1320	46.5	Stopped Purging						

Pumping Rate ~1.0 GPM | 80% Recharge 54.20 | Sample Time 1335

Max Drawdown 63.53 | Recovery Depth 54.00 @ 1334 | Field Duplicate Y / (N)

Notes:

Recovery Rate: FAST

Hz 185 ↑ 195 Replaced Cap ☐ Replaced Lock ☐

Signature W.B. Cook | Date 09-11-13 | Page of

GROUNDWATER SAMPLING FIELD DATA SHEET

Client, SS# Del Amo Waste Pits | **Well #** XP-02 | **Sampled By** SMJ/WBC

Well Information | Well Survey Point TOC to N

Casing Material PVC | Casing Diameter (in.)(CD) 4"

Constructed Well Depth (ft) NP | Borehole Diameter (in.)(BD) 10"

Measured Well Depth (ft) 76.4 | Casing Vol 19.9 | Borehole Vol ——

Depth to Product (ft) ND | Actual Purge Volume 60.0 (Gal)

Depth to Water (ft) (DTW) 45.84 | Product / Water Removed — / — (Gal)

Water Column (ft) (WC) 30.56 | Color Of Product —

Well Box Type and Location ☐ Emco Wheaton ☐ Pomeco ☐ M/D ☐ Vault (_____)

☒ DWP (Steel / Alum.) ☐ Alhambra ☐ Monument Box Location: _____

Well Box Security # of Bolts 2 ☐ 7/16" ☐ 1/2" ☐ 9/16" ☐ 5/8" ☒ 3/4" ☐ 5/16" ☒ Allen

# of Bolts Broken Off — # of Bolts Missing — ☑ Cap ☐ Lock NO LOCK

Ext. Seal Condition ☐ Good ☑ Fair ☐ Poor (_____) ☐ Cracked ☐ None

Crown Height ☐ Good ☐ Fair ☑ Poor (ASPHALT OVERLAY SINCE INSTALL) ☐ Depressed

☐ None (_____) ☐ Not Applicable (Monument Box)

Time	Volume (Gal)	Temp (°C)	pH	Cond (µMhos)	Turb-idity	D.O. (mg/L)	Color/ HC Odor	ORP
1057	ϕ	22.79	7.06	1290	2.5	1.75	CLEAR	-20
1105	19.9	21.92	7.01	1020	9.7	0.98	CLEAR	41
1114	39.8	21.79	6.98	1040	6.6	1.89	"	42
1124	59.7	21.88	6.98	1030	4.7	1.72	"	39
1124	60.0	STOPPED PURGE						

Pumping Rate ~2.2 GPM | 80% Recharge 51.95 | Sample Time 1130

Max Drawdown 55.55 | Recovery Depth 49.58 @ 1128 | Field Duplicate Y / N

Notes: PORTABLE RFII USED

Recovery Rate: FAST

Hz 225 ↓ 205 Replaced Cap ☐ Replaced Lock ☐

Signature W. B. Cleep | Date 09-11-13 | Page of

APPENDIX H

GROUNDWATER LABORATORY RESULTS
(VIA CD-ROM)

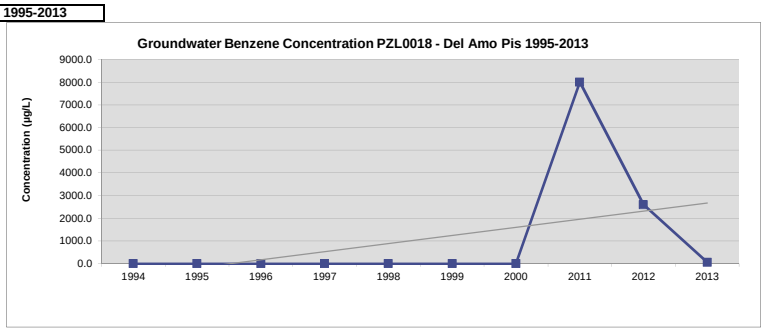
APPENDIX I

GROUNDWATER
MANN-KENDALL ANALYSIS

Appendix I
Mann-Kendall 1995-2013
Del Amo Waste Pits

Graph Title: **Groundwater Benzene Concentration PZL0018 - Del Amo Pis 1995-2013**

y-axis title:	Concentration (µg/L)
1994	**0.63**
1995	**0.50**
1996	**0.68**
1997	**0.50**
1998	**0.27**
1999	**0.53**
2000	**1.40**
2011	**8000.00**
2012	**2600.00**
2013	**61.00**



n=number of time periods
n= **10**

Subtract each earlier year from each later year

year J:		1994	1995	1996	1997	1998	1999	2000	2011	2012	2013		
year K:		0.6	0.5	0.7	0.5	0.3	0.5	1.4	8000.0	2600.0	61.0	# +	# -
1994	0.6		-0.13	0.05	-0.13	-0.36	-0.10	0.77	7999.37	2599.37	60.37	5.00	4.00
1995	0.5			0.18	0.00	-0.23	0.03	0.90	7999.50	2599.50	60.50	6.00	1.00
1996	0.7				-0.18	-0.41	-0.15	0.72	7999.32	2599.32	60.32	4.00	3.00
1997	0.5					-0.23	0.03	0.90	7999.50	2599.50	60.50	5.00	1.00
1998	0.3						0.26	1.13	7999.73	2599.73	60.73	5.00	0.00
1999	0.5							0.87	7999.47	2599.47	60.47	4.00	0.00
2000	1.4								7998.60	2598.60	59.60	3.00	0.00
2011	8000.0									-5400.00	-7939.00	0.00	2.00
2012	2600.0										-2539.00	0.00	1.00
2013	61.0												
# ties (diff=0):		0	0	0	1	0	0	0	0	0	0	32.00	12.00

S=	32.00	minus	12.00
S=	**20.00**		

If n>=10, then use the variance calculation to estimate probability.
If n<10, then use the table, below. Note: a significant p value is not possible with fewer than 4 time periods.
n>=5 is required to reach p<.05.

# Positive diffs	32.00
# Negative diffs	12.00
S	20.00

Evaluation (Normal Approximation, N>=10)

Variance(S)	125	=(n(n-1))(2n+5)/18) This formula may be conservative in the presence of tied values.
Z_S	1.70	
$Z_{crit,.05}$	1.96	(two-tailed. For one-tailed test use 1.65)
Interpretation	**No Trend**	

Evaluation (Lookup Table for Fewer Than 10 Years)
If S>=S-crit, then reject H0

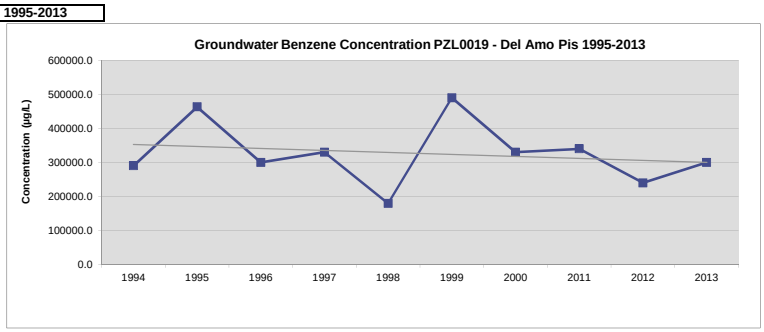
	S-crit (p<.05)	
# Years	1-tailed	2-tailed
4	6	
5	8	10
6	11	13
7	13	15
8	16	18
9	18	20
10	21	23

Appendix I
Mann-Kendall 1995-2013
Del Amo Waste Pits

Graph Title: **Groundwater Benzene Concentration PZL0019 - Del Amo Pis 1995-2013**

y-axis title:	Concentration (µg/L)
1994	**290333.33**
1995	**463333.33**
1996	**300000.00**
1997	**330000.00**
1998	**180000.00**
1999	**490000.00**
2000	**330000.00**
2011	**340000.00**
2012	**240000.00**
2013	**300000.00**

n=number of time periods
n= **10**



Subtract each earlier year from each later year

	year J:	1994	1995	1996	1997	1998	1999	2000	2011	2012	2013		
year K:		290333.3	463333.3	300000.0	330000.0	180000.0	490000.0	330000.0	340000.0	240000.0	300000.0	# +	# -
1994	290333.3		173000.00	9666.67	39666.67	-110333.33	199666.67	39666.67	49666.67	-50333.33	9666.67	7.00	2.00
1995	463333.3			-163333.33	-133333.33	-283333.33	26666.67	-133333.33	-123333.33	-223333.33	-163333.33	1.00	7.00
1996	300000.0				30000.00	-120000.00	190000.00	30000.00	40000.00	-60000.00	0.00	4.00	2.00
1997	330000.0					-150000.00	160000.00	0.00	10000.00	-90000.00	-30000.00	2.00	3.00
1998	180000.0						310000.00	150000.00	160000.00	60000.00	120000.00	5.00	0.00
1999	490000.0							-160000.00	-150000.00	-250000.00	-190000.00	0.00	4.00
2000	330000.0								10000.00	-90000.00	-30000.00	1.00	2.00
2011	340000.0									-100000.00	-40000.00	0.00	2.00
2012	240000.0										60000.00	1.00	0.00
2013	300000.0												
	# ties (diff=0):	0	0	0	0	0	0	1	0	0	1	21.00	22.00

S= 21.00 minus 22.00
S= -1.00

If n>=10, then use the variance calculation to estimate probability.
If n<10, then use the table, below. Note: a significant p value is not possible with fewer than 4 time periods.
n>=5 is required to reach p<.05.

# Positive diffs	21.00
# Negative diffs	22.00
S	-1.00

Evaluation (Normal Approximation, N>=10)

Variance(S)	125	=(n(n-1))(2n+5)/18) This formula may be conservative in the presence of tied values.
Z_S	0.00	
$Z_{crit,.05}$	1.96	(two-tailed. For one-tailed test use 1.65)
Interpretation	**No Trend**	

Evaluation (Lookup Table for Fewer Than 10 Years)
If S>=S-crit, then reject H0

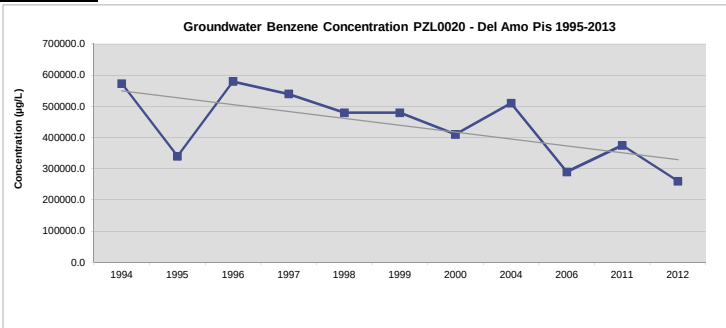
	S-crit (p<.05)	
# Years	1-tailed	2-tailed
4	6	
5	8	10
6	11	13
7	13	15
8	16	18
9	18	20
10	21	23

Appendix I
Mann-Kendall 1995-2013
Del Amo Waste Pits

Graph Title: **Groundwater Benzene Concentration PZL0020 - Del Amo Pis 1995-2013**

y-axis title:	Concentration (µg/L)
1994	**573333.33**
1995	**340000.00**
1996	**580000.00**
1997	**540000.00**
1998	**480000.00**
1999	**480000.00**
2000	**410000.00**
2004	**510000.00**
2006	**290000.00**
2011	**375000.00**
2012	**260000.00**
2013	**400000.00**

n=number of time periods
n= **12**



Subtract each earlier year from each later year

	year J:	1994	1995	1996	1997	1998	1999	2000	2004	2006	2011	2012	2013		
year K:		573333.3	340000.0	580000.0	540000.0	480000.0	480000.0	410000.0	510000.0	290000.0	375000.0	260000.0	400000.0	# +	# -
1994	573333.3		-233333.33	6666.67	-33333.33	-93333.33	-93333.33	-163333.33	-63333.33	-283333.33	-198333.33	-313333.33	-173333.33	1.00	10.00
1995	340000.0			240000.00	200000.00	140000.00	140000.00	70000.00	170000.00	-50000.00	35000.00	-80000.00	60000.00	8.00	2.00
1996	580000.0				-40000.00	-100000.00	-100000.00	-170000.00	-70000.00	-290000.00	-205000.00	-320000.00	-180000.00	0.00	9.00
1997	540000.0					-60000.00	-60000.00	-130000.00	-30000.00	-250000.00	-165000.00	-280000.00	-140000.00	0.00	8.00
1998	480000.0						0.00	-70000.00	30000.00	-190000.00	-105000.00	-220000.00	-80000.00	1.00	5.00
1999	480000.0							-70000.00	30000.00	-190000.00	-105000.00	-220000.00	-80000.00	1.00	5.00
2000	410000.0								100000.00	-120000.00	-35000.00	-150000.00	-10000.00	1.00	4.00
2004	510000.0									-220000.00	-135000.00	-250000.00	-110000.00	0.00	4.00
2006	290000.0										85000.00	-30000.00	110000.00	2.00	1.00
2011	375000.0											-115000.00	25000.00	1.00	1.00
2012	260000.0												140000.00	1.00	0.00
2013	400000.0														
	# ties (diff=0):	0	0	0	0	0	1	0	0	0	0	0	0	16.00	49.00

S= 16.00 minus 49.00
S= -33.00

If n>=10, then use the variance calculation to estimate probability.
If n<10, then use the table, below. Note: a significant p value is not possible with fewer than 4 time periods.
n>=5 is required to reach p<.05.

# Positive diffs	16.00
# Negative diffs	49.00
S	-33.00

Evaluation (Normal Approximation, N>=10)

Variance(S)	212.6666667	=(n(n-1))(2n+5)/18) This formula may be conservative in the presence of tied values.
Z_S	-2.19	
$Z_{crit,.05}$	1.96	(two-tailed. For one-tailed test use 1.65)
Interpretation	**Sig. Decreasing**	

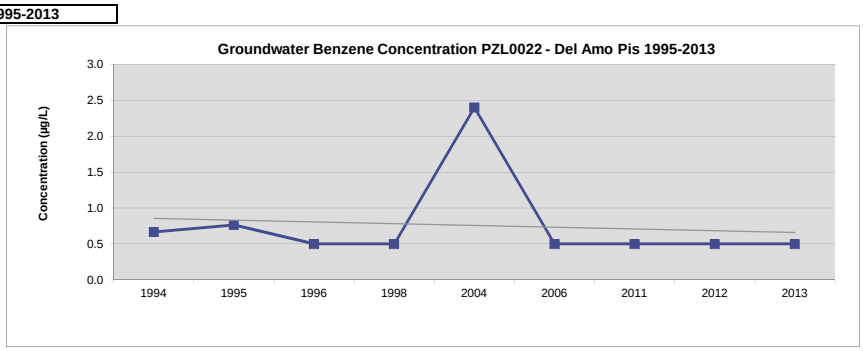
Evaluation (Lookup Table for Fewer Than 10 Years)
If S>=S-crit, then reject H0

	S-crit (p<.05)	
# Years	1-tailed	2-tailed
4	6	
5	8	10
6	11	13
7	13	15
8	16	18
9	18	20
10	21	23

Appendix I
Mann-Kendall 1995-2013
Del Amo Waste Pits

Graph Title: **Groundwater Benzene Concentration PZL0022 - Del Amo Pis 1995-2013**

y-axis title:	Concentration (µg/L)
1994	**0.67**
1995	**0.77**
1996	**0.50**
1998	**0.50**
2004	**2.40**
2006	**0.50**
2011	**0.50**
2012	**0.50**
2013	**0.50**



n=number of time periods
n= 9

Subtract each earlier year from each later year

	year J:	1994	1995	1996	1998	2004	2006	2011	2012	2013		
year K:		0.7	0.8	0.5	0.5	2.4	0.5	0.5	0.5	0.5	# +	# -
1994	0.7		0.10	-0.17	-0.17	1.73	-0.17	-0.17	-0.17	-0.17	2.00	6.00
1995	0.8			-0.27	-0.27	1.63	-0.27	-0.27	-0.27	-0.27	1.00	6.00
1996	0.5				0.00	1.90	0.00	0.00	0.00	0.00	1.00	0.00
1998	0.5					1.90	0.00	0.00	0.00	0.00	1.00	0.00
2004	2.4						-1.90	-1.90	-1.90	-1.90	0.00	4.00
2006	0.5							0.00	0.00	0.00	0.00	0.00
2011	0.5								0.00	0.00	0.00	0.00
2012	0.5									0.00	0.00	0.00
2013	0.5											
	# ties (diff=0):	0	0	0	1	0	2	3	4	5	5.00	16.00

S= 5.00 minus 16.00
S= -11.00

If n>=10, then use the variance calculation to estimate probability.
If n<10, then use the table, below. Note: a significant p value is not possible with fewer than 4 time periods.
n>=5 is required to reach p<.05.

# Positive diffs	5.00
# Negative diffs	16.00
S	-11.00

Evaluation (Normal Approximation, N>=10)

Variance(S)	92	=(n(n-1))(2n+5)/18) This formula may be conservative in the presence of tied values.
Z_S	-1.04	
$Z_{crit,.05}$	1.96	(two-tailed. For one-tailed test use 1.65)
Interpretation	**No Trend**	

Evaluation (Lookup Table for Fewer Than 10 Years)
If S>=S-crit, then reject H0

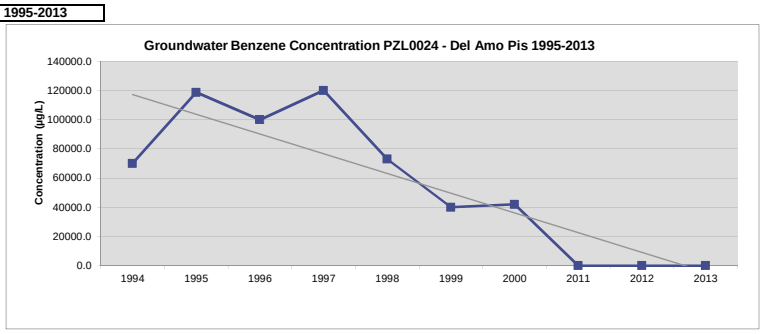
	S-crit (p<.05)	
# Years	1-tailed	2-tailed
4	6	
5	8	10
6	11	13
7	13	15
8	16	18
9	18	20
10	21	23

Appendix I
Mann-Kendall 1995-2013
Del Amo Waste Pits

Graph Title: **Groundwater Benzene Concentration PZL0024 - Del Amo Pis 1995-2013**

y-axis title:	Concentration (µg/L)
1994	**70000.00**
1995	**118666.67**
1996	**100000.00**
1997	**120000.00**
1998	**73000.00**
1999	**40000.00**
2000	**42000.00**
2011	**0.50**
2012	**0.50**
2013	**0.50**

n=number of time periods
n= **10**



Subtract each earlier year from each later year

	year J:	1994	1995	1996	1997	1998	1999	2000	2011	2012	2013		
year K:		70000.0	118666.7	100000.0	120000.0	73000.0	40000.0	42000.0	0.5	0.5	0.5	# +	# -
1994	70000.0		48666.67	30000.00	50000.00	3000.00	-30000.00	-28000.00	-69999.50	-69999.50	-69999.50	4.00	5.00
1995	118666.7			-18666.67	1333.33	-45666.67	-78666.67	-76666.67	-118666.17	-118666.17	-118666.17	1.00	7.00
1996	100000.0				20000.00	-27000.00	-60000.00	-58000.00	-99999.50	-99999.50	-99999.50	1.00	6.00
1997	120000.0					-47000.00	-80000.00	-78000.00	-119999.50	-119999.50	-119999.50	0.00	6.00
1998	73000.0						-33000.00	-31000.00	-72999.50	-72999.50	-72999.50	0.00	5.00
1999	40000.0							2000.00	-39999.50	-39999.50	-39999.50	1.00	3.00
2000	42000.0								-41999.50	-41999.50	-41999.50	0.00	3.00
2011	0.5									0.00	0.00	0.00	0.00
2012	0.5										0.00	0.00	0.00
2013	0.5												
	# ties (diff=0):	0	0	0	0	0	0	0	0	1	2	7.00	35.00

S= 7.00 minus 35.00
S= -28.00

If n>=10, then use the variance calculation to estimate probability.
If n<10, then use the table, below. Note: a significant p value is not possible with fewer than 4 time periods.
n>=5 is required to reach p<.05.

# Positive diffs	7.00
# Negative diffs	35.00
S	-28.00

Evaluation (Normal Approximation, N>=10)

Variance(S)	125	=(n(n-1))(2n+5)/18 This formula may be conservative in the presence of tied values.
Z_S	-2.41	
$Z_{crit,.05}$	1.96	(two-tailed. For one-tailed test use 1.65)
Interpretation	**Sig. Decreasing**	

Evaluation (Lookup Table for Fewer Than 10 Years)
If S>=S-crit, then reject H0

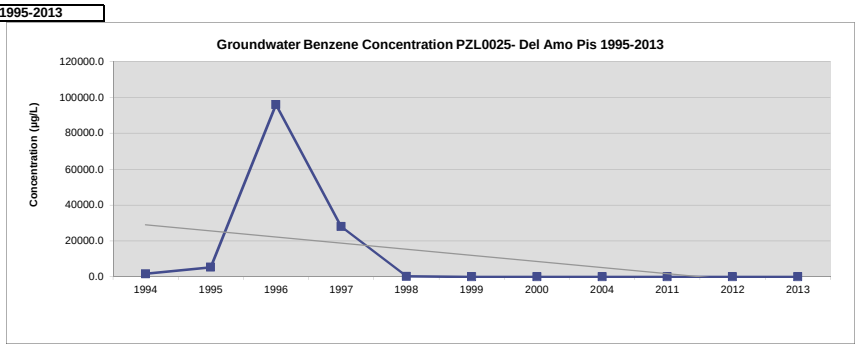
	S-crit (p<.05)	
# Years	1-tailed	2-tailed
4	6	
5	8	10
6	11	13
7	13	15
8	16	18
9	18	20
10	21	23

Appendix I
Mann-Kendall 1995-2013
Del Amo Waste Pits

Graph Title: **Groundwater Benzene Concentration PZL0025- Del Amo Pis 1995-2013**

y-axis title:	Concentration (µg/L)
1994	**1733.33**
1995	**5366.67**
1996	**96000.00**
1997	**28000.00**
1998	**330.00**
1999	**12.00**
2000	**1.00**
2004	**1.50**
2011	**0.54**
2012	**0.50**
2013	**0.50**

n=number of time periods
n= **11**



Subtract each earlier year from each later year

year J:		1994	1995	1996	1997	1998	1999	2000	2004	2011	2012	2013		
year K:		1733.3	5366.7	96000.0	28000.0	330.0	12.0	1.0	1.5	0.5	0.5	0.5	# +	# -
1994	1733.3		3633.33	94266.67	26266.67	-1403.33	-1721.33	-1732.33	-1731.83	-1732.79	-1732.83	-1732.83	3.00	7.00
1995	5366.7			90633.33	22633.33	-5036.67	-5354.67	-5365.67	-5365.17	-5366.12	-5366.17	-5366.17	2.00	7.00
1996	96000.0				-68000.00	-95670.00	-95988.00	-95999.00	-95998.50	-95999.46	-95999.50	-95999.50	0.00	8.00
1997	28000.0					-27670.00	-27988.00	-27999.00	-27998.50	-27999.46	-27999.50	-27999.50	0.00	7.00
1998	330.0						-318.00	-329.00	-328.50	-329.46	-329.50	-329.50	0.00	6.00
1999	12.0							-11.00	-10.50	-11.46	-11.50	-11.50	0.00	5.00
2000	1.0								0.50	-0.46	-0.50	-0.50	1.00	3.00
2004	1.5									-0.96	-1.00	-1.00	0.00	3.00
2011	0.5										-0.04	-0.04	0.00	2.00
2012	0.5											0.00	0.00	0.00
2013	0.5													
	# ties (diff=0):	0	0	0	0	0	0	0	0	0	0	1	6.00	48.00

S= 6.00 minus 48.00
S= -42.00

If n>=10, then use the variance calculation to estimate probability.
If n<10, then use the table, below. Note: a significant p value is not possible with fewer than 4 time periods.
n>=5 is required to reach p<.05.

# Positive diffs	6.00
# Negative diffs	48.00
S	-42.00

Evaluation (Normal Approximation, N>=10)

Variance(S)	165	=(n(n-1))(2n+5)/18) This formula may be conservative in the presence of tied values.
Z_S	-3.19	
$Z_{crit,.05}$	1.96	(two-tailed. For one-tailed test use 1.65)
Interpretation	**Sig. Decreasing**	

Evaluation (Lookup Table for Fewer Than 10 Years)
If S>=S-crit, then reject H0

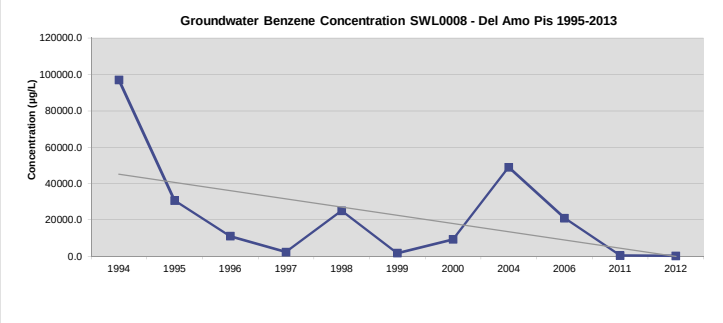
	S-crit (p<.05)	
# Years	1-tailed	2-tailed
4	6	
5	8	10
6	11	13
7	13	15
8	16	18
9	18	20
10	21	23

Appendix I
Mann-Kendall 1995-2013
Del Amo Waste Pits

Graph Title: **Groundwater Benzene Concentration SWL0008 - Del Amo Pis 1995-2013**

y-axis title:	Concentration (µg/L)
1994	**97000.00**
1995	**30666.67**
1996	**11000.00**
1997	**2300.00**
1998	**25000.00**
1999	**1700.00**
2000	**9300.00**
2004	**49000.00**
2006	**21000.00**
2011	**335.50**
2012	**220.00**
2013	**77.00**

n=number of time periods
n= **12**



Subtract each earlier year from each later year

	year J:	1994	1995	1996	1997	1998	1999	2000	2004	2006	2011	2012	2013		
year K:		97000.0	30666.7	11000.0	2300.0	25000.0	1700.0	9300.0	49000.0	21000.0	335.5	220.0	77.0	# +	# -
1994	97000.0		-66333.33	-86000.00	-94700.00	-72000.00	-95300.00	-87700.00	-48000.00	-76000.00	-96664.50	-96780.00	-96923.00	0.00	11.00
1995	30666.7			-19666.67	-28366.67	-5666.67	-28966.67	-21366.67	18333.33	-9666.67	-30331.17	-30446.67	-30589.67	1.00	9.00
1996	11000.0				-8700.00	14000.00	-9300.00	-1700.00	38000.00	10000.00	-10664.50	-10780.00	-10923.00	3.00	6.00
1997	2300.0					22700.00	-600.00	7000.00	46700.00	18700.00	-1964.50	-2080.00	-2223.00	4.00	4.00
1998	25000.0						-23300.00	-15700.00	24000.00	-4000.00	-24664.50	-24780.00	-24923.00	1.00	6.00
1999	1700.0							7600.00	47300.00	19300.00	-1364.50	-1480.00	-1623.00	3.00	3.00
2000	9300.0								39700.00	11700.00	-8964.50	-9080.00	-9223.00	2.00	3.00
2004	49000.0									-28000.00	-48664.50	-48780.00	-48923.00	0.00	4.00
2006	21000.0										-20664.50	-20780.00	-20923.00	0.00	3.00
2011	335.5											-115.50	-258.50	0.00	2.00
2012	220.0												-143.00	0.00	1.00
2013	77.0														
# ties (diff=0):		0	0	0	0	0	0	0	0	0	0	0	0	14.00	52.00

S= 14.00 minus 52.00
S= -38.00

If n>=10, then use the variance calculation to estimate probability.
If n<10, then use the table, below. Note: a significant p value is not possible with fewer than 4 time periods.
n>=5 is required to reach p<.05.

# Positive diffs	14.00
# Negative diffs	52.00
S	-38.00

Evaluation (Normal Approximation, N>=10)

Variance(S)	212.6666667	=(n(n-1)(2n+5)/18) This formula may be conservative in the presence of tied values.
Z_S	-2.54	
$Z_{crit,.05}$	1.96	(two-tailed. For one-tailed test use 1.65)
Interpretation	**Sig. Decreasing**	

Evaluation (Lookup Table for Fewer Than 10 Years)
If S>=S-crit, then reject H0

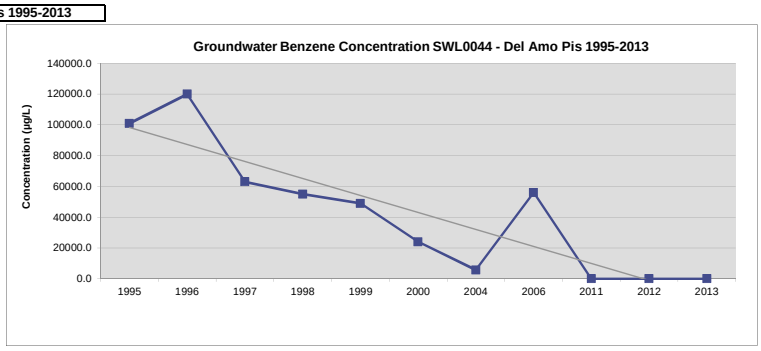
	S-crit (p<.05)	
# Years	1-tailed	2-tailed
4	6	
5	8	10
6	11	13
7	13	15
8	16	18
9	18	20
10	21	23

Appendix I
Mann-Kendall 1995-2013
Del Amo Waste Pits

Graph Title: **Groundwater Benzene Concentration SWL0044 - Del Amo Pis 1995-2013**

y-axis title:	Concentration (µg/L)
1995	**101000.00**
1996	**120000.00**
1997	**63000.00**
1998	**55000.00**
1999	**49000.00**
2000	**24000.00**
2004	**5700.00**
2006	**56000.00**
2011	**20.90**
2012	**0.50**
2013	**1.20**

n=number of time periods
n= **11**



Subtract each earlier year from each later year

	year J:	1995	1996	1997	1998	1999	2000	2004	2006	2011	2012	2013		
year K:		101000.0	120000.0	63000.0	55000.0	49000.0	24000.0	5700.0	56000.0	20.9	0.5	1.2	# +	# -
1995	101000.0		19000.00	-38000.00	-46000.00	-52000.00	-77000.00	-95300.00	-45000.00	-100979.10	-100999.50	-100998.80	1.00	9.00
1996	120000.0			-57000.00	-65000.00	-71000.00	-96000.00	-114300.00	-64000.00	-119979.10	-119999.50	-119998.80	0.00	9.00
1997	63000.0				-8000.00	-14000.00	-39000.00	-57300.00	-7000.00	-62979.10	-62999.50	-62998.80	0.00	8.00
1998	55000.0					-6000.00	-31000.00	-49300.00	1000.00	-54979.10	-54999.50	-54998.80	1.00	6.00
1999	49000.0						-25000.00	-43300.00	7000.00	-48979.10	-48999.50	-48998.80	1.00	5.00
2000	24000.0							-18300.00	32000.00	-23979.10	-23999.50	-23998.80	1.00	4.00
2004	5700.0								50300.00	-5679.10	-5699.50	-5698.80	1.00	3.00
2006	56000.0									-55979.10	-55999.50	-55998.80	0.00	3.00
2011	20.9										-20.40	-19.70	0.00	2.00
2012	0.5											0.70	1.00	0.00
2013	1.2													
	# ties (diff=0):	0	0	0	0	0	0	0	0	0	0	0	6.00	49.00

S= 6.00 minus 49.00
S= -43.00

If n>=10, then use the variance calculation to estimate probability.
If n<10, then use the table, below. Note: a significant p value is not possible with fewer than 4 time periods.
n>=5 is required to reach p<.05.

# Positive diffs	6.00
# Negative diffs	49.00
S	-43.00

Evaluation (Normal Approximation, N>=10)

Variance(S)	165	=(n(n-1))(2n+5)/18) This formula may be conservative in the presence of tied values.
Z_S	-3.27	
$Z_{crit,.05}$	1.96	(two-tailed. For one-tailed test use 1.65)
Interpretation	**Sig. Decreasing**	

Evaluation (Lookup Table for Fewer Than 10 Years)
If S>=S-crit, then reject H0

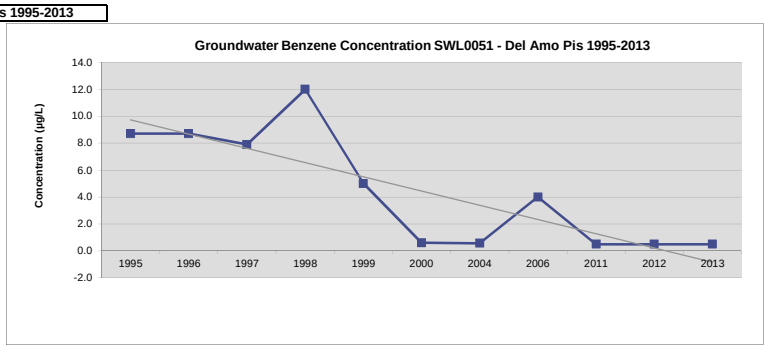
	S-crit (p<.05)	
# Years	1-tailed	2-tailed
4	6	
5	8	10
6	11	13
7	13	15
8	16	18
9	18	20
10	21	23

Appendix I
Mann-Kendall 1995-2013
Del Amo Waste Pits

Graph Title: **Groundwater Benzene Concentration SWL0051 - Del Amo Pis 1995-2013**

y-axis title:	Concentration (µg/L)
1995	**8.70**
1996	**8.70**
1997	**7.90**
1998	**12.00**
1999	**5.00**
2000	**0.61**
2004	**0.57**
2006	**4.00**
2011	**0.50**
2012	**0.50**
2013	**0.50**

n=number of time periods
n= **11**



Subtract each earlier year from each later year

year J:		1995	1996	1997	1998	1999	2000	2004	2006	2011	2012	2013		
year K:		8.7	8.7	7.9	12.0	5.0	0.6	0.6	4.0	0.5	0.5	0.5	# +	# -
1995	8.7		0.00	-0.80	3.30	-3.70	-8.09	-8.13	-4.70	-8.20	-8.20	-8.20	1.00	8.00
1996	8.7			-0.80	3.30	-3.70	-8.09	-8.13	-4.70	-8.20	-8.20	-8.20	1.00	8.00
1997	7.9				4.10	-2.90	-7.29	-7.33	-3.90	-7.40	-7.40	-7.40	1.00	7.00
1998	12.0					-7.00	-11.39	-11.43	-8.00	-11.50	-11.50	-11.50	0.00	7.00
1999	5.0						-4.39	-4.43	-1.00	-4.50	-4.50	-4.50	0.00	6.00
2000	0.6							-0.04	3.39	-0.11	-0.11	-0.11	1.00	4.00
2004	0.6								3.43	-0.07	-0.07	-0.07	1.00	3.00
2006	4.0									-3.50	-3.50	-3.50	0.00	3.00
2011	0.5										0.00	0.00	0.00	0.00
2012	0.5											0.00	0.00	0.00
2013	0.5													
# ties (diff=0):		0	1	0	0	0	0	0	0	0	1	2	5.00	46.00

S= 5.00 minus 46.00
S= -41.00

If n>=10, then use the variance calculation to estimate probability.
If n<10, then use the table, below. Note: a significant p value is not possible with fewer than 4 time periods.
n>=5 is required to reach p<.05.

# Positive diffs	5.00
# Negative diffs	46.00
S	-41.00

Evaluation (Normal Approximation, N>=10)

Variance(S)	165	=(n(n-1))(2n+5)/18) This formula may be conservative in the presence of tied values.
Z_S	-3.11	
$Z_{crit,.05}$	1.96	(two-tailed. For one-tailed test use 1.65)
Interpretation	**Sig. Decreasing**	

Evaluation (Lookup Table for Fewer Than 10 Years)
If S>=S-crit, then reject H0

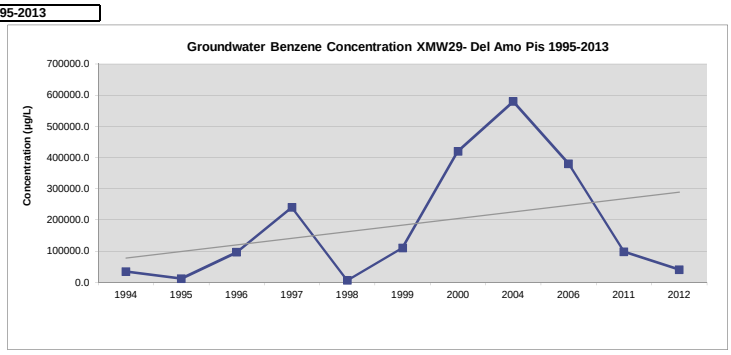
	S-crit (p<.05)	
# Years	1-tailed	2-tailed
4	6	
5	8	10
6	11	13
7	13	15
8	16	18
9	18	20
10	21	23

Appendix I
Mann-Kendall 1995-2013
Del Amo Waste Pits

Graph Title: **Groundwater Benzene Concentration XMW29- Del Amo Pis 1995-2013**

y-axis title:	Concentration (µg/L)
1994	**34000.00**
1995	**11433.33**
1996	**96000.00**
1997	**240000.00**
1998	**5700.00**
1999	**110000.00**
2000	**420000.00**
2004	**580000.00**
2006	**380000.00**
2011	**97500.00**
2012	**40000.00**
2013	**5100.00**

n=number of time periods
n= **12**



Subtract each earlier year from each later year

	year J:	1994	1995	1996	1997	1998	1999	2000	2004	2006	2011	2012	2013		
year K:		34000.0	11433.3	96000.0	240000.0	5700.0	110000.0	420000.0	580000.0	380000.0	97500.0	40000.0	5100.0	# +	# -
1994	34000.0		-22566.67	62000.00	206000.00	-28300.00	76000.00	386000.00	546000.00	346000.00	63500.00	6000.00	-28900.00	8.00	3.00
1995	11433.3			84566.67	228566.67	-5733.33	98566.67	408566.67	568566.67	368566.67	86066.67	28566.67	-6333.33	8.00	2.00
1996	96000.0				144000.00	-90300.00	14000.00	324000.00	484000.00	284000.00	1500.00	-56000.00	-90900.00	6.00	3.00
1997	240000.0					-234300.00	-130000.00	180000.00	340000.00	140000.00	-142500.00	-200000.00	-234900.00	3.00	5.00
1998	5700.0						104300.00	414300.00	574300.00	374300.00	91800.00	34300.00	-600.00	6.00	1.00
1999	110000.0							310000.00	470000.00	270000.00	-12500.00	-70000.00	-104900.00	3.00	3.00
2000	420000.0								160000.00	-40000.00	-322500.00	-380000.00	-414900.00	1.00	4.00
2004	580000.0									-200000.00	-482500.00	-540000.00	-574900.00	0.00	4.00
2006	380000.0										-282500.00	-340000.00	-374900.00	0.00	3.00
2011	97500.0											-57500.00	-92400.00	0.00	2.00
2012	40000.0												-34900.00	0.00	1.00
2013	5100.0														
# ties (diff=0):		0	0	0	0	0	0	0	0	0	0	0	0	35.00	31.00

S= 35.00 minus 31.00
S= 4.00

If n>=10, then use the variance calculation to estimate probability.
If n<10, then use the table, below. Note: a significant p value is not possible with fewer than 4 time periods.
n>=5 is required to reach p<.05.

# Positive diffs	35.00
# Negative diffs	31.00
S	4.00

Evaluation (Normal Approximation, N>=10)

Variance(S)	212.6666667	=(n(n-1)(2n+5)/18) This formula may be conservative in the presence of tied values.
Z_S	0.21	
$Z_{crit,.05}$	1.96	(two-tailed. For one-tailed test use 1.65)
Interpretation	**No Trend**	

Evaluation (Lookup Table for Fewer Than 10 Years)
If S>=S-crit, then reject H0

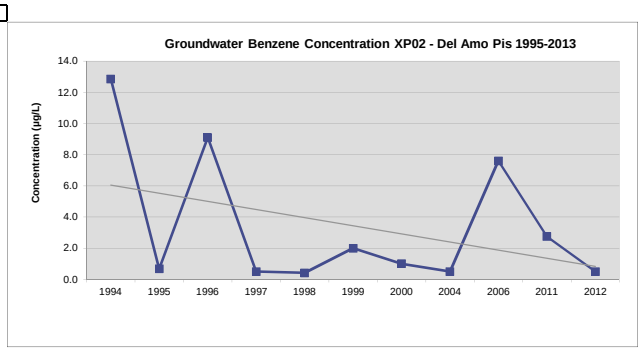
	S-crit (p<.05)	
# Years	1-tailed	2-tailed
4	6	
5	8	10
6	11	13
7	13	15
8	16	18
9	18	20
10	21	23

Appendix I
Mann-Kendall 1995-2013
Del Amo Waste Pits

Graph Title: **Groundwater Benzene Concentration XP02 - Del Amo Pis 1995-2013**

y-axis title:	Concentration (µg/L)
1994	**12.86**
1995	**0.67**
1996	**9.10**
1997	**0.50**
1998	**0.41**
1999	**2.00**
2000	**1.00**
2004	**0.50**
2006	**7.60**
2011	**2.75**
2012	**0.50**
2013	**1.90**

n=number of time periods
n= **12**



Subtract each earlier year from each later year

year J:	1994	1995	1996	1997	1998	1999	2000	2004	2006	2011	2012	2013		
year K:	12.9	0.7	9.1	0.5	0.4	2.0	1.0	0.5	7.6	2.8	0.5	1.9	# +	# -
1994 12.9		-12.19	-3.76	-12.36	-12.45	-10.86	-11.86	-12.36	-5.26	-10.11	-12.36	-10.96	0.00	11.00
1995 0.7			8.43	-0.17	-0.26	1.33	0.33	-0.17	6.93	2.08	-0.17	1.23	6.00	4.00
1996 9.1				-8.60	-8.69	-7.10	-8.10	-8.60	-1.50	-6.35	-8.60	-7.20	0.00	9.00
1997 0.5					-0.09	1.50	0.50	0.00	7.10	2.25	0.00	1.40	5.00	1.00
1998 0.4						1.59	0.59	0.09	7.19	2.34	0.09	1.49	7.00	0.00
1999 2.0							-1.00	-1.50	5.60	0.75	-1.50	-0.10	2.00	4.00
2000 1.0								-0.50	6.60	1.75	-0.50	0.90	3.00	2.00
2004 0.5									7.10	2.25	0.00	1.40	3.00	0.00
2006 7.6										-4.85	-7.10	-5.70	0.00	3.00
2011 2.8											-2.25	-0.85	0.00	2.00
2012 0.5												1.40	1.00	0.00
2013 1.9														
# ties (diff=0):	0	0	0	0	0	0	0	1	0	0	2	0	27.00	36.00

S= 27.00 minus 36.00
S= -9.00

If n>=10, then use the variance calculation to estimate probability.
If n<10, then use the table, below. Note: a significant p value is not possible with fewer than 4 time periods.
n>=5 is required to reach p<.05.

# Positive diffs	27.00
# Negative diffs	36.00
S	-9.00

Evaluation (Normal Approximation, N>=10)

Variance(S)	212.6666667	=(n(n-1)(2n+5)/18) This formula may be conservative in the presence of tied values.
Z_S	-0.55	
$Z_{crit,.05}$	1.96	(two-tailed. For one-tailed test use 1.65)
Interpretation	**No Trend**	

Evaluation (Lookup Table for Fewer Than 10 Years)
If S>=S-crit, then reject H0

	S-crit (p<.05)	
# Years	1-tailed	2-tailed
4	6	
5	8	10
6	11	13
7	13	15
8	16	18
9	18	20
10	21	23

APPENDIX J

GROUNDWATER AVERAGE
AND PERFORMANCE STANDARDS
(VIA CD-ROM)