Scott Schoeman
PaulsCorp, LLC
100 St. Paul Street, Suite 300
Denver, CO 80206

Ms. Dilan Roe
Alameda County Health Care Services Agency
Department of Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Re: 1233 Bockman Road – Acknowledgement Statement
San Lorenzo, California
ACEH Case No. 3239

Dear Ms. Roe:

PaulsCorp, LLC, has retained the environmental consultant referenced on the attached report for the project referenced above. The attached report is being submitted on PaulsCorp's, LLC, behalf.

I have read and acknowledge the content, recommendations and/or conclusions contained in the attached document or report submitted on my behalf to ACDEH's FTP server and the State Water Resources Control Board's GeoTracker website.

Sincerely,

Scott Schoeman
Development Associate

May 12, 2017

Scott Schoeman
PaulsCorp, LLC
100 Saint Paul Street
Denver, Colorado 80206

Re: **Remedial Design and Implementation Plan**
Bockman Road Property (East Sector)
1233 Bockman Road
San Lorenzo, California 94577
ACDEH Case # RO003239

Dear Mr. Schoeman:

On behalf of PaulsCorp, LLC, PANGEA Environmental Services, Inc. (PANGEA) prepared this *Remedial Design and Implementation Plan* (RDIP) for the subject property. This RDIP was prepared to mitigate potential vapor intrusion risk in conjunction with development of the property as requested by the lead regulatory oversight agency for this case, Alameda County Department of Environmental Health.

If you have any questions or comments, please call me at (510) 435-8664 or email briddell@pangeaenv.com.

Sincerely,
PANGEA Environmental Services, Inc.

Bob Clark-Riddell, P.E.
Principal Engineer

Attachment: *Remedial Action Implementation Plan*

REMEDIAL DESIGN AND IMPLEMENTATION PLAN

Bockman Road Property (East Sector)
1233 Bockman Road
San Lorenzo, CA 94577
ACDEH Case # RO003239

May 12, 2017

Prepared for:

PaulsCorp, LLC
100 Saint Paul Street
Denver, Colorado 80206

Prepared by:

PANGEA Environmental Services, Inc.
1710 Franklin Street, Suite 200
Oakland, California 94612

Written by:

Ron Scheele, P.G.
Principal Geologist

Bob Clark-Riddell, P.E.
Principal Engineer

TABLE OF CONTENTS

ATTACHMENTS

1.0 INTRODUCTION

On behalf of PaulsCorp, LLC, PANGEA Environmental Services, Inc. (PANGEA) prepared this *Remedial Design and Implementation Plan* (RDIP) for the property located at 1233 Bockman Road in San Lorenzo, California (Site). This RDIP was prepared to mitigate the vapor intrusion risk in conjunction with development of the property as requested by Alameda County Department of Environmental Health (ACDEH) in a letter dated March 29, 2017 (Appendix A). The Site background, recent site assessment results, and proposed remedial soil excavation are presented below.

2.0 SITE BACKGROUND

The Site is located in a commercial and residential area along Bockman Road in San Lorenzo, California (Figure 1). The Site is currently under construction and being redeveloped into residential housing. Prior site assessment activities have identified volatile organic compounds (VOCs) in the subsurface. The VOC impact is apparently due a historic dry cleaner at 1269 Bockman Road (eastern portion of Site), a former auto shop at 1415 Bockman Road (western portion of the Site), and potential offsite sources of petroleum hydrocarbons from 1210 Bockman (former Impulse Motors fueling station/auto repair facility) and 17093 Via Chiquita (commercial street sweeping business).

2.1 Site Description and History

The Site consists of an approximately 3.87-acre lot along Bockman road in San Lorenzo, California (Figure 2). The property is owned and being redeveloped by PaulsCorp, LLC into 53 two-story residential units. The assessor parcel number (APN) for the Site is 411-63-17. The subject property is relatively flat and lies at an elevation of about 20 feet above mean sea level. There are currently no buildings onsite but historically the Site consisted of a strip mall and associated parking lot. The Site is surrounded in all directions by single and multi-family residences.

According to a Phase I Environmental Site Assessment (ESA) prepared on June 3, 2016, by ENGEO Incorporated (ENGEO), the Site was used a strip mall until the buildings were demolished in 2007. Two former tenants of note were identified: a dry cleaner that operated between approximately 1960 and 1979; and an automotive repair shop that operated hydraulic lifts. The report also noted that a gasoline service station previously existed on the adjacent parcel located south of the Site across Bockman Road at 1210 Bockman Road.

2.2 Chemicals of Potential Concern

The chemicals of potential concern at this Site primarily include tetrachloroethene (PCE) and its potential breakdown products, and include petroleum hydrocarbons. The following chemicals have been detected in shallow *soil gas* in excess of conservative residential soil vapor environmental screening levels (ESLs)

established by the San Francisco Bay Region Water Quality Control Board (RWQCB) and were identified as chemicals of concern (COCs): *benzene, ethylbenzene, and PCE*. The following additional VOCs have been detected at the Site below ESLs: acetone; chloroform; 1,2-dichloroethane; naphthalene; 1,1,1-trichloroethylene (TCE); toluene; xylenes; and gas-range, diesel-range, and motor oil-range total petroleum hydrocarbons. No significant VOC impact has been detected in soil or groundwater based on data comparison to ESLs.

2.3 Summary of Previous Site Investigations

The following provides a general overview of previous environmental investigations at the Site. All available historical Site assessment data is summarized on Tables 1 through 3.

- **November 18, 2004, Phase I Environmental Site Assessment, Secor International Inc. (Secor):** A Phase 1 ESA revealed that the auto repair shop located on the western portion of the Site may have formerly had a fuel dispenser island and that an oil/water separator existed within the building. The possibility of a dry cleaner was noted but it was not determined if operations were onsite or if the business was just a drop-off location. A former gasoline station/automotive repair facility located at 1210 Bockman Road (adjacent to the Site to the south) was also indicated as an environmental concern due to the elevated levels of petroleum hydrocarbons detected in confirmation samples during tank removal activities in 2004.

- **December 21, 2004, Phase II Environmental Site Assessment, Secor:** A total of eight soil borings were advanced onsite to a depth of 10 to 15 feet below ground surface (bgs), but sample data was not reported.

- **June 30, 2015, Phase I Environmental Site Assessment, ENGEO:** A Phase 1 ESA revealed the same three environmental concerns as the Phase 1 ESA completed in 2004: possible historical dry cleaner operations, the gas station adjacent and south of the Site, and the former automotive repair facility located on the western portion of the Site. Based on these findings and the lack of data from the Phase II ESA completed in 2004, ENGEO recommended completion of a new Phase II ESA.

- **July 2, 2015, Phase II Environmental Site Assessment, ENGEO:** Soil, groundwater, and soil gas were sampled to identify potential concerns related to the aforementioned historic operations. Three soil borings were advanced (S-1 through S-3) to a depth of 10 feet bgs in the vicinity of the former dry cleaner (S-1) and the former automotive repair facility (S-2 and S-3). Soil samples were collected at depths of 1, 5, and 10 feet bgs from each boring. Grab groundwater samples (GW-1 through GW-3) were also collected from three separate borings at depths ranging from 15 to 25 feet bgs depending on where groundwater was first observed. Soil and groundwater samples were analyzed for VOCs, CAM-17 metals, and total petroleum hydrocarbons as gasoline (TPHg), diesel (TPHd), and motor oil (TPHmo). While VOCs, TPHg, and metals were detected in groundwater samples, all analytes were below screening levels except arsenic (which likely represents background conditions). For the two

analyzed soil gas samples (SG-1 and SG-2), no VOCs were reported above environmental screening levels.

- **October 1, 2015, Geotechnical Investigation (Langan Treadwell Rollo):** A geotechnical investigation was conducted for the Site. The report concluded that from a geotechnical standpoint, the Site can be developed as planned, provided the recommendations presented in this section of the report are incorporated into the design and contract documents. Criteria for foundation design, together with recommendations for Site preparation, floor slabs, fill placement and seismic design were presented the report.

- **June 3, 2016, Phase I Environmental Site Assessment Update, ENGEO:** The Phase 1 ESA completed in 2015 was updated to include the results of an environmental record search. No new environmental concerns were recognized.

- **August 2, 2016, Revised Phase II Environmental Site Assessment, ENGEO:** Additional Site assessment activities including installing and sampling six new temporary soil gas wells (SG-5 through SG-10) and collecting four grab groundwater samples (GW-1 through GW-4). The soil gas wells were installed to depths of 7 feet bgs (SG-6, SG-8, and SG-9) and 10 feet bgs (SG-5, SG-7, and SG-10) and sampled for TPHg and VOCs. PCE was detected in SG-6 and SG-9 at an identical concentration of 256 micrograms per cubic meter ($\mu g/m^3$). Grab groundwater borings GW-1 through GW-3 were advanced in close proximity to the borings by the same identity in 2015. All four borings were advanced to a depth of 16 to 17 feet bgs depending on where first encountered groundwater was observed. A sample was collected from each boring and analyzed for VOCs, TPHg, TPHd, TPHmo, and CAM-17 metals. VOCs, TPHg, and metals were detected below screening levels except for arsenic.

- **August 17, 2016, Site Management Plan Supplement, PANGEA:** A Site Management Plan Supplement was prepared to facilitate grading work at the western portion of the Site.

- **August 26, 2016, Site Assessment Report, PANGEA:** A dynamic site assessment was conducted involving the sampling of soil, groundwater, and shallow soil gas. Pangea employed MiHPT, a high resolution site characterization technique, to help delineate the extent of contaminants in the subsurface and to evaluate hydrogeologic conditions, primarily in the vicinity of the former drycleaners. No significant VOC impact was detected in soil and groundwater, but shallow soil gas in the eastern portion of the Site is impacted with concentrations of PCE, benzene, and ethylbenzene that exceed their respective residential shallow soil gas ESLs.

- **October 7, 2016, Pilot Study Workplan, PANGEA:** A Pilot Study Workplan was prepared to outline procedures to test the effectiveness of a proposed soil excavation approach, prior to full implementation. The pilot study area targeted VOC impact near planned Buildings 5 and 8.

- **October 14, 2016, Draft Corrective Action Plan, PANGEA:** A Draft Corrective Action Plan (CAP) was prepared to provide an approach to remediate VOC impact and help mitigate potential vapor intrusion issues in conjunction with development at the Site. The CAP proposed soil excavation, an excavation pilot study, and addition site assessment in conjunction with remediation and mitigation efforts for the eastern Site area (Buildings 5 through 10).

- **October 26, 2016 Interim Remediation Report – Former Auto Repair Area, PANGEA:** The report documents soil excavation activities in the area of the former auto repair facility (Buildings 1 and 2 of the Site development). Approximately 690 cubic yards of impacted soil was excavated from the vicinity of the former auto repair facility. Confirmation soil sampling data indicated that remaining residual impact was well below regulatory screening levels.

- **November 16, 2016, Data Gap Investigation Report - Buildings 3 & 4, PANGEA:** Site assessment activities involved the installation and sampling of four soil gas probes (SV-51 through SV-54) to assess VOC levels within the footprint of proposed Buildings 3 and 4. No PCE or benzene were detected above their respective residential shallow soil gas ESLs. Based on the soil gas sampling data, ACDEH concurred that no remediation was required near Buildings 3 and 4 and vapor mitigation could involve subslab ventilation and a contingent post-slab engineered vapor barrier.

- **November 29, 2016 (Revised January 18, 2017), Vapor Intrusion Mitigation System (VIMS) Basis of Design Report for Buildings 1 through 4, PANGEA:** The report described construction of a proposed vapor intrusion mitigation system (VIMS) and related Operations & Maintenance (O&M) Plan for Buildings 1 through 4. The proposed VIMS consisted of SSV piping and a contingent post-slab construction engineered vapor barrier.

- **February 13, 2017, Vapor Intrusion Mitigation System (VIMS) Basis of Design Report for Buildings 5 & 8, PANGEA:** The report described construction of proposed VIMS and related O&M Plan for Buildings 5 and 8. The proposed VIMS consisted of SSV piping and a subslab engineered vapor barrier.

- **February 17, 2017, Pilot Study Report, PANGEA:** The report documents soil excavation activities and associated soil and groundwater sampling, along with post-excavation soil gas sampling. The pilot study was conducted to confirm the effectiveness of the excavation and soil reuse approach presented

in PANGEA's *Draft Corrective Action Plan* (CAP) dated October 7, 2016 prior to full CAP implementation.

- **March 13, 2016, Data Gap Field Investigation Workplan, PANGEA:** A Data Gap Field Investigation Workplan was prepared to further delineate contamination to help refine the corrective action approach prior to full implementation.

- **March 30, 2017, Pilot Study Report Addendum, PANGEA:** The report documents third and final soil gas sampling event from soil gas wells within the pilot study area. Results confirmed the effectiveness of the excavation and soil reuse approach presented in PANGEA's *Draft Corrective Action Plan* (CAP) dated October 7, 2016.

2.4 Potential Offsite Sources of VOCs

1210 Bockman: A fueling station/auto repair facility (Impulse Motors, B.P.) was formerly located across the street from the Site and operated from the 1950s until 2004. In 2004, three fuel USTs, and two dispensers with associated piping were removed. Elevated levels of TPHg, TPHd and BTEX were detected in soil, groundwater and soil gas. The environmental case was granted closure by ACDEH in 2013. The case closure summary with historical maps and data is included in Appendix A. The 1210 Bockman property is located directly upgradient of the Site and may be the source or contributing source of select petroleum hydrocarbon compounds at the eastern boundary of the Site, where ethylbenzene concentrations in soil gas exceed ESLs. In 2013, dissolved-phased TPHd concentrations were reported in an irrigation well at a residential property (17109 Via Chiquita) located 155 feet north of the 1210 Bockman property.

17093 Via Chiquita: This property, immediately adjacent the Site's eastern property boundary, is currently occupied by a street sweeping business (Midnight Sweepers) with several commercial vehicles parked periodically at the property. PANGEA understands that historically numerous automotive vehicles are stored at this property. This property may be the source or contributing source of select petroleum hydrocarbon compounds at the eastern boundary of the Site, where ethylbenzene concentrations in soil gas exceed ESLs.

2.5 Site Geology and Hydrogeology

The Site property is located within the East Bay Plain subbasin, which is part of the larger Santa Clara Valley Groundwater Basin. The East Bay Plain subbasin is a northwest trending alluvial plain bounded to the north by San Pablo bay, to the east by the contact with Franciscan Basement rock, and to the south by the Niles Cone Groundwater basin. The basin extends beneath San Francisco Bay to the west. Groundwater is generally found very near the surface throughout the basin.

The East Bay Plain subbasin aquifer system consists of unconsolidated sediments of Quaternary age. The Early Holocene Temescal Formation is the most recently deposited and consists of primarily silts and clays with some gravel layers.

The relatively flat Site lies at an elevation of approximately 20 feet above mean sea level to the east of San Francisco Bay (Figure 1). Soil beneath the Site consists of sandy gravel fill (likely base rock material) to approximately 1 ft bgs underlain by 2 to 3 feet of moderately plastic clay. The clay layer is underlain by silt and a discontinuous, one-foot thick sand lens observed intermittently between 6 and 10 feet bgs. Pangea observed groundwater between 7 and 9 feet bgs, while others reported first encountered groundwater deeper. Based on data from neighboring sites, static groundwater was approximately 8 ft bgs (1201 Bockman) and groundwater flows to the northwest.

2.6 Site Development Phases

Development of the Site is expected to be completed in three main phases, moving from west to east across the Site. Construction began with Buildings 1 through 4 in the west sector of the Site, which was re-surveyed to obtain a new legal description (Figure 3). Construction would then proceed to Building 5 and 8 in the center of the Site, and then commence to Buildings 6, 7, 9 and 10 in the east sector of the Site; the eastern area of Buildings 5 through 10 were re-surveyed to obtain a new legal description (Figure 3). This splitting of the Site was described during a February 2, 2017 meeting with ACDEH. A new agency case (no. RO3239) was setup for the western portion of the Site and current agency case no. RO3217 applies to the eastern portion of the Site. The Site will remain as one parcel for sale to one homeowner's association in the future.

2.7 Agency Direction

During meetings on January 9 and March 2, 2017, ACDEH requested additional investigation to further delineate contamination in the east portion of the Site and to help refine the corrective action approach presented in the *Draft CAP* dated October 14, 2016. In response, PANGEA submitted a *Data Gap Field Investigation Workplan* dated March 13, 2017. Results from implementation of this March 2017 *Data Gap Field Investigation Workplan* and partial implementation of the earlier October 17, 2016 *Data Gap Field Investigation Workplan* are documented below in Section 3.0.

During a subsequent meeting on May 4, 2017, ACDEH reviewed the preliminary data gap sampling results and a draft remedial excavation plan. Together with installation of vapor mitigation system beneath proposed Buildings 5 and 8, ACDEH concurred with the proposed remedial approach to address the contamination in the east portion of the Site. The procedures for the proposed remedial excavation are described below in Section 4.0. Installation of vapor mitigation system beneath Buildings 5 and 8 will be conducted and documented by Langan Engineering and Environmental Services according to PANGEA's *Vapor Intrusion Mitigation System Basis of Design Report – Buildings 5 & 8* dated February 13, 2017.

3.0 RESULTS FROM RECENT DATA GAP SAMPLING

Recent soil, groundwater and soil gas sampling was conducted as part of the implementation of PANGEA's *Data Gap Field Investigation Workplan* dated March 13, 2017 and partial implementation of PANGEA's *Data Gap Field Investigation Workplan* dated October 17, 2016. Results from recent soil, soil gas, and groundwater sampling relevant to pending site remediation are described below.

3.1 Exploratory Trenching for Sewer Laterals

Former subsurface sewer laterals potentially related to the former dry cleaners were identified on blueprints obtained by PaulsCorp from the Alameda County Building Department. On March 15 and 16, 2017, DCI Construction Inc. of Walnut Creek, California attempted to locate the sewer laterals by excavating three northerly trending exploratory trenches in the vicinity of the former dry cleaners as shown on Figure 4. The trenches were approximately 30-inch wide and extended to a depth of approximately 8 ft bgs. No sewer laterals were encountered and no visual evidence of a former sewer lateral was observed.

3.2 Soil and Groundwater Sampling to Evaluate PCE Extent

During exploratory sewer trenching, soil and groundwater samples were collected to evaluate the extent of PCE. Soil was initially screened for VOCs during trenching using a photo-ionization detector (PID). No indications of VOCs were observed and no PID readings were detected during field screening. Two soil samples (T-5-6' and T-7-6') were collected at 6 ft bgs from two of the trenches using a TerraCore™. During trenching, groundwater was encountered at 8 ft bgs so small pits were dug to 8.5 ft within each trench to facilitate collection of a grab groundwater sample. Ten grab groundwater samples (T-1-W through T-10-W) were collected along all three trenches using a modified bailer. Soil and groundwater samples were submitted to C&T for analysis for VOCs by EPA Method 8260B. Following exploratory trenching, all excavated soil was returned into the trench.

Soil Data: No VOCs were detected in soil except for a low detection of acetone at 0.13 mg/kg in soil sample T-5-6. Soil analytical results are shown on Figure 4 and presented in Table 1. The laboratory analytical report is provided in Appendix E.

Groundwater Data: No VOCs were detected in the groundwater, except for low concentrations of PCE. PCE was detected in three of the ten groundwater samples (T-8-W, T-9-W, and T-10-W) located on the north and east sides of the former dry cleaners. PCE concentrations ranged from 0.2 to 0.7 µg/L and were below the Tier I ESL for groundwater of 3.0 µg/L. Due to the low levels, the PCE concentration data was j-flagged by the laboratory to indicate that the data represents an estimated value between the method detection limit and laboratory reporting limit. Groundwater analytical results are summarized on Figure 5 and Table 2. As shown on Figure 5, the primary PCE impact in groundwater is present west and beneath the middle of the former dry cleaner building. The laboratory analytical report is provided in Appendix E.

3.3 Soil Sampling to Determine Hydrocarbon Impact Relative to LTCP Criteria

Soil sampling was conducted to help evaluate the presence of a bioattenuation zone as defined by the SWRCB's Low Threat Closure Policy (LTCP). The soil sampling confirmed that the upper five feet of soil contained TPH impact below 100 mg/kg.

On October 30, 2016, six soil borings (SB-17 through SB-22) and three borings for soil gas probe installation (SV-63, SV-64 and SV-65) were drilled by PeneCore Drilling (PeneCore) of Woodland, California. As shown on Figure 4, the nine soil borings were drilled along the north, south and east sides of the Site where elevated benzene and/or ethylbenzene were previously detected in soil gas. All borings were drilled to 5 ft bgs using a hand auger and soil was logged and field screened for hydrocarbons using a PID. No PID readings were detected so a soil sample was collected at 2.5 ft bgs from each boring using a TerraCore™ and stainless sleeve and submitted to C&T for analysis of TPHg and TPHd by EPA Method 8015B.

No TPHg was detected in any of the soil samples. Low levels of TPHd was detected in six of the nine soil samples collected from borings located along the north and east sides of the Site. TPHd concentrations ranged from 1.3 to 15 mg/kg. The combined TPHg and TPHd concentrations were well below the LTCP's criteria of 100 mg/kg required to confirm the presence of a bioattentuation zone. Oxygen levels in soil gas greater than 4% also confirm the presence of a bioattentuation zone as discussed below in Section 3.4. Soil analytical results are shown on Figure 4 and presented in Table 1. Soil boring logs are provided in Appendix C. Laboratory analytical reports are provided in Appendix E.

3.4 Soil Gas Sampling for Delineation and Trend Analysis Relative to LTCP Criteria

On March 30, 2017, three soil gas wells (SV-63, SV-64, and SV-65) were installed to further delineate the extent of benzene in soil gas along the north and east sides of future Building 10 (Figure 6). Elevated benzene concentrations in soil gas had previously been detected in soil probes SV-55 and SV-56 located within the footprint of future Building 10. Soil gas wells SV-63, SV-64, and SV-65 were installed by PeneCore to a depth of 5.5 ft bgs in accordance with the CalEPA/DTSC *Advisory: Active Soil Gas Investigation* dated July 2015. Each soil gas well was constructed by setting a vapor implant attached to ¼-inch Teflon™ tubing at approximately 5 ft bgs. The vapor implant was placed within the center of a 1-foot-thick layer of Monterey #3 sand. A ½-foot of dry bentonite crumbles was placed on top of the sand and the remaining annular space was backfilled with hydrated bentonite. The Teflon™ tubing was set in a 2-inch PVC monument casing and capped to prevent moisture from entering. Soil gas well installation permits obtained from Alameda County Public Works Agency are provided in Appendix B. Boring logs with soil gas well construction details are provided in Appendix C.

On April 3 and 4, 2017, soil gas samples were collected from the following eleven new and existing soil gas wells to delineate the extent and concentration trends of VOCs in soil gas: wells SV-3, SV-18, SV-19, SV-24, SV-27, SV-33, SV-55, SV-56, SV-63, SV-64 and SV-65. While PANGEA attempted to collect soil gas samples from additional wells, two wells (SV-1 and SV-2) were inaccessible and five other wells (SV-8, SV-10, SV-11, SV-12 and SV-23) had entrained water in the tubing or no flow. Samples were collected using laboratory-supplied manifolds and certified-clean 1-liter Summa™ canisters supplied with a vacuum of approximately 30 inches of mercury. Prior to sample collection from the wells, a shut-in test was conducted on the Summa™ canisters and manifolds. Approximately three casing volumes was purged from each well at a flow rate between 100-200 milliliters per minute (mL/min), except for wells SV-3, SV-24, and SV-27 where low flow conditions existed. DTSC's guidance for soil gas sampling in low permeability soil was followed for SV-3, SV-24 and SV-27. Upon completion of purging, the sampling Summa™ canister was opened for sample collection. The pre-set valve regulated the vapor flow to approximately 150 mL/min of soil gas. After approximately 22 minutes, the vacuum within the Summa™ canisters decreased to approximately 5 inches of mercury and the Summa™ canister valve was closed. To further evaluate potential leakage within the sampling system, a leak-check enclosure/shroud was placed over the sample train and isopropyl alcohol was introduced into the shroud. A PID was used to monitor the concentration of isopropyl alcohol within the shroud during sample collection. An aboveground shroud sample and contingency soil gas sample was collected from probe SV-37. Only the shroud sample was submitted for analysis for isopropyl alcohol. Soil gas samples were transported for laboratory analysis following chain-of-custody protocol. Samples were analyzed for VOCs by EPA Method TO-15 and sample from SV-24 was also analyzed for oxygen, carbon dioxide and methane by ASTM Method D1946-90. Field forms for soil gas purging and sampling are included in Appendix D.

No VOCs were detected in any of the soil gas samples except for PCE in one sample. A PCE concentration of 440 µg/m^3 was detected in SV-3 located with the footprint of the former dry cleaners. The PCE detected was above the residential shallow soil gas ESL of 240 µg/m^3. Oxygen was detected at 15% in SV-24. The soil gas analytical results for PCE, benzene and ethylbenzene are shown on Figures 6, 7, and 8, respectively. VOC results are summarized on Table 3. Laboratory analytical reports are provided in Appendix E.

Leak check compound isopropyl alcohol was detected at a concentration of 170,000 µg/m^3 in the aboveground shroud sample. Very low concentrations of isopropyl alcohol ranging from 53 to 2,400 µg/m^3 were detected in five of the eleven soil gas samples. These leak check analyses indicate that the maximum isopropyl alcohol concentration in the soil gas samples was <1.5% of the shroud concentration. According to the CalEPA/DTSC *Advisory: Active Soil Gas Investigation* dated July 2015, an ambient air leak of up to 5% is acceptable if quantitative tracer testing is performed by shrouding. This information suggests the soil gas probes did not 'short circuit' to surface air and that the results *are* likely representative of soil gas conditions.

3.5 Summary of Data Gap investigation Results

Recent and historic groundwater and soil gas sampling results indicate that PCE impact is limited to the area beneath and near the former dry cleaners. Given the lack of PCE detected in soil and groundwater concentrations below the ESL, only the PCE impact in soil gas exceeds 2016 Tier 1 ESLs applicable to residential site use. From recent soil gas sampling, the extent of the PCE soil gas plume likely remains unchanged and extends eastward from the former dry cleaners as shown in in Figure 6.

For the benzene and ethylbenzene areas of concern, recent soil gas sampling found significantly lower concentrations than beforehand. The lack of benzene detected in new soil gas probes SV-63, SV-64, and SV-65 indicates the benzene impact near Building 10 is very limited. For the ethylbenzene area of concern near the eastern property boundary, no ethylbenzene (<11 µg/m^3) was detected in well SV-24 (where 1,300 µg/m^3 was previously detected) or in well SV-33 (<4.8 µg/m^3). In addition, the recent soil and soil gas data indicates the presence of a bioattenuation zone as defined by the LTCP. The soil sampling confirmed that the upper five feet of soil contained TPH impact well below the LTCP soil criteria of 100 mg/kg. Oxygen levels of 14-15% in wells SV-24, SV-55 and SV-56 exceeded the 4% oxygen criteria for a bioattenuation zone per LTCP.

Based on recent and historic data, no further sampling is warranted for data gap assessment. The ethylbenzene, oxygen data, and TPH soil data indicate the contingent vapor barrier along the eastern boundary is not warranted. The planned 'full blown' engineered vapor mitigation system is designed to provide sufficient mitigation of any residual VOCs for future Site residents.

4.0 PROPOSED REMEDIAL SOIL EXCAVATION

The RDIP provides design and implementation procedures for the proposed remedial soil. The remedial soil excavation will target residual PCE and ethylbenzene impact that could pose a potential vapor intrusion risk to future Site residents. Remedial soil excavation was first proposed in the October 7, 2016 *Draft Corrective Action Plan* (Draft CAP). The Draft CAP work scope included an excavation pilot test. The completed pilot test confirmed the effectiveness of soil excavation, as documented in the February 17, 2017 *Pilot Study Report* and the March 3, 2017 *Pilot Study Report Addendum.* The excavation work scope in this RDIP is based on results of the pilot study excavation, and is consistent with the objectives and procedures of the Draft CAP.

4.1 Remedial Soil Excavation Design

The proposed soil excavation targets the primary residual PCE and ethylbenzene impact that exceeds the soil gas ESLs established by the RWQCB for residential site use. As shown on Figure 9, the proposed 15 ft wide excavation extends approximately 160 ft within the axis of the PCE soil gas plume. This proposed excavation intersects the prior soil gas wells with the highest PCE impact (SV-2, SV-10 and SV-11). The excavation also targets the PCE impact in shallow soil indicated by MIP assessment data at location MIP-2 within the former

dry cleaner. This long and narrow excavation targeting the residual PCE soil gas impact is informally considered the 'hockey stick'. As with the successful pilot study, the excavation will be completed to a depth of 6.5 ft bgs. Based on the 2,400-square foot excavation area (160 ft x 15 ft) and depth (6.5 ft), the PCE excavation will target approximately 580 bank cubic yards (BCY) of soil. This is equivalent to approximately 980 tons of soil, assuming 1.7 tons/BCY.

To target the residual ethylbenzene impact, the proposed excavation is 20 ft x 25 ft by 6.5 ft depth. This smaller excavation targeting the residual ethylbenzene soil gas impact is informally considered the 'hockey puck'. Based on the 500-square foot excavation area to 6.5 ft depth, the ethylbenzene excavation will target approximately 120 BCY of soil. This is equivalent to approximately 205 tons of soil, assuming 1.7 tons/BCY.

4.2 Excavation Preparation, Permitting and Notification

Soil excavation will be performed by an appropriately licensed contractor. Prior to initiating field activities, the following tasks will be conducted:

- Obtain authorization from ACDEH and permits from the City of San Lorenzo, as necessary.
- Pre-mark the excavation area with white paint and notify Underground Service Alert (USA) of the excavation activities at least 48 hours before work begins;
- Prepare a Site-specific health and safety plan to educate personnel and minimize their exposure to potential hazards related to Site activities; and
- Coordinate with excavation and laboratory contractors and with involved parties.

Soil excavation will be conducted consistent to prior approved plans and grading/construction permits. Perimeter barriers will be installed and maintained throughout excavation and backfilling activities. Soil handing and dust monitoring procedures are described below.

4.3 Soil Excavation Sequence, Screening and Stockpiling

Excavated soil will be screened for onsite reuse or offsite disposal based on soil sampling and field screening procedures described in this section. Based on our understanding of Site conditions, Site soil is not significantly impacted by VOCs, other than some limited impact identified soil approximately 4 to 6 ft bgs at location MIP-2 within the former dry cleaning machine. More extensive soil screening will be conducted near MIP-2 and for any encountered thin, laterally discontinuous sand materials.

Step 1 – Lift Excavation and Stockpiling: Based on conditions encountered during the excavation pilot study, soil screening will be performed in lifts as indicated below in Table A. These lifts correspond to different soil types and proximity to the former dry cleaner and the capillary fringe. For the lift west and within the former dry cleaner, a 60 ft long lift will be excavated and stockpiled. Within the remaining 100 ft of the PCE excavation length, two 50 ft long lifts will be excavated and stockpiled. This equates to three stockpiles for each lift across the length of the 160 ft long hockey stick. For the ethylbenzene area, three stockpiles will be created. This approach will yield ten (10) total stockpiles for the PCE excavation, and three for the ethylbenzene excavation.

Table A – Soil Screening Sequence

Excavation Area	Soil Lift Depth (ft-ft bgs)	Soil Horizon
Within Former Dry Cleaners (Batch 1, 60 ft Long per Lift)	0-1	Gravelly top soil
	1-3	Upper unsaturated clay soil
	3-5	Middle unsaturated clay soil.
	5-6.5	Deeper unsaturated clay close to capillary fringe
Rest of PCE Excavation (Batches 2&3, 50 ft long per Lift)	0-1	Gravelly top soil
	1-5	Upper middle unsaturated clay soil
	5-6.5	Deeper unsaturated clay close to capillary fringe
Ethylbenzene Excavation (1 Batch per Lift)	0-1	Gravelly top soil
	1-5	Upper middle unsaturated clay soil
	5-6.5	Deeper unsaturated clay close to capillary fringe

Step 2 – PID Screening During Stockpiling: During soil excavation, periodic soil screening with be performed using a PID. In the event of PID detections, the above soil excavation and stockpiling sequence may be expanded for additional segregations. Field staff/technicians will screen soil with a PID in numerous manners. As soil is excavated and stockpiled, technicians will screen soil in the stockpile, within the excavator bucket, and within newly exposed soil. Soil will also be placed in a plastic bag for screening. Due to the silt and clay composition of Site soil, technicians will loosen soil within the bag while screening for VOCs with the PID. (Visual observations may also assist with screening, although the limited VOC impact suggests there will be limited or no visual VOC manifestation).

Step 3 – PID Screening of Stockpiled Soil: After each stockpile is complete and covered with plastic sheeting and sand bags, technicians will screen stockpile for VOCs. The technician will insert the PID tip into a small slit or hole cut in the plastic cover and record the PID reading. On the following morning, the technician will collect another PID reading using the same procedure.

4.4 Soil Reuse Criteria and Soil Sampling

Our soil reuse criteria is as follows. For the PCE impact area, any stockpiled soil with final PID readings at or above 0.1 ppmv will not be reused and will be disposed offsite. While empirically 0.1 ppmv PCE equals 680 $\mu g/m^3$, a PID reading of 0.1 ppmv roughly correlates to a soil gas concentration of approximately 240 $\mu g/m^3$ (the residential soil gas ESL for PCE) based on our experience correlating laboratory analysis with PID readings. Therefore, a PID reading of 0.1 ppmv is an appropriate screening levels for PCE-impacted soil to considered for reuse.

For the ethylbenzene impact area, any stockpiled soil with final PID readings at or above 0.2 ppmv will not be reused since the residential soil gas ESL for ethylbenzene of 560 $\mu g/m^3$ is twice the corresponding ESL for PCE.

For soil planned for reuse, soil analytical testing will be performed as follows: a minimum of one discrete soil sample will be collected and analyzed for every 100 cubic yards of soil slated for reuse. This may involve consolidation of smaller stockpiles previously screened for VOCs using a PID. The soil samples will be collected using EPA Method 5035 (e.g., TerraCore) and analyzed for VOCs by EPA Method 8260B using at a California-certified laboratory. Soil exceeding Tier 1 ESL criteria will not be reused at the Site.

4.5 Offsite Soil Disposal

Soil for offsite disposal will be profiled according to requirements of the soil accepting facility. Existing profiles may be sufficient to allow soil disposal at the Chuck Corica Golf Complex. Additional soil sample collection and analysis will be conducted as required by the disposal facilities.

A State-licensed waste hauler will transport any offsite disposal soil to the appropriate facility. Trucks transporting soil off the Site will follow procedures described below in Section 4.10 and in the approved Storm Water Pollution Prevention Plan (SWPPP). Trucks will follow the approved transit plan involving routing along Bockman Road to access Highway 880.

4.6 Soil Backfilling

The excavation area will be backfilled with imported material, soil from the excavation area that meets soil reuse criteria, or other Site soil available from grading operations that meets reuse criteria. The bottom foot or so will likely be backfilled with imported rock to facilitate compaction, as performed during the successful pilot study. Reused Site soil may require some amendments or handling to meet compaction requirements of the PaulsCorp's geotechnical consultant. Any imported material will be screened or recorded following import procedures described in Section 4.11. While the excavation pit is open, the excavation will be secured with fencing and sloping as required to comply with OSHA safety requirements.

4.7 Soil Excavation Practices

Throughout field activities, all applicable municipal codes and best management practices (BMPs) and standards will be followed. Mechanical and manual (hand digging) excavation techniques will be utilized during remedial activities. Procedures before and during excavation activity include:

- A competent person trained to identify hazardous conditions, with authority to take corrective action, will be in charge of excavation. This person will inspect excavations daily and after every rain event, and ensure that all equipment and materials are in good, working condition.

- Excavated or other materials as required will be stored 2 feet or more from the edge of the excavation. Workers will stay away from any equipment loading or unloading material. Perimeter protection will be provided at all times.

- Workers will have all appropriate training and wear the required personal protective equipment including hardhats, safety footwear, gloves, eye protection, hearing protection, and fall protection devices, as needed.

- Excavated material and the excavation pit will be monitored by hand-held screening instrumentation, (e.g., PID), as well as visual and olfactory indications of soil impact from petroleum hydrocarbons or chlorinated solvents (e.g., visible green or gray staining, odor).

- Stockpiles of materials will not be placed within the public right of way, will not obstruct drainage ways, will not be subject to erosion, will not endanger other properties and will not create a public nuisance or safety hazard. Stockpiles of any contaminated soil will be placed away from the north and east property boundaries to minimize any potential impact to offsite residences.

- Debris (brick, rubble, etc.) encountered during excavation as well as concrete and/or asphalt cuttings will be separated from the excavated soil and handled separately for recycling.

The contractor will comply with Cal/OSHA requirement to ensure a safe working environment and to keep the sides of the excavation stable. Excavation activities will be documented by photographs.

4.8 Odor, Dust and Noise Control

Air monitoring will be conducted during the excavation and handling of any contaminated soil consistent with the procedures outlined in PANGEA's *Site and Perimeter Air Monitoring, and Dust Mitigation Plan* dated November 16, 2017, which is incorporated below.

Air Monitoring for VOCs: A portable RAE Systems MiniRAE 3000 Photo-Ionization Detector (PID) or equivalent will be used to collect VOC measurements near soil work activity as necessary for worker health and safety during onsite excavation activities. If VOC concentrations are measured above 50 parts per million per volume (ppmv) during the handling of any contaminated soil, PID readings will be collected every hour along the downwind perimeter of the Site. If the Site is windless, PID readings will be taken from the perimeter location(s) closest to the Site activities. The dominant downwind direction at the Site is towards the east based on previous Site observations. The downwind direction and speed will be estimated daily using a windsock mounted at the Site. A handheld digital anemometer will also be used to confirm the wind speed. A high wind condition is defined as 18 mph sustained for at least 5 minutes in any 1-hour period.

Air Mitigation Measures: VOC emissions from the Site will be maintained below 50 parts per million per volume (ppmv) in accordance with the Bay Area Air Quality Management's Regulation 8, Organic Compounds Rule 40. The 50 ppmv threshold also corresponds to an action level that is 50% of the 8-hour time-weighted-average permissible exposure limit of 100 ppmv for PCE and ethylbenzene established by Cal OSHA. If VOC concentrations exceed the 50 ppmv (above background), operations will cease until the source of the vapor emissions is identified and mitigated. Potential mitigation steps would include covering the area/stockpile with heavy duty plastic and/or applying a vapor/odor suppressant such as Simple Green™ onto the soil.

Dust Monitoring: Dust monitoring will be conducted daily at the Site during any grading or earthwork activities at the Site using a perimeter continuous logging station and using a portable dust meter.

Perimeter dust monitoring for real-time PM_{10} concentrations will be conducted each work day (approximately 7AM to 5PM) using a mounted, battery-powered, TSI Dust Trak 8530 meter or equivalent. Perimeter dust monitoring results will be recorded continuously on a daily basis from a fixed tripod-mounted station setup along the east property boundary (see Figure 2). Wind direction and wind speed will also be monitored periodically throughout the day using a handheld digital anemometer and a windsock mounted at the Site. Should the downwind direction fluctuate or vary at the Site, the mounted dust meter will either be relocated to an appropriate downwind perimeter location, or additional dust measurements will be collected on an hourly basis in the downwind direction using a portable dust meter. Field personnel will visit the monitoring station during the beginning, middle, and end of each work day to ensure to ensure the meter is operating.

Onsite dust monitoring for real-time PM_{10} concentrations will be also conducted adjacent to any grading or earthwork activities using a portable TSI AIM 510 meter or equivalent. The dust monitoring results will be written manually on preformatted data field sheets. All manual entries are to be made in a legible and orderly manner using permanent ink. Erasures will be avoided. If an error is made, it is to be crossed out with a single line and the correction immediately made. Cancellations or insertions should be initialed, dated, and explained (in the margin, if possible) by an appropriate notation. All operating details and conditions should be recorded. Each page will be signed and dated by the individual making the entry and performing the work. An example of the Air and Dust Monitoring Log for field work is provided in Appendix F.

Dust Mitigation Measures

Dust from the Site will be maintained below the California Ambient Air Quality Standard (CAAQS) PM_{10} concentration of 50 $\mu g/m^3$ in accordance with 17 California Code of Regulations [CCR] 70200. Should PM_{10} readings exceed 50 $\mu g/m^3$ (above background) for more than for 5 minutes along the perimeter, or for more than 15 minutes downwind of the grading/earthwork location, graded surfaces of any nature shall be wetted with water or Soil Sement®, or otherwise suitably contained to prevent nuisance from dust or spillage onto city streets or adjacent properties. For high wind days, the upwind/downwind subtraction will be used to calculate the dust contribution from the Site at the property boundary as well as the ten percent contribution above the federal National Ambient Air Quality Standard PM_{10} value of 150 $\mu g/m^3$. For example, the Site would be in compliance with the agency requirement assuming the following:

- PM_{10} (upwind) = 200 $\mu g/m^3$
- PM_{10} (downwind) = 220 $\mu g/m^3$
- Contribution from the Site = 20 $\mu g/m^3$
- Total loading at ten percent of 220 $\mu g/m^3$ = 22 $\mu g/m^3$

Equipment, materials and roadways on the Site shall be used in a manner or treated as to prevent excessive dust conditions. Dust and dirt control activities shall not result in any material entering the storm drain system. These procedures supplement the procedures in the Storm Water Pollution Prevention Plan (SWPPP) approved for the Site grading operations, which include best management practices (BMP) implemented throughout excavation activities.

Dust control measures during any grading, earthwork or handling of aggregate will consist of spraying the minimum amount of water needed to suppress the dust onto the soil and work area, and limiting the speed of traffic through the work area to 15 miles per hour. Any soil not off-hauled from the Site the same day will be stockpiled on plastic sheeting and covered with plastic, if significant rain is expected, or if visible dust is being generated from the stockpiles.

Documentation and Record Keeping: Documentation of all air and dust monitoring will include copies of air and dust monitoring logs and/or written field notes. All monitoring equipment maintenance and calibration will also be documented. Photos will be taken of the monitoring stations and various dust mitigation measures used at the Site.

4.9 Groundwater Control

Although groundwater is not expected to be encountered in the excavation, if necessary, groundwater removal and disposal will be performed to manage any potential groundwater accumulation in the excavation. Depending on the volumes and recharge rates, groundwater will be pumped either directly into vacuum trucks for transport and disposal, or will be pumped into a recovery tank for storage and offsite recycling/disposal at an appropriate facility.

4.10 Grading and Erosion Control

In addition to procedures in the Storm Water Pollution Prevention Plan (SWPPP) approved for the Site grading operations, the following grading and erosion control best management practices (BMP) will be observed and implemented throughout excavation activities:

- Delineate with field markers clearing limits, easements, setbacks, sensitive or critical areas, buffer zones, trees, and drainage courses.
- Stabilize all denuded areas and install and maintain all temporary erosion and sediment controls continuously between October 15th and April 15th.
- Perform clearing and earth moving activities only during dry weather (without significant rainfall).
- Provisions will be made for diverting onsite runoff around exposed areas and diverting offsite runoff around the Site.
- Provisions for preventing erosion and trapping sediment on Site, storm drain inlet protection, covers for soil stock piles, and/or other measures.
- Store, handle, and dispose of construction materials and wastes properly, so as to prevent their contact with stormwater.
- Control and prevent the discharge of all potential pollutants, including pavement cutting wastes, concrete, petroleum products, chemicals, washwater or sediments, and non-storm water discharges to storm drains and any nearby surface water.

- Avoid cleaning or maintaining vehicles on Site, except in a designated area where washwater is contained and treated.
- Protect adjacent properties and undisturbed areas from construction impacts.
- Limit construction access routes and stabilize designated access points.
- Avoid tracking dirt or other materials off Site; clean offsite paved areas and sidewalks using dry sweeping methods.
- Train and provide instruction to all employees and subcontractors regarding the construction BMPs.

If any storm water catch basins are found in close proximity to excavation, the contractor will implement the following procedures designed to ensure that grading and erosion control practices proposed for the above project comply with best management practices and standards.

- Any catch basin will be protected by silt fencing or other erosion sedimentation prevention devices at all times.
- Erosion control devices will not be moved or modified without approval of the project manager.
- All removable erosion protective devices shall be in place at the beginning and end of each working day at all times.
- All silt and debris shall be removed from streets and public right of way immediately.
- All immediate downstream inlets will be protected.

4.11 Criteria for Import of Backfill Material

For import of fill material from commercial sources or quarries, letters of certification will be provided by the quarry or commercial business providing the engineered fill, baserock or other material. If the certification information is deemed insufficient, additional soil characterization will be conducted to facilitate the use of imported fill.

For non-commercial facilities, documentation regarding the previous land use and any environmental site assessments performed at the source of the fill will be provided to minimize the potential of introducing contaminated fill material onto the Site. If an environmental site assessment was performed at the fill source site, its findings will be provided.

If adequate documentation cannot be provided, the source fill material will be tested for potential impact to ensure that 'clean' fill is being brought onsite. Per ACDEH direction, the source fill material will be sampled and analyzed for TPH, VOCs, SVOCs, and CAM-17 metals, and results will be compared to RWQCB Tier 1 ESLs. Samples will be submitted under chain-of-custody to a California certified laboratory.

4.12 Soil Gas Probe Abandonment

Upon completion of the pilot study excavation, all remaining soil gas probes will be drilled out and properly abandoned according to agency requirements.

4.13 Reporting

PANGEA will prepare a *Remedial Excavation Completion Report* documenting excavation activities and soil gas probe destruction.

5.0 REFERENCES

CalEPA/DTSC, 2011, (CalEPA, 2011) *Vapor Intrusion Mitigation Advisory (VIMA),* October.

CalEPA/DTSC, 2015, (CalEPA, 2015) *Advisory – Active Soil Gas Investigations,* July.

ENGEO, 2015, *Phase I Environmental Site Assessment*, June 30.

ENGEO, 2015, *Phase II Environmental Site Assessment,* July 2.

ENGEO, 2016, *Phase I Environmental Site Assessment Update*, June 3.

ENGEO, 2016, *Revised Phase II Environmental Site Assessment*, August 2.

PANGEA, 2016, *Site Management Plan Addendum,* August 17.

PANGEA, 2016, *Site Assessment Report,* August 26.

PANGEA, 2016, *Pilot Study Workplan*, October 7.

PANGEA, 2016, *Draft Corrective Action Plan*, October 14.

PANGEA, 2016, *Data Gap Field Investigation Workplan,* October 17.

PANGEA, 2016, *Data Gap Investigation Report - Buildings 3 & 4,* November 16.

PANGEA, 2017, *Vapor Intrusion Mitigation System Basis of Design Report, Construction Quality Assurance Plan, and Operations & Maintenance Plan – Buildings 5 & 8,* February 13.

PANGEA, 2017, *Pilot Study Report,* February 17.

PANGEA, 2017, *Pilot Study Report Addendum,* March 30

Secor, 2004, *Phase I Environmental Site Assessment*, November 2004.

Secor, 2004, *Phase II Environmental Site Assessment*, December 2004.

Figure 1

1233 Bockman Road
San Lorenzo, California

PANGEA

Vicinity Map

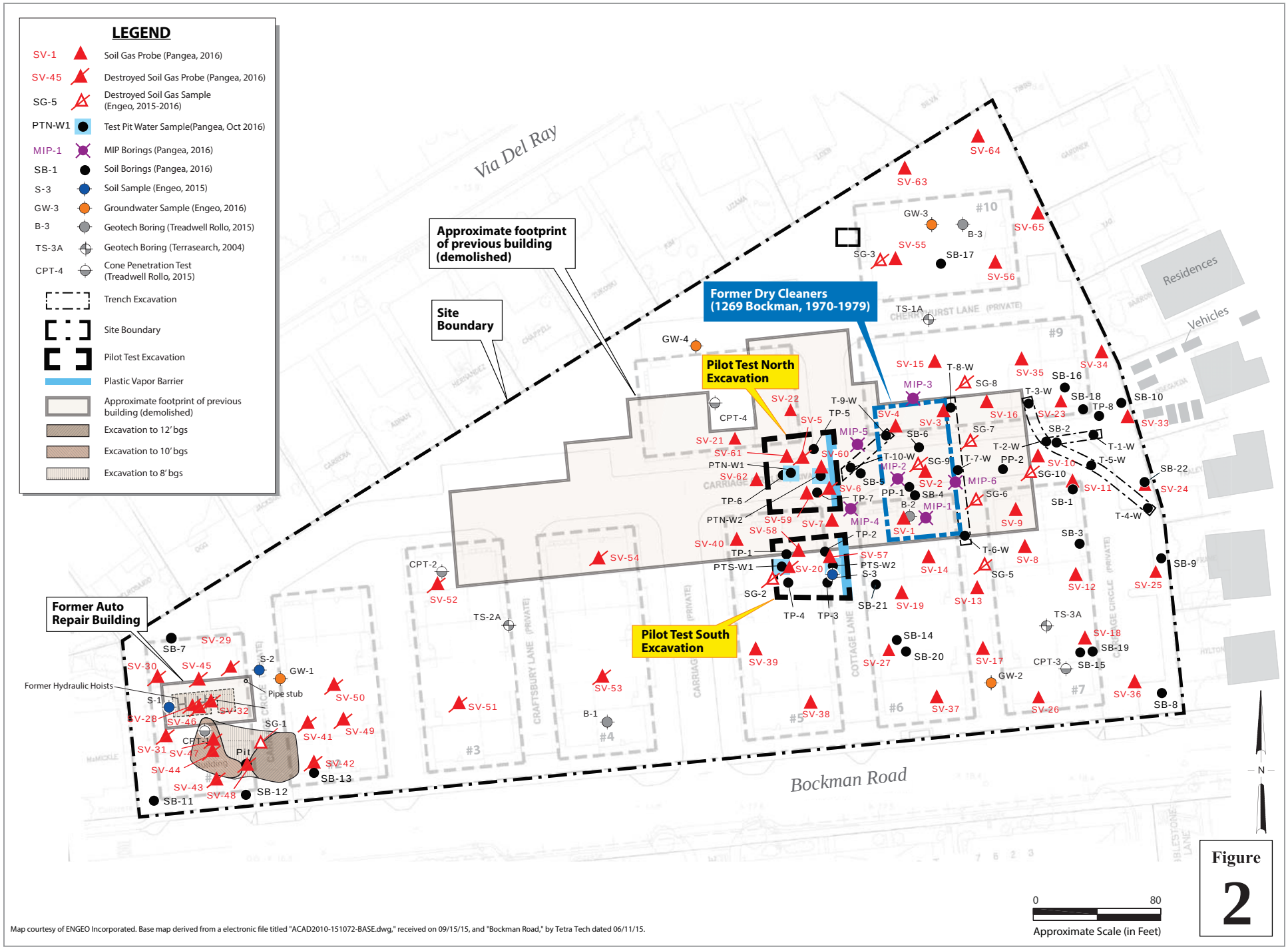


Figure 2

Map courtesy of ENGEO Incorporated. Base map derived from a electronic file titled "ACAD2010-151072-BASE.dwg," received on 09/15/15, and "Bockman Road," by Tetra Tech dated 06/11/15.

1233 Bockman Road
San Lorenzo, California

PANGEA

Site Map

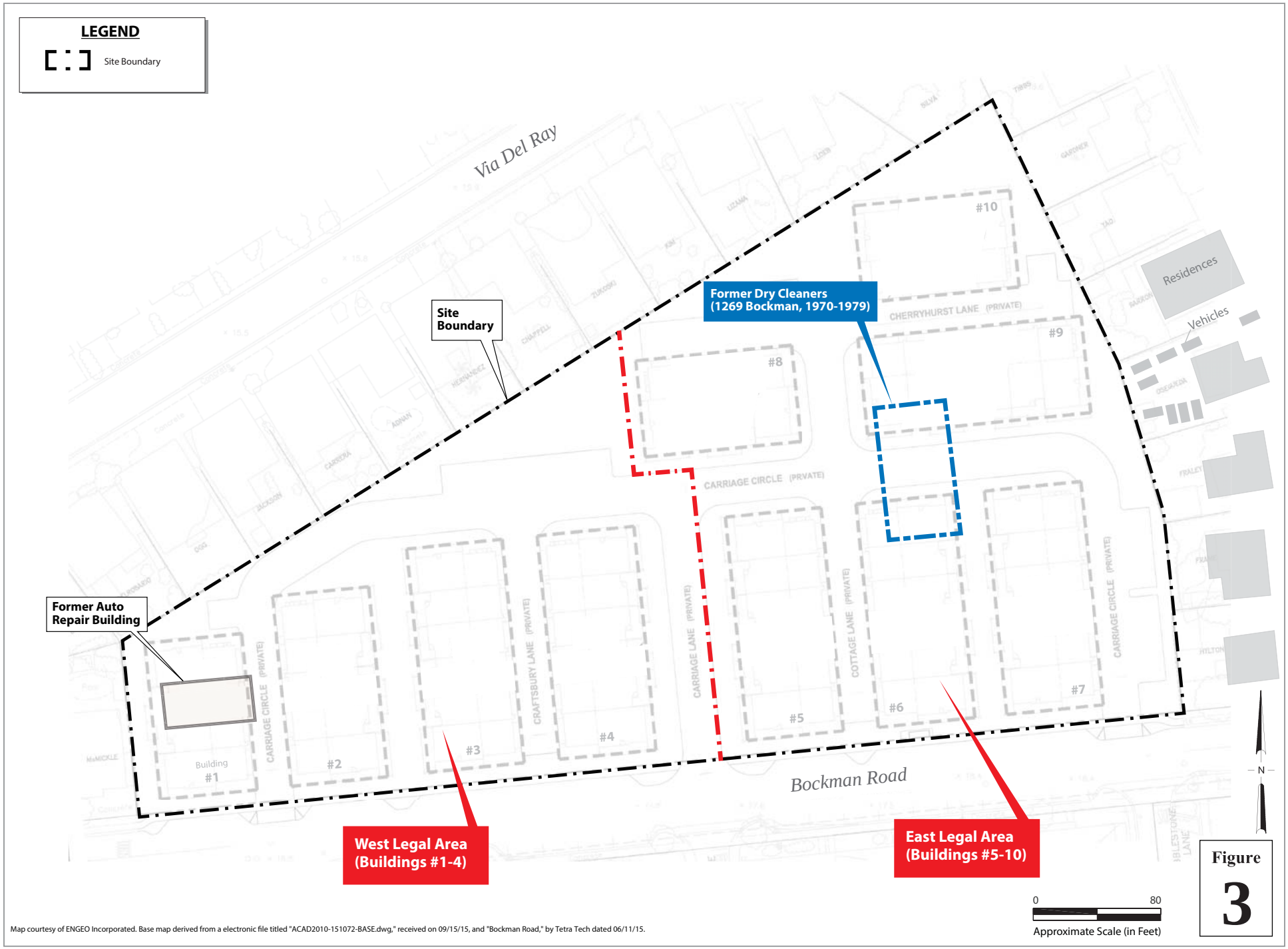


Figure 3

Map courtesy of ENGEO Incorporated. Base map derived from a electronic file titled "ACAD2010-151072-BASE.dwg," received on 09/15/15, and "Bockman Road," by Tetra Tech dated 06/11/15.

1233 Bockman Road
San Lorenzo, California

PANGEA

West and East Site Legal Areas

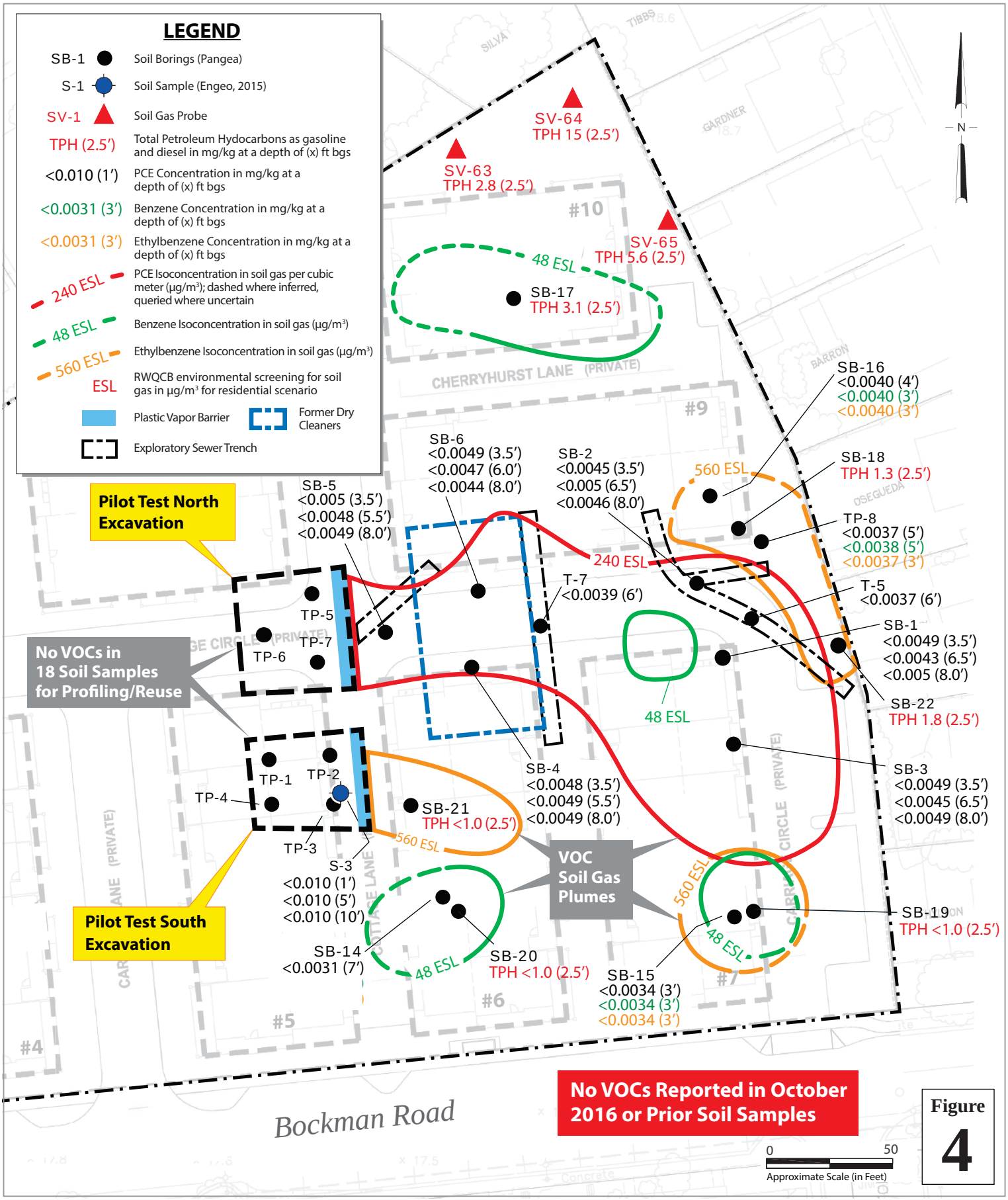


Figure 4

1233 Bockman Road
San Lorenzo, California

PANGEA

VOCs in Soil

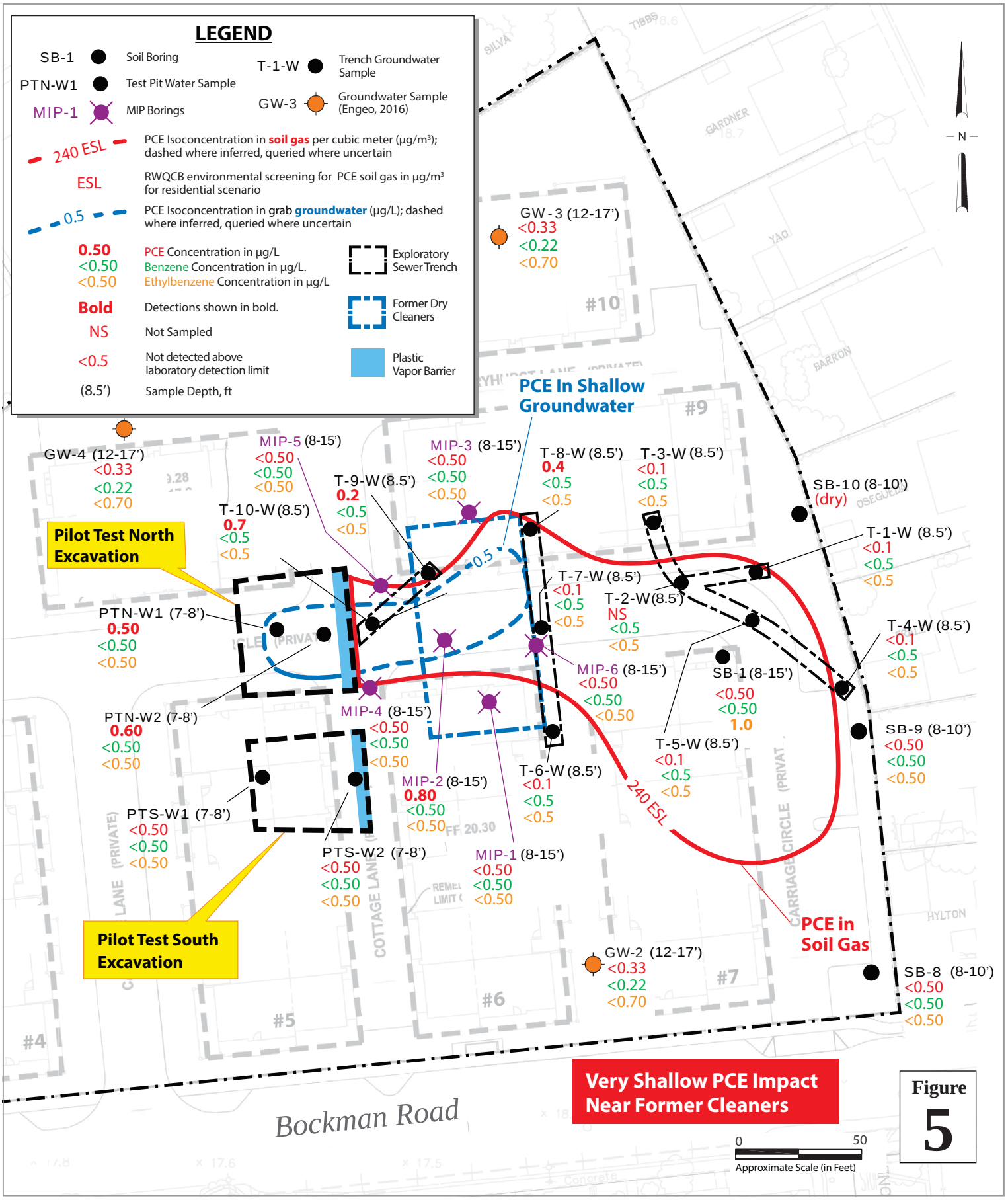


Figure 5

1233 Bockman Road
San Lorenzo, California

PANGEA

VOCs in Groundwater

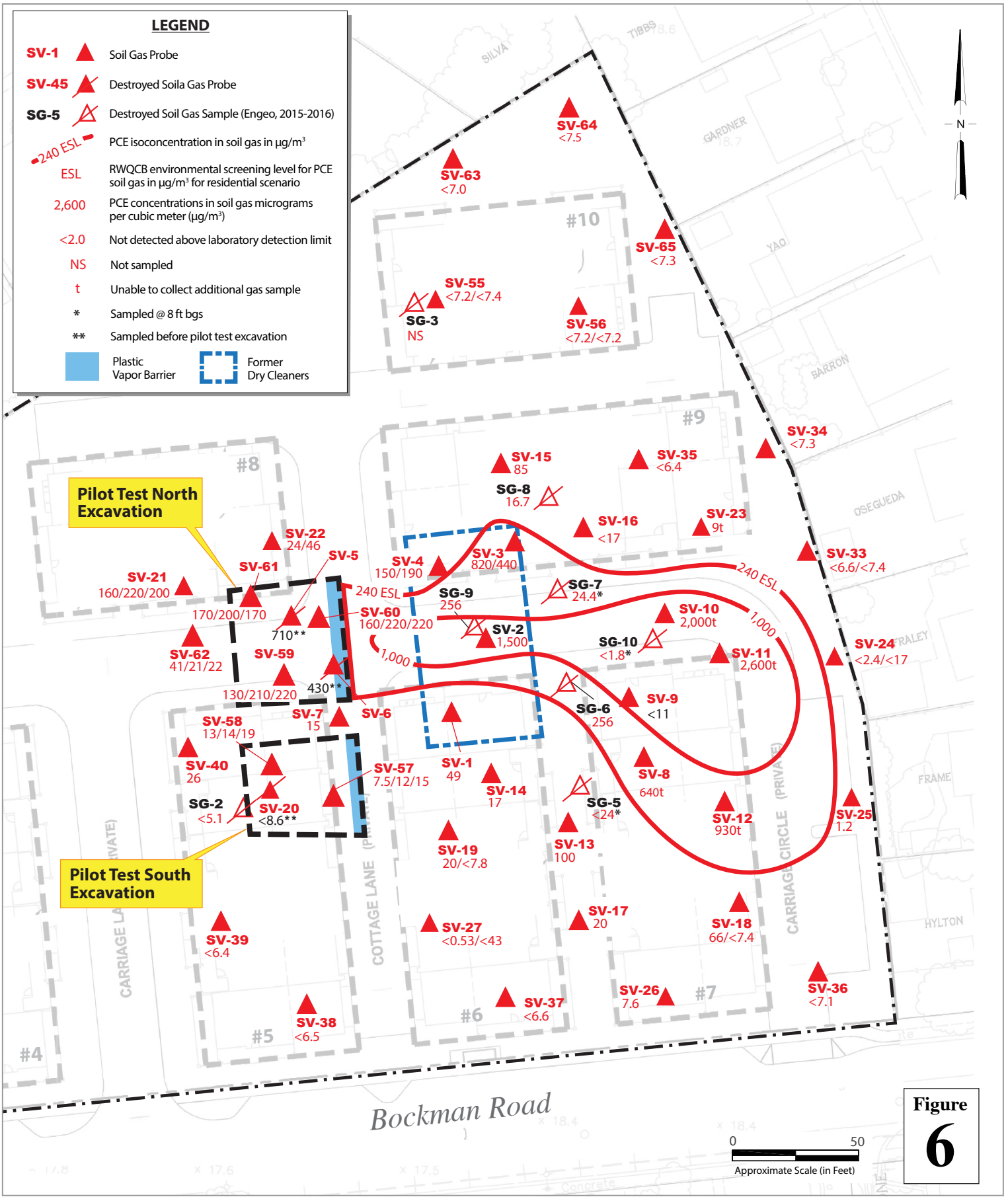


Figure 6

1233 Bockman Road
San Lorenzo, California

PANGEA

PCE in Shallow Soil Gas

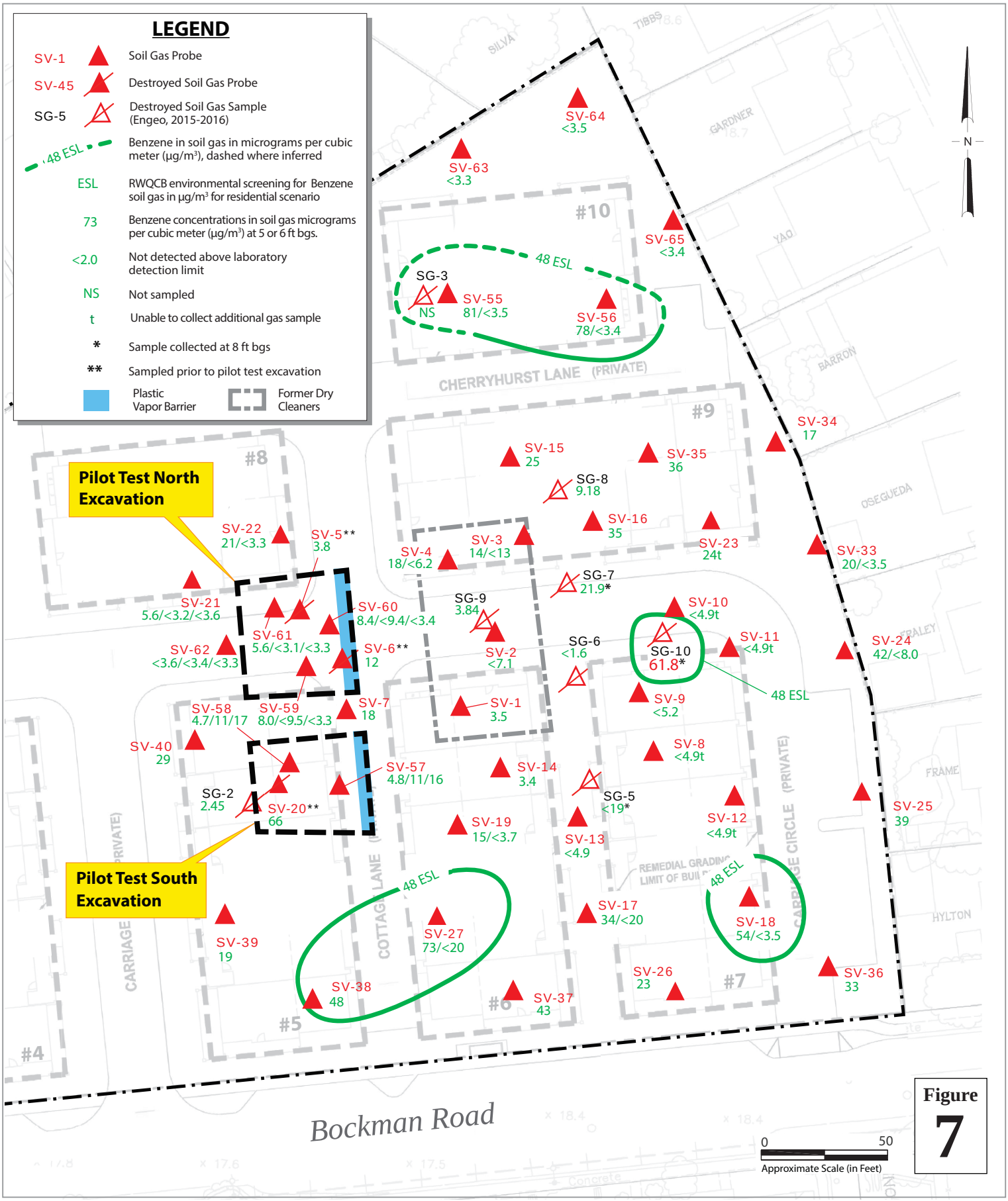


Figure 7

1233 Bockman Road
San Lorenzo, California

PANGEA

Benzene in Shallow Soil Gas

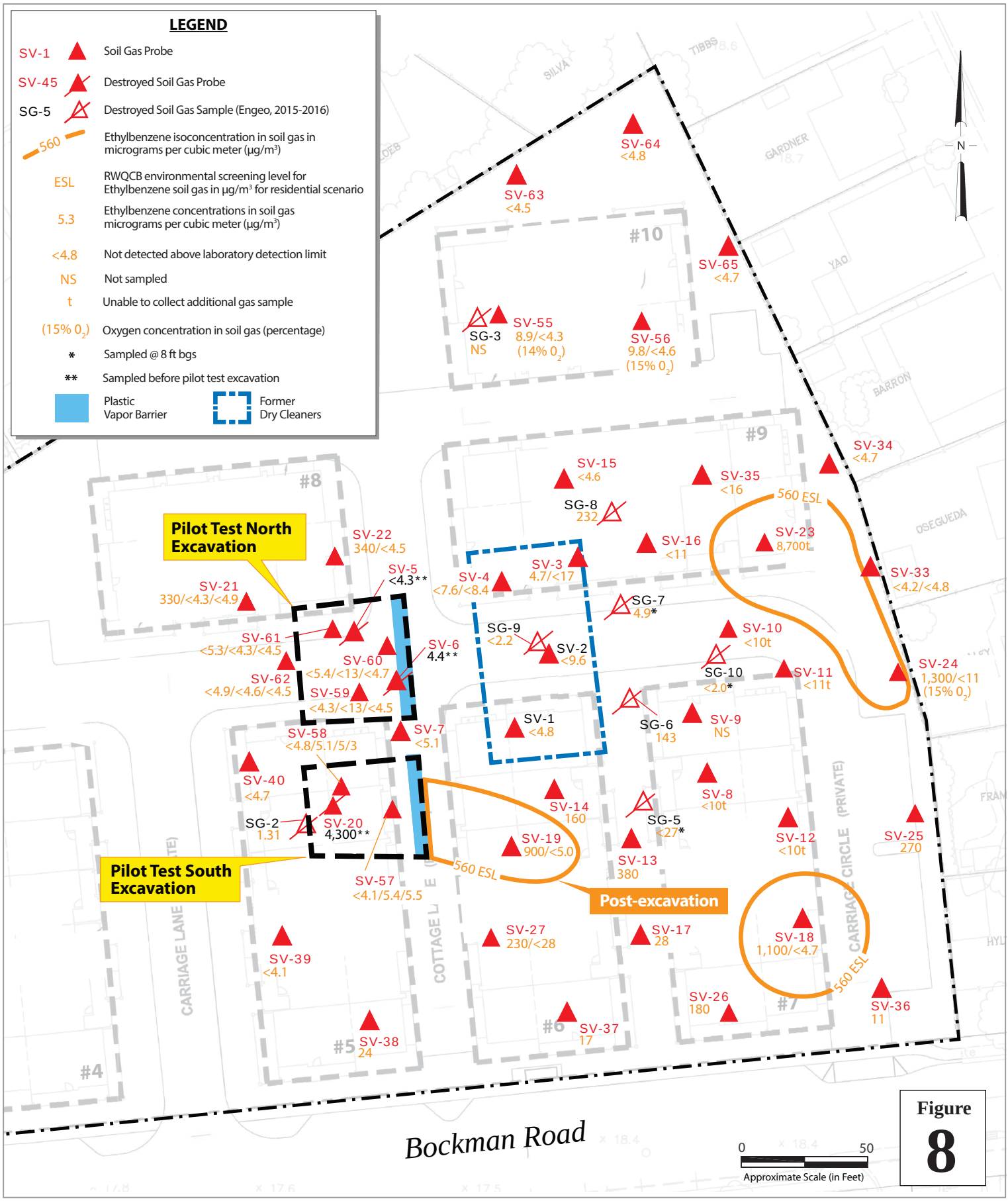


Figure 8

1233 Bockman Road
San Lorenzo, California

PANGEA

Ethylbenzene in Shallow Soil Gas

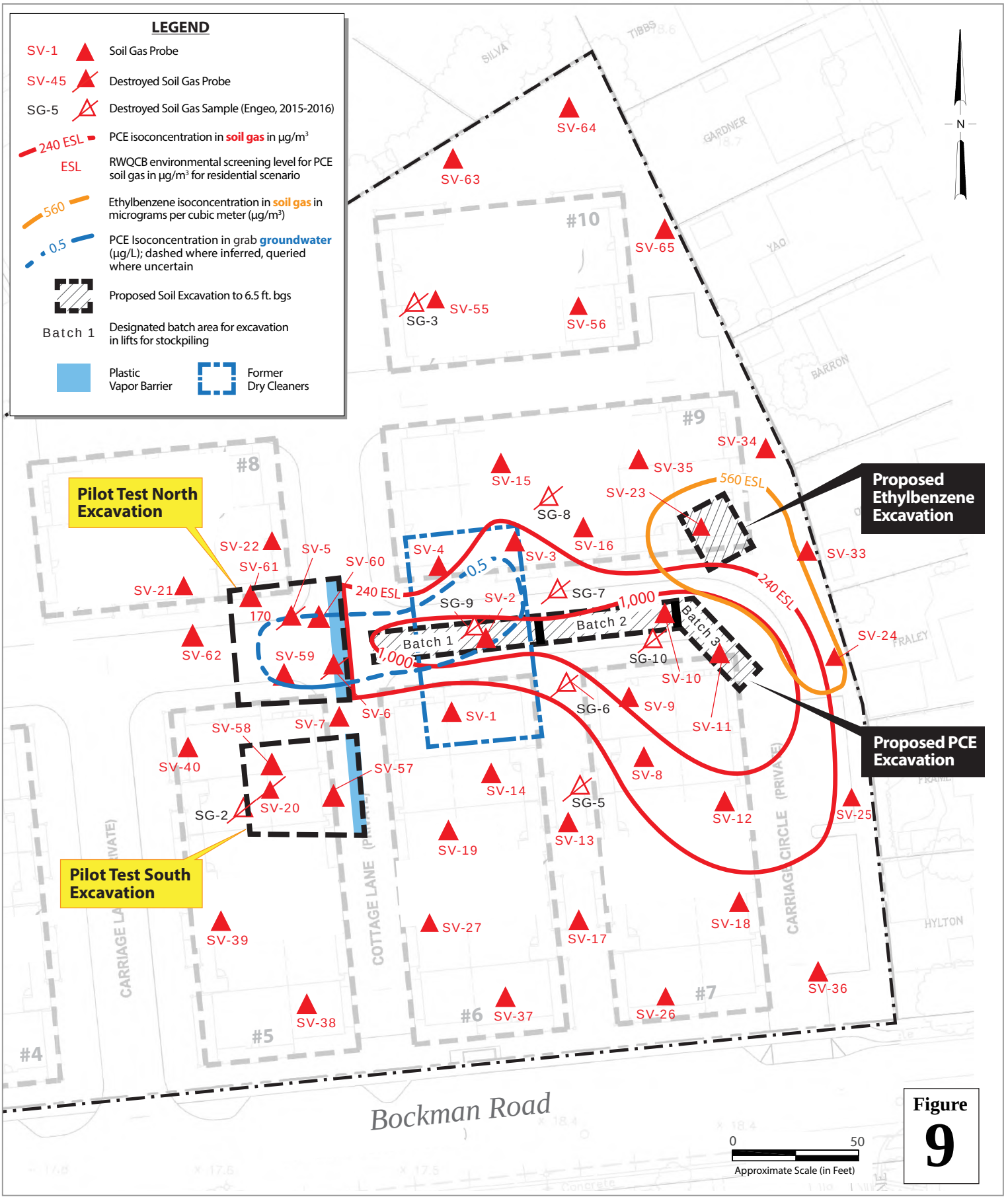


Figure 9

1233 Bockman Road
San Lorenzo, California

PANGEA

Proposed Remedial Soil Excavation

Pangea

Table 1. Soil Analytical Data - 1233 Bockman Road, San Lorenzo California

Boring / Sample ID	Date Sampled	Sample Depth (ft bgs)	TPHg	TPHd	TPHmo	Lead	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	Naphthalene	1,2-DCA	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl Chloride	Chloroform	Acetone	Other VOC's	SVOCs	PCBs	Notes
Direct Exposure ESL - residential, shallow soil:			740	230	11,000	80	0.23	970	5.1	560	42	3.3	0.37	0.6	1.2	19	160	0.0082	0.30	59,000	varies	varies	varies	
			← mg/Kg →																					
ENGEO Site Assessment 2015																								
S-1	6/25/2015	1	<0.1	3.6	32	13	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	---	<0.021	---	---	former auto repair area
	6/25/2015	5	<0.1	<2.0	<10	5.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	---	<0.021	---	---	former auto repair area
	6/25/2015	10	<0.1	<2.0	<10	5.6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	---	<0.021	---	---	former auto repair area
S-2	6/25/2015	1	<0.1	<2.0	<10	7.6	<0.01	<0.01	<0.01	22.6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	---	<0.021	---	---	former auto repair area
	6/25/2015	5	<0.1	<2.0	<10	8.3	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	---	<0.021	---	---	former auto repair area
	6/25/2015	10	<0.1	<2.0	<10	4.9	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	---	<0.021	---	---	former auto repair area
S-3	6/25/2015	1	<0.1	14	230	1.3	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	---	<0.021	---	---	
	6/25/2015	5	<0.1	<2.0	17	6.3	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	---	<0.021	---	---	
	6/25/2015	10	<0.1	<2.0	<10	5.6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	---	<0.021	---	---	
PANGEA Site Assessment - West Sector																								
SV-28	8/22/2016	7.5	5.2	**1,400**	2,800	---	<0.0048	<0.0048	<0.0048	<0.0096	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0095	<0.0048	<0.019	<0.048	---	---	Excavated to 8'
SS-1	9/2/2016	2.5	---	---	---	---	<0.0047	<0.0047	<0.0047	<0.0094	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0094	<0.0047	<0.019	<0.047	---	---	
SS-2	9/2/2016	2.5	<1.0	43	300	---	<0.0046	<0.0046	<0.0046	<0.0092	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0093	<0.0046	<0.019	<0.046	---	---	Excavated to 8'
SS-3	9/2/2016	2.5	---	---	---	---	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.020	<0.050	---	---	
SS-4	9/2/2016	2.5	---	---	---	---	<0.0049	<0.0049	<0.0049	<0.0098	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0098	<0.0049	0.059	<0.049	---	---	
SS-5	9/2/2016	2.5	---	---	---	---	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	0.050	<0.050	---	---	
SS-6	9/2/2016	8	---	---	---	---	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	0.0084	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.020	<0.050	---	---	Excavated to 12'
	9/2/2016	10	---	---	---	---	<0.0049	<0.0049	<0.0049	<0.0098	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0097	<0.0049	<0.019	<0.049	---	---	
SS-7	9/2/2016	8	---	---	---	---	<0.0049	<0.0049	<0.0049	<0.0098	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0097	<0.0049	<0.019	<0.049	---	---	
SS-8	9/2/2016	8	---	---	---	---	<0.0045	<0.0045	<0.0045	<0.0090	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0090	<0.0045	<0.018	<0.045	---	---	
SS-9	9/2/2016	8	4.0	**650**	3,100	---	<0.0049	<0.0049	<0.0049	<0.0098	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0098	<0.0049	0.030	<0.049	---	---	Excavated to 10'
	9/2/2016	10	<0.96	<1.0	<5.0	---	<0.0049	<0.0049	<0.0049	<0.0098	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0099	<0.0049	<0.020	<0.049	<0.660 a	---	
Confirmation Samples - West Sector																								
H-1	8/30/2016	8	---	110	310	---	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0095	<0.0048	<0.019	<0.048	<0.660 a	<0.024	bottom of excavation sample
H-2	8/30/2016	8	---	<1.0	<5.0	---	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0095	<0.0048	<0.019	<0.048	---	<0.024	bottom of excavation sample
H-3	8/30/2016	8	---	1.5	16	---	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0092	<0.0046	<0.018	<0.048	---	<0.024	bottom of excavation sample
BS-1-12	9/7/2016	12	<1.1	<1.0	<5.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	bottom of excavation sample
BS-2-12	9/7/2016	12	<1.1	<0.99	<5.0	---	<0.0048	<0.0048	<0.0048	<0.0096	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0097	<0.0048	<0.019	<0.048	---	---	bottom of excavation sample
BS-3-12	9/7/2016	12	<1.0	<1.0	<5.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	bottom of excavation sample
BS-4-8	9/7/2016	8	<1.1	<1.0	<5.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	bottom of excavation sample
BS-5-10	9/7/2016	10	<0.97	<0.99	<5.0	---	<0.0048	<0.0048	<0.0048	<0.0096	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0097	<0.0048	<0.019	<0.048	---	---	bottom of excavation sample

Pangea

Table 1. Soil Analytical Data - 1233 Bockman Road, San Lorenzo California

Boring / Sample ID	Date Sampled	Sample Depth (ft bgs)	TPHg	TPHd	TPHmo	Lead	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	Naphthalene	1,2-DCA	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl Chloride	Chloroform	Acetone	Other VOC's	SVOCs	PCBs	Notes
Direct Exposure ESL - residential, shallow soil:			740	230	11,000	80	0.23	970	5.1	560	42	3.3	0.37	0.6	1.2	19	160	0.0082	0.30	59,000	varies	varies	varies	
			← mg/Kg →																					
BS-6-10	9/7/2016	10	<0.94	<1.0	<5.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	bottom of excavation sample
BS-7-10	9/7/2016	10	<0.97	<0.99	<5.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	bottom of excavation sample
SW-1-10	9/7/2016	10	<1.0	<1.0	<5.0	---	<0.0049	<0.0049	<0.0049	<0.0098	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0099	<0.0049	<0.020	<0.049	---	---	excavation sidewall sample
SW-2-10	9/7/2016	10	<1.0	<0.99	<5.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	excavation sidewall sample
SW-3-10	9/8/2016	10	<0.97	1.1	<5.0	---	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0099	<0.0049	<0.020	<0.050	---	---	excavation sidewall sample
SW-4-8	9/7/2016	8	<0.97	<1.0	<5.0	---	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0099	<0.0050	<0.020	<0.050	---	---	excavation sidewall sample
SW-5-8	9/7/2016	8	<0.95	<1.0	<5.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	excavation sidewall sample
SW-6-8	9/7/2016	8	<1.0	<1.0	<5.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	excavation sidewall sample
PANGEA Site Assessment - East Sector																								
SB-1	8/3/2016	3.5	---	---	---	---	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0098	<0.0049	<0.02	<0.049	---	---	
		6.5	<0.96	---	---	---	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0087	<0.0043	<0.017	<0.043	---	---	
		8	---	---	---	---	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0099	<0.005	<0.02	<0.050	---	---	
SB-2	8/3/2016	1	---	---	---	3.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
		3	---	---	---	8.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
		3.5	---	---	---	---	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0091	<0.0045	<0.018	<0.045	---	---	
		6	---	---	---	6.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
		6.5	<1.1	---	---	---	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.02	<0.050	---	---	
		8	---	---	---	---	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0093	<0.0046	<0.019	<0.046	---	---	
SB-3	8/3/2016	3.5	---	---	---	---	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0098	<0.0049	0.027	<0.049	---	---	
		6.5	<0.99	---	---	---	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0091	<0.0045	<0.018	<0.045	---	---	
		8	---	---	---	---	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0098	<0.0049	<0.02	<0.049	---	---	
SB-4	8/3/2016	3.5	---	---	---	---	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0097	<0.0048	<0.019	<0.048	---	---	
		5.5	<0.99	---	---	---	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0097	<0.0049	<0.019	<0.049	---	---	
		8	---	---	---	---	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0098	<0.0049	<0.02	<0.049	---	---	
SB-5	8/3/2016	3.5	---	---	---	---	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0099	<0.005	<0.02	<0.050	---	---	
		5.5	<1.1	---	---	---	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0097	<0.0048	<0.019	<0.048	---	---	
		8	---	---	---	---	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0098	<0.0049	<0.02	<0.049	---	---	

SB-6	8/3/2016	1	---	---	---	7.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
		3	---	---	---	5.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
		3.5	---	---	---	---	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0097	<0.0049	<0.019	<0.049	---	---	
		6	<0.98	---	---	4.1	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0093	<0.0047	<0.019	<0.047	---	---	
		8	---	---	---	---	<0.0044	<0.0044	<0.0044	<0.0044	<0.0044	<0.0044	<0.0044	<0.0044	<0.0044	<0.0044	<0.0044	<0.0089	<0.0044	<0.018	<0.044	---	---	

SB-7	9/8/2016	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	no samples taken from boring
																						---		
SB-8	9/8/2016	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	no samples taken from boring
																						---		
SB-9	9/8/2016	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	no samples taken from boring
																						---		

Pangea

Table 1. Soil Analytical Data - 1233 Bockman Road, San Lorenzo California

Boring / Sample ID	Date Sampled	Sample Depth (ft bgs)	TPHg	TPHd	TPHmo	Lead	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	Naphthalene	1,2-DCA	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl Chloride	Chloroform	Acetone	Other VOC's	SVOCs	PCBs	Notes
Direct Exposure ESL - residential, shallow soil:			740	230	11,000	80	0.23	970	5.1	560	42	3.3	0.37	0.6	1.2	19	160	0.0082	0.30	59,000	varies	varies	varies	
			← mg/Kg →																					
SB-10	9/8/2016	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	no samples taken from boring
SB-11	9/8/2016	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	no samples taken from boring
SB-12	9/8/2016	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	no samples taken from boring
SB-13	9/8/2016	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	no samples taken from boring
SB-14	10/20/2016	7.0	---	---	---	---	<0.0031	<0.0031	<0.0031	<0.0062	<0.0031	<0.0031	<0.0031	<0.0031	<0.0031	<0.0031	<0.0031	<0.0062	<0.0031	<0.012	<0.031	---	---	
SB-15	10/20/2016	3.0	---	---	---	---	<0.0034	<0.0034	<0.0034	<0.0068	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0068	<0.0034	<0.014	<0.034	---	---	
SB-16	10/20/2016	4.0	---	---	---	---	<0.0040	<0.0040	<0.0040	<0.0080	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0079	<0.0040	<0.016	<0.0040	---	---	
T-5-6'	3/15/2017	6.0	---	---	---	---	<0.0037	<0.0037	<0.0037	<0.0074	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0075	<0.0037	0.13	<0.0037	---	---	
T-7-6'	3/16/2017	6.0	---	---	---	---	<0.0039	<0.0039	<0.0039	<0.0078	<0.0039	<0.0039	<0.0039	<0.0039	<0.0039	<0.0039	<0.0039	<0.0078	<0.0039	<0.016	<0.0039	---	---	
SB-17	3/30/2017	2.5	<0.15	3.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
SB-18	3/30/2017	2.5	<0.15	1.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
SB-19	3/30/2017	2.5	<0.15	<1.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
SB-20	3/30/2017	2.5	<0.15	<1.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
SB-21	3/30/2017	2.5	<0.14	<1.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
SB-22	4/10/2017	2.5	<0.16	1.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
SV-63	3/30/2017	2.5	<0.14	2.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
SV-64	3/30/2017	2.5	<0.15	15	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
SV-65	3/30/2017	2.5	<0.14	5.6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Pilot Study Excavation - East Sector																								
COMPA (TP1-TP4)	9/16/2016	1.0	<0.96	11	68	0.94	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	<0.050	<0.019	TP-1 thru TP-4 composite
COMPB (TP1-TP4)	9/16/2016	3.0	<1.0	4.3	<5.0	7.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	<0.0051	<0.019	TP-1 thru TP-4 composite
COMPC (TP1-TP4)	9/16/2016	6.0	<1.0	3.1	<5.0	5.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	<0.0050	<0.019	TP-1 thru TP-4 composite
TP-1	9/16/2016	1.0	---	---	---	---	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0090	<0.0045	<0.180	<0.045	---	---	PTS
TP-1	9/16/2016	3.0	---	---	---	---	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0089	<0.0045	<0.180	<0.045	---	---	PTS
TP-1	9/16/2016	6.0	---	---	---	---	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0081	<0.0041	<0.160	<0.041	---	---	PTS
TP-5	10/3/2016	2.0	<0.14	<1.0	<5.0	6.0	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0074	<0.0037	<0.150	<0.037	b	<0.019	PTN
TP-6	10/3/2016	4.0	<0.16	<1.0	<5.0	5.2	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0074	<0.0037	<0.150	<0.037	<0.005	<0.019	PTN
TP-7	10/3/2016	6.0	<0.14	<0.99	<5.0	5.6	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0074	<0.0034	<0.140	<0.034	<0.005	<0.019	PTN
TP-8	10/3/2016	5.0	<0.15	<1.0	<5.0	7.4	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0068	<0.0037	<0.150	<0.037	<0.005	<0.019	East property line
PTN-Comp1 (A-D)	10/19/2016	0-1	<1.0	1.4	16	3.2	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0093	<0.0047	<0.190	<0.047	---	---	soil stockpile from PTN 0-1 ft bgs
PTN-Comp2 (A-D)	10/19/2016	1-4	<0.99	<1.0	<5.0	6.2	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0098	<0.0049	<0.200	<0.049	---	---	soil stockpile from PTN 1-4 ft bgs
PTN-Discrete1	10/20/2016	1-4	---	---	---	---	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0086	<0.0043	<0.170	<0.043	---	---	soil stockpile from PTN 1-4 ft bgs
PTN-Discrete2	10/20/2016	4.5	---	---	---	---	<0.0036	<0.0036	<0.0036	<0.0036	<0.0036	<0.0036	<0.0036	<0.0036	<0.0036	<0.0036	<0.0036	<0.0073	<0.0036	<0.150	<0.036	---	---	insitu PTN
PTN-Discrete3	10/25/2016	5-6.5	---	---	---	---	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0092	<0.0046	<0.180	<0.046	---	---	soil stockpile from PTN 5-6.5 ft bgs

Pangea

Table 1. Soil Analytical Data - 1233 Bockman Road, San Lorenzo California

Boring / Sample ID	Date Sampled	Sample Depth (ft bgs)	TPHg	TPHd	TPHmo	Lead	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	Naphthalene	1,2-DCA	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl Chloride	Chloroform	Acetone	Other VOC's	SVOCs	PCBs	Notes
Direct Exposure ESL - residential, shallow soil:			740	230	11,000	80	0.23	970	5.1	560	42	3.3	0.37	0.6	1.2	19	160	0.0082	0.30	59,000	varies	varies	varies	
			← mg/Kg →																					
PTS-Discrete1	11/3/2016	0-1	---	---	---	---	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035	<0.0071	<0.0035	<0.140	<0.035	---	---	soil stockpile from PTS 0-1 ft bgs
PTS-Discrete2	11/3/2016	1-4	---	---	---	---	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0080	<0.0040	<0.160	<0.040	---	---	soil stockpile from PTS 1-5 ft bgs
PTS-Discrete3	11/3/2016	1-4	---	---	---	---	<0.0036	<0.0036	<0.0036	<0.0036	<0.0036	<0.0036	<0.0036	<0.0036	<0.0036	<0.0036	<0.0036	<0.0072	<0.0036	<0.140	<0.036	---	---	soil stockpile from PTS 1-5 ft bgs
PTS-Discrete4	11/3/2016	5-6.5	---	---	---	---	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0076	<0.0038	<0.150	<0.038	---	---	soil stockpile from PTS 5-6.5 ft bgs
COMP6 (1-4)	10/18/2016	stockpile	<0.93	13	200	7.9	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.050	<0.020	<0.050	<33	<0.0095	Offsite utility trenching near Building 1&2
COMP7 (1-4)	10/24/2016	stockpile	<1.1	24	300	9.5	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0099	<0.0049	<0.020	<0.049	---	---	Onsite utility trenching near Building 1&2
B1&2 - Discrete1	11/10/2016	stockpile	---	---	---	---	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0075	<0.0037	<0.015	<0.037	---	---	Buildings 1&2 trenching stockpile
B3&4 - Discrete1	11/10/2016	stockpile	---	---	---	---	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0068	<0.0034	<0.014	<0.034	---	---	Buildings 3&4 trenching stockpile

Explanation:

TPHd and TPHmo analyzed by EPA Method 8015, TPHg and VOC's analyzed by EPA Method 8260

Benzene, Toluene, Ethylbenzene and Xylenes by EPA Method 8021.

TPHd = Total Petroleum Hydrocarbons as diesel

TPHmo = Total Petroleum Hydrocarbons as motor oil

MTBE = Methyl tert-butyl ether

1,2-DCA = 1,2-Dichloroethane

PCE = Tetrachloroethene

TCE = Trichloroethene

cis-1,2-DCE = cis-1,2-Dichloroethene

VOCs = Volatile organic compounds by EPA Method 8260.

SVOCs = Semi-volatile organic compounds by EPA Method 8270.

PCB = Total polychlorinated biphenyls including Aroclors 1016, 1221, 1232, 1242, 1248, 1254, and 1260

mg/Kg = Milligrams per kilogram

ft bgs = Depth below ground surface (bgs) in feet.

ft bgs = Depth below ground surface (bgs) in feet.

ESL = Environmental Screening Level, from California Regional Water Quality Control Board - San Francisco Bay Region, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Revised February 2016 (Revision 3).

< n = Chemical not present at a concentration in excess of detection limit shown.

--- = Not analyzed

j = Sample was j-flagged; the presented results are below the reporting limit.

a = All chemicals below shown reporting limit (except benzoic acid with a reporting level of 1.7 mg/kg). See laboratory report for lower reporting limits for other chemicals.

b = Flouranthene detected at 0.0056 mg/kg, pyrene detected at 0.0089 mg/kg, both are below ESLs

ND = not detected

contaminant detections highlighted in gray

PTN = pilot test north excavation area

PTS = pilot test south excavation area

Pangea

Table 2. Groundwater Analytical Data - 1233 Bockman Road, San Lorenzo, California

Boring / Sample ID	Date Sampled	Depth to Water (ft bgs)	TPHg (µg/L)	TPHd (µg/L)	TPHmo (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	Naphthalene (µg/L)	1,2-DCA (µg/L)	PCE (µg/L)	TCE (µg/L)	Chloroform (µg/L)	Other VOCs (µg/L)	Notes
Tier 1 ESL - Groundwater:			100	100	n/a	1.0	40	13	20	0.12	0.5	3.0	5.0	50	varies	
Vapor Intrusion ESL - shallow groundwater, residential:			100	100	n/a	1.1	3,600	13	1,300	20	6.1	3.0	5.6	2.3	varies	
Vapor Intrusion ESL - shallow groundwater, commercial:			5,000	5,000	n/a	9.7	30,000	110	11,000	170	53	26	49	20	varies	
ENGEO Site Assessment 2015 - 2016																
GW-1	6/25/2015	15-25[a]	51	--	--	0.48	0.42	<0.59	0.26	0.28	<0.17	<0.59	<0.59	<0.59	--	
	7/15/2016	12-17[b]	<41	--	--	0.41	<0.20	<0.70	<0.55	<1.7	0.15	0.62	<0.70	<0.70	--	
GW-2	6/25/2015	15-25[a]	<50	--	--	<0.50	<0.50	<0.50	<1.0	<0.16	<0.17	<0.50	<0.50	<0.50	--	
	7/15/2016	12-17[b]	<41	--	--	<0.22	<0.20	<0.70	<0.55	<1.7	<0.15	<0.33	<0.70	<0.70	--	
GW-3	6/25/2015	15-25[a]	<50	--	--	<0.50	<0.50	<0.50	<1.0	<0.16	<0.17	<0.50	<0.50	<0.50	--	
	7/15/2016	12-17[b]	53.2	--	--	<0.22	<0.20	<0.70	<0.55	<1.7	<0.13	<0.33	<0.70	<0.70	--	
GW-4	7/15/2016	12-17[b]	<41	--	--	<0.22	<0.20	<0.70	<0.55	<1.7	<0.15	<0.33	<0.70	<0.70	ND	
PANGEA Site Assessment - West Sector																
SB-11	9/8/2016	dry	--	--	--	--	--	--	--	--	--	--	--	--	--	Auto repair area
SB-12	9/8/2016	dry	--	--	--	--	--	--	--	--	--	--	--	--	--	Auto repair area
SB-13	9/8/2016	8-10	<50	<50	<250	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<10	Auto repair area
Pit	9/7/2016	8	64	73	<250	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<10[c]	Auto repair area excavati
PANGEA Site Assessment - East Sector																
MIP-1	7/25/2016	8-15	<50	--	--	<0.5	0.70	<0.5	<1.0	<2.0	<0.5	<0.5	<0.5	**2.3**	<10	
MIP-2	7/25/2016	8-15	<50	--	--	<0.5	<0.5	<0.5	<1.0	<2.0	<0.5	0.80	<0.5	**3.6**	<10	
MIP-3	7/25/2016	8-15	<50	--	--	<0.5	3.3	<0.5	<1.0	<2.0	<0.5	<0.5	<0.5	**8.1**	<10	
MIP-4	7/25/2016	8-15	<50	--	--	<0.5	1.5	<0.5	0.6	<2.0	<0.5	<0.5	<0.5	**13**	<10	
MIP-5	7/25/2016	8-15	<50	--	--	<0.5	<0.5	<0.5	<1.0	<2.0	<0.5	<0.5	<0.5	<0.5	<10	
MIP-6	7/25/2016	8-15	<50	--	--	<0.5	<0.5	<0.5	<1.0	<2.0	<0.5	<0.5	<0.5	**2.6**	<10	
SB-1	8/3/2016	8-15	<50	--	--	<0.5	<0.5	1.0	6.2	<2.0	<0.5	<0.5	<0.5	<0.5	<10	
SB-7	8/22/2016	8-10	--	--	--	<0.5	<0.5	<0.5	<1.0	<2.0	<0.5	<0.5	<0.5	<0.5	<10	
SB-8	9/7/2016	8-10	<50	**590**	17,000	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<10	
SB-9	9/7/2016	8-10	<50	**380**	4,300	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<10	
SB-10	9/8/2016	dry	--	--	--	--	--	--	--	--	--	--	--	--	--	

Pangea

Table 2. Groundwater Analytical Data - 1233 Bockman Road, San Lorenzo, California

Boring / Sample ID	Date Sampled	Depth to Water (ft bgs)	TPHg	TPHd	TPHmo	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	1,2-DCA	PCE	TCE	Chloroform	Other VOCs	Notes
			µg/L													
Tier 1 ESL - Groundwater:			100	100	n/a	1.0	40	13	20	0.12	0.5	3.0	5.0	50	varies	
Vapor Intrusion ESL - shallow groundwater, residential:			100	100	n/a	1.1	3,600	13	1,300	20	6.1	3.0	5.6	2.3	varies	
Vapor Intrusion ESL - shallow groundwater, commercial:			5,000	5,000	n/a	9.7	30,000	110	11,000	170	53	26	49	20	varies	
Pilot Test - East Sector																
PTN-w1	10/19/2016	8	--	--	--	<0.5	<0.5	<0.5	<1.0	<2.0	<0.5	0.5	<0.5	<0.5	<10	
PTN-w2	10/19/2016	8	--	--	--	<0.5	<0.5	<0.5	<1.0	<2.0	<0.5	0.6	<0.5	<0.5	<10	
PTS-w1	11/1/2016	8	--	--	--	<0.5	<0.5	<0.5	<1.0	<2.0	<0.5	<0.5	<0.5	<0.5	<10	
PTS-w2	11/1/2016	8	--	--	--	<0.5	<0.5	<0.5	<1.0	<2.0	<0.5	<0.5	<0.5	<0.5	<10	
Exploratory Trenching - East Sector																
T-1-W	3/15/2017	8.5	--	--	--	<0.5	<0.5	<0.5	<1.0	<2.0	<0.5	<0.1*	<0.5	<0.5	--	
T-3-W	3/15/2017	8.5	--	--	--	<0.5	<0.5	<0.5	<1.0	<2.0	<0.5	<0.1*	<0.5	<0.5	--	
T-4-W	3/15/2017	8.5	--	--	--	<0.5	<0.5	<0.5	<1.0	<2.0	<0.5	<0.1*	<0.5	<0.5	--	
T-5-W	3/15/2017	8.5	--	--	--	<0.5	<0.5	<0.5	<1.0	<2.0	<0.5	<0.1*	<0.5	<0.5	--	
T-6-W	3/16/2017	8.5	--	--	--	<0.5	<0.5	<0.5	<1.0	<2.0	<0.5	<0.1*	<0.5	<0.5	--	
T-7-W	3/16/2017	8.5	--	--	--	<0.5	<0.5	<0.5	<1.0	<2.0	<0.5	<0.1*	<0.5	<0.5	--	
T-8-W	3/16/2017	8.5	--	--	--	<0.5	<0.5	<0.5	<1.0	<2.0	<0.5	0.4*	<0.5	<0.5	--	
T-9-W	3/16/2017	8.5	--	--	--	<0.5	<0.5	<0.5	<1.0	<2.0	<0.5	0.2*	<0.5	<0.5	--	
T-10-W	3/16/2017	8.5	--	--	--	<0.5	<0.5	<0.5	<1.0	<2.0	<0.5	0.7	<0.5	<0.5	--	

Explanation:

TPHg = Gasoline range Total Petroleum Hydrocarbons by EPA Method SW8021B/8015Bm.

TPHd = Diesel Range Total Petroleum Hydrocarbons by EPA Method SW8015B.

TPHmo = Motor Oil Range Total Petroleum Hydrocarbons by EPA Method SW8015B.

VOCs = Volatile Organic Compounds by EPA Methond 8260B.

1,2-DCA = 1,2-Dichloroethane

PCE = Tetrachloroethene

TCE = Trichloroethene

µg/L = micrograms per Liter

ft bgs = feet below grade surface.

ESL = Environmental screening level established by the SFB-RWQCB, Interim Final - November 2007 and amended in February 2016, (Rev. 3)

--- = Not analyzed or not available.

*=j-flag data is estimates value between the method detection limit and laboratory reporting limit

a = ENGEO report dated 07/02/2015 states samples were taken at first encountered groundwater which ranged between 15-25 ft bgs

Pangea

Table 2. Groundwater Analytical Data - 1233 Bockman Road, San Lorenzo, California

Boring / Sample ID	Date Sampled	Depth to Water (ft bgs)	TPHg (µg/L)	TPHd (µg/L)	TPHmo (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	Naphthalene (µg/L)	1,2-DCA (µg/L)	PCE (µg/L)	TCE (µg/L)	Chloroform (µg/L)	Other VOCs (µg/L)	Notes
Tier 1 ESL - Groundwater:			100	100	n/a	1.0	40	13	20	0.12	0.5	3.0	5.0	50	varies	
Vapor Intrusion ESL - shallow groundwater, residential:			100	100	n/a	1.1	3,600	13	1,300	20	6.1	3.0	5.6	2.3	varies	
Vapor Intrusion ESL - shallow groundwater, commercial:			5,000	5,000	n/a	9.7	30,000	110	11,000	170	53	26	49	20	varies	

b = ENGEO report dated 08/02/2016 states samples were taken at first encountered groundwater which ranged between 12-17 ft bgs

c = N-butylbenzene (0.64 ug/L) and 1,2,4-trimethylbenzene (1.6 ug/L)

d7 = strongly aged gasoline or diesel range compounds are significant in the TPH(g) chromatogram

e2 = diesel range compounds are significant; no recognizable pattern

e7 = oil range compounds are significant

e4/e11 = gasoline range compounds are significant; and/or stoddard solvent/mineral spirit?

Bold indicates concentration meets or exceeds Residential Vapor Intrusion ESL

< n = Chemical not present at a concentration in excess of laboratory detection limit shown.

Constituent detections highlighted in gray

PTN = pilot test north excavation area

PTS = pilot test south excavation area

Pangea

Table 3. Soil Gas Analytical Data - 1233 Bockman Road, San Lorenzo, California

Boring/ Sample ID	Date Sampled	Sample Depth (ft bgs)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	1,2-DCA	PCE	TCE	Other VOCs	Isopropyl Alcohol (Leak Check Compound)	Carbon Dioxide	Oxygen	Methane	Notes
			ug/m^3										%	%	%	
Residential ESL - Soil/Subslab Gas:			**48**	**160,000**	**560**	**52,000**	**41**	**54**	**240**	**240**	**Varies**	**NA**	**NA**	**NA**	**NA**	
ENGEO Site Assessment 2015-2016																
SG-1	06/25/15	5.0	1.34	6.33	<3.2	<6.5	<7.8	<3.1	<5.1	<8.1	--	<30	--	--	--	West Sector
SG-2	06/25/15	5.0	2.45	18.3	1.81	14.83	<7.8	<3.1	<5.1	<8.1	--	<30	--	--	--	East Sector
SG-5	06/24/16	8.0	<19	<26	<27	<44	<140	<55	<24	<150	--	--	--	--	--	East Sector
SG-6	06/24/16	6.0	<1.6	4.1	143	260	<5.2	<2.1	**256**	<5.4	--	--	--	--	--	East Sector
SG-7	06/24/16	8.0	21.9	20.9	<4.9	<9.9	<12	<4.7	24.4	<12	--	--	--	--	--	East Sector
SG-8	06/24/16	6.0	9.18	19.1	232	1,172	<5.2	<2.1	16.7	<5.4	--	--	--	--	--	East Sector
SG-9	06/24/16	6.0	3.84	9.96	<2.2	4.69	<5.2	<2.1	**256**	<5.4	--	--	--	--	--	East Sector
SG-10	06/24/16	8.0	**61.8**	76.2	<2.0	6.97	<10	<4.1	<1.8	<11	--	--	--	--	--	East Sector
PANGEA Site Assessment - West Sector																
SV-28	08/23/16	6.0	<3.3	<3.9	<4.5	<9.0	<22	<4.2	200	9.6	#	1,800	--	--	--	West Sector, Building 1
SV-29	08/23/16	6.0	7.5	<3.9	<4.5	17.1	<21	<4.1	7.0	<5.5	#	83	--	--	--	West Sector, Building 1
SV-30	09/01/16	6.0	31	42	6.3	33.3	<21	<4.0	<6.7	<5.3	#	<9.7	--	--	--	West Sector, Building 1
SV-31	09/01/16	6.0	16	34	6.4	40	<19	<3.7	<6.2	<4.9	#	<9.0	--	--	--	West Sector, Building 1
SV-32	09/01/16	6.0	6.4	3.9	<4.5	<9.0	<21	<4.1	14	<5.5	#	<10	--	--	--	West Sector, Building 1
SV-41	09/19/16	6.0	**49**	31	<6.1	7.6	<30	<5.7	<9.6	<7.6	#	<14	--	2.9	--	West Sector, Building 2
SV-42	09/19/16	6.0	<20	<24	<27	<54	<130	<25	<43	<34	#	<62	--	11	--	West Sector, Building 2
SV-43	09/19/16	6.5	7.2	23	6.9	32.2	<20	<3.9	<6.5	<5.2	#	<9.5	--	10	--	West Sector, Building 1
SV-44	09/19/16	6.0	--	--	--	--	--	--	--	--	--	--	--	--	--	West Sector, Building 1
SV-45	09/19/16	6.0	8.7	33	9.4	43.3	<23	<4.4	20	<5.8	#	<11	--	4.5	--	West Sector, Building 1
SV-46	10/21/16	5.0	16	17	6.3	30.3	<22	<4.2	9.4	<5.6	#	<10	0.76	2.0	0.93	West Sector, Building 1
SV-47	10/21/16	5.0	15	19	6.4	38	<20	<3.9	9.4	13	#	32	0.69	2.5	0.86	West Sector, Building 1
SV-48	10/21/16	5.0	10	15	7.1	67	<23	<4.4	8.0	<5.9	#	14	0.94	2.4	<0.22	West Sector, Building 1
SV-49	10/21/16	5.0	22	26	<4.8	12	<23	<4.5	<7.5	<5.9	#	<11	5.6	1.7	0.33	West Sector, Building 2
SV-50	10/21/16	5.0	37	36	<4.8	13	<23	<4.5	<7.5	<5.9	#	14	3.7	2.4	0.35	West Sector, Building 2
SV-51	10/21/16	5.0	7.4	8.8	<4.5	7.0	<21	<4.1	<7.0	<5.5	#	12	--	--	--	West Sector, Building 3
SV-52	10/21/16	5.0	4.7	4.6	<4.4	<8.8	<21	<4.1	23	<5.5	#	13	--	--	--	West Sector, Building 3
SV-53	10/21/16	5.0	9.3	9.6	<4.6	8.3	<22	<4.3	19	5.7	#	15	--	--	--	West Sector, Building 4
SV-54	10/21/16	5.0	5.6	6.0	<4.3	4.7	<21	<4.0	41	<5.3	#	32	--	--	--	West Sector, Building 4
PANGEA Site Assessment - East Sector																
SV-1	07/27/16	6.0	<3.5	<4.2	<4.8	<4.8	<23	<4.5	49	<5.9	#	<11	--	--	--	East Sector
SV-2	07/27/16	6.0	<7.1	<8.3	<9.6	<9.6	<46	<8.9	**1,500**	<12	#	<22	--	--	--	East Sector
SV-3	07/27/16	6.0	14	14	4.7	7.7	<22	<4.2	**820**	<5.6	#	140	--	--	--	East Sector
	04/03/17	6.0	<13	<15	<17	<34	<83	<16	**440**	<21	#	2,400	--	--	--	East Sector

Pangea

Table 3. Soil Gas Analytical Data - 1233 Bockman Road, San Lorenzo, California

Boring/ Sample ID	Date Sampled	Sample Depth (ft bgs)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	1,2-DCA	PCE	TCE	Other VOCs	Isopropyl Alcohol (Leak Check Compound)	Carbon Dioxide	Oxygen	Methane	Notes
			ug/m^3										%	%	%	
Residential ESL - Soil/Subslab Gas:			**48**	**160,000**	**560**	**52,000**	**41**	**54**	**240**	**240**	**Varies**	**NA**	**NA**	**NA**	**NA**	
SV-4	07/27/16	6.0	18	7.5	<7.6	<7.6	<36	<7.0	150	<9.4	#	<17	--	--	--	East Sector
	09/01/16	6.0	<6.2	<7.3	<8.4	<16.8	<40	<7.8	190	<10	#	<19	--	--	--	East Sector
SV-5	07/27/16	6.0	3.8	<3.7	<4.3	<4.3	<21	<4.0	**710**	<5.3	#	<9.6	--	--	--	East Sector
SV-6	07/27/16	6.0	12	<3.8	<4.4	<4.4	<21	<4.1	**430**	<5.4	#	<9.9	--	--	--	East Sector
SV-7	07/27/16	6.0	18	27	<5.1	<5.1	<25	<4.7	15	<6.3	#	<12	--	--	--	East Sector
SV-8	07/28/16	6.0	<4.9*	<11*	<10*	<15*	--	<14*	**640**	<8.7*	#	<22*	--	--	--	East Sector
Shroud (SV-8)	07/28/16	--	--	--	--	--	--	--	--	--	--	130,000	--	--	--	East Sector, Shroud Sample
SV-9	09/01/16	6.0	<5.2	<6.1	<7.1	<14.2	<34	<6.6	<11	<8.8	#	62	--	--	--	East Sector
SV-10	07/28/16	6.0	<4.9*	<11*	<10*	<15*	--	<14*	**2,000**	170*	#	<22*	--	--	--	East Sector
SV-11	07/28/16	6.0	<4.9*	<11*	<10*	<15*	--	<14*	**2,600**	150*	#	<22*	--	--	--	East Sector
SV-12	07/28/16	6.0	<4.9*	<11*	<10*	110*	--	<14*	**930**	76*	#	<22*	--	--	--	East Sector
SV-13	07/28/16	6.0	<4.9*	<11*	380	1,470	--	<14*	100*	<8.7*	#	<22*	--	--	--	East Sector
SV-14	07/27/16	6.0	3.4	3.6	160	980	<20	<3.8	17	<5.1	#	64	--	--	--	East Sector
SV-15	07/27/16	6.0	25	9.2	<4.6	8.6	<22	<4.3	85	6.1	#	<10	--	--	--	East Sector
SV-16	07/27/16	6.0	35	13	<11	<11	<52	<10	<17	<13	#	<24	--	--	--	East Sector
SV-17	07/28/16	6.0	34	13	28	191	--	<4.1	20	9.7	#	150	--	--	--	East Sector
SV-18	07/28/16	6.0	**54**	59	**1,100**	3,190	--	<4.1	66	<5.5	#	7.9*	--	--	--	East Sector
	04/03/17	6.0	<3.5	<4.1	<4.7	9.4	<23	<4.4	<7.4	<5.8	#	630	--	--	--	East Sector
SV-19	07/28/16	6.0	15	40	**900**	2,490	--	<4.1	20	11	#	8.7*	--	--	--	East Sector
	04/03/17	6.0	<3.7	<4.4	<5.0	<10	<24	<4.7	<7.8	<6.2	--	<11	--	--	--	East Sector
SV-20	08/05/16	6.0	66*	160	**4,300**	18,400	17*	<130	<8.6*	<170	#	<310	--	--	--	East Sector
SV-21	08/05/16	6.0	5.6*	<11	330	3,090	3.2*	<12	160	<16	#	<29	--	--	--	East Sector
	09/01/16	6.0	<3.2	<3.8	<4.3	9.7	<21	<4.0	220	<5.4	#	<9.8	--	--	--	East Sector
SV-22	08/05/16	6.0	21*	<82	340	18,100	10*	<88	24*	<120	#	<210	--	--	--	East Sector
	09/01/16	6.0	<3.3	<3.9	<4.5	30.7	<21	<4.1	46	<5.5	#	<10	--	--	--	East Sector
SV-23	08/05/16	6.0	24*	150	**8,700**	34,000	19*	<130	9.0*	<170	#	<310	--	--	--	East Sector
SV-24	08/05/16	6.0	42	45	**1,300**	5,500	13*	<35	<2.4*	<47	#	<86	--	--	--	East Sector
	04/03/17	6.0	<8.0	<9.5	<11	<22	<53	<10	<17	<13	#	2,200	0.53	15	<0.25	East Sector
Shroud (SV-24)	08/05/16	--	--	--	--	--	--	--	--	--	--	180,000	--	--	--	East Sector, Shroud Sample
SV-25	08/05/16	6.0	39	47	270	1,440	<1.2*	<11	1.2*	<14	#	<26	--	--	--	East Sector
SV-26	08/05/16	6.0	23	28	180	920	2.6*	<4.4	7.6	<5.8	#	<11	--	--	--	East Sector
SV-27	08/05/16	6.0	**73**	48	230	1,250	3.9*	<7.9	<0.53*	<11	#	<19	--	--	--	East Sector
	04/03/17	6.0	<20	<24	<28	<56	<130	<26	<43	<34	#	530	--	--	--	East Sector
SV-33	09/01/16	6.0	20	27	<4.2	8.8	<20	<3.9	<6.6	<5.2	#	<9.5	--	--	--	East Sector
	04/03/17	6.0	<3.5	<4.1	<4.8	<9.6	<23	<4.4	<7.4	<5.9	--	53	--	--	--	East Sector
SV-34	09/01/16	6.0	17	33	4.7	24.3	<22	<4.3	<7.3	<5.7	#	<11	--	--	--	East Sector
SV-35	09/01/16	6.0	36	100	16	79	<20	<3.8	<6.4	<5.1	#	<9.3	--	--	--	East Sector

Pangea

Table 3. Soil Gas Analytical Data - 1233 Bockman Road, San Lorenzo, California

Boring/ Sample ID	Date Sampled	Sample Depth (ft bgs)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	1,2-DCA	PCE	TCE	Other VOCs	Isopropyl Alcohol (Leak Check Compound)	Carbon Dioxide	Oxygen	Methane	Notes
			ug/m^3										%	%	%	
Residential ESL - Soil/Subslab Gas:			**48**	**160,000**	**560**	**52,000**	**41**	**54**	**240**	**240**	**Varies**	**NA**	**NA**	**NA**	**NA**	
SV-36	09/01/16	6.0	33	72	11	53	<22	<4.2	<7.1	<5.6	#	<10	--	--	--	East Sector
SV-37	09/01/16	6.0	43	110	17	85	<21	<4.0	<6.6	<5.3	#	<9.6	--	--	--	East Sector
Shroud (SV-37)	04/04/17	--	--	--	--	--	--	--	--	--	--	170,000	--	--	--	East Sector, Shroud sample
SV-38	09/01/16	6.0	**48**	120	24	120	<20	<3.9	<6.5	<5.2	#	<9.4	--	--	--	East Sector
SV-39	09/01/16	6.0	19	30	<4.1	12	<20	<3.8	<6.4	<5.1	#	<9.3	--	--	--	East Sector
SV-40	09/01/16	6.0	29	51	<4.7	22.2	<23	<4.4	26	<5.9	#	<11	--	--	--	East Sector
SV-55	10/21/16	5.0	**81**	98	8.9	48	<22	<4.3	<7.2	<5.7	#	<10	0.79	14	<0.21	East Sector
	04/03/17	5.0	<3.5	<4.1	<4.7	<9.4	<23	<4.4	<7.4	<5.8	#	<11	--	--	--	East Sector
SV-56	10/21/16	5.0	**78**	85	9.8	55	<22	<4.3	<7.2	<5.7	#	<10	1.0	15	<0.21	East Sector
Shroud (SV-56)	10/21/16	--	--	--	--	--	--	--	--	--	--	39,000	--	--	--	East Sector, Shroud sample
SV-56	04/03/17	5.0	<3.4	<4.0	<4.6	<9.2	<22	<4.3	<7.2	<5.7	--	<10	--	--	--	East Sector
SV-63	04/04/17	5.0	<3.3	<3.9	<4.5	<9.0	<22	<4.2	<7.0	<5.5	--	<10	--	--	--	East Sector
SV-64	04/04/17	5.0	<3.5	<4.1	<4.8	<9.6	<23	<4.5	<7.5	<5.9	--	<11	--	--	--	East Sector
SV-65	04/04/17	5.0	<3.4	<4.1	<4.7	<9.4	<23	<4.4	<7.3	<5.8	--	<11	--	--	--	East Sector
Pilot Test Assessment - East Sector																
SV-21	12/01/16	6.0	<3.6	<4.3	<4.9	<4.9	<24	<4.6	200	<6.1	--	<11	--	--	--	East Sector, Northwest of PTN
SV-57	12/01/16	5.0	4.8	3.7	<4.1	8.9	<20	<3.8	7.5	<5.1	#	<9.2	--	--	--	East Sector, PTS
	01/16/17	5.0	11	8.9	5.4	26.1	<21	<4.1	12	<5.4	#	49	--	--	--	East Sector, PTS
	03/03/17	5.0	16	11	5.5	24	<21	<4.1	15	<5.4	#	<9.9	--	--	--	East Sector, PTS
SV-58	12/01/16	4.6	4.7	15	<4.8	6.7	<23	<4.5	13	<6.0	#	<11	0.24	1.7	<0.22	East Sector, PTS
	01/16/17	4.6	11	12	5.1	25.7	<21	<4.0	14	<5.3	#	<9.7	--	--	--	East Sector, PTS
	03/03/17	4.6	17	13	5.3	25	<22	<4.3	19	<5.7	#	<10	--	--	--	East Sector, PTS
SV-59	12/01/16	5.3	8.0	7.6	<4.6	<9.2	<22	<4.3	130	<5.7	#	<10	--	--	--	East Sector, PTN
	01/16/17	5.3	<9.5	<11	<13	<26	<63	<12	210	<16	#	<29	--	--	--	East Sector, PTN
	03/03/17	5.3	<3.3	<3.9	<4.5	<9.0	<22	<4.2	220	<5.6	#	<10	--	--	--	East Sector, PTN
SV-60	12/01/16	5.2	8.4	32	<5.4	6.3	<26	<5.1	160	<6.7	#	15	1.3	1.3	<0.25	East Sector, PTN
	01/16/17	5.2	<9.4	<11	<13	<26	<62	<12	220	<16	#	65	--	--	--	East Sector, PTN
	03/03/17	5.2	<3.4	<4.1	<4.7	<9.4	<23	<4.4	220	<5.8	#	<11	--	--	--	East Sector, PTN
SV-61	12/01/16	5.6	5.6	19	<5.3	<10.6	<26	<4.9	170	<6.6	#	<12	--	--	--	East Sector, PTN
	01/16/17	5.6	<3.1	<3.7	<4.3	<8.6	<21	<4.0	200	<5.3	#	<9.7	--	--	--	East Sector, PTN
	03/03/17	5.6	<3.3	<3.9	<4.5	<9.0	<22	<4.2	170	<5.6	#	<10	--	--	--	East Sector, PTN

Pangea

Table 3. Soil Gas Analytical Data - 1233 Bockman Road, San Lorenzo, California

Boring/ Sample ID	Date Sampled	Sample Depth (ft bgs)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	1,2-DCA	PCE	TCE	Other VOCs	Isopropyl Alcohol (Leak Check Compound)	Carbon Dioxide	Oxygen	Methane	Notes
			ug/m^3										%	%	%	
Residential ESL - Soil/Subslab Gas:			**48**	**160,000**	**560**	**52,000**	**41**	**54**	**240**	**240**	**Varies**	**NA**	**NA**	**NA**	**NA**	
SV-62	12/01/16	5.0	<3.6	<4.3	<4.9	<9.8	<24	<4.6	41	<6.1	#	<11	--	--	--	East Sector, West of PTN
	01/16/17	5.0	<3.4	<4.0	<4.6	<9.2	<22	<4.3	21	<5.7	#	<10	--	--	--	East Sector, West of PTN
	03/03/17	5.0	<3.3	<3.9	<4.5	<9.0	<21	<4.1	22	<5.5	#	<10	--	--	--	East Sector, West of PTN
Shroud (SV-61)	12/01/16	--	--	--	--	--	--	--	--	--	--	140,000	--	--	--	East Sector, Shroud sample
Shroud (SV-62)	01/16/17	--	--	--	--	--	--	--	--	--	--	190,000	--	--	--	East Sector, Shroud sample
Shroud (SV-58)	03/03/17	--	--	--	--	--	--	--	--	--	--	76,000	--	--	--	East Sector, Shroud sample

Abbreviations:

DCA = 1,2-dichloroethane

PCE = Tetrachloroethene

TCE = Trichloroethene

VOCs = volatile organic compounds

VOCs by EPA Method TO-15.

ug/m^3 = Micrograms per cubic meter.

ft bgs = Feet below ground surface

ESL = Environmental Screening Level for Shallow Soil Gas for Evaluation of Potential Vapor Intrusion (Table E-2). Established by the SFBRWQCB, Interim Final - November 2007; Feb 2016 (Rev. 3)

-- = Not analyzed

Bold concentrations exceed residential ESL.

* = Represents an estimated concentration (j-flag value) below the reporting limit, or indicates that there was no detection above the method detection limit.

= other VOCs detected below screening level thresholds. See lab report for details.

constituent detections highlighted in gray

PTN = pilot test north excavation

PTS = pilot test south excavation

APPENDIX A

Agency Correspondence

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
REBECCA GEBHART, Interim Director

DEPARTMENT OF ENVIRONMENTAL HEALTH
LOCAL OVERSIGHT PROGRAM (LOP)
For Hazardous Materials Releases
1131 HARBOR BAY PARKWAY, SUITE 250
ALAMEDA, CA 94502
(510) 567-6700
FAX (510) 337-9335

March 29, 2017

Mr. Scott Schoeman
PaulsCorp LLC
100 Saint Paul Street
Denver, CO 80206
(Sent via E-mail to: Scott.schoeman@paulscorp.com)

Subject: Approval of Data Gap Investigation Work Plan for Site Cleanup Case No. RO0003239 and GeoTracker Global ID T10000010163, East Sector of 1233 Bockman Road, San Lorenzo, CA 94580

Dear Mr. Schoeman:

Alameda County Department of Environmental Health (ACDEH) staff has reviewed the Site Cleanup Case file for the above referenced site including the recently submitted document entitled *Data Gap Investigation Work Plan (*Work Plan*)*, dated March 13, 2017, prepared on your behalf by Pangea Environmental Services, Inc.

The Work Plan was prepared to further delineate chemicals of concern at the site and to further refine the corrective action approach which will be presented in a Remedial Design and Implementation Plan (RDIP) for the site. Specifically, the objectives of the data gap investigation are to: investigate subsurface sewer laterals/trenches associated with the former dry cleaners that may represent residual source of tetrachloroethene (PCE), or act as a preferential pathway for PCE migration in soil, soil gas and groundwater; delineate the extent of PCE in shallow groundwater associated with the potential discovery of sewer laterals and elevated PCE soil gas concentrations; provide trend data for PCE, benzene and ethylbenzene concentrations in soil gas based on high groundwater elevation/wet season scenario; to further delineate the extent of benzene in soil gas near the proposed Building 10 in the northeast corner of the site; to assess soil gas hotspots for benzene and ethylbenzene and to collect additional data to evaluate site conditions with respect to the San Francisco Bay Regional Water Quality Control Board's (RWQCB).

Based on our review of the Work Plan, ACDEH approves of the scope of work.

SUBMITTAL ACKNOWLEDGEMENT STATEMENT

Please note that ACDEH has updated its Attachment 1 with regards to report submittals to ACDEH. ACDEH will now be requiring a Submittal Acknowledgement Statement, replacing the Perjury Statement, as a cover letter signed by the Responsible Party (RP). The language for the Submittal Acknowledgement Statement is as follows:

"I have read and acknowledge the content, recommendations and/or conclusions contained in the attached document or report submitted on my behalf to ACDEH's FTP server and the State Water Resources Control Board's GeoTracker website."

Note this change to your submittals to ACDEH.

TECHNICAL REPORT REQUEST

Please submit technical reports to the Geotracker and ACDEH ftp sites using the designations indicated below according to the following schedule:

- **May 8, 2017**– Remedial Design and Implementation Plan Report
  File to be named: RO3239 RDIP_R_yyyy-mm-dd

If you have any questions, please call me at (510) 567-6791 or send me an electronic mail message at kit.soo@acgov.org. Online case files are available for review at the following website: http://www.acgov.org/aceh/index.htm.

Sincerely,

Kit Soo

Digitally signed by Kit Soo
DN: cn=Kit Soo, o=ACDEH, ou, email=Kit.Soo@acgov.org, c=US
Date: 2017.03.29 11:21:18 -07'00'

Kit Soo, California PG 8957
Senior Hazardous Materials Specialist

Attachment: Attachment 1
Responsible Party(ies) Legal Requirements/Obligations
ACDEH Electronic Report Upload (ftp) Instructions

cc: Andrew Lavaux, PaulsCorp LLC, (*Sent via Email to: Andrew.Lavaux@paulscorp.com*)

Bob Clark-Riddell, Pangea Environmental Services, Inc. (*Sent via E-mail to: briddell@pangeaenv.com*)

Dilan Roe, ACDEH (*Sent via E-mail to: dilan.roe@acgov.org*)
Paresh Khatri, ACDEH (*Sent via E-mail to: paresh.khatri@acgov.org*)
Kit Soo, ACDEH (*Sent via E-mail to: kit.soo@acgov.org*)

GeoTracker, eFile

APPENDIX B

Permits

Alameda County Public Works Agency - Water Resources Well Permit

Public Works Agency
Alameda County

399 Elmhurst Street
Hayward, CA 94544-1395
Telephone: (510)670-6633 Fax:(510)782-1939

Application Approved on: 11/18/2016 By jamesy

Permit Numbers: W2016-0817
Permits Valid from 11/21/2016 to 11/21/2016

Application Id: 1479433110223 **City of Project Site:** San Lorenzo
Site Location: 1233 Bockman Road, San Lorenzo
Project Start Date: 11/21/2016 **Completion Date:** 11/21/2016
Assigned Inspector: Contact Marcelino Vialpando at (510) 670-5760 or Marcelino@acpwa.org

Applicant: Pangea Environmental Services, Inc. - Patrick Groff
1710 Franklin ST #200, Oakland, CA 94612 **Phone:** 925-818-0010

Property Owner: Andrew Lavaux
100 St. Paul Street, #300, Denver, CA 80206 **Phone:** --

Client: ** same as Property Owner **

Total Due: $265.00
Receipt Number: WR2016-0566 **Total Amount Paid:** $265.00
Payer Name : Robert Clark-Riddell Paid By: VISA **PAID IN FULL**

Works Requesting Permits:

Well Destruction-Vapor monitoring well - 9 Wells
Driller: Pangea Environmental Services, Inc. - Lic #: 906899 - Method: over **Work Total: $265.00**

Specifications

Permit #	Issued Date	Expire Date	Owner Well Id	Hole Diam.	Casing Diam.	Seal Depth	Max. Depth	State Well #	Orig. Permit #	DWR #
W2016-0817	11/18/2016	02/19/2017	SV-46	2.25 in.	0.25 in.	4.50 ft	5.00 ft	SV-46	W2016-0762	SV-46
W2016-0817	11/18/2016	02/19/2017	SV-47	2.25 in.	0.25 in.	4.50 ft	5.00 ft	SV-47	W2016-0762	SV-47
W2016-0817	11/18/2016	02/19/2017	SV-48	2.25 in.	0.25 in.	4.50 ft	5.00 ft	SV-48	W2016-0762	SV-48
W2016-0817	11/18/2016	02/19/2017	SV-49	2.25 in.	0.25 in.	4.50 ft	5.00 ft	SV-49	W2016-0762	SV-49
W2016-0817	11/18/2016	02/19/2017	SV-50	2.25 in.	0.25 in.	4.50 ft	5.00 ft	SV-50	W2016-0762	SV-50
W2016-0817	11/18/2016	02/19/2017	SV-51	2.25 in.	0.25 in.	4.50 ft	5.00 ft	SV-51	W2016-0762	SV-51
W2016-0817	11/18/2016	02/19/2017	SV-52	2.25 in.	0.25 in.	4.50 ft	5.00 ft	SV-52	W2016-0762	SV-52
W2016-0817	11/18/2016	02/19/2017	SV-53	2.25 in.	0.25 in.	4.50 ft	5.00 ft	SV-53	W2016-0762	SV-53
W2016-0817	11/18/2016	02/19/2017	SV-54	2.25 in.	0.25 in.	4.50 ft	5.00 ft	SV-54	W2016-0762	SV-54

Specific Work Permit Conditions

1. Drilling Permit(s) can be voided/ cancelled only in writing. It is the applicant's responsibility to notify Alameda County Public Works Agency, Water Resources Section in writing for an extension or to cancel the drilling permit application. No drilling permit application(s) shall be extended beyond ninety (90) days from the original start date. Applicants may not cancel a drilling permit application after the completion date of the permit issued has passed.

2. Compliance with the above well-sealing specifications shall not exempt the well-sealing contractor from complying with appropriate state reporting-requirements related to well destruction (Sections 13750 through 13755 (Division 7, Chapter 10, Article 3) of the California Water Code). Contractor must complete State DWR Form 188 and mail original to the

Alameda County Public Works Agency, Water Resources Section, within 30 days, including permit number and site map.

3. Permittee shall assume entire responsibility for all activities and uses under this permit and shall indemnify, defend and save the Alameda County Public Works Agency, its officers, agents, and employees free and harmless from any and all expense, cost, liability in connection with or resulting from the exercise of this Permit including, but not limited to, properly damage, personal injury and wrongful death.

4. Permittee, permittee's contractors, consultants or agents shall be responsible to assure that all material or waters generated during drilling, boring destruction, and/or other activities associated with this Permit will be safely handled, properly managed, and disposed of according to all applicable federal, state, and local statutes regulating such. In no case shall these materials and/or waters be allowed to enter, or potentially enter, on or off-site storm sewers, dry wells, or waterways or be allowed to move off the property where work is being completed.

5. Prior to any drilling activities, it shall be the applicant's responsibility to contact and coordinate an Underground Service Alert (USA), obtain encroachment permit(s), excavation permit(s) or any other permits or agreements required for that Federal, State, County or City, and follow all City or County Ordinances. No work shall begin until all the permits and requirements have been approved or obtained. It shall also be the applicants responsibilities to provide to the Cities or to Alameda County an Traffic Safety Plan for any lane closures or detours planned. No work shall begin until all the permits and requirements have been approved or obtained.

6. No changes in construction procedures or well type shall change, as described on this permit application. This permit may be voided if it contains incorrect information.

7. Applicant shall contact assigned inspector listed on the top of the permit at least five (5) working days prior to starting, once the permit has been approved. Confirm the scheduled date(s) at least 24 hours prior to drilling.

8. Remove the Christy box or similar structure. Overdrill or clean out to original depth. After the seal has set, backfill the remaining hole with concrete or compacted material to match existing.

9. Copy of approved drilling permit must be on site at all times. Failure to present or show proof of the approved permit application on site shall result in a fine of $500.00.

10. Electronic Reporting Regulations (Chapter 30, Division 3 of Title 23 & Division 3 of Title 27, CCR) require electronic submission of any report or data required by a regulatory agency from a cleanup site. Submission dates are set by a Regional Water Board or by a regulatory agency. Once a report/data is successfully uploaded, as required, you have met the reporting requirement (i.e. the compliance measure for electronic submittals is the actual upload itself). The upload date should be on or prior to the regulatory due date.

11. Vapor monitoring wells constructed with tubing shall be decomissioned by complete removal of tubing, grout seal, and fill material of sand or bentonite. Fill material may be removed by hand auger if material can be removed completely.

Vapor monitoring wells constructed with pvc pipe less than 2" shall be overdrilled to total depth.

Vapor monitoring wells constructed with 2" pvc pipe or larger may be grouted by tremie pipe (any depth) or pressure grouted (less than 30', 25 psi for 5 min).

12. Note: Work Completed on Nov 17, 2016.

Alameda County Public Works Agency - Water Resources Well Permit

Public Works Agency
Alameda County

399 Elmhurst Street
Hayward, CA 94544-1395
Telephone: (510)670-6633 Fax:(510)782-1939

Application Approved on: 03/28/2017 By jamesy

Permit Numbers: W2017-0277
Permits Valid from 03/30/2017 to 03/30/2017

Application Id:	1489798085361	**City of Project Site:**	San Lorenzo
Site Location:	1233 Bockman Road, San Lorenzo, CA		
Project Start Date:	03/30/2017	**Completion Date:**	03/30/2017
Assigned Inspector:	Contact Marcelino Vialpando at (510) 670-5760 or Marcelino@acpwa.org		
Applicant:	Pangea Environmental Services, Inc. - Patrick Groff 1710 Franklin Street, #200, Oakland, CA 94612	**Phone:**	925-818-0010
Property Owner:	Andrew Lavaux 100 St Paul Street, #300, Denver, CO 80206	**Phone:**	--
Client:	Andrew Lavaux 100 St Paul Street, #300, Denver, CO 80206	**Phone:**	--

	Total Due:	$265.00
Receipt Number: WR2017-0146	**Total Amount Paid:**	$265.00
Payer Name : Robert Clark-Riddell	Paid By: VISA	**PAID IN FULL**

Works Requesting Permits:

Well Construction-Vapor monitoring well-Vapor monitoring well - 3 Wells
Driller: Penecore Drilling, Inc. - Lic #: 906899 - Method: Hand **Work Total: $265.00**

Specifications

Permit #	Issued Date	Expire Date	Owner Well Id	Hole Diam.	Casing Diam.	Seal Depth	Max. Depth
W2017-0277	03/28/2017	06/28/2017	SV-63	3.25 in.	0.25 in.	4.50 ft	5.50 ft
W2017-0277	03/28/2017	06/28/2017	SV-64	3.25 in.	0.25 in.	4.50 ft	5.50 ft
W2017-0277	03/28/2017	06/28/2017	SV-65	3.25 in.	0.25 in.	4.50 ft	5.50 ft

Specific Work Permit Conditions

1. Drilling Permit(s) can be voided/ cancelled only in writing. It is the applicant's responsibility to notify Alameda County Public Works Agency, Water Resources Section in writing for an extension or to cancel the drilling permit application. No drilling permit application(s) shall be extended beyond ninety (90) days from the original start date. Applicants may not cancel a drilling permit application after the completion date of the permit issued has passed.

2. Compliance with the above well-sealing specifications shall not exempt the well-sealing contractor from complying with appropriate state reporting-requirements related to well destruction (Sections 13750 through 13755 (Division 7, Chapter 10, Article 3) of the California Water Code). Contractor must complete State DWR Form 188 and mail original to the Alameda County Public Works Agency, Water Resources Section, within 30 days, including permit number and site map.

3. Permittee shall assume entire responsibility for all activities and uses under this permit and shall indemnify, defend and save the Alameda County Public Works Agency, its officers, agents, and employees free and harmless from any and all expense, cost, liability in connection with or resulting from the exercise of this Permit including, but not limited to, properly damage, personal injury and wrongful death.

4. Permittee, permittee's contractors, consultants or agents shall be responsible to assure that all material or waters generated during drilling, boring destruction, and/or other activities associated with this Permit will be safely handled,

properly managed, and disposed of according to all applicable federal, state, and local statutes regulating such. In no case shall these materials and/or waters be allowed to enter, or potentially enter, on or off-site storm sewers, dry wells, or waterways or be allowed to move off the property where work is being completed.

5. Prior to any drilling activities, it shall be the applicant's responsibility to contact and coordinate an Underground Service Alert (USA), obtain encroachment permit(s), excavation permit(s) or any other permits or agreements required for that Federal, State, County or City, and follow all City or County Ordinances. No work shall begin until all the permits and requirements have been approved or obtained. It shall also be the applicants responsibilities to provide to the Cities or to Alameda County an Traffic Safety Plan for any lane closures or detours planned. No work shall begin until all the permits and requirements have been approved or obtained.

6. No changes in construction procedures or well type shall change, as described on this permit application. This permit may be voided if it contains incorrect information.

7. Applicant shall submit the copies of the approved encroachment permit to this office within 10 days.

8. Applicant shall contact assigned inspector listed on the top of the permit at least five (5) working days prior to starting, once the permit has been approved. Confirm the scheduled date(s) at least 24 hours prior to drilling.

9. Copy of approved drilling permit must be on site at all times. Failure to present or show proof of the approved permit application on site shall result in a fine of $500.00.

10. Electronic Reporting Regulations (Chapter 30, Division 3 of Title 23 & Division 3 of Title 27, CCR) require electronic submission of any report or data required by a regulatory agency from a cleanup site. Submission dates are set by a Regional Water Board or by a regulatory agency. Once a report/data is successfully uploaded, as required, you have met the reporting requirement (i.e. the compliance measure for electronic submittals is the actual upload itself). The upload date should be on or prior to the regulatory due date.

11. Vapor monitoring wells above water level constructed with tubing maybe be backfilled with pancake-batter consistency bentonite. Minimum surface seal thickness is two inches of cement grout around well box.

Vapor monitoring wells above water level constructed with pvc pipe shall have a minimum seal depth (Neat Cement Seal) of 2 feet below ground surface (BGS). Minimum surface seal thickness is two inches of cement grout around well box. All other conditions for monitoring well construction shall apply.

APPENDIX C

Boring Logs/Soil Gas Probe Construction Details

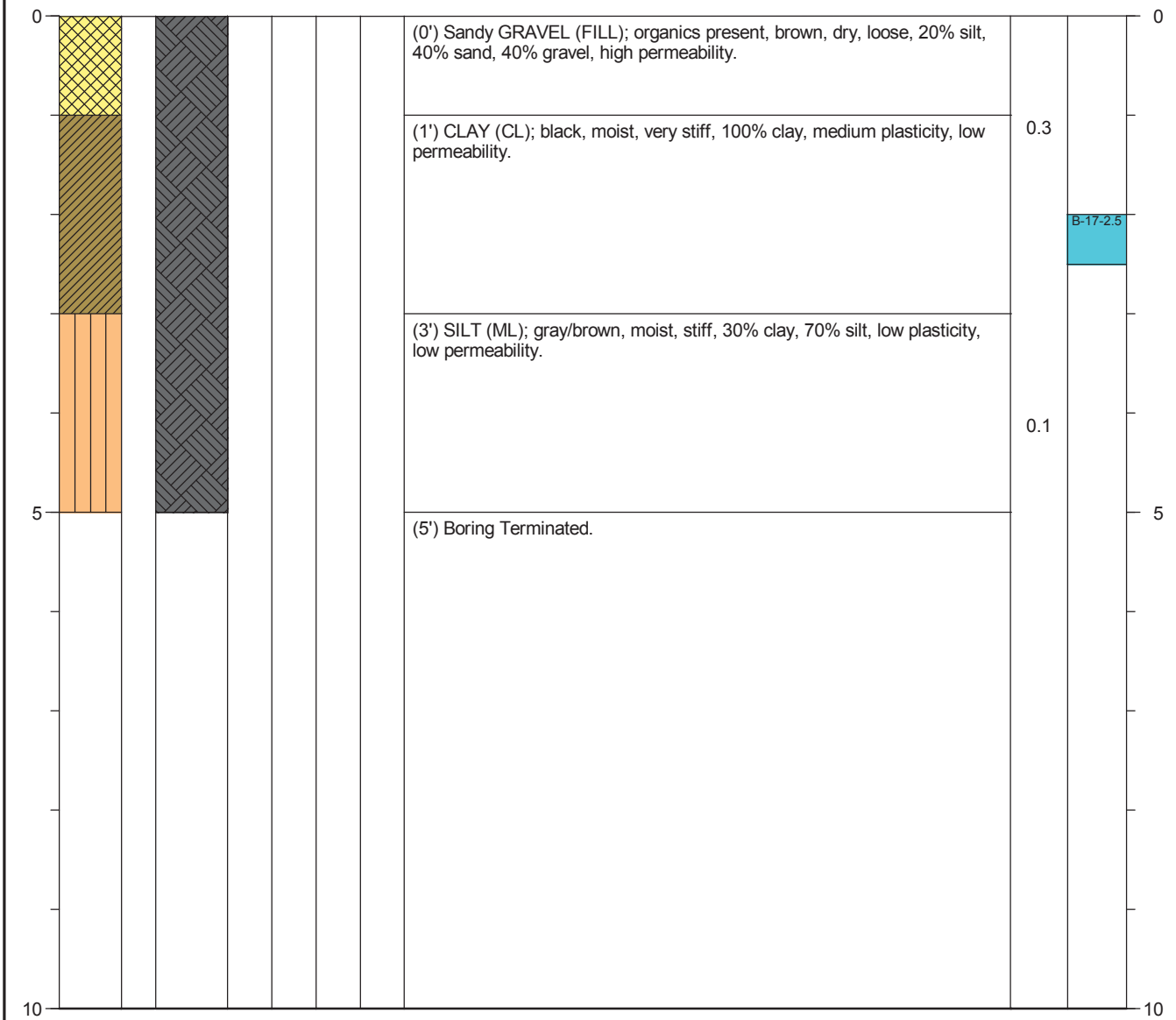
BORING AND WELL LOG LEGEND

LITHOLOGY	WATER LEVEL	WELL/BORING COMPLETION	SAMPLE TYPE	DESCRIPTION
				ASPHALT
				CONCRETE
				FILL
				TOPSOIL
				COBBLES
				IGNEOUS Rock
				METAMORPHIC Rock
				SEDIMENTARY Rock
				Well-graded GRAVEL (GW)
				Poorly graded GRAVEL (GP)
				Silty GRAVEL (GM)
				Clayey GRAVEL (GC)
				Well-graded GRAVEL with silt (GW-GM)
				Poorly graded GRAVEL with silt (GP-GM)
				Well-graded GRAVEL with clay (GW-GC)
				Poorly graded GRAVEL with clay (GP-GC)
				Well-graded SAND (SW)
				Poorly graded SAND (SP)
				Silty SAND (SM)
				Clayey SAND (SC)
				Well-graded SAND with silt (SW-SM)
				Poorly graded SAND with silt (SP-SM)
				Well-graded SAND with clay (SW-SC)
				Poorly graded SAND with clay (SP-SC)
				SILT (ML)
				Lean CLAY (CL)
				Organic SOIL (OL)
				Elastic SILT (MH)
				Fat CLAY (CH)
				Organic SOIL (OH)
				PEAT (PT)
				Volume Descriptors: Trace = <5% Few = 5-10% Little = 15-25% Some = 30-45% Mostly = >=50%
	▽ ▼			Water Level During Drilling Water Level at End of Drilling/in Completed Well
				Cap Riser Screen Cement Bentonite Grout Bentonite Seal Filter Pack Backfill
			GR	Grab
			EN	Encore
			SS	Split Spoon
			SH	Shelby Tube
			CO	Core Barrel
			DP	Direct Push
			ID	Lab Sample and ID

NOTES:

PANGEA	**Client:** Pauls Corporation, LLC **Project:** Bockman **Address:** 1233 Bockman Road, San Lorenzo, CA	**BORING LOG** **Boring No. SB-17** **Page: 1 of 1**

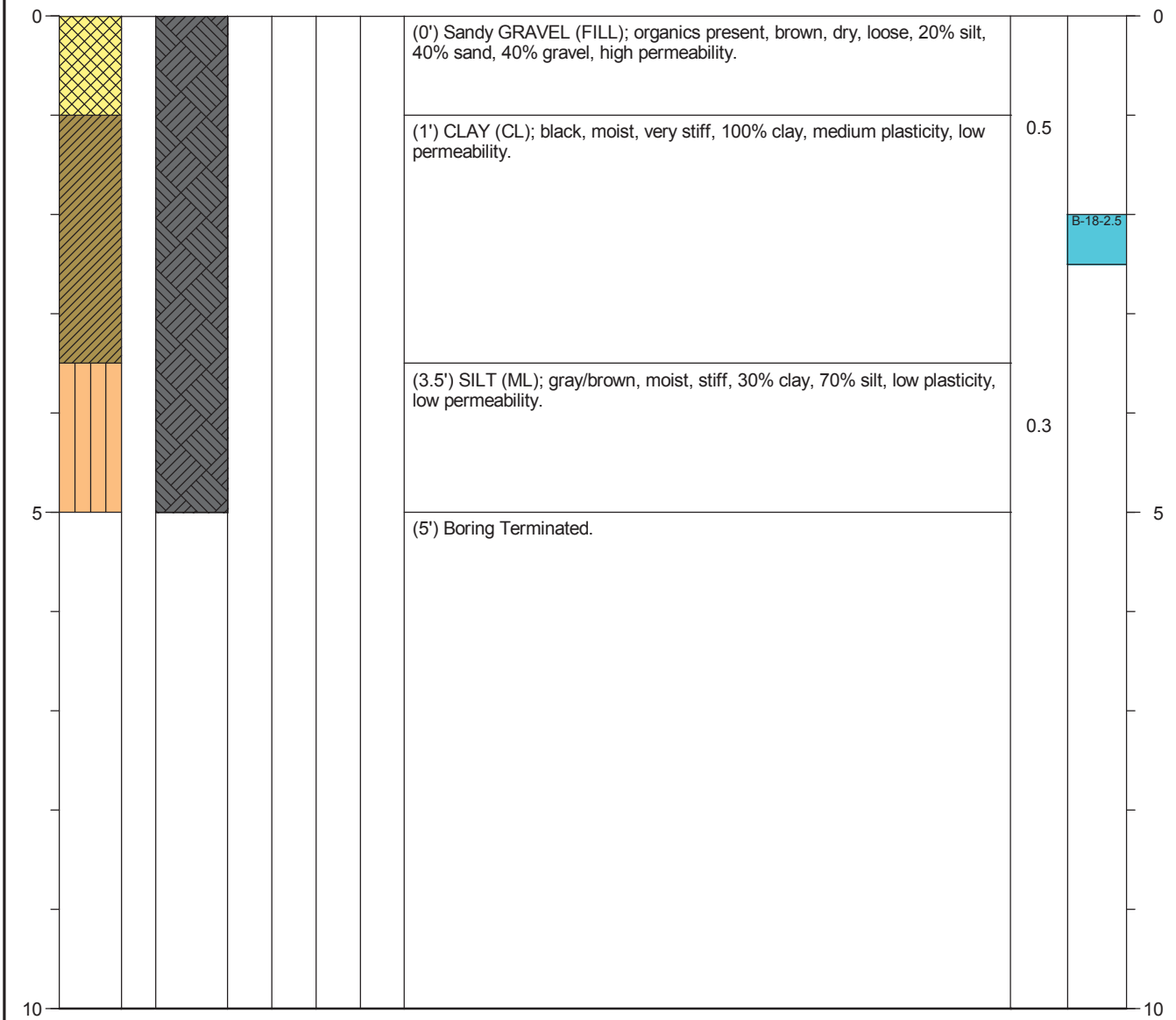
Drilling Start Date:	**03/30/2017**	Boring Depth (ft):	**5**
Drilling End Date:	**03/30/2017**	Boring Diameter (in):	**3.25**
Drilling Company:	**Penecore**	Sampling Method(s):	
Drilling Method:	**Hand Auger**	DTW During Drilling (ft):	
Drilling Equipment:		DTW After Drilling (ft):	
Driller:		Ground Surface Elev. (ft):	
Logged By:	**EL**	Location (X,Y):	



NOTES:

PANGEA	**Client:** Pauls Corporation, LLC **Project:** Bockman **Address:** 1233 Bockman Road, San Lorenzo, CA	**BORING LOG** **Boring No. SB-18** **Page: 1 of 1**

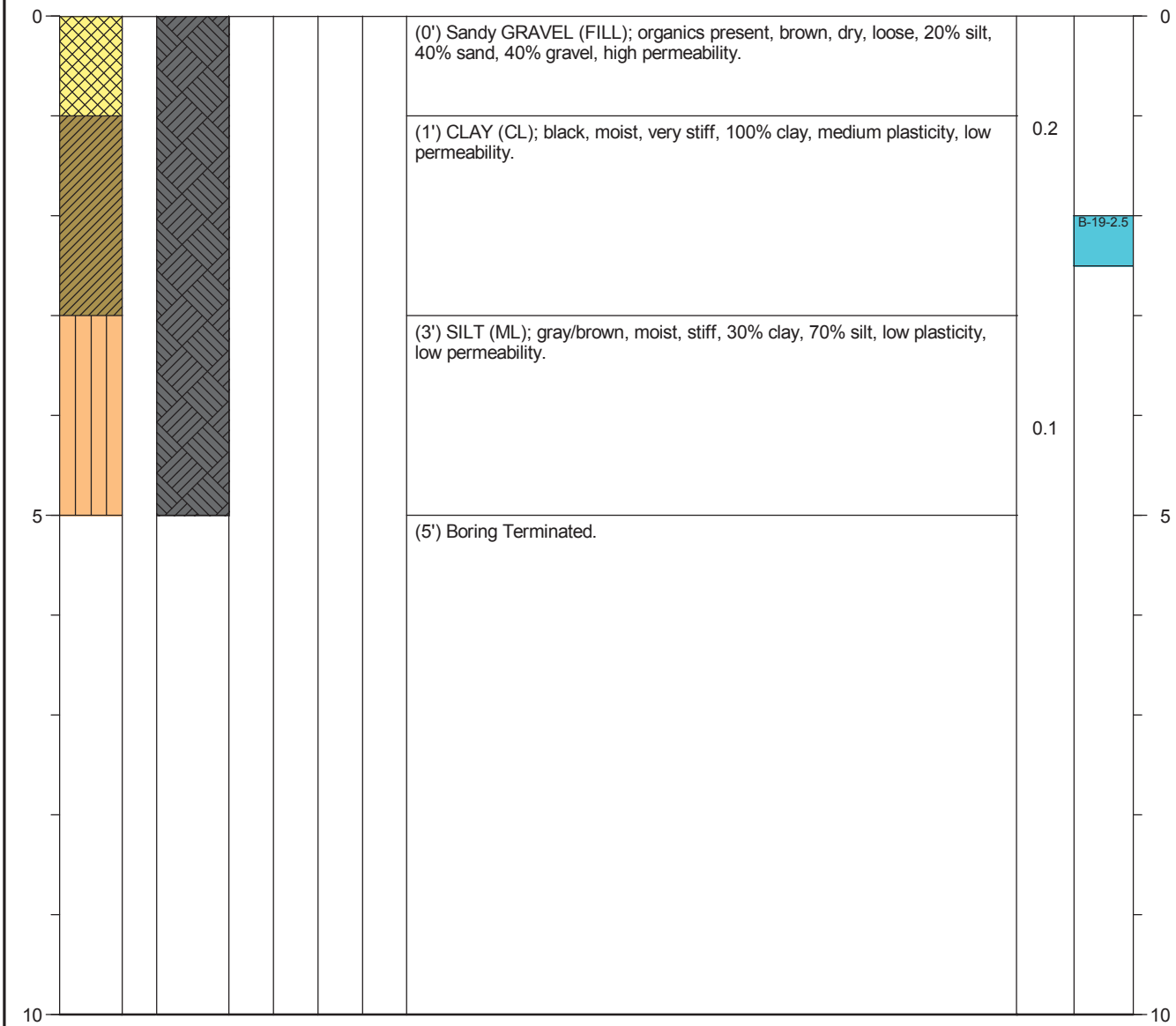
Drilling Start Date:	**03/30/2017**	Boring Depth (ft):	**5**
Drilling End Date:	**03/30/2017**	Boring Diameter (in):	**3.25**
Drilling Company:	**Penecore**	Sampling Method(s):	
Drilling Method:	**Hand Auger**	DTW During Drilling (ft):	
Drilling Equipment:		DTW After Drilling (ft):	
Driller:		Ground Surface Elev. (ft):	
Logged By:	**EL**	Location (X,Y):	



NOTES:

PANGEA	**Client:** Pauls Corporation, LLC **Project:** Bockman **Address:** 1233 Bockman Road, San Lorenzo, CA	**BORING LOG** **Boring No. SB-19** **Page: 1 of 1**

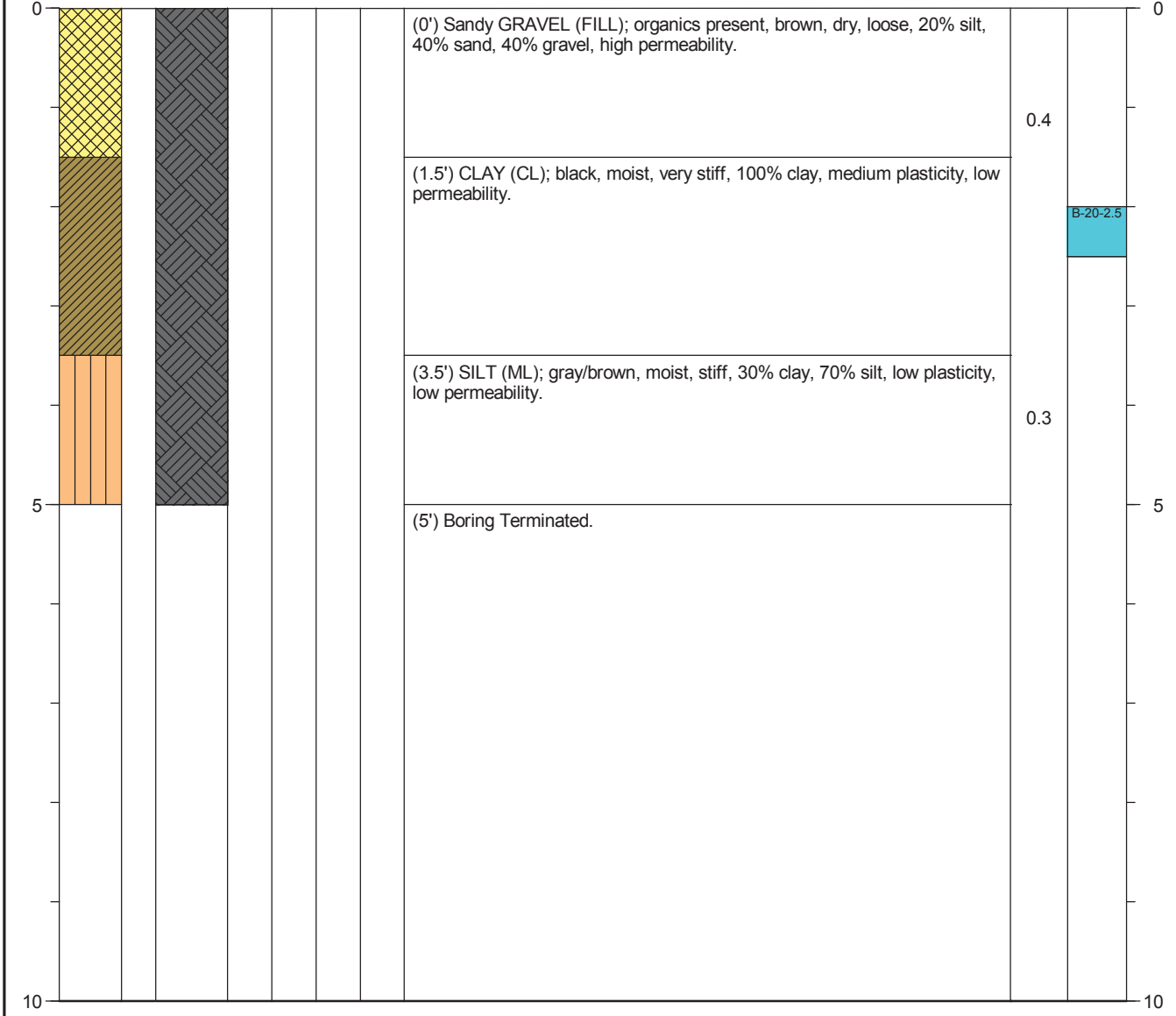
Drilling Start Date:	**03/30/2017**	Boring Depth (ft):	**5**
Drilling End Date:	**03/30/2017**	Boring Diameter (in):	**3.25**
Drilling Company:	**Penecore**	Sampling Method(s):	
Drilling Method:	**Hand Auger**	DTW During Drilling (ft):	
Drilling Equipment:		DTW After Drilling (ft):	
Driller:		Ground Surface Elev. (ft):	
Logged By:	**EL**	Location (X,Y):	



NOTES:

PANGEA	**Client:** Pauls Corporation, LLC **Project:** Bockman **Address:** 1233 Bockman Road, San Lorenzo, CA	**BORING LOG** **Boring No. SB-20** **Page: 1 of 1**

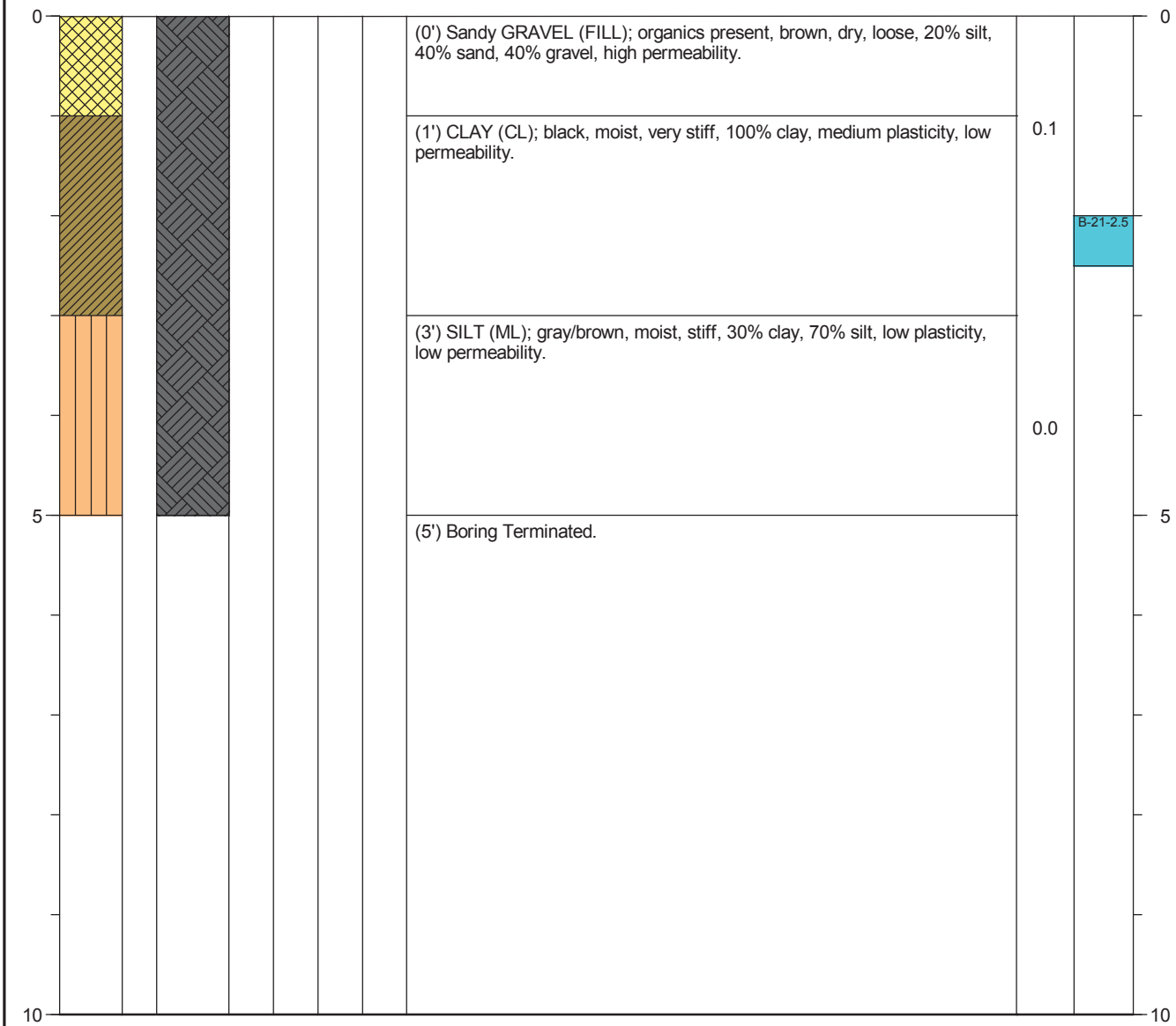
Drilling Start Date:	**03/30/2017**	Boring Depth (ft):	**5**
Drilling End Date:	**03/30/2017**	Boring Diameter (in):	**3.25**
Drilling Company:	**Penecore**	Sampling Method(s):	
Drilling Method:	**Hand Auger**	DTW During Drilling (ft):	
Drilling Equipment:		DTW After Drilling (ft):	
Driller:		Ground Surface Elev. (ft):	
Logged By:	**EL**	Location (X,Y):	



NOTES:

PANGEA	**Client:** Pauls Corporation, LLC **Project:** Bockman **Address:** 1233 Bockman Road, San Lorenzo, CA	**BORING LOG** **Boring No. SB-21** **Page: 1 of 1**

Drilling Start Date:	**03/30/2017**	Boring Depth (ft):	**5**
Drilling End Date:	**03/30/2017**	Boring Diameter (in):	**3.25**
Drilling Company:	**Penecore**	Sampling Method(s):	
Drilling Method:	**Hand Auger**	DTW During Drilling (ft):	
Drilling Equipment:		DTW After Drilling (ft):	
Driller:		Ground Surface Elev. (ft):	
Logged By:	**EL**	Location (X,Y):	



NOTES:

PANGEA	**Client:** Pauls Corporation, LLC **Project:** Bockman **Address:** 1233 Bockman Road, San Lorenzo, CA	**BORING LOG** **Boring No. SB-22** **Page: 1 of 1**

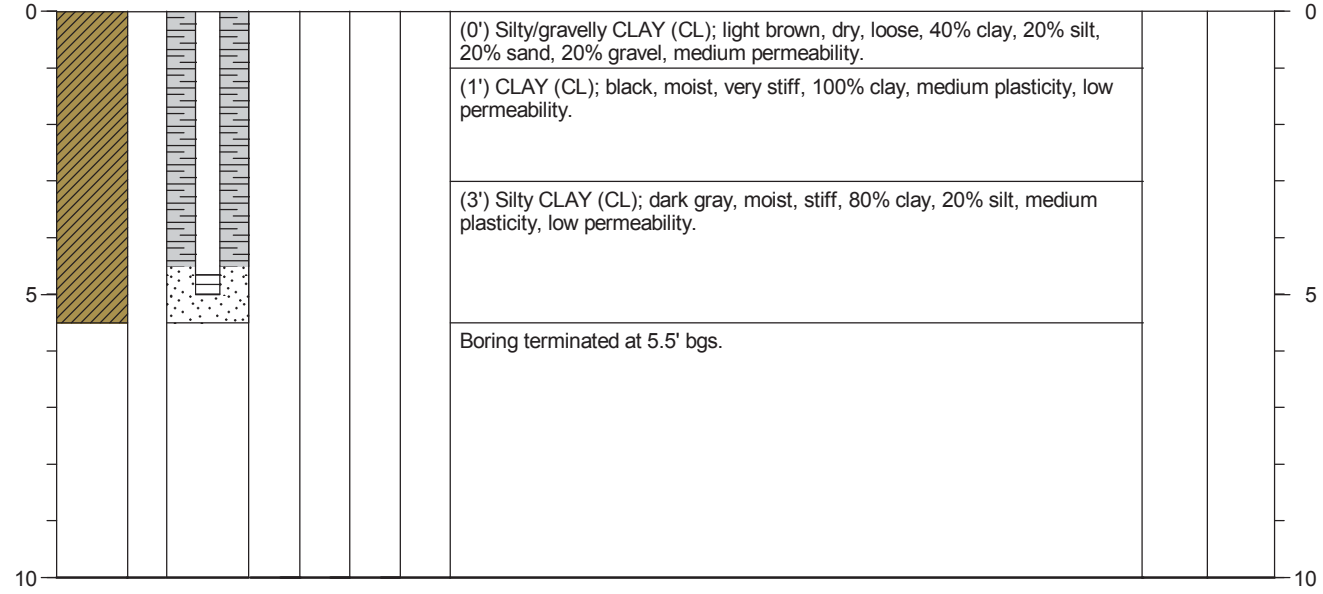
Drilling Start Date:	**04/10/2017**	Boring Depth (ft):	**5**
Drilling End Date:	**04/10/2017**	Boring Diameter (in):	**2**
Drilling Company:	**Pangea**	Sampling Method(s):	
Drilling Method:	**Hand Auger**	DTW During Drilling (ft):	
Drilling Equipment:		DTW After Drilling (ft):	
Driller:		Ground Surface Elev. (ft):	
Logged By:	**Erik Lervaag**	Location (X,Y):	

DEPTH (ft)	LITHOLOGY	WATER LEVEL	BORING COMPLETION	COLLECT: Sample Type	COLLECT: Date & Time	COLLECT: Blow Counts	COLLECT: Recovery (%)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	MEASURE: Lab Sample	DEPTH (ft)
0								(0') 4" ASPHALT.	0.0		0
								(4") FILL: Sandy GRAVEL.			
								(1') Silty SAND (SM); gray, 20% silt, 50% sand, 30% gravel, medium permeability.	0.0		
								(2') CLAY (CL); black, moist, 100% clay, medium plasticity, low permeability.	0.0	SB-22-2.5	
								(3') SILT (ML); gray, moist, 20% clay, 65% silt, 15% sand, medium plasticity, low permeability.	0.0		
									0.0		
5								(5') End of Boring.			5
10											10

NOTES:

PANGEA	**Client:** Pauls Corporation, LLC **Project:** Bockman **Address:** 1233 Bockman Road, San Lorenzo, CA	**WELL LOG** **Well No.** SV-55 **Page:** 1 of 1

Drilling Start Date:	**10/20/2016**	Boring Depth (ft):	**5.5**	Well Depth (ft):	**5**
Drilling End Date:	**10/20/2016**	Boring Diameter (in):	**3.25**	Well Diameter (in):	**1/4**
Drilling Company:	**Penecore**	Sampling Method(s):		Screen Slot (in):	**N/A**
Drilling Method:	**Hand Auger**	DTW During Drilling (ft):		Riser Material:	**Teflon Tubing**
Drilling Equipment:		DTW After Drilling (ft):		Screen Material:	**Vapor Implant**
Driller:		Top of Casing Elev. (ft):		Seal Material(s):	**Bentonite**
Logged By:	**Patrick Groff**	Location (X,Y):		Filter Pack:	**#3 Sand**



NOTES: Hydrated bentonite 0-4.0'
Dry bentonite 4-4.5'
Sand 4.5-5.5'

PANGEA	**Client:** Pauls Corporation, LLC **Project:** Bockman **Address:** 1233 Bockman Road, San Lorenzo, CA	**WELL LOG** **Well No.** SV-56 **Page:** 1 of 1

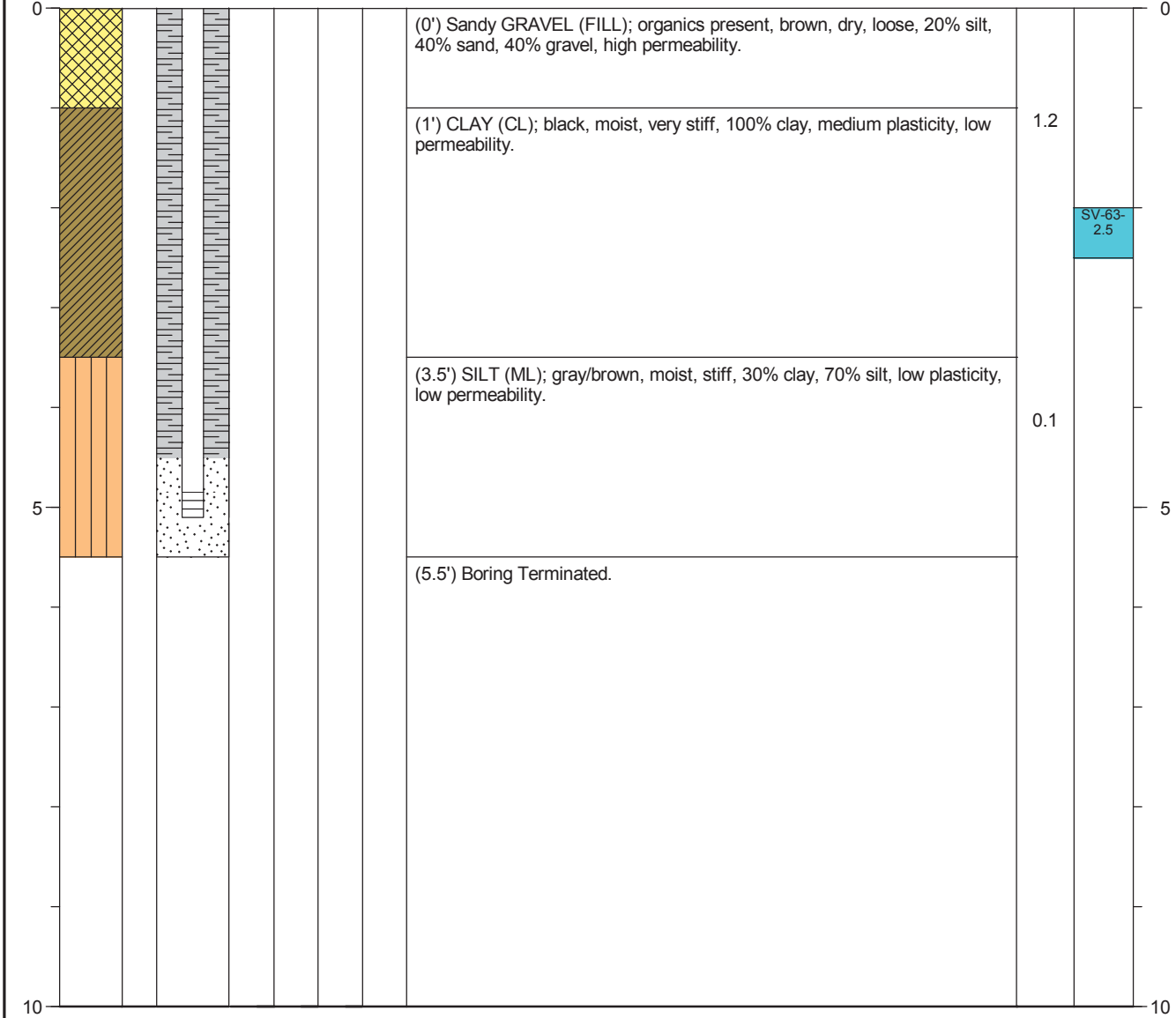
Drilling Start Date:	**10/20/2016**	Boring Depth (ft):	**5.5**	Well Depth (ft):	**5**
Drilling End Date:	**10/20/2016**	Boring Diameter (in):	**3.25**	Well Diameter (in):	**1/4**
Drilling Company:	**Penecore**	Sampling Method(s):		Screen Slot (in):	**N/A**
Drilling Method:	**Hand Auger**	DTW During Drilling (ft):		Riser Material:	**Teflon Tubing**
Drilling Equipment:		DTW After Drilling (ft):		Screen Material:	**Vapor Implant**
Driller:		Top of Casing Elev. (ft):		Seal Material(s):	**Bentonite**
Logged By:	**Patrick Groff**	Location (X,Y):		Filter Pack:	**#3 Sand**

DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT: Sample Type	COLLECT: Date & Time	COLLECT: Blow Counts	COLLECT: Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	MEASURE: Lab Sample	DEPTH (ft)
0								(0') Silty/gravelly CLAY (CL); light brown, dry, loose, 40% clay, 20% silt, 20% sand, 20% gravel, medium permeability.			0
								(1') CLAY (CL); black, moist, very stiff, 100% clay, medium plasticity, low permeability.			
								(3') Silty CLAY (CL); dark gray, moist, stiff, 80% clay, 20% silt, medium plasticity, low permeability.			
5								Boring terminated at 5.5' bgs.			5
10											10

NOTES: Hydrated bentonite 0-4.0'
Dry bentonite 4-4.5'
Sand 4.5-5.5'

PANGEA	**Client:** Pauls Corporation, LLC **Project:** Bockman **Address:** 1233 Bockman Road, San Lorenzo, CA	**WELL LOG** **Well No.** SV-63 **Page:** 1 of 1

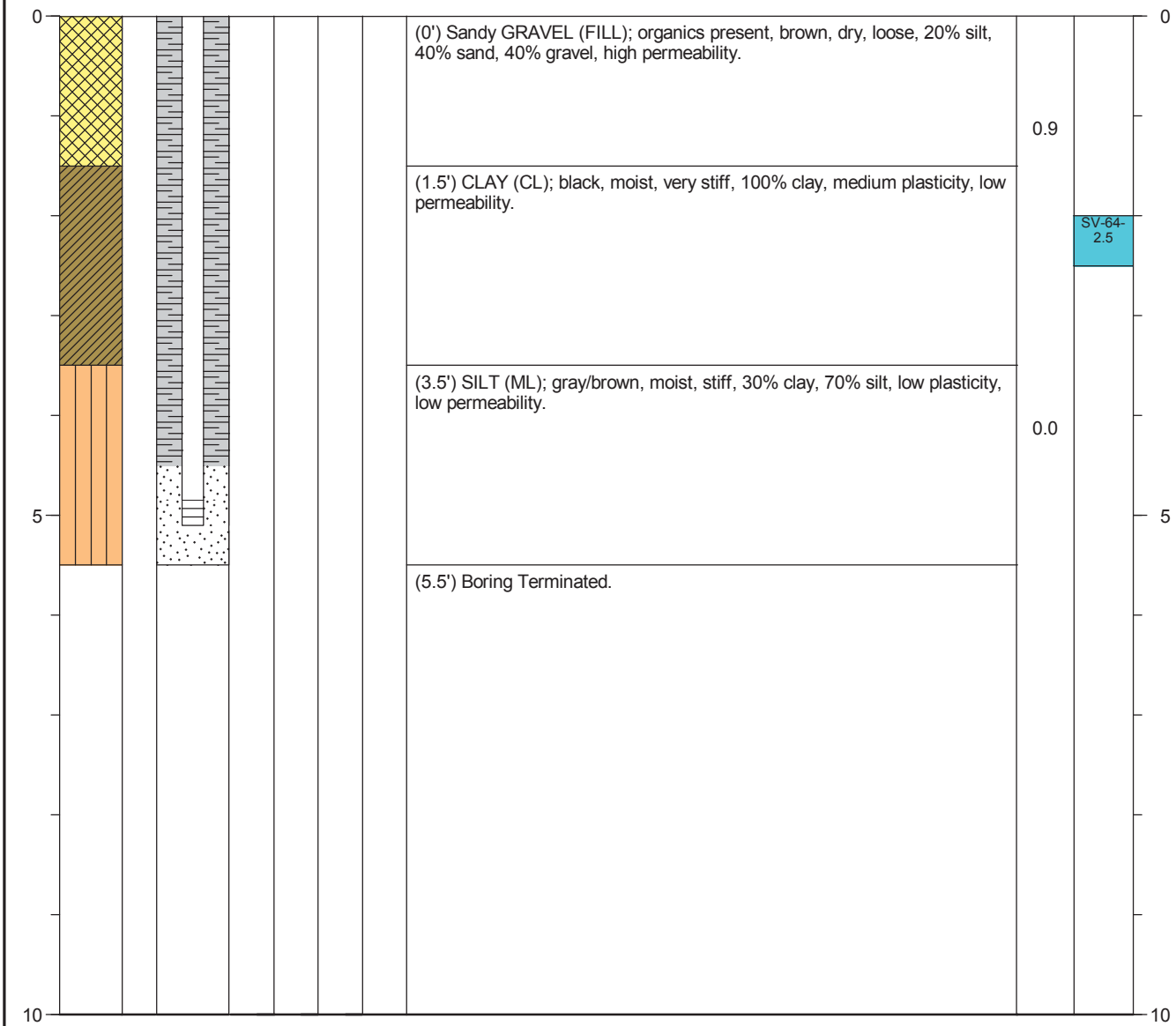
Drilling Start Date:	**03/30/2017**	Boring Depth (ft):	**5.5**	Well Depth (ft):	**5.5**
Drilling End Date:	**03/30/2017**	Boring Diameter (in):	**3.25**	Well Diameter (in):	**1/4**
Drilling Company:	**Penecore**	Sampling Method(s):		Screen Slot (in):	**N/A**
Drilling Method:	**Hand Auger**	DTW During Drilling (ft):		Riser Material:	**Teflon Tubing**
Drilling Equipment:		DTW After Drilling (ft):		Screen Material:	**Vapor Implant**
Driller:		Top of Casing Elev. (ft):		Seal Material(s):	**Hydrated Bentonite**
Logged By:	**EL**	Location (X,Y):		Filter Pack:	**#3 Sand**



NOTES: Hydrated bentonite 0-4.0'
Dry bentonite 4-4.5'
Sand 4.5-5.5'

PANGEA	**Client:** Pauls Corporation, LLC **Project:** Bockman **Address:** 1233 Bockman Road, San Lorenzo, CA	**WELL LOG** **Well No.** SV-64 **Page:** 1 of 1

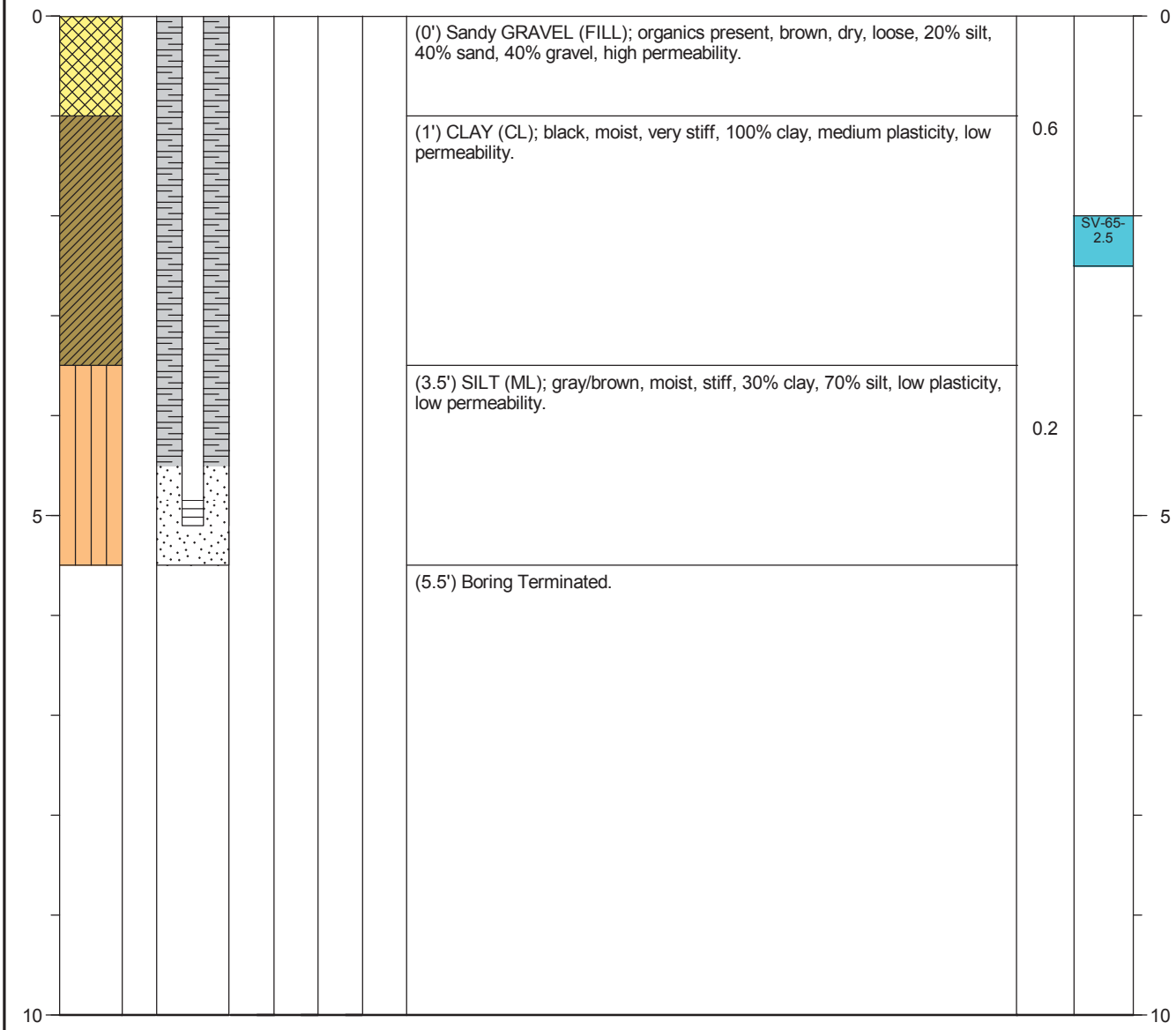
Drilling Start Date:	**03/30/2017**	Boring Depth (ft):	**5.5**	Well Depth (ft):	**5.5**
Drilling End Date:	**03/30/2017**	Boring Diameter (in):	**3.25**	Well Diameter (in):	**1/4**
Drilling Company:	**Penecore**	Sampling Method(s):		Screen Slot (in):	**N/A**
Drilling Method:	**Hand Auger**	DTW During Drilling (ft):		Riser Material:	**Teflon Tubing**
Drilling Equipment:		DTW After Drilling (ft):		Screen Material:	**Vapor Implant**
Driller:		Top of Casing Elev. (ft):		Seal Material(s):	**Hydrated Bentonite**
Logged By:	**EL**	Location (X,Y):		Filter Pack:	**#3 Sand**



NOTES: Hydrated bentonite 0-4.0'
Dry bentonite 4-4.5'
Sand 4.5-5.5'

PANGEA	**Client:** Pauls Corporation, LLC **Project:** Bockman **Address:** 1233 Bockman Road, San Lorenzo, CA	**WELL LOG** **Well No.** SV-65 **Page:** 1 of 1

Drilling Start Date:	**03/30/2017**	Boring Depth (ft):	**5.5**	Well Depth (ft):	**5.5**
Drilling End Date:	**03/30/2017**	Boring Diameter (in):	**3.25**	Well Diameter (in):	**1/4**
Drilling Company:	**Penecore**	Sampling Method(s):		Screen Slot (in):	**N/A**
Drilling Method:	**Hand Auger**	DTW During Drilling (ft):		Riser Material:	**Teflon Tubing**
Drilling Equipment:		DTW After Drilling (ft):		Screen Material:	**Vapor Implant**
Driller:		Top of Casing Elev. (ft):		Seal Material(s):	**Hydrated Bentonite**
Logged By:	**EL**	Location (X,Y):		Filter Pack:	**#3 Sand**



NOTES: Hydrated bentonite 0-4.0'
Dry bentonite 4-4.5'
Sand 4.5-5.5'

APPENDIX D

Soil Gas Sampling Field Forms

SOIL GAS PURGING / SAMPLING LOG

Project Name: Beckman
Job Number: 2030.001
Date: 10-21-16
Sampler(s): BG, EL
Sample ID / Time:

Probe / Well ID: SV-55
Canister Serial #: 00162
Flow Contoller #: A00206
Initial Vacuum: 29.5
Final Vacuum: 6.0

Notes:

SPECIFICATIONS

Tubing Length: ____ inches
Tubing Diameter: ____ inches
Boring Diameter: ____ inches
Sandpack height: ____ inches
Probe Length: ____ inches
Probe Diameter: ____ inches
Summa Flow Rate: ____ mL/min
Purge Flow Rate: ____ mL/min

No Purge

PURGE VOLUME CALCULATION

Purge Volume = tubing + sandpack
Tubing = π x (tubing diameter/2)^2 x length
Tubing = ____ inches^3
Sandpack = π x (boring diameter/2)^2 sandpack height x porosity
Sandpack = ____ inches^3
Single Purge Volume = ____ inches^3
Total Purge Volumes = ____
Start Time = ____
Total Purge Time = ____

π = 3.1416 1 inch^3 = 16.4 mL Estimated Max Porosity = 0.375

TIME	PURGE TIME (min./sec.)	He / IPA IN SHROUD (% / PPM)	CANISTER PRESSURE ("Hg)	VOCs (ppm)	COMMENTS
		No purge Sample			
1313	Start shut-in test 94.0" H_2O				
1314	Stop shut-in test 94.0" H_2O				
1349	—	16.4	28		Field vacuum Ø
1350	—	29.8	25		"
1351	—	11.2	20		"
1353	—	7.7	15		"
1355	—	7.4	10		"
1358	—	4.1	5		"

SOIL GAS PURGING / SAMPLING LOG

Project Name: Rockynar
Job Number: 2030.001
Date: 10-21-16
Sampler(s): RP EL
Sample ID / Time:

PANGEA

Probe / Well ID: SV-56
Canister Serial #: 00307
Flow Contoller #: 00189
Initial Vacuum: 29
Final Vacuum: 6

Notes:

SPECIFICATIONS

Tubing Length: ____ inches
Tubing Diameter: ____ inches
Boring Diameter: ____ inches
Sandpack height: ____ inches
Probe Length: ____ inches
Probe Diameter: ____ inches
Summa Flow Rate: ____ mL/min
Purge Flow Rate: ____ mL/min

No Purge

PURGE VOLUME CALCULATION

Purge Volume = tubing + sandpack
Tubing = π x (tubing diameter/2)^2 x length
Tubing = ____ inches^3
Sandpack = π x (boring diameter/2)^2 sandpack height x porosity
Sandpack = ____ inches^3
Single Purge Volume = ____ inches^3
Total Purge Volumes = ____
Start Time = ____
Total Purge Time = ____

π = 3.1416 1 inch^3 = 16.4 mL Estimated Max Porosity = 0.375

TIME	PURGE TIME (min./sec.)	He / IPA IN SHROUD (% / PPM)	CANISTER PRESSURE ("Hg)	VOCs (ppm)	COMMENTS
		No purge Sample			
1356	Start shut in test - 92.5" H_2O				
1357	Stop shut in test - 92.5" H_2O				
1409	—	7.7	27		Field vacuum
1413	—	15.0	18		"
1414	—	10.6	15		"
1415	—	5.1	10		"
1417	—	14.7	5		"

Soil Vapor Probe Purging/Sampling Log

Shroud

Project Name: Backman
Job Number: 2030.001
Date: 10-21-16
Sampler(s): AP, EL
Sample ID and Time:
Notes:

Sub-Slab Probe ID:
Summa Can Serial #: 00171
Flow Controller #: 400299
Initial Vacuum: 29
Final Vacuum: 5

Specifications

Tubing length: ____ cm
Tubing inner diameter: ____ cm
Boring diameter: ____ cm
Sandpack height: ____ cm
Probe length: ____ cm
Probe diameter: ____ cm
Summa flow rate: 150 mL/min
Purge flow rate: 25 mL/min

No Purge.

Purge Volume Calculation

Purge volume = tubing + sandpack
Tubing = PI * (inner diameter/2)^2 * length
= cm3
Sandpack = PI * (boring diameter/2)^2 * sandpack height * porosity
= cm3
Single purge volume: ____ cm^3
Total purge volumes extracted: ____
PI = 3.1416
1 inch = 2.54 cm
1 ml = 1 cm3

Start Time: ____
Total Purge Time: ____
Est. max. porosity = 0.375

IPA

Time	He Delivery Pressure (psi)	He in Shroud (% or ppm)	Purge Time (min./sec.)	He in Purge Sample (% or ppm)	VOCs (ppmv)	O_2 (%) Inches Hg	CO_2 (%)	CH_4 (%)	Comments
			No Purge Sample						
1400	Start	shut in	test	– 98.5" H_2O					
1401	Stop	shut in	test	+ 98.5" H_2O					
1411		15.4				~~29~~ 27			Shroud performed
1413		14.5				25			on SV-56
1415		6.8				20			
1417		11.5				15			
1420		24.0				10			
1423		24.5				5			

SOIL GAS PURGING / SAMPLING LOG

Project Name: Beckman
Project/Task Number: 2030.001
Date: 4-3-17
Sampler(s): HQ & EL
Sample ID / Time:

PANGEA

Probe / Well ID: SV-18
Canister Serial #: 267
Flow Controller #: A00189
Initial Vacuum: 29
Final Vacuum: 4

SPECIFICATIONS

Tubing Length:	120	inches
Tubing Diameter (ID):	0.17 ~~0.017~~	inches
Boring Diameter:	3.25	inches
Dry Bentonite Height:	6"	inches
Sandpack height:	12	inches
Probe Length:	1	inches
Probe Diameter:	0.5	inches
Summa Flow Rate:	150	mL/min
Purge Flow Rate:	150	mL/min

PURGE VOLUME CALCULATION

Purge Volume = tubing + sandpack+bentonite
Tubing = π x (tubing diameter/2)^2 x length
Tubing = 50 mL
Bentonite = π x (boring diameter/2)^2 bentonite height x .5[porosity] x 16.4
Sandpack = π x (boring diameter/2)^2 sandpack height x .4[porosity] x 16.4
bentonite= 407 mL
Sandpack = ~~815~~ mL ← 652
Single Purge Volume = ~~1,273~~ 1,109 mL
Three Total Purge Volumes = ~~3,800~~ 3,300 mL
Total Purge Time = ~~25 min 25~~ seconds
22 min

π = 3.1416 | 1 inch^3 = 16.4 mL | 5 mL purge / 1 ft tubing | Estimated Porosity, Sandpack = 0.4; bentonite = 0.5

SHUT-IN TEST start time/pressure ("Hg): 0955 / 98 "H_2O end time/pressure ("Hg): 1005 98 "H_2O

TIME	PURGE TIME (min./sec.)	He / IPA IN SHROUD (% / PPM)	CANISTER PRESSURE ("Hg)	Probe-side Vacuum ("H20 / "Hg)	COMMENTS
1107 ~~1104~~	~~3:00~~		~~24~~	24	
11:10 ~~1107~~	6:00			24	
11:13	9:00			24	
11:16	12 min			24	
11:18	14 min	15.0		27	Started Shroud @ 13 min
11:21	17 min	11.7		27	
11:24	20 min	11.8		27	
11:26	22 min	5.7		27	
11:27		2.3	30+		Start Sample
1128	1 min	1.5	30	43	
1130	2 min	14.0	25	51	
1132	2 min	13.4	20	51	
1133	1 min	8.8	15	50	
1135	2 min	10.9	10	38	
1137	2 min	7.3	8	32	
1138			4	*	Post-sampling PID screening (ppm): 5.0

NOTES:

SOIL GAS PURGING / SAMPLING LOG

Project Name: 1233 Bockman
Project/Task Number: 2030.001.318
Date: 4.3.17
Sampler(s): E. Lerraag
Sample ID / Time: SV-3

PANGEA

Probe / Well ID: SV-3
Canister Serial #: 00289
Flow Controller #: A00274
Initial Vacuum: 29
Final Vacuum: 15

SPECIFICATIONS

Tubing Length: _____ inches
Tubing Diameter (ID): _____ inches
Boring Diameter: _____ inches
Dry Bentonite Height: _____ inches
Sandpack height: _____ inches
Probe Length: _____ inches
Probe Diameter: _____ inches
Summa Flow Rate: _____ mL/min
Purge Flow Rate: _____ mL/min

See SV-1B calcs

PURGE VOLUME CALCULATION

Purge Volume = tubing + sandpack+bentonite
Tubing = π x (tubing diameter/2)^2 x length
Tubing = _____ mL
Bentonite = π x (boring diameter/2)^2 bentonite height x .5[porosity] x 16.4
Sandpack = π x (boring diameter/2)^2 sandpack height x .4[porosity] x 16.4
bentonite= _____ mL
Sandpack = _____ mL
Single Purge Volume = _____ mL
Three Total Purge Volumes = _____ mL
Total Purge Time = 22 seconds

π = 3.1416 | 1 inch^3 = 16.4 mL | 5 mL purge / 1 ft tubing | Estimated Porosity, Sandpack = 0.4; bentonite = 0.5

SHUT-IN TEST start time/pressure ("Hg): 1533 / 91 end time/pressure ("Hg): 1537 / 91

TIME	PURGE TIME (min./sec.)	He / IPA IN SHROUD (% / PPM)	CANISTER PRESSURE ("Hg)	Probe-side Vacuum ("H20 / "Hg)	COMMENTS
1544	0	2.1		0	Start Purge
1547	3	7.8		42	
1550	6	9.3		91	Stop Purge, allow recovery
1555	restart	10.1		8	
1600	11	7.2		87	add IPA. stop purge
1604	restart	15.2		12	
1608	15	11.2		93	Stop Purge
1613	restart	6.2		11	Add IPA
1618	20	17.2		92	stop Purge
1622	restart	9.2		10	Add IPA
1624	22	13.3		61	Stop Purge
1624		13.1	29	80	Start Sample
1626		10.7	~~25~~	90	stop Sample
1631	restart	8.5	~~20~~	14	Add IPA
1633		14.9	20	92	stop Purge
1638	restaft	11.1		13	Post-sampling PID screening (ppm):
1640		9.2	15	92	
		Stop	Sample		

NOTES: DTSC Low-Permeability Methodology

SOIL GAS PURGING / SAMPLING LOG

Project Name: Bockman
Project/Task Number: 2030.002
Date: 4-3-17
Sampler(s): EL + PG
Sample ID / Time:

PANGEA

Probe / Well ID: SV-19
Canister Serial #: 342
Flow Controller #: A00235
Initial Vacuum: 29
Final Vacuum: 5

SPECIFICATIONS

Tubing Length: _____ inches
Tubing Diameter (ID): _____ inches
Boring Diameter: _____ inches
Dry Bentonite Height: _____ inches
Sandpack height: _____ inches
Probe Length: _____ inches
Probe Diameter: _____ inches
Summa Flow Rate: _____ mL/min
Purge Flow Rate: _____ mL/min

See SV-18 Calcs

PURGE VOLUME CALCULATION

Purge Volume = tubing + sandpack+bentonite
Tubing = π x (tubing diameter/2)^2 x length
Tubing = _____ mL
Bentonite = π x (boring diameter/2)^2 bentonite height x .5[porosity] x 16.4
Sandpack = π x (boring diameter/2)^2 sandpack height x .4[porosity] x 16.4
bentonite= _____ mL
Sandpack = _____ mL
Single Purge Volume = _____ mL
Three Total Purge Volumes = _____ mL
Total Purge Time = 22 min seconds

π = 3.1416 | 1 inch^3 = 16.4 mL | 5 mL purge / 1 ft tubing | Estimated Porosity, Sandpack = 0.4; bentonite = 0.5

SHUT-IN TEST start time/pressure ("Hg): 11:42 / 99" end time/pressure ("Hg): 11:45 / 99"

TIME	PURGE TIME (min./sec.)	He / IPA IN SHROUD (% / PPM)	CANISTER PRESSURE ("Hg)	Probe-side Vacuum ("H20 / "Hg)	COMMENTS
11:49	0	17.3	~~5~~	33	
11:52	3 min	11.0		33	
11:55	6 min	7.2		33	
11:58	9 min	7.3		33	
12:01	12 min	17.7		32	Add IPA
12:04	15 min	6.8		~~30~~	
12:07	18 min	37.9		30	Add IPA
12:10	21 min	11.7		34	
12:11	22 min	10.1		33	
12:15	0	4.1	~~29~~ 30+	27	Start Sample
12:17	2 min	10.3	25	27	Add IPA
12:20	3 min	9.7	20	26	
12:24	4 min	11.5	15	24	
12:28	4 min	29.2	10	21	Add IPA
12:30	2 min	7.3	8	19	
12:31	1 min		5		Post-sampling PID screening (ppm): 1.5

NOTES: _____

SOIL GAS PURGING / SAMPLING LOG

Project Name: Beckman
Project/Task Number: 2030.001
Date: 4-3-17
Sampler(s): EL + BG
Sample ID / Time:

PANGEA

Probe / Well ID: SV-24
Canister Serial #: 131
Flow Controller #: A00222
Initial Vacuum: ~~30~~ 29
Final Vacuum: 10

SPECIFICATIONS

Tubing Length: _____ inches
Tubing Diameter (ID): _____ inches
Boring Diameter: _____ inches
Dry Bentonite Height: _____ inches
Sandpack height: _____ inches
Probe Length: _____ inches
Probe Diameter: _____ inches
Summa Flow Rate: _____ mL/min
Purge Flow Rate: _____ mL/min

Purge Only

PURGE VOLUME CALCULATION

Purge Volume = tubing + sandpack+bentonite
Tubing = π x (tubing diameter/2)^2 x length
Tubing = _____ mL
Bentonite = π x (boring diameter/2)^2 bentonite height x .5[porosity] x 16.4
Sandpack = π x (boring diameter/2)^2 sandpack height x .4[porosity] x 16.4
bentonite= _____ mL
Sandpack = _____ mL
Single Purge Volume = _____ mL
Three Total Purge Volumes = _____ mL
Total Purge Time = 22 min _____ seconds

π = 3.1416 | 1 inch^3 = 16.4 mL | 5 mL purge / 1 ft tubing | Estimated Porosity, Sandpack = 0.4; bentonite = 0.5

SHUT-IN TEST start time/pressure ("Hg): 1331 | 96" ~~Hg~~ H2O end time/pressure ("Hg): 1336 | 96"

TIME	PURGE TIME (min./sec.)	He / IPA IN SHROUD (% / RPM)	CANISTER PRESSURE ("Hg)	Probe-side Vacuum ("H20 / "Hg)	COMMENTS
1:41	0	6.5		60	
1:44	3	2.3		90	Probe side gauge exceeded 90", shut off.
1:50	3	1.0		10	Restart pump, add IPA
1:53	6	4.5		91	Shut off pump
1:58	6	5.0		10	Restart pump
2:02	9	9.7		90	Shut off
2:07	9	6.0		10	Restart
2:10	12	8.4		95	Shut off
2:20	12	2.5		10	Restart
2:23	15	8.0		95	Shut off
2:28	15			10	Restart
2:31	18			100	Shut off
2:35	18			10	Restart
2:37	20			100	Shut off
2:40	20			10	Restart
2:43	22			100	Shut off
					Post-sampling PID screening (ppm):

NOTES:

SOIL GAS PURGING / SAMPLING LOG

Project Name: Beckman
Project/Task Number: 2030.001
Date: 4-3-17
Sampler(s): EL + PG
Sample ID / Time:

PANGEA

Probe / Well ID: SV-24
Canister Serial #: 131
Flow Controller #: A00222
Initial Vacuum: 29
Final Vacuum: 6

SPECIFICATIONS

Tubing Length: _____ inches
Tubing Diameter (ID): _____ inches
Boring Diameter: _____ inches
Dry Bentonite Height: _____ inches
Sandpack height: _____ inches
Probe Length: _____ inches
Probe Diameter: _____ inches
Summa Flow Rate: _____ mL/min
Purge Flow Rate: _____ mL/min

PURGE VOLUME CALCULATION

Purge Volume = tubing + sandpack+bentonite
Tubing = π x (tubing diameter/2)^2 x length
Tubing = _____ mL
Bentonite = π x (boring diameter/2)^2 bentonite height x .5[porosity] x 16.4
Sandpack = π x (boring diameter/2)^2 sandpack height x .4[porosity] x 16.4
bentonite= _____ mL
Sandpack = _____ mL
Single Purge Volume = _____ mL
Three Total Purge Volumes = _____ mL
Total Purge Time = _____ seconds

π = 3.1416 | 1 inch^3 = 16.4 mL | 5 mL purge / 1 ft tubing | Estimated Porosity, Sandpack = 0.4; bentonite = 0.5

SHUT-IN TEST start time/pressure ("Hg): end time/pressure ("Hg):

TIME	PURGE TIME (min./sec.)	He / IPA IN SHROUD (% / PPM)	CANISTER PRESSURE ("Hg)	Probe-side Vacuum ("H20 / "Hg)	COMMENTS
2:44	Ø	3.1	30	10	
2:46	2	7.6	25	10	
2:48	2	7.3	20	42	
3:00	5 - Sec notes		15		
			10		
					Pg 2 of 2
					Post-sampling PID screening (ppm):

NOTES: Canister gauge slowed drastically at 20". Had

SOIL GAS PURGING / SAMPLING LOG

Project Name: 1233 Beckman
Project/Task Number:
Date: 4-3-17
Sampler(s): E. Lervaag
Sample ID / Time: SS-27

PANGEA

Probe / Well ID: SS-27
Canister Serial #: 00313
Flow Controller #: A00299
Initial Vacuum: 29
Final Vacuum:

SPECIFICATIONS

Tubing Length: _____ inches
Tubing Diameter (ID): _____ inches
Boring Diameter: _____ inches
Dry Bentonite Height: _____ inches
Sandpack height: _____ inches
Probe Length: _____ inches
Probe Diameter: _____ inches
Summa Flow Rate: _____ mL/min
Purge Flow Rate: _____ mL/min

See SS-18

PURGE VOLUME CALCULATION

Purge Volume = tubing + sandpack+bentonite
Tubing = π x (tubing diameter/2)^2 x length
Tubing = _____ mL
Bentonite = π x (boring diameter/2)^2 bentonite height x .5[porosity] x 16.4
Sandpack = π x (boring diameter/2)^2 sandpack height x .4[porosity] x 16.4
bentonite= _____ mL
Sandpack = _____ mL
Single Purge Volume = _____ mL
Three Total Purge Volumes = _____ mL
Total Purge Time = 22 min seconds

π = 3.1416 | 1 inch^3 = 16.4 mL | 5 mL purge / 1 ft tubing | Estimated Porosity, Sandpack = 0.4; bentonite = 0.5

SHUT-IN TEST start time/pressure ("Hg): 1353 96" H_2O end time/pressure ("Hg): 1358 96" H_2O

TIME	PURGE TIME (min./sec.)	He / IPA IN SHROUD (% / PPM)	CANISTER PRESSURE ("Hg)	Probe-side Vacuum ("H20 / "Hg)	COMMENTS
1416	0	3.1		0	Start Purge
1419	3	11.6		26	
1422	6	21.3		33	
1425	9	17.3		33	
1428	12	15.2		34	
1431	15	7.4		34	
1434	18	14.5		34	
1438	22	9.2		34	Stop Purge
1438		9.2	28	42	Start Sample
1439		Stop Sampling	27+	90	
					Post-sampling PID screening (ppm):

NOTES: Left sampling train connected overnight (24 hrs) no change in probe side vacuum. Still 90" H_2O

SOIL GAS PURGING / SAMPLING LOG

Project Name: Beckman
Project/Task Number: 2030.001
Date: 4-3-17
Sampler(s): EL + PG
Sample ID / Time:

PANGEA

Probe / Well ID: SV-33
Canister Serial #: 121
Flow Controller #: A00272
Initial Vacuum: 29
Final Vacuum: 5

SPECIFICATIONS

Tubing Length: _____ inches
Tubing Diameter (ID): _____ inches
Boring Diameter: _____ inches
Dry Bentonite Height: _____ inches
Sandpack height: _____ inches
Probe Length: _____ inches
Probe Diameter: _____ inches
Summa Flow Rate: _____ mL/min
Purge Flow Rate: _____ mL/min

PURGE VOLUME CALCULATION

Purge Volume = tubing + sandpack+bentonite
Tubing = π x (tubing diameter/2)^2 x length
Tubing = _____ mL
Bentonite = π x (boring diameter/2)^2 bentonite height x .5[porosity] x 16.4
Sandpack = π x (boring diameter/2)^2 sandpack height x .4[porosity] x 16.4
bentonite= _____ mL
Sandpack = _____ mL
Single Purge Volume = _____ mL
Three Total Purge Volumes = _____ mL
Total Purge Time = _____ seconds

π = 3.1416 | 1 inch^3 = 16.4 mL | 5 mL purge / 1 ft tubing | Estimated Porosity, Sandpack = 0.4; bentonite = 0.5

SHUT-IN TEST start time/pressure ("Hg): 1522/97 end time/pressure ("Hg): 1528/97

TIME	PURGE TIME (min./sec.)	He / IPA IN SHROUD (% / PPM)	CANISTER PRESSURE ("Hg)	Probe-side Vacuum ("H20 / "Hg)	COMMENTS
3:31	Ø	9.7		0	
3:34	3	12.1		2	
3:37	6	2.8		2	
3:40	9	6.0		2	Add IPA
3:43	12	11.9		2	
3:46	15	10.6		2	
3:49	18	9.6		2	
3:53	22	8.3		2	
3:54	Ø	8.2	29	2	Start Sample
3:55	1	8.6	25	2	
3:57	2	11.5	20	2	
3:59	2	9.2	15	2	
4:01	2	7.4	10	2	
4:02	1	7.4	8	2	
					Post-sampling PID screening (ppm):
					2.1

NOTES:

SOIL GAS PURGING / SAMPLING LOG

Project Name: 1233 Bockman
Project/Task Number: 2030.001.318
Date: 4.4.17
Sampler(s): B. Lesraay
Sample ID / Time: SV-37 / 1634

PANGEA

Probe / Well ID: SV-37
Canister Serial #: 00072
Flow Controller #: A00219
Initial Vacuum: 29
Final Vacuum: 4

SPECIFICATIONS

Tubing Length: _____ inches
Tubing Diameter (ID): _____ inches
Boring Diameter: _____ inches
Dry Bentonite Height: _____ inches
Sandpack height: _____ inches
Probe Length: _____ inches
Probe Diameter: _____ inches
Summa Flow Rate: _____ mL/min
Purge Flow Rate: _____ mL/min

See SV-18 calcs

PURGE VOLUME CALCULATION

Purge Volume = tubing + sandpack+bentonite
Tubing = π x (tubing diameter/2)^2 x length
Tubing = _____ mL
Bentonite = π x (boring diameter/2)^2 bentonite height x .5[porosity] x 16.4
Sandpack = π x (boring diameter/2)^2 sandpack height x .4[porosity] x 16.4
bentonite= _____ mL
Sandpack = _____ mL
Single Purge Volume = _____ mL
Three Total Purge Volumes = _____ mL
Total Purge Time = 22 seconds

π = 3.1416 | 1 inch^3 = 16.4 mL | 5 mL purge / 1 ft tubing | Estimated Porosity, Sandpack = 0.4; bentonite = 0.5

SHUT-IN TEST start time/pressure ("Hg): 1547 / 98 end time/pressure ("Hg): 1552 / 98

TIME	PURGE TIME (min./sec.)	He / IPA IN SHROUD (% / PPM)	CANISTER PRESSURE ("Hg)	Probe-side Vacuum ("H20 / "Hg)	COMMENTS
1612	0	2.1		0	start purge
1615	3	13.3		3	
1618	6	15.7		3	
1621	9	14.1		3	
1624	12	12.7		3	
1627	15	13.3		3	
1630	18	10.6		3	
1634	22	8.3		3	stop purge/add IPA
1634		17.9	29	3	start Sample
1635		15.1	25	3	
1636		13.5	20	3	
1638		12.7	15	3	
1640		12.9	10	3	
1641		11.1	5	3	Stop Sample
					Post-sampling PID screening (ppm):
					0.0

NOTES:

SOIL GAS PURGING / SAMPLING LOG

Project Name: 1233 Bockman
Project/Task Number: 2080.001 318
Date: 4.3.17
Sampler(s): E. Lervaag
Sample ID / Time: SV-55 |

PANGEA

Probe / Well ID: SV-55
Canister Serial #: 00276
Flow Controller #: A00271
Initial Vacuum: 29
Final Vacuum: 4

SPECIFICATIONS

Tubing Length: _____ inches
Tubing Diameter (ID): _____ inches
Boring Diameter: _____ inches
Dry Bentonite Height: _____ inches
Sandpack height: _____ inches
Probe Length: _____ inches
Probe Diameter: _____ inches
Summa Flow Rate: _____ mL/min
Purge Flow Rate: _____ mL/min

See SV-18

PURGE VOLUME CALCULATION

Purge Volume = tubing + sandpack+bentonite
Tubing = π x (tubing diameter/2)^2 x length
Tubing = _____ mL
Bentonite = π x (boring diameter/2)^2 bentonite height x .5[porosity] x 16.4
Sandpack = π x (boring diameter/2)^2 sandpack height x .4[porosity] x 16.4
bentonite= _____ mL
Sandpack = _____ mL
Single Purge Volume = _____ mL
Three Total Purge Volumes = _____ mL
Total Purge Time = 22 min seconds

π = 3.1416 | 1 inch^3 = 16.4 mL | 5 mL purge / 1 ft tubing | Estimated Porosity, Sandpack = 0.4; bentonite = 0.5

SHUT-IN TEST start time/pressure ("Hg): 1602 / 95 end time/pressure ("Hg): 1607 / 95

TIME	PURGE TIME (min./sec.)	He / IPA IN SHROUD (%/ PPM)	CANISTER PRESSURE ("Hg)	Probe-side Vacuum ("H20 / "Hg)	COMMENTS
1615	0	1.3		0	Start Purge
1618	3	17.2		2	
1621	6	15.6		2	
1624	9	12.7		2	
1627	12	10.8		2	
1630	15	8.9		2	Add IPA
1633	18	15.6		2	
1637	22	13.3		2	Stop Purge
1638		12.8	30	3	Start Sample
1639		9.9	25	3	Add IPA
1641		17.7	20	2	
1642		14.9	15	2	
1643		13.2	10	2	
1644		11.6	5	2	Stop Sample
					Post-sampling PID screening (ppm):
					0.0

NOTES: _____

SOIL GAS PURGING / SAMPLING LOG

Project Name: 1233 Beckman
Project/Task Number: 2030.001.318
Date: 4.3.17
Sampler(s): E. Lervaag
Sample ID / Time: SV-56 / 1621

PANGEA

Probe / Well ID: SV-56
Canister Serial #: 00071
Flow Controller #: A00297
Initial Vacuum: 29
Final Vacuum: 4

SPECIFICATIONS

Tubing Length: _____ inches See
Tubing Diameter (ID): _____ inches
Boring Diameter: _____ inches SV-18
Dry Bentonite Height: _____ inches
Sandpack height: _____ inches
Probe Length: _____ inches
Probe Diameter: _____ inches
Summa Flow Rate: _____ mL/min
Purge Flow Rate: _____ mL/min

PURGE VOLUME CALCULATION

Purge Volume = tubing + sandpack+bentonite
Tubing = π x (tubing diameter/2)^2 x length
Tubing = _____ mL
Bentonite = π x (boring diameter/2)^2 bentonite height x .5[porosity] x 16.4
Sandpack = π x (boring diameter/2)^2 sandpack height x .4[porosity] x 16.4
bentonite= _____ mL
Sandpack = _____ mL
Single Purge Volume = _____ mL
Three Total Purge Volumes = _____ mL
Total Purge Time = 22 seconds

π = 3.1416 | 1 inch^3 = 16.4 mL | 5 mL purge / 1 ft tubing | Estimated Porosity, Sandpack = 0.4; bentonite = 0.5

SHUT-IN TEST start time/pressure ("Hg): 1543 / 92 end time/pressure ("Hg): 1549 / 92

TIME	PURGE TIME (min./sec.)	He / IPA IN SHROUD (%/ PPM)	CANISTER PRESSURE ("Hg)	Probe-side Vacuum ("H20 / "Hg)	COMMENTS
1557	0			0	
1600	3			6	
1603	6			10	
1606	9			10	
1609	12			10	
1612	15			10	
1615	18			10	
1619	22			10	
1620		14.7	30	10	Start Sample
1621		12.6	25	10	
1622		9.2	20	10	Add IPA
1623		17.1	15	10	
1624		15.3	10	10	
1622		10.6	5	10	Stop Sample
					Post-sampling PID screening (ppm):
					0.0

NOTES:

SOIL GAS PURGING / SAMPLING LOG

Project Name: 1233 Bellman
Project/Task Number: 2030.001.31F
Date: 4.4.17
Sampler(s): E. Lervaag
Sample ID / Time: SV-63 / 0933

PANGEA

Probe / Well ID: SV-63
Canister Serial #: 000[illegible]67
Flow Controller #: A00
Initial Vacuum: 29
Final Vacuum: 3.5

SPECIFICATIONS

Tubing Length: _____ inches
Tubing Diameter (ID): _____ inches
Boring Diameter: _____ inches
Dry Bentonite Height: _____ inches
Sandpack height: _____ inches
Probe Length: _____ inches
Probe Diameter: _____ inches
Summa Flow Rate: _____ mL/min
Purge Flow Rate: _____ mL/min

See SV-18 calcs

PURGE VOLUME CALCULATION

Purge Volume = tubing + sandpack+bentonite
Tubing = π x (tubing diameter/2)^2 x length
Tubing = _____ mL
Bentonite = π x (boring diameter/2)^2 bentonite height x .5[porosity] x 16.4
Sandpack = π x (boring diameter/2)^2 sandpack height x .4[porosity] x 16.4
bentonite= _____ mL
Sandpack = _____ mL
Single Purge Volume = _____ mL
Three Total Purge Volumes = _____ mL
Total Purge Time = 22 min seconds

π = 3.1416 | 1 inch^3 = 16.4 mL | 5 mL purge / 1 ft tubing | Estimated Porosity, Sandpack = 0.4; bentonite = 0.5

SHUT-IN TEST start time/pressure ("Hg): 0901 / 94" H_2O end time/pressure ("Hg): 0905 / 94"

TIME	PURGE TIME (min./sec.)	He / IPA IN SHROUD (% / PPM)	CANISTER PRESSURE ("Hg)	Probe-side Vacuum ("H20 / "Hg)	COMMENTS
0910	0	0.8		0	Start Purge
0913	3	15.2		22	
0916	6	21.4		26	
0919	9	19.6		30	
0922	12	18.5		30	
0925	15	18.1		30	
0928	18	17.3		30	
0932	22	17.7		30	Stop Purge
0933		17.2	30	52	Start Sample
0935		16.1	25	50	
0937		16.4	20	41	
0938		15.7	15	38	
0940		14.6	10	32	
0942		13.8	5	32	Stop Sample
					Post-sampling PID screening (ppm):
					0.0

NOTES: _____

SOIL GAS PURGING / SAMPLING LOG

Project Name: 1233 Beckman
Project/Task Number: 2030.001.318
Date: 4.4.17
Sampler(s): E. Lovaas
Sample ID / Time: SV-64 / 0950

PANGEA

Probe / Well ID: SV-64
Canister Serial #: 126
Flow Controller #: 163
Initial Vacuum: 29
Final Vacuum: 4

SPECIFICATIONS

Tubing Length: _____ inches
Tubing Diameter (ID): _____ inches
Boring Diameter: _____ inches
Dry Bentonite Height: _____ inches
Sandpack height: _____ inches
Probe Length: _____ inches
Probe Diameter: _____ inches
Summa Flow Rate: _____ mL/min
Purge Flow Rate: _____ mL/min

See SV-18 calc

PURGE VOLUME CALCULATION

Purge Volume = tubing + sandpack+bentonite
Tubing = π x (tubing diameter/2)^2 x length
Tubing = _____ mL
Bentonite = π x (boring diameter/2)^2 bentonite height x .5[porosity] x 16.4
Sandpack = π x (boring diameter/2)^2 sandpack height x .4[porosity] x 16.4
bentonite= _____ mL
Sandpack = _____ mL
Single Purge Volume = _____ mL
Three Total Purge Volumes = _____ mL
Total Purge Time = 22 min seconds

π = 3.1416 | 1 inch^3 = 16.4 mL | 5 mL purge / 1 ft tubing | Estimated Porosity, Sandpack = 0.4; bentonite = 0.5

SHUT-IN TEST start time/pressure ("Hg): 0921 / 99 end time/pressure ("Hg): 0927 / 99

TIME	PURGE TIME (min./sec.)	He / IPA IN SHROUD (% / PPM)	CANISTER PRESSURE ("Hg)	Probe-side Vacuum ("H20 / "Hg)	COMMENTS
0927	0	3.3		0	Start Purge
0930	3	17.6		17	
0933	6	15.8		23	
0936	9	15.1		25	
0939	12	14.7		28	
0942	15	14.4		31	
0945	18	14.9		31	
0949	22	13.6		31	Stop Purge
0950		13.2	29	42	Start Sample
0952		12.7	25	40	
0954		12.1	20	40	
0956		11.5	15	36	
0957		10.6	10	32	
0959		9.8	5	32	Stop Sample
					Post-sampling PID screening (ppm): 0.0

NOTES: _____

SOIL GAS PURGING / SAMPLING LOG

Project Name: 1233 Beckman
Project/Task Number: 2030.001.318
Date: 4.4.17
Sampler(s): B. Lerraag
Sample ID / Time: SV-65 / 1013

PANGEA

Probe / Well ID: SV-65
Canister Serial #: 00099
Flow Controller #: A002199
Initial Vacuum: 29
Final Vacuum: 5

SPECIFICATIONS

Tubing Length: _____ inches
Tubing Diameter (ID): _____ inches
Boring Diameter: _____ inches
Dry Bentonite Height: _____ inches
Sandpack height: _____ inches
Probe Length: _____ inches
Probe Diameter: _____ inches
Summa Flow Rate: _____ mL/min
Purge Flow Rate: _____ mL/min

See SV-18 calcs

PURGE VOLUME CALCULATION

Purge Volume = tubing + sandpack+bentonite
Tubing = π x (tubing diameter/2)^2 x length
Tubing = _____ mL
Bentonite = π x (boring diameter/2)^2 bentonite height x .5[porosity] x 16.4
Sandpack = π x (boring diameter/2)^2 sandpack height x .4[porosity] x 16.4
bentonite= _____ mL
Sandpack = _____ mL
Single Purge Volume = _____ mL
Three Total Purge Volumes = _____ mL
Total Purge Time = 22 min seconds

π = 3.1416 | 1 inch^3 = 16.4 mL | 5 mL purge / 1 ft tubing | Estimated Porosity, Sandpack = 0.4; bentonite = 0.5

SHUT-IN TEST start time/pressure ("Hg): 1000 / 92 end time/pressure ("Hg): 1005 / 92

TIME	PURGE TIME (min./sec.)	He / IPA IN SHROUD (% / PPM)	CANISTER PRESSURE ("Hg)	Probe-side Vacuum ("H20 / "Hg)	COMMENTS
0951	0	1.4		0	Start Purge
0954	3	17.6		27	
0957	6	16.5		38	
1000	9	16.1		47	
1003	12	16.5		50	
1006	15	15.9		50	
1009	18	15.7		51	
1013	22	15.2		51	
1013		14.9	30	63	Start Sample
1015		14.3	25	60	
1017		13.4	20	55	
1019		12.7	15	53	
1021		12.2	10	51	
1024		11.5	5	51	Stop Sample
					Post-sampling PID screening (ppm): 0.0

NOTES: _____

SOIL GAS PURGING / SAMPLING LOG

Project Name: 1233 Bockman
Project/Task Number: 2030.001.318
Date: 4.4.17
Sampler(s): B. Lervaas
Sample ID / Time: Shroud / 1640

PANGEA

Probe / Well ID: Shroud
Canister Serial #: 379
Flow Controller #: 287
Initial Vacuum: 29
Final Vacuum: 9.5

SPECIFICATIONS

Tubing Length: _____ inches
Tubing Diameter (ID): _____ inches
Boring Diameter: _____ inches
Dry Bentonite Height: _____ inches
Sandpack height: _____ inches
Probe Length: _____ inches
Probe Diameter: _____ inches
Summa Flow Rate: _____ mL/min
Purge Flow Rate: _____ mL/min

No purge

PURGE VOLUME CALCULATION

Purge Volume = tubing + sandpack+bentonite
Tubing = π x (tubing diameter/2)^2 x length
Tubing = _____ mL
Bentonite = π x (boring diameter/2)^2 bentonite height x .5[porosity] x 16.4
Sandpack = π x (boring diameter/2)^2 sandpack height x .4[porosity] x 16.4
bentonite= _____ mL
Sandpack = _____ mL
Single Purge Volume = _____ mL
Three Total Purge Volumes = _____ mL
Total Purge Time = _____ seconds

π = 3.1416 | 1 inch^3 = 16.4 mL | 5 mL purge / 1 ft tubing | Estimated Porosity, Sandpack = 0.4; bentonite = 0.5

SHUT-IN TEST start time/pressure ("Hg): 1629 / 91 end time/pressure ("Hg): 1634 / 91

TIME	PURGE TIME (min./sec.)	He / IPA IN SHROUD (% / PPM)	CANISTER PRESSURE ("Hg)	Probe-side Vacuum ("H20 / "Hg)	COMMENTS
1640		12.9	29	—	Start Sample
1641		11.1	25	—	
1643		9.8	20	—	
1644		8.0	15	—	
1646		10.8	10	—	
1647		9.3	5	—	Stop Sample
					Post-sampling PID screening (ppm):

NOTES: Collected at SV-37

APPENDIX E

Laboratory Analytical Reports


Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 287071
ANALYTICAL REPORT

Pangea Environmental	Project : 1233 BOCKMAN
1710 Franklin Street	Location : 1233 Bockman
Oakland, CA 94612	Level : II

Sample ID	Lab ID
T-1-6'	287071-001
T-2-6'	287071-002
T-3-6'	287071-003
T-4-6'	287071-004
T-5-6'	287071-005
T-6-6'	287071-006
T-7-6'	287071-007
T-8-6'	287071-008
T-9-6'	287071-009
T-10-6'	287071-010

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: _____ Date: 03/21/2017

Mike Dahlquist
Project Manager
mike.dahlquist@ctberk.com
(510) 204-2225 Ext 13101

CA ELAP# 2896, NELAP# 4044-001

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**287071**
Client:	**Pangea Environmental**
Project:	**1233 BOCKMAN**
Location:	**1233 Bockman**
Request Date:	**03/16/17**
Samples Received:	**03/16/17**

This data package contains sample and QC results for two soil samples, requested for the above referenced project on 03/16/17. The samples were received cold and intact.

Volatile Organics by GC/MS (EPA 8260B):
No analytical problems were encountered.

Curtis & Tompkins, Ltd.
Analytical Laboratory Since 1878
2323 Fifth Street
Berkeley, CA 94710
(510)486-0900 Phone
(510)486-0532 Fax

CHAIN OF CUSTODY

Chain of Custody # :

C&T LOGIN # 227071

Project No: 1233 Bockman
Project Name:
EDD Format: _____ **Rpt Level:** ☐ II ☐ III ☐ I
Turnaround Time: ☒ RUSH 3 DAY ☐ Standar

Sampler: E. Lervaag
Report To: Ron Scheele
Company : Pangea
Telephone: 510-836-3700
Email: rscheele@pangeaenv.com

Lab No.	Sample ID.	Sampling Date	Sampling Time	Matrix: Water	Matrix: Soil	Matrix:	Matrix:	# of Containers	Chemical Preservative: HCl	Chemical Preservative: H_2SO_4	Chemical Preservative: HNO_3	Chemical Preservative: NaOH	Chemical Preservative: None	Analytical Request: 8260	Analytical Request: Hold
1	T-1-6'	3.15.17			X			3							X
2	T-2-6'				X			3							X
3	T-3-6'				X			3							X
4	T-4-6'				X			3							X
5	T-5-6'				X			3						X	X
6	T-6-6'	3.16.17			X			3							X
7	T-7-6'				X			3						X	X
8	T-8-6'				X			3							X
9	T-9-6'				X			3							X
10	T-10-6'				X			3							X

Notes:

SAMPLE RECEIPT
☐ Intact ☐ Cold
☐ On Ice ☐ Ambient

RELINQUISHED BY:	RECEIVED BY:
3.16.17 1900 DATE/TIME	3/16/17 19:00 DATE/TIME
DATE/TIME	DATE/TIME
DATE/TIME	DATE/TIME

COOLER RECEIPT CHECKLIST

Curtis & Tompkins, Ltd.

Login # 287071 Date Received 3/16/17 Number of coolers 1
Client Pangea Project 1233 Bockman

Date Opened 3/16 By (print) DTN (sign) [signature]
Date Logged in ↓ By (print) ↓ (sign) ↓
Date Labeled ↓ By (print) [illegible] (sign) [signature]

1. Did cooler come with a shipping slip (airbill, etc) _____ YES (NO)
   Shipping info _____

2A. Were custody seals present? .... ☐ YES (circle) on cooler on samples (NO)
   How many _____ Name _____ Date _____
2B. Were custody seals intact upon arrival? _____ YES NO (N/A)
3. Were custody papers dry and intact when received? _____ (YES) NO
4. Were custody papers filled out properly (ink, signed, etc)? _____ (YES) NO
5. Is the project identifiable from custody papers? (If so fill out top of form) ___ (YES) NO
6. Indicate the packing in cooler: (if other, describe) _____

☐ Bubble Wrap ☐ Foam blocks ☒ Bags ☐ None
☐ Cloth material ☐ Cardboard ☐ Styrofoam ☐ Paper towels

7. Temperature documentation: * Notify PM if temperature exceeds 6°C

Type of ice used: ☐ Wet ☐ Blue/Gel ☒ None Temp(°C) _____

☐ Temperature blank(s) included? ☐ Thermometer# _____ ☐ IR Gun# _____

☐ Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present? _____ (YES) NO
   If YES, what time were they transferred to freezer? @ 23:50
9. Did all bottles arrive unbroken/unopened? _____ (YES) NO
10. Are there any missing / extra samples? _____ YES (NO)
11. Are samples in the appropriate containers for indicated tests? _____ (YES) NO
12. Are sample labels present, in good condition and complete? _____ (YES) NO
13. Do the sample labels agree with custody papers? _____ (YES) NO
14. Was sufficient amount of sample sent for tests requested? _____ (YES) NO
15. Are the samples appropriately preserved? _____ YES NO N/A
16. Did you check preservatives for all bottles for each sample? _____ YES NO N/A
17. Did you document your preservative check? (pH strip lot# _____) YES NO N/A
18. Did you change the hold time in LIMS for unpreserved VOAs? _____ YES NO N/A
19. Did you change the hold time in LIMS for preserved terracores? _____ YES NO N/A
20. Are bubbles > 6mm absent in VOA samples? _____ YES NO N/A
21. Was the client contacted concerning this sample delivery? _____ YES NO
   If YES, Who was called? _____ By _____ Date: _____

COMMENTS

_____

_____

_____

_____

_____

_____

Curtis & Tompkins, Ltd.

Detections Summary for 287071

Results for any subcontracted analyses are not included in this summary.

Client : Pangea Environmental
Project : 1233 BOCKMAN
Location : 1233 Bockman

Client Sample ID : T-5-6' Laboratory Sample ID : 287071-005

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Acetone	130		15	ug/Kg	As Recd	0.7452	EPA 8260B	EPA 5035

Client Sample ID : T-7-6' Laboratory Sample ID : 287071-007

No Detections

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	287071	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5035
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Field ID:	T-5-6'	Diln Fac:	0.7452
Lab ID:	287071-005	Batch#:	245616
Matrix:	Soil	Sampled:	03/15/17
Units:	ug/Kg	Received:	03/16/17
Basis:	as received	Analyzed:	03/17/17

Analyte	Result	RL
Freon 12	ND	7.5
Chloromethane	ND	7.5
Vinyl Chloride	ND	7.5
Bromomethane	ND	7.5
Chloroethane	ND	7.5
Trichlorofluoromethane	ND	3.7
Acetone	130	15
Freon 113	ND	3.7
1,1-Dichloroethene	ND	3.7
Methylene Chloride	ND	15
Carbon Disulfide	ND	3.7
MTBE	ND	3.7
trans-1,2-Dichloroethene	ND	3.7
Vinyl Acetate	ND	37
1,1-Dichloroethane	ND	3.7
2-Butanone	ND	7.5
cis-1,2-Dichloroethene	ND	3.7
2,2-Dichloropropane	ND	3.7
Chloroform	ND	3.7
Bromochloromethane	ND	3.7
1,1,1-Trichloroethane	ND	3.7
1,1-Dichloropropene	ND	3.7
Carbon Tetrachloride	ND	3.7
1,2-Dichloroethane	ND	3.7
Benzene	ND	3.7
Trichloroethene	ND	3.7
1,2-Dichloropropane	ND	3.7
Bromodichloromethane	ND	3.7
Dibromomethane	ND	3.7
4-Methyl-2-Pentanone	ND	7.5
cis-1,3-Dichloropropene	ND	3.7
Toluene	ND	3.7
trans-1,3-Dichloropropene	ND	3.7
1,1,2-Trichloroethane	ND	3.7
2-Hexanone	ND	7.5
1,3-Dichloropropane	ND	3.7
Tetrachloroethene	ND	3.7

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	287071	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5035
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Field ID:	T-5-6'	Diln Fac:	0.7452
Lab ID:	287071-005	Batch#:	245616
Matrix:	Soil	Sampled:	03/15/17
Units:	ug/Kg	Received:	03/16/17
Basis:	as received	Analyzed:	03/17/17

Analyte	Result	RL
Dibromochloromethane	ND	3.7
1,2-Dibromoethane	ND	3.7
Chlorobenzene	ND	3.7
1,1,1,2-Tetrachloroethane	ND	3.7
Ethylbenzene	ND	3.7
m,p-Xylenes	ND	3.7
o-Xylene	ND	3.7
Styrene	ND	3.7
Bromoform	ND	3.7
Isopropylbenzene	ND	3.7
1,1,2,2-Tetrachloroethane	ND	3.7
1,2,3-Trichloropropane	ND	3.7
Propylbenzene	ND	3.7
Bromobenzene	ND	3.7
1,3,5-Trimethylbenzene	ND	3.7
2-Chlorotoluene	ND	3.7
4-Chlorotoluene	ND	3.7
tert-Butylbenzene	ND	3.7
1,2,4-Trimethylbenzene	ND	3.7
sec-Butylbenzene	ND	3.7
para-Isopropyl Toluene	ND	3.7
1,3-Dichlorobenzene	ND	3.7
1,4-Dichlorobenzene	ND	3.7
n-Butylbenzene	ND	3.7
1,2-Dichlorobenzene	ND	3.7
1,2-Dibromo-3-Chloropropane	ND	3.7
1,2,4-Trichlorobenzene	ND	3.7
Hexachlorobutadiene	ND	3.7
Naphthalene	ND	3.7
1,2,3-Trichlorobenzene	ND	3.7

Surrogate	%REC	Limits
Dibromofluoromethane	111	80-128
1,2-Dichloroethane-d4	104	80-136
Toluene-d8	105	80-120
Bromofluorobenzene	105	80-132

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	287071	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5035
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Field ID:	T-7-6'	Diln Fac:	0.7825
Lab ID:	287071-007	Batch#:	245616
Matrix:	Soil	Sampled:	03/16/17
Units:	ug/Kg	Received:	03/16/17
Basis:	as received	Analyzed:	03/17/17

Analyte	Result	RL
Freon 12	ND	7.8
Chloromethane	ND	7.8
Vinyl Chloride	ND	7.8
Bromomethane	ND	7.8
Chloroethane	ND	7.8
Trichlorofluoromethane	ND	3.9
Acetone	ND	16
Freon 113	ND	3.9
1,1-Dichloroethene	ND	3.9
Methylene Chloride	ND	16
Carbon Disulfide	ND	3.9
MTBE	ND	3.9
trans-1,2-Dichloroethene	ND	3.9
Vinyl Acetate	ND	39
1,1-Dichloroethane	ND	3.9
2-Butanone	ND	7.8
cis-1,2-Dichloroethene	ND	3.9
2,2-Dichloropropane	ND	3.9
Chloroform	ND	3.9
Bromochloromethane	ND	3.9
1,1,1-Trichloroethane	ND	3.9
1,1-Dichloropropene	ND	3.9
Carbon Tetrachloride	ND	3.9
1,2-Dichloroethane	ND	3.9
Benzene	ND	3.9
Trichloroethene	ND	3.9
1,2-Dichloropropane	ND	3.9
Bromodichloromethane	ND	3.9
Dibromomethane	ND	3.9
4-Methyl-2-Pentanone	ND	7.8
cis-1,3-Dichloropropene	ND	3.9
Toluene	ND	3.9
trans-1,3-Dichloropropene	ND	3.9
1,1,2-Trichloroethane	ND	3.9
2-Hexanone	ND	7.8
1,3-Dichloropropane	ND	3.9
Tetrachloroethene	ND	3.9

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	287071	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5035
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Field ID:	T-7-6'	Diln Fac:	0.7825
Lab ID:	287071-007	Batch#:	245616
Matrix:	Soil	Sampled:	03/16/17
Units:	ug/Kg	Received:	03/16/17
Basis:	as received	Analyzed:	03/17/17

Analyte	Result	RL
Dibromochloromethane	ND	3.9
1,2-Dibromoethane	ND	3.9
Chlorobenzene	ND	3.9
1,1,1,2-Tetrachloroethane	ND	3.9
Ethylbenzene	ND	3.9
m,p-Xylenes	ND	3.9
o-Xylene	ND	3.9
Styrene	ND	3.9
Bromoform	ND	3.9
Isopropylbenzene	ND	3.9
1,1,2,2-Tetrachloroethane	ND	3.9
1,2,3-Trichloropropane	ND	3.9
Propylbenzene	ND	3.9
Bromobenzene	ND	3.9
1,3,5-Trimethylbenzene	ND	3.9
2-Chlorotoluene	ND	3.9
4-Chlorotoluene	ND	3.9
tert-Butylbenzene	ND	3.9
1,2,4-Trimethylbenzene	ND	3.9
sec-Butylbenzene	ND	3.9
para-Isopropyl Toluene	ND	3.9
1,3-Dichlorobenzene	ND	3.9
1,4-Dichlorobenzene	ND	3.9
n-Butylbenzene	ND	3.9
1,2-Dichlorobenzene	ND	3.9
1,2-Dibromo-3-Chloropropane	ND	3.9
1,2,4-Trichlorobenzene	ND	3.9
Hexachlorobutadiene	ND	3.9
Naphthalene	ND	3.9
1,2,3-Trichlorobenzene	ND	3.9

Surrogate	%REC	Limits
Dibromofluoromethane	111	80-128
1,2-Dichloroethane-d4	104	80-136
Toluene-d8	106	80-120
Bromofluorobenzene	103	80-132

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	287071	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5035
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC877296	Batch#:	245616
Matrix:	Soil	Analyzed:	03/17/17
Units:	ug/Kg		

Analyte	Spiked	Result	%REC	Limits
1,1-Dichloroethene	25.00	28.61	114	65-127
Benzene	25.00	25.10	100	75-124
Trichloroethene	25.00	24.97	100	76-122
Toluene	25.00	26.37	105	77-120
Chlorobenzene	25.00	25.34	101	80-120

Surrogate	%REC	Limits
Dibromofluoromethane	105	80-128
1,2-Dichloroethane-d4	99	80-136
Toluene-d8	104	80-120
Bromofluorobenzene	99	80-132

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	287071	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Field ID:	ZZZZZZZZZZ	Batch#:	245616
MSS Lab ID:	287045-009	Sampled:	03/15/17
Matrix:	Soil	Received:	03/16/17
Units:	ug/Kg	Analyzed:	03/17/17
Basis:	as received		

Type: MS Diln Fac: 0.9579
Lab ID: QC877297

Analyte	MSS Result	Spiked	Result	%REC	Limits
1,1-Dichloroethene	<0.5723	47.89	47.42	99	65-131
Benzene	<0.6668	47.89	38.72	81	68-123
Trichloroethene	<0.6945	47.89	36.80	77	60-136
Toluene	<0.7304	47.89	36.97	77	64-120
Chlorobenzene	<0.5988	47.89	31.15	65	59-120

Surrogate	%REC	Limits
Dibromofluoromethane	109	80-128
1,2-Dichloroethane-d4	105	80-136
Toluene-d8	104	80-120
Bromofluorobenzene	100	80-132

Type: MSD Diln Fac: 0.9311
Lab ID: QC877298

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
1,1-Dichloroethene	46.55	50.50	108	65-131	9	33
Benzene	46.55	40.17	86	68-123	6	30
Trichloroethene	46.55	38.46	83	60-136	7	34
Toluene	46.55	38.41	83	64-120	7	31
Chlorobenzene	46.55	31.72	68	59-120	5	33

Surrogate	%REC	Limits
Dibromofluoromethane	108	80-128
1,2-Dichloroethane-d4	105	80-136
Toluene-d8	105	80-120
Bromofluorobenzene	100	80-132

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	287071	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5035
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC877299	Batch#:	245616
Matrix:	Soil	Analyzed:	03/17/17
Units:	ug/Kg		

Analyte	Result	RL
Freon 12	ND	10
Chloromethane	ND	10
Vinyl Chloride	ND	10
Bromomethane	ND	10
Chloroethane	ND	10
Trichlorofluoromethane	ND	5.0
Acetone	ND	20
Freon 113	ND	5.0
1,1-Dichloroethene	ND	5.0
Methylene Chloride	ND	20
Carbon Disulfide	ND	5.0
MTBE	ND	5.0
trans-1,2-Dichloroethene	ND	5.0
Vinyl Acetate	ND	50
1,1-Dichloroethane	ND	5.0
2-Butanone	ND	10
cis-1,2-Dichloroethene	ND	5.0
2,2-Dichloropropane	ND	5.0
Chloroform	ND	5.0
Bromochloromethane	ND	5.0
1,1,1-Trichloroethane	ND	5.0
1,1-Dichloropropene	ND	5.0
Carbon Tetrachloride	ND	5.0
1,2-Dichloroethane	ND	5.0
Benzene	ND	5.0
Trichloroethene	ND	5.0
1,2-Dichloropropane	ND	5.0
Bromodichloromethane	ND	5.0
Dibromomethane	ND	5.0
4-Methyl-2-Pentanone	ND	10
cis-1,3-Dichloropropene	ND	5.0
Toluene	ND	5.0
trans-1,3-Dichloropropene	ND	5.0
1,1,2-Trichloroethane	ND	5.0
2-Hexanone	ND	10
1,3-Dichloropropane	ND	5.0
Tetrachloroethene	ND	5.0

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	287071	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5035
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC877299	Batch#:	245616
Matrix:	Soil	Analyzed:	03/17/17
Units:	ug/Kg		

Analyte	Result	RL
Dibromochloromethane	ND	5.0
1,2-Dibromoethane	ND	5.0
Chlorobenzene	ND	5.0
1,1,1,2-Tetrachloroethane	ND	5.0
Ethylbenzene	ND	5.0
m,p-Xylenes	ND	5.0
o-Xylene	ND	5.0
Styrene	ND	5.0
Bromoform	ND	5.0
Isopropylbenzene	ND	5.0
1,1,2,2-Tetrachloroethane	ND	5.0
1,2,3-Trichloropropane	ND	5.0
Propylbenzene	ND	5.0
Bromobenzene	ND	5.0
1,3,5-Trimethylbenzene	ND	5.0
2-Chlorotoluene	ND	5.0
4-Chlorotoluene	ND	5.0
tert-Butylbenzene	ND	5.0
1,2,4-Trimethylbenzene	ND	5.0
sec-Butylbenzene	ND	5.0
para-Isopropyl Toluene	ND	5.0
1,3-Dichlorobenzene	ND	5.0
1,4-Dichlorobenzene	ND	5.0
n-Butylbenzene	ND	5.0
1,2-Dichlorobenzene	ND	5.0
1,2-Dibromo-3-Chloropropane	ND	5.0
1,2,4-Trichlorobenzene	ND	5.0
Hexachlorobutadiene	ND	5.0
Naphthalene	ND	5.0
1,2,3-Trichlorobenzene	ND	5.0

Surrogate	%REC	Limits
Dibromofluoromethane	106	80-128
1,2-Dichloroethane-d4	99	80-136
Toluene-d8	104	80-120
Bromofluorobenzene	101	80-132

ND= Not Detected
RL= Reporting Limit


Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 287072
ANALYTICAL REPORT

Pangea Environmental	Project : 1233 BOCKMAN
1710 Franklin Street	Location : 1233 Bockman
Oakland, CA 94612	Level : II

Sample ID	Lab ID
T-1-W	287072-001
T-2-W	287072-002
T-3-W	287072-003
T-4-W	287072-004
T-5-W	287072-005
T-6-W	287072-006
T-7-W	287072-007
T-8-W	287072-008
T-9-W	287072-009
T-10-W	287072-010

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: _____ Date: 03/23/2017

Will Rice
Project Manager
will.rice@ctberk.com
(510) 204-2221 Ext 13102

CA ELAP# 2896, NELAP# 4044-001

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**287072**
Client:	**Pangea Environmental**
Project:	**1233 BOCKMAN**
Location:	**1233 Bockman**
Request Date:	**03/16/17**
Samples Received:	**03/16/17**

This data package contains sample and QC results for nine water samples, requested for the above referenced project on 03/16/17. The samples were received cold and intact.

Volatile Organics by GC/MS (EPA 8260B):

1,2,3-trichlorobenzene was detected above the RL in the method blank for batch 245669; this analyte was not detected in samples at or above the RL. No other analytical problems were encountered.

CHAIN OF CUSTODY

Chain of Custody # _____

Curtis & Tompkins Laboratories
ENVIRONMENTAL ANALYTICAL TESTING LABORATORY
In Business Since 1878

2323 Fifth Street
Berkeley, CA 94710

Phone (510) 486-0900
Fax (510) 486-0532

C&T LOGIN # 287072

Project No: 1233 Beckman
Project Name:
Project P. O. No:
EDD Format: Report Level ☐ II ☐ III ☐ IV
Turnaround Time: ☒ RUSH 3day ☐ Standard

Sampler: E. Lervaag
Report To: Ron Scheele
Company: Pangea
Telephone: 510-836-3700
Email: rscheele@pangeaenv.com

Lab No.	Sample ID.	SAMPLING		MATRIX				# of Containers	CHEMICAL PRESERVATIVE					ANALYTICAL REQUEST	
		Date Collected	Time Collected	Water	Solid				HCl	H2SO4	HNO3	NaOH	None	8260	HOLD
1	T-1-W	3.15.16		X				2	X					X	
2	T-2-W			X				2	X						X
3	T-3-W			X				3	X					X	
4	T-4-W			X				3	X					X	
5	T-5-W			X				3	X					X	
6	T-6-W	3.16.17		X				3	X					X	
7	T-7-W			X				3	X					X	
8	T-8-W			X				3	X					X	
9	T-9-W			X				3	X					X	
10	T-10-W	3.10.17		X				3	X						X

Notes:

SAMPLE RECEIPT
☐ Intact
☐ Cold
☐ On Ice
☐ Ambient

RELINQUISHED BY:
3.16.17 DATE: 1900 TIME:
DATE: TIME:
DATE: TIME:

RECEIVED BY:
DATE: 3/16/17 TIME: 1900
DATE: TIME:
DATE: TIME:

COOLER RECEIPT CHECKLIST

Curtis & Tompkins, Ltd.

Login # 287072 Date Received 3/16/17 Number of coolers 1
Client Pangea Project 1233 Beckman

Date Opened 3/16 By (print) DTN (sign) [signature]
Date Logged in ↓ By (print) ↓ (sign) ↓
Date Labeled ↓ By (print) ↓ (sign) ↓

1. Did cooler come with a shipping slip (airbill, etc) _____ YES (NO)
   Shipping info _____

2A. Were custody seals present? .... ☐ YES (circle) on cooler on samples ☒ NO
   How many _____ Name _____ Date _____
2B. Were custody seals intact upon arrival? _____ YES NO (N/A)
3. Were custody papers dry and intact when received? _____ (YES) NO
4. Were custody papers filled out properly (ink, signed, etc)? _____ (YES) NO
5. Is the project identifiable from custody papers? (If so fill out top of form) ___ (YES) NO
6. Indicate the packing in cooler: (if other, describe) _____

☐ Bubble Wrap ☐ Foam blocks ☒ Bags ☐ None
☐ Cloth material ☐ Cardboard ☐ Styrofoam ☐ Paper towels

7. Temperature documentation: * Notify PM if temperature exceeds 6°C

Type of ice used: ☐ Wet ☐ Blue/Gel ☒ None Temp(°C) _____

☐ Temperature blank(s) included? ☐ Thermometer# _____ ☐ IR Gun# _____

☐ Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present? _____ YES (NO)
   If YES, what time were they transferred to freezer? _____
9. Did all bottles arrive unbroken/unopened? _____ (YES) NO
10. Are there any missing / extra samples? _____ YES (NO)
11. Are samples in the appropriate containers for indicated tests? _____ (YES) NO
12. Are sample labels present, in good condition and complete? _____ (YES) NO
13. Do the sample labels agree with custody papers? _____ (YES) NO
14. Was sufficient amount of sample sent for tests requested? _____ (YES) NO
15. Are the samples appropriately preserved? _____ (YES) NO N/A
16. Did you check preservatives for all bottles for each sample? _____ YES NO (N/A)
17. Did you document your preservative check? (pH strip lot# _____) YES NO (N/A)
18. Did you change the hold time in LIMS for unpreserved VOAs? _____ YES NO (N/A)
19. Did you change the hold time in LIMS for preserved terracores? _____ YES NO (N/A)
20. Are bubbles > 6mm absent in VOA samples? _____ (YES) NO N/A
21. Was the client contacted concerning this sample delivery? _____ YES (NO)
   If YES, Who was called? _____ By _____ Date: _____

COMMENTS

_____

_____

_____

_____

_____

_____

Curtis & Tompkins, Ltd.

Detections Summary for 287072

Results for any subcontracted analyses are not included in this summary.

Client : Pangea Environmental
Project : 1233 BOCKMAN
Location : 1233 Bockman

Client Sample ID : T-1-W Laboratory Sample ID : 287072-001

No Detections

Client Sample ID : T-3-W Laboratory Sample ID : 287072-003

No Detections

Client Sample ID : T-4-W Laboratory Sample ID : 287072-004

No Detections

Client Sample ID : T-5-W Laboratory Sample ID : 287072-005

No Detections

Client Sample ID : T-6-W Laboratory Sample ID : 287072-006

No Detections

Client Sample ID : T-7-W Laboratory Sample ID : 287072-007

No Detections

Client Sample ID : T-8-W Laboratory Sample ID : 287072-008

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Tetrachloroethene	0.4	J	0.5	0.1	ug/L	As Recd	1.000	EPA 8260B	EPA 5030B

Client Sample ID : T-9-W Laboratory Sample ID : 287072-009

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Tetrachloroethene	0.2	J	0.5	0.1	ug/L	As Recd	1.000	EPA 8260B	EPA 5030B

Client Sample ID : T-10-W Laboratory Sample ID : 287072-010

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Tetrachloroethene	0.7		0.5	0.1	ug/L	As Recd	1.000	EPA 8260B	EPA 5030B

J = Estimated value

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	287072	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Field ID:	T-1-W	Batch#:	245634
Lab ID:	287072-001	Sampled:	03/15/17
Matrix:	Water	Received:	03/16/17
Units:	ug/L	Analyzed:	03/17/17
Diln Fac:	1.000		

Analyte	Result	RL	MDL
Freon 12	ND	1.0	
Chloromethane	ND	1.0	
Vinyl Chloride	ND	0.5	
Bromomethane	ND	1.0	
Chloroethane	ND	1.0	
Trichlorofluoromethane	ND	1.0	
Acetone	ND	10	
Freon 113	ND	2.0	
1,1-Dichloroethene	ND	0.5	
Methylene Chloride	ND	10	
Carbon Disulfide	ND	0.5	
MTBE	ND	0.5	
trans-1,2-Dichloroethene	ND	0.5	
Vinyl Acetate	ND	10	
1,1-Dichloroethane	ND	0.5	
2-Butanone	ND	10	
cis-1,2-Dichloroethene	ND	0.5	
2,2-Dichloropropane	ND	0.5	
Chloroform	ND	0.5	
Bromochloromethane	ND	0.5	
1,1,1-Trichloroethane	ND	0.5	
1,1-Dichloropropene	ND	0.5	
Carbon Tetrachloride	ND	0.5	
1,2-Dichloroethane	ND	0.5	
Benzene	ND	0.5	
Trichloroethene	ND	0.5	
1,2-Dichloropropane	ND	0.5	
Bromodichloromethane	ND	0.5	
Dibromomethane	ND	0.5	
4-Methyl-2-Pentanone	ND	10	
cis-1,3-Dichloropropene	ND	0.5	
Toluene	ND	0.5	
trans-1,3-Dichloropropene	ND	0.5	
1,1,2-Trichloroethane	ND	0.5	
2-Hexanone	ND	10	
1,3-Dichloropropane	ND	0.5	
Tetrachloroethene	ND	0.5	0.1
Dibromochloromethane	ND	0.5	
1,2-Dibromoethane	ND	0.5	
Chlorobenzene	ND	0.5	
1,1,1,2-Tetrachloroethane	ND	0.5	
Ethylbenzene	ND	0.5	
m,p-Xylenes	ND	0.5	
o-Xylene	ND	0.5	
Styrene	ND	0.5	
Bromoform	ND	1.0	
Isopropylbenzene	ND	0.5	
1,1,2,2-Tetrachloroethane	ND	0.5	
1,2,3-Trichloropropane	ND	0.5	
Propylbenzene	ND	0.5	
Bromobenzene	ND	0.5	
1,3,5-Trimethylbenzene	ND	0.5	
2-Chlorotoluene	ND	0.5	

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	287072	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Field ID:	T-1-W	Batch#:	245634
Lab ID:	287072-001	Sampled:	03/15/17
Matrix:	Water	Received:	03/16/17
Units:	ug/L	Analyzed:	03/17/17
Diln Fac:	1.000		

Analyte	Result	RL	MDL
4-Chlorotoluene	ND	0.5	
tert-Butylbenzene	ND	0.5	
1,2,4-Trimethylbenzene	ND	0.5	
sec-Butylbenzene	ND	0.5	
para-Isopropyl Toluene	ND	0.5	
1,3-Dichlorobenzene	ND	0.5	
1,4-Dichlorobenzene	ND	0.5	
n-Butylbenzene	ND	0.5	
1,2-Dichlorobenzene	ND	0.5	
1,2-Dibromo-3-Chloropropane	ND	2.0	
1,2,4-Trichlorobenzene	ND	0.5	
Hexachlorobutadiene	ND	2.0	
Naphthalene	ND	2.0	
1,2,3-Trichlorobenzene	ND	0.5	

Surrogate	%REC	Limits
Dibromofluoromethane	104	80-120
1,2-Dichloroethane-d4	101	73-136
Toluene-d8	102	80-120
Bromofluorobenzene	103	80-120

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	287072	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Field ID:	T-3-W	Batch#:	245634
Lab ID:	287072-003	Sampled:	03/15/17
Matrix:	Water	Received:	03/16/17
Units:	ug/L	Analyzed:	03/17/17
Diln Fac:	1.000		

Analyte	Result	RL	MDL
Freon 12	ND	1.0	
Chloromethane	ND	1.0	
Vinyl Chloride	ND	0.5	
Bromomethane	ND	1.0	
Chloroethane	ND	1.0	
Trichlorofluoromethane	ND	1.0	
Acetone	ND	10	
Freon 113	ND	2.0	
1,1-Dichloroethene	ND	0.5	
Methylene Chloride	ND	10	
Carbon Disulfide	ND	0.5	
MTBE	ND	0.5	
trans-1,2-Dichloroethene	ND	0.5	
Vinyl Acetate	ND	10	
1,1-Dichloroethane	ND	0.5	
2-Butanone	ND	10	
cis-1,2-Dichloroethene	ND	0.5	
2,2-Dichloropropane	ND	0.5	
Chloroform	ND	0.5	
Bromochloromethane	ND	0.5	
1,1,1-Trichloroethane	ND	0.5	
1,1-Dichloropropene	ND	0.5	
Carbon Tetrachloride	ND	0.5	
1,2-Dichloroethane	ND	0.5	
Benzene	ND	0.5	
Trichloroethene	ND	0.5	
1,2-Dichloropropane	ND	0.5	
Bromodichloromethane	ND	0.5	
Dibromomethane	ND	0.5	
4-Methyl-2-Pentanone	ND	10	
cis-1,3-Dichloropropene	ND	0.5	
Toluene	ND	0.5	
trans-1,3-Dichloropropene	ND	0.5	
1,1,2-Trichloroethane	ND	0.5	
2-Hexanone	ND	10	
1,3-Dichloropropane	ND	0.5	
Tetrachloroethene	ND	0.5	0.1
Dibromochloromethane	ND	0.5	
1,2-Dibromoethane	ND	0.5	
Chlorobenzene	ND	0.5	
1,1,1,2-Tetrachloroethane	ND	0.5	
Ethylbenzene	ND	0.5	
m,p-Xylenes	ND	0.5	
o-Xylene	ND	0.5	
Styrene	ND	0.5	
Bromoform	ND	1.0	
Isopropylbenzene	ND	0.5	
1,1,2,2-Tetrachloroethane	ND	0.5	
1,2,3-Trichloropropane	ND	0.5	
Propylbenzene	ND	0.5	
Bromobenzene	ND	0.5	
1,3,5-Trimethylbenzene	ND	0.5	
2-Chlorotoluene	ND	0.5	

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	287072	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Field ID:	T-3-W	Batch#:	245634
Lab ID:	287072-003	Sampled:	03/15/17
Matrix:	Water	Received:	03/16/17
Units:	ug/L	Analyzed:	03/17/17
Diln Fac:	1.000		

Analyte	Result	RL	MDL
4-Chlorotoluene	ND	0.5	
tert-Butylbenzene	ND	0.5	
1,2,4-Trimethylbenzene	ND	0.5	
sec-Butylbenzene	ND	0.5	
para-Isopropyl Toluene	ND	0.5	
1,3-Dichlorobenzene	ND	0.5	
1,4-Dichlorobenzene	ND	0.5	
n-Butylbenzene	ND	0.5	
1,2-Dichlorobenzene	ND	0.5	
1,2-Dibromo-3-Chloropropane	ND	2.0	
1,2,4-Trichlorobenzene	ND	0.5	
Hexachlorobutadiene	ND	2.0	
Naphthalene	ND	2.0	
1,2,3-Trichlorobenzene	ND	0.5	

Surrogate	%REC	Limits
Dibromofluoromethane	102	80-120
1,2-Dichloroethane-d4	98	73-136
Toluene-d8	105	80-120
Bromofluorobenzene	105	80-120

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	287072	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Field ID:	T-4-W	Batch#:	245634
Lab ID:	287072-004	Sampled:	03/15/17
Matrix:	Water	Received:	03/16/17
Units:	ug/L	Analyzed:	03/17/17
Diln Fac:	1.000		

Analyte	Result	RL	MDL
Freon 12	ND	1.0	
Chloromethane	ND	1.0	
Vinyl Chloride	ND	0.5	
Bromomethane	ND	1.0	
Chloroethane	ND	1.0	
Trichlorofluoromethane	ND	1.0	
Acetone	ND	10	
Freon 113	ND	2.0	
1,1-Dichloroethene	ND	0.5	
Methylene Chloride	ND	10	
Carbon Disulfide	ND	0.5	
MTBE	ND	0.5	
trans-1,2-Dichloroethene	ND	0.5	
Vinyl Acetate	ND	10	
1,1-Dichloroethane	ND	0.5	
2-Butanone	ND	10	
cis-1,2-Dichloroethene	ND	0.5	
2,2-Dichloropropane	ND	0.5	
Chloroform	ND	0.5	
Bromochloromethane	ND	0.5	
1,1,1-Trichloroethane	ND	0.5	
1,1-Dichloropropene	ND	0.5	
Carbon Tetrachloride	ND	0.5	
1,2-Dichloroethane	ND	0.5	
Benzene	ND	0.5	
Trichloroethene	ND	0.5	
1,2-Dichloropropane	ND	0.5	
Bromodichloromethane	ND	0.5	
Dibromomethane	ND	0.5	
4-Methyl-2-Pentanone	ND	10	
cis-1,3-Dichloropropene	ND	0.5	
Toluene	ND	0.5	
trans-1,3-Dichloropropene	ND	0.5	
1,1,2-Trichloroethane	ND	0.5	
2-Hexanone	ND	10	
1,3-Dichloropropane	ND	0.5	
Tetrachloroethene	ND	0.5	0.1
Dibromochloromethane	ND	0.5	
1,2-Dibromoethane	ND	0.5	
Chlorobenzene	ND	0.5	
1,1,1,2-Tetrachloroethane	ND	0.5	
Ethylbenzene	ND	0.5	
m,p-Xylenes	ND	0.5	
o-Xylene	ND	0.5	
Styrene	ND	0.5	
Bromoform	ND	1.0	
Isopropylbenzene	ND	0.5	
1,1,2,2-Tetrachloroethane	ND	0.5	
1,2,3-Trichloropropane	ND	0.5	
Propylbenzene	ND	0.5	
Bromobenzene	ND	0.5	
1,3,5-Trimethylbenzene	ND	0.5	
2-Chlorotoluene	ND	0.5	

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	287072	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Field ID:	T-4-W	Batch#:	245634
Lab ID:	287072-004	Sampled:	03/15/17
Matrix:	Water	Received:	03/16/17
Units:	ug/L	Analyzed:	03/17/17
Diln Fac:	1.000		

Analyte	Result	RL	MDL
4-Chlorotoluene	ND	0.5	
tert-Butylbenzene	ND	0.5	
1,2,4-Trimethylbenzene	ND	0.5	
sec-Butylbenzene	ND	0.5	
para-Isopropyl Toluene	ND	0.5	
1,3-Dichlorobenzene	ND	0.5	
1,4-Dichlorobenzene	ND	0.5	
n-Butylbenzene	ND	0.5	
1,2-Dichlorobenzene	ND	0.5	
1,2-Dibromo-3-Chloropropane	ND	2.0	
1,2,4-Trichlorobenzene	ND	0.5	
Hexachlorobutadiene	ND	2.0	
Naphthalene	ND	2.0	
1,2,3-Trichlorobenzene	ND	0.5	

Surrogate	%REC	Limits
Dibromofluoromethane	101	80-120
1,2-Dichloroethane-d4	108	73-136
Toluene-d8	103	80-120
Bromofluorobenzene	104	80-120

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	287072	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Field ID:	T-5-W	Batch#:	245634
Lab ID:	287072-005	Sampled:	03/15/17
Matrix:	Water	Received:	03/16/17
Units:	ug/L	Analyzed:	03/17/17
Diln Fac:	1.000		

Analyte	Result	RL	MDL
Freon 12	ND	1.0	
Chloromethane	ND	1.0	
Vinyl Chloride	ND	0.5	
Bromomethane	ND	1.0	
Chloroethane	ND	1.0	
Trichlorofluoromethane	ND	1.0	
Acetone	ND	10	
Freon 113	ND	2.0	
1,1-Dichloroethene	ND	0.5	
Methylene Chloride	ND	10	
Carbon Disulfide	ND	0.5	
MTBE	ND	0.5	
trans-1,2-Dichloroethene	ND	0.5	
Vinyl Acetate	ND	10	
1,1-Dichloroethane	ND	0.5	
2-Butanone	ND	10	
cis-1,2-Dichloroethene	ND	0.5	
2,2-Dichloropropane	ND	0.5	
Chloroform	ND	0.5	
Bromochloromethane	ND	0.5	
1,1,1-Trichloroethane	ND	0.5	
1,1-Dichloropropene	ND	0.5	
Carbon Tetrachloride	ND	0.5	
1,2-Dichloroethane	ND	0.5	
Benzene	ND	0.5	
Trichloroethene	ND	0.5	
1,2-Dichloropropane	ND	0.5	
Bromodichloromethane	ND	0.5	
Dibromomethane	ND	0.5	
4-Methyl-2-Pentanone	ND	10	
cis-1,3-Dichloropropene	ND	0.5	
Toluene	ND	0.5	
trans-1,3-Dichloropropene	ND	0.5	
1,1,2-Trichloroethane	ND	0.5	
2-Hexanone	ND	10	
1,3-Dichloropropane	ND	0.5	
Tetrachloroethene	ND	0.5	0.1
Dibromochloromethane	ND	0.5	
1,2-Dibromoethane	ND	0.5	
Chlorobenzene	ND	0.5	
1,1,1,2-Tetrachloroethane	ND	0.5	
Ethylbenzene	ND	0.5	
m,p-Xylenes	ND	0.5	
o-Xylene	ND	0.5	
Styrene	ND	0.5	
Bromoform	ND	1.0	
Isopropylbenzene	ND	0.5	
1,1,2,2-Tetrachloroethane	ND	0.5	
1,2,3-Trichloropropane	ND	0.5	
Propylbenzene	ND	0.5	
Bromobenzene	ND	0.5	
1,3,5-Trimethylbenzene	ND	0.5	
2-Chlorotoluene	ND	0.5	

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	287072	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Field ID:	T-5-W	Batch#:	245634
Lab ID:	287072-005	Sampled:	03/15/17
Matrix:	Water	Received:	03/16/17
Units:	ug/L	Analyzed:	03/17/17
Diln Fac:	1.000		

Analyte	Result	RL	MDL
4-Chlorotoluene	ND	0.5	
tert-Butylbenzene	ND	0.5	
1,2,4-Trimethylbenzene	ND	0.5	
sec-Butylbenzene	ND	0.5	
para-Isopropyl Toluene	ND	0.5	
1,3-Dichlorobenzene	ND	0.5	
1,4-Dichlorobenzene	ND	0.5	
n-Butylbenzene	ND	0.5	
1,2-Dichlorobenzene	ND	0.5	
1,2-Dibromo-3-Chloropropane	ND	2.0	
1,2,4-Trichlorobenzene	ND	0.5	
Hexachlorobutadiene	ND	2.0	
Naphthalene	ND	2.0	
1,2,3-Trichlorobenzene	ND	0.5	

Surrogate	%REC	Limits
Dibromofluoromethane	102	80-120
1,2-Dichloroethane-d4	103	73-136
Toluene-d8	101	80-120
Bromofluorobenzene	101	80-120

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	287072	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Field ID:	T-6-W	Batch#:	245634
Lab ID:	287072-006	Sampled:	03/16/17
Matrix:	Water	Received:	03/16/17
Units:	ug/L	Analyzed:	03/17/17
Diln Fac:	1.000		

Analyte	Result	RL	MDL
Freon 12	ND	1.0	
Chloromethane	ND	1.0	
Vinyl Chloride	ND	0.5	
Bromomethane	ND	1.0	
Chloroethane	ND	1.0	
Trichlorofluoromethane	ND	1.0	
Acetone	ND	10	
Freon 113	ND	2.0	
1,1-Dichloroethene	ND	0.5	
Methylene Chloride	ND	10	
Carbon Disulfide	ND	0.5	
MTBE	ND	0.5	
trans-1,2-Dichloroethene	ND	0.5	
Vinyl Acetate	ND	10	
1,1-Dichloroethane	ND	0.5	
2-Butanone	ND	10	
cis-1,2-Dichloroethene	ND	0.5	
2,2-Dichloropropane	ND	0.5	
Chloroform	ND	0.5	
Bromochloromethane	ND	0.5	
1,1,1-Trichloroethane	ND	0.5	
1,1-Dichloropropene	ND	0.5	
Carbon Tetrachloride	ND	0.5	
1,2-Dichloroethane	ND	0.5	
Benzene	ND	0.5	
Trichloroethene	ND	0.5	
1,2-Dichloropropane	ND	0.5	
Bromodichloromethane	ND	0.5	
Dibromomethane	ND	0.5	
4-Methyl-2-Pentanone	ND	10	
cis-1,3-Dichloropropene	ND	0.5	
Toluene	ND	0.5	
trans-1,3-Dichloropropene	ND	0.5	
1,1,2-Trichloroethane	ND	0.5	
2-Hexanone	ND	10	
1,3-Dichloropropane	ND	0.5	
Tetrachloroethene	ND	0.5	0.1
Dibromochloromethane	ND	0.5	
1,2-Dibromoethane	ND	0.5	
Chlorobenzene	ND	0.5	
1,1,1,2-Tetrachloroethane	ND	0.5	
Ethylbenzene	ND	0.5	
m,p-Xylenes	ND	0.5	
o-Xylene	ND	0.5	
Styrene	ND	0.5	
Bromoform	ND	1.0	
Isopropylbenzene	ND	0.5	
1,1,2,2-Tetrachloroethane	ND	0.5	
1,2,3-Trichloropropane	ND	0.5	
Propylbenzene	ND	0.5	
Bromobenzene	ND	0.5	
1,3,5-Trimethylbenzene	ND	0.5	
2-Chlorotoluene	ND	0.5	

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	287072	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Field ID:	T-6-W	Batch#:	245634
Lab ID:	287072-006	Sampled:	03/16/17
Matrix:	Water	Received:	03/16/17
Units:	ug/L	Analyzed:	03/17/17
Diln Fac:	1.000		

Analyte	Result	RL	MDL
4-Chlorotoluene	ND	0.5	
tert-Butylbenzene	ND	0.5	
1,2,4-Trimethylbenzene	ND	0.5	
sec-Butylbenzene	ND	0.5	
para-Isopropyl Toluene	ND	0.5	
1,3-Dichlorobenzene	ND	0.5	
1,4-Dichlorobenzene	ND	0.5	
n-Butylbenzene	ND	0.5	
1,2-Dichlorobenzene	ND	0.5	
1,2-Dibromo-3-Chloropropane	ND	2.0	
1,2,4-Trichlorobenzene	ND	0.5	
Hexachlorobutadiene	ND	2.0	
Naphthalene	ND	2.0	
1,2,3-Trichlorobenzene	ND	0.5	

Surrogate	%REC	Limits
Dibromofluoromethane	102	80-120
1,2-Dichloroethane-d4	107	73-136
Toluene-d8	106	80-120
Bromofluorobenzene	105	80-120

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	287072	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Field ID:	T-7-W	Batch#:	245669
Lab ID:	287072-007	Sampled:	03/16/17
Matrix:	Water	Received:	03/16/17
Units:	ug/L	Analyzed:	03/19/17
Diln Fac:	1.000		

Analyte	Result	RL	MDL
Freon 12	ND	1.0	
Chloromethane	ND	1.0	
Vinyl Chloride	ND	0.5	
Bromomethane	ND	1.0	
Chloroethane	ND	1.0	
Trichlorofluoromethane	ND	1.0	
Acetone	ND	10	
Freon 113	ND	2.0	
1,1-Dichloroethene	ND	0.5	
Methylene Chloride	ND	10	
Carbon Disulfide	ND	0.5	
MTBE	ND	0.5	
trans-1,2-Dichloroethene	ND	0.5	
Vinyl Acetate	ND	10	
1,1-Dichloroethane	ND	0.5	
2-Butanone	ND	10	
cis-1,2-Dichloroethene	ND	0.5	
2,2-Dichloropropane	ND	0.5	
Chloroform	ND	0.5	
Bromochloromethane	ND	0.5	
1,1,1-Trichloroethane	ND	0.5	
1,1-Dichloropropene	ND	0.5	
Carbon Tetrachloride	ND	0.5	
1,2-Dichloroethane	ND	0.5	
Benzene	ND	0.5	
Trichloroethene	ND	0.5	
1,2-Dichloropropane	ND	0.5	
Bromodichloromethane	ND	0.5	
Dibromomethane	ND	0.5	
4-Methyl-2-Pentanone	ND	10	
cis-1,3-Dichloropropene	ND	0.5	
Toluene	ND	0.5	
trans-1,3-Dichloropropene	ND	0.5	
1,1,2-Trichloroethane	ND	0.5	
2-Hexanone	ND	10	
1,3-Dichloropropane	ND	0.5	
Tetrachloroethene	ND	0.5	0.1
Dibromochloromethane	ND	0.5	
1,2-Dibromoethane	ND	0.5	
Chlorobenzene	ND	0.5	
1,1,1,2-Tetrachloroethane	ND	0.5	
Ethylbenzene	ND	0.5	
m,p-Xylenes	ND	0.5	
o-Xylene	ND	0.5	
Styrene	ND	0.5	
Bromoform	ND	1.0	
Isopropylbenzene	ND	0.5	
1,1,2,2-Tetrachloroethane	ND	0.5	
1,2,3-Trichloropropane	ND	0.5	
Propylbenzene	ND	0.5	
Bromobenzene	ND	0.5	
1,3,5-Trimethylbenzene	ND	0.5	
2-Chlorotoluene	ND	0.5	

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	287072	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Field ID:	T-7-W	Batch#:	245669
Lab ID:	287072-007	Sampled:	03/16/17
Matrix:	Water	Received:	03/16/17
Units:	ug/L	Analyzed:	03/19/17
Diln Fac:	1.000		

Analyte	Result	RL	MDL
4-Chlorotoluene	ND	0.5	
tert-Butylbenzene	ND	0.5	
1,2,4-Trimethylbenzene	ND	0.5	
sec-Butylbenzene	ND	0.5	
para-Isopropyl Toluene	ND	0.5	
1,3-Dichlorobenzene	ND	0.5	
1,4-Dichlorobenzene	ND	0.5	
n-Butylbenzene	ND	0.5	
1,2-Dichlorobenzene	ND	0.5	
1,2-Dibromo-3-Chloropropane	ND	2.0	
1,2,4-Trichlorobenzene	ND	0.5	
Hexachlorobutadiene	ND	2.0	
Naphthalene	ND	2.0	
1,2,3-Trichlorobenzene	ND	0.5	

Surrogate	%REC	Limits
Dibromofluoromethane	97	80-120
1,2-Dichloroethane-d4	90	73-136
Toluene-d8	97	80-120
Bromofluorobenzene	99	80-120

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	287072	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Field ID:	T-8-W	Batch#:	245669
Lab ID:	287072-008	Sampled:	03/16/17
Matrix:	Water	Received:	03/16/17
Units:	ug/L	Analyzed:	03/19/17
Diln Fac:	1.000		

Analyte	Result	RL	MDL
Freon 12	ND	1.0	
Chloromethane	ND	1.0	
Vinyl Chloride	ND	0.5	
Bromomethane	ND	1.0	
Chloroethane	ND	1.0	
Trichlorofluoromethane	ND	1.0	
Acetone	ND	10	
Freon 113	ND	2.0	
1,1-Dichloroethene	ND	0.5	
Methylene Chloride	ND	10	
Carbon Disulfide	ND	0.5	
MTBE	ND	0.5	
trans-1,2-Dichloroethene	ND	0.5	
Vinyl Acetate	ND	10	
1,1-Dichloroethane	ND	0.5	
2-Butanone	ND	10	
cis-1,2-Dichloroethene	ND	0.5	
2,2-Dichloropropane	ND	0.5	
Chloroform	ND	0.5	
Bromochloromethane	ND	0.5	
1,1,1-Trichloroethane	ND	0.5	
1,1-Dichloropropene	ND	0.5	
Carbon Tetrachloride	ND	0.5	
1,2-Dichloroethane	ND	0.5	
Benzene	ND	0.5	
Trichloroethene	ND	0.5	
1,2-Dichloropropane	ND	0.5	
Bromodichloromethane	ND	0.5	
Dibromomethane	ND	0.5	
4-Methyl-2-Pentanone	ND	10	
cis-1,3-Dichloropropene	ND	0.5	
Toluene	ND	0.5	
trans-1,3-Dichloropropene	ND	0.5	
1,1,2-Trichloroethane	ND	0.5	
2-Hexanone	ND	10	
1,3-Dichloropropane	ND	0.5	
Tetrachloroethene	0.4 J	0.5	0.1
Dibromochloromethane	ND	0.5	
1,2-Dibromoethane	ND	0.5	
Chlorobenzene	ND	0.5	
1,1,1,2-Tetrachloroethane	ND	0.5	
Ethylbenzene	ND	0.5	
m,p-Xylenes	ND	0.5	
o-Xylene	ND	0.5	
Styrene	ND	0.5	
Bromoform	ND	1.0	
Isopropylbenzene	ND	0.5	
1,1,2,2-Tetrachloroethane	ND	0.5	
1,2,3-Trichloropropane	ND	0.5	
Propylbenzene	ND	0.5	
Bromobenzene	ND	0.5	
1,3,5-Trimethylbenzene	ND	0.5	

J= Estimated value
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	287072	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Field ID:	T-8-W	Batch#:	245669
Lab ID:	287072-008	Sampled:	03/16/17
Matrix:	Water	Received:	03/16/17
Units:	ug/L	Analyzed:	03/19/17
Diln Fac:	1.000		

Analyte	Result	RL	MDL
2-Chlorotoluene	ND	0.5	
4-Chlorotoluene	ND	0.5	
tert-Butylbenzene	ND	0.5	
1,2,4-Trimethylbenzene	ND	0.5	
sec-Butylbenzene	ND	0.5	
para-Isopropyl Toluene	ND	0.5	
1,3-Dichlorobenzene	ND	0.5	
1,4-Dichlorobenzene	ND	0.5	
n-Butylbenzene	ND	0.5	
1,2-Dichlorobenzene	ND	0.5	
1,2-Dibromo-3-Chloropropane	ND	2.0	
1,2,4-Trichlorobenzene	ND	0.5	
Hexachlorobutadiene	ND	2.0	
Naphthalene	ND	2.0	
1,2,3-Trichlorobenzene	ND	0.5	

Surrogate	%REC	Limits
Dibromofluoromethane	98	80-120
1,2-Dichloroethane-d4	88	73-136
Toluene-d8	97	80-120
Bromofluorobenzene	98	80-120

J= Estimated value
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	287072	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Field ID:	T-9-W	Batch#:	245669
Lab ID:	287072-009	Sampled:	03/16/17
Matrix:	Water	Received:	03/16/17
Units:	ug/L	Analyzed:	03/19/17
Diln Fac:	1.000		

Analyte	Result	RL	MDL
Freon 12	ND	1.0	
Chloromethane	ND	1.0	
Vinyl Chloride	ND	0.5	
Bromomethane	ND	1.0	
Chloroethane	ND	1.0	
Trichlorofluoromethane	ND	1.0	
Acetone	ND	10	
Freon 113	ND	2.0	
1,1-Dichloroethene	ND	0.5	
Methylene Chloride	ND	10	
Carbon Disulfide	ND	0.5	
MTBE	ND	0.5	
trans-1,2-Dichloroethene	ND	0.5	
Vinyl Acetate	ND	10	
1,1-Dichloroethane	ND	0.5	
2-Butanone	ND	10	
cis-1,2-Dichloroethene	ND	0.5	
2,2-Dichloropropane	ND	0.5	
Chloroform	ND	0.5	
Bromochloromethane	ND	0.5	
1,1,1-Trichloroethane	ND	0.5	
1,1-Dichloropropene	ND	0.5	
Carbon Tetrachloride	ND	0.5	
1,2-Dichloroethane	ND	0.5	
Benzene	ND	0.5	
Trichloroethene	ND	0.5	
1,2-Dichloropropane	ND	0.5	
Bromodichloromethane	ND	0.5	
Dibromomethane	ND	0.5	
4-Methyl-2-Pentanone	ND	10	
cis-1,3-Dichloropropene	ND	0.5	
Toluene	ND	0.5	
trans-1,3-Dichloropropene	ND	0.5	
1,1,2-Trichloroethane	ND	0.5	
2-Hexanone	ND	10	
1,3-Dichloropropane	ND	0.5	
Tetrachloroethene	0.2 J	0.5	0.1
Dibromochloromethane	ND	0.5	
1,2-Dibromoethane	ND	0.5	
Chlorobenzene	ND	0.5	
1,1,1,2-Tetrachloroethane	ND	0.5	
Ethylbenzene	ND	0.5	
m,p-Xylenes	ND	0.5	
o-Xylene	ND	0.5	
Styrene	ND	0.5	
Bromoform	ND	1.0	
Isopropylbenzene	ND	0.5	
1,1,2,2-Tetrachloroethane	ND	0.5	
1,2,3-Trichloropropane	ND	0.5	
Propylbenzene	ND	0.5	
Bromobenzene	ND	0.5	
1,3,5-Trimethylbenzene	ND	0.5	

J= Estimated value
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	287072	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Field ID:	T-9-W	Batch#:	245669
Lab ID:	287072-009	Sampled:	03/16/17
Matrix:	Water	Received:	03/16/17
Units:	ug/L	Analyzed:	03/19/17
Diln Fac:	1.000		

Analyte	Result	RL	MDL
2-Chlorotoluene	ND	0.5	
4-Chlorotoluene	ND	0.5	
tert-Butylbenzene	ND	0.5	
1,2,4-Trimethylbenzene	ND	0.5	
sec-Butylbenzene	ND	0.5	
para-Isopropyl Toluene	ND	0.5	
1,3-Dichlorobenzene	ND	0.5	
1,4-Dichlorobenzene	ND	0.5	
n-Butylbenzene	ND	0.5	
1,2-Dichlorobenzene	ND	0.5	
1,2-Dibromo-3-Chloropropane	ND	2.0	
1,2,4-Trichlorobenzene	ND	0.5	
Hexachlorobutadiene	ND	2.0	
Naphthalene	ND	2.0	
1,2,3-Trichlorobenzene	ND	0.5	

Surrogate	%REC	Limits
Dibromofluoromethane	97	80-120
1,2-Dichloroethane-d4	89	73-136
Toluene-d8	97	80-120
Bromofluorobenzene	99	80-120

J= Estimated value
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	287072	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Field ID:	T-10-W	Batch#:	245769
Lab ID:	287072-010	Sampled:	03/16/17
Matrix:	Water	Received:	03/16/17
Units:	ug/L	Analyzed:	03/22/17
Diln Fac:	1.000		

Analyte	Result	RL	MDL
Freon 12	ND	1.0	
Chloromethane	ND	1.0	
Vinyl Chloride	ND	0.5	
Bromomethane	ND	1.0	
Chloroethane	ND	1.0	
Trichlorofluoromethane	ND	1.0	
Acetone	ND	10	
Freon 113	ND	2.0	
1,1-Dichloroethene	ND	0.5	
Methylene Chloride	ND	10	
Carbon Disulfide	ND	0.5	
MTBE	ND	0.5	
trans-1,2-Dichloroethene	ND	0.5	
Vinyl Acetate	ND	10	
1,1-Dichloroethane	ND	0.5	
2-Butanone	ND	10	
cis-1,2-Dichloroethene	ND	0.5	
2,2-Dichloropropane	ND	0.5	
Chloroform	ND	0.5	
Bromochloromethane	ND	0.5	
1,1,1-Trichloroethane	ND	0.5	
1,1-Dichloropropene	ND	0.5	
Carbon Tetrachloride	ND	0.5	
1,2-Dichloroethane	ND	0.5	
Benzene	ND	0.5	
Trichloroethene	ND	0.5	
1,2-Dichloropropane	ND	0.5	
Bromodichloromethane	ND	0.5	
Dibromomethane	ND	0.5	
4-Methyl-2-Pentanone	ND	10	
cis-1,3-Dichloropropene	ND	0.5	
Toluene	ND	0.5	
trans-1,3-Dichloropropene	ND	0.5	
1,1,2-Trichloroethane	ND	0.5	
2-Hexanone	ND	10	
1,3-Dichloropropane	ND	0.5	
Tetrachloroethene	0.7	0.5	0.1
Dibromochloromethane	ND	0.5	
1,2-Dibromoethane	ND	0.5	
Chlorobenzene	ND	0.5	
1,1,1,2-Tetrachloroethane	ND	0.5	
Ethylbenzene	ND	0.5	
m,p-Xylenes	ND	0.5	
o-Xylene	ND	0.5	
Styrene	ND	0.5	
Bromoform	ND	1.0	
Isopropylbenzene	ND	0.5	
1,1,2,2-Tetrachloroethane	ND	0.5	
1,2,3-Trichloropropane	ND	0.5	
Propylbenzene	ND	0.5	
Bromobenzene	ND	0.5	
1,3,5-Trimethylbenzene	ND	0.5	
2-Chlorotoluene	ND	0.5	

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	287072	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Field ID:	T-10-W	Batch#:	245769
Lab ID:	287072-010	Sampled:	03/16/17
Matrix:	Water	Received:	03/16/17
Units:	ug/L	Analyzed:	03/22/17
Diln Fac:	1.000		

Analyte	Result	RL	MDL
4-Chlorotoluene	ND	0.5	
tert-Butylbenzene	ND	0.5	
1,2,4-Trimethylbenzene	ND	0.5	
sec-Butylbenzene	ND	0.5	
para-Isopropyl Toluene	ND	0.5	
1,3-Dichlorobenzene	ND	0.5	
1,4-Dichlorobenzene	ND	0.5	
n-Butylbenzene	ND	0.5	
1,2-Dichlorobenzene	ND	0.5	
1,2-Dibromo-3-Chloropropane	ND	2.0	
1,2,4-Trichlorobenzene	ND	0.5	
Hexachlorobutadiene	ND	2.0	
Naphthalene	ND	2.0	
1,2,3-Trichlorobenzene	ND	0.5	

Surrogate	%REC	Limits
Dibromofluoromethane	92	80-120
1,2-Dichloroethane-d4	81	73-136
Toluene-d8	95	80-120
Bromofluorobenzene	95	80-120

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	287072	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC877370	Batch#:	245634
Matrix:	Water	Analyzed:	03/17/17
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
1,1-Dichloroethene	12.50	12.37	99	66-127
Benzene	12.50	12.40	99	78-123
Trichloroethene	12.50	12.04	96	75-120
Toluene	12.50	12.85	103	80-120
Chlorobenzene	12.50	12.53	100	80-120

Surrogate	%REC	Limits
Dibromofluoromethane	101	80-120
1,2-Dichloroethane-d4	92	73-136
Toluene-d8	100	80-120
Bromofluorobenzene	105	80-120

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	287072	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Type:	BLANK	Dil'n Fac:	1.000
Lab ID:	QC877371	Batch#:	245634
Matrix:	Water	Analyzed:	03/17/17
Units:	ug/L		

Analyte	Result	RL	MDL
Freon 12	ND	1.0	
Chloromethane	ND	1.0	
Vinyl Chloride	ND	0.5	
Bromomethane	ND	1.0	
Chloroethane	ND	1.0	
Trichlorofluoromethane	ND	1.0	
Acetone	ND	10	
Freon 113	ND	2.0	
1,1-Dichloroethene	ND	0.5	
Methylene Chloride	ND	10	
Carbon Disulfide	ND	0.5	
MTBE	ND	0.5	
trans-1,2-Dichloroethene	ND	0.5	
Vinyl Acetate	ND	10	
1,1-Dichloroethane	ND	0.5	
2-Butanone	ND	10	
cis-1,2-Dichloroethene	ND	0.5	
2,2-Dichloropropane	ND	0.5	
Chloroform	ND	0.5	
Bromochloromethane	ND	0.5	
1,1,1-Trichloroethane	ND	0.5	
1,1-Dichloropropene	ND	0.5	
Carbon Tetrachloride	ND	0.5	
1,2-Dichloroethane	ND	0.5	
Benzene	ND	0.5	
Trichloroethene	ND	0.5	
1,2-Dichloropropane	ND	0.5	
Bromodichloromethane	ND	0.5	
Dibromomethane	ND	0.5	
4-Methyl-2-Pentanone	ND	10	
cis-1,3-Dichloropropene	ND	0.5	
Toluene	ND	0.5	
trans-1,3-Dichloropropene	ND	0.5	
1,1,2-Trichloroethane	ND	0.5	
2-Hexanone	ND	10	
1,3-Dichloropropane	ND	0.5	
Tetrachloroethene	ND	0.5	0.1
Dibromochloromethane	ND	0.5	
1,2-Dibromoethane	ND	0.5	
Chlorobenzene	ND	0.5	
1,1,1,2-Tetrachloroethane	ND	0.5	
Ethylbenzene	ND	0.5	
m,p-Xylenes	ND	0.5	
o-Xylene	ND	0.5	
Styrene	ND	0.5	
Bromoform	ND	1.0	
Isopropylbenzene	ND	0.5	
1,1,2,2-Tetrachloroethane	ND	0.5	
1,2,3-Trichloropropane	ND	0.5	
Propylbenzene	ND	0.5	
Bromobenzene	ND	0.5	
1,3,5-Trimethylbenzene	ND	0.5	
2-Chlorotoluene	ND	0.5	

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	287072	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC877371	Batch#:	245634
Matrix:	Water	Analyzed:	03/17/17
Units:	ug/L		

Analyte	Result	RL	MDL
4-Chlorotoluene	ND	0.5	
tert-Butylbenzene	ND	0.5	
1,2,4-Trimethylbenzene	ND	0.5	
sec-Butylbenzene	ND	0.5	
para-Isopropyl Toluene	ND	0.5	
1,3-Dichlorobenzene	ND	0.5	
1,4-Dichlorobenzene	ND	0.5	
n-Butylbenzene	ND	0.5	
1,2-Dichlorobenzene	ND	0.5	
1,2-Dibromo-3-Chloropropane	ND	2.0	
1,2,4-Trichlorobenzene	ND	0.5	
Hexachlorobutadiene	ND	2.0	
Naphthalene	ND	2.0	
1,2,3-Trichlorobenzene	ND	0.5	

Surrogate	%REC	Limits
Dibromofluoromethane	102	80-120
1,2-Dichloroethane-d4	98	73-136
Toluene-d8	97	80-120
Bromofluorobenzene	103	80-120

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	287072	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	245669
Units:	ug/L	Analyzed:	03/19/17
Diln Fac:	1.000		

Type: BS Lab ID: QC877489

Analyte	Spiked	Result	%REC	Limits
1,1-Dichloroethene	12.50	10.41	83	66-127
Benzene	12.50	11.30	90	78-123
Trichloroethene	12.50	11.19	89	75-120
Toluene	12.50	11.29	90	80-120
Chlorobenzene	12.50	11.72	94	80-120

Surrogate	%REC	Limits
Dibromofluoromethane	95	80-120
1,2-Dichloroethane-d4	86	73-136
Toluene-d8	96	80-120
Bromofluorobenzene	94	80-120

Type: BSD Lab ID: QC877490

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
1,1-Dichloroethene	12.50	11.30	90	66-127	8	20
Benzene	12.50	12.03	96	78-123	6	20
Trichloroethene	12.50	11.83	95	75-120	6	20
Toluene	12.50	11.96	96	80-120	6	20
Chlorobenzene	12.50	12.19	97	80-120	4	20

Surrogate	%REC	Limits
Dibromofluoromethane	94	80-120
1,2-Dichloroethane-d4	86	73-136
Toluene-d8	96	80-120
Bromofluorobenzene	94	80-120

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	287072	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Type:	BLANK	Dil'n Fac:	1.000
Lab ID:	QC877491	Batch#:	245669
Matrix:	Water	Analyzed:	03/19/17
Units:	ug/L		

Analyte	Result	RL	MDL
Freon 12	ND	1.0	
Chloromethane	ND	1.0	
Vinyl Chloride	ND	0.5	
Bromomethane	ND	1.0	
Chloroethane	ND	1.0	
Trichlorofluoromethane	ND	1.0	
Acetone	ND	10	
Freon 113	ND	2.0	
1,1-Dichloroethene	ND	0.5	
Methylene Chloride	ND	10	
Carbon Disulfide	ND	0.5	
MTBE	ND	0.5	
trans-1,2-Dichloroethene	ND	0.5	
Vinyl Acetate	ND	10	
1,1-Dichloroethane	ND	0.5	
2-Butanone	ND	10	
cis-1,2-Dichloroethene	ND	0.5	
2,2-Dichloropropane	ND	0.5	
Chloroform	ND	0.5	
Bromochloromethane	ND	0.5	
1,1,1-Trichloroethane	ND	0.5	
1,1-Dichloropropene	ND	0.5	
Carbon Tetrachloride	ND	0.5	
1,2-Dichloroethane	ND	0.5	
Benzene	ND	0.5	
Trichloroethene	ND	0.5	
1,2-Dichloropropane	ND	0.5	
Bromodichloromethane	ND	0.5	
Dibromomethane	ND	0.5	
4-Methyl-2-Pentanone	ND	10	
cis-1,3-Dichloropropene	ND	0.5	
Toluene	ND	0.5	
trans-1,3-Dichloropropene	ND	0.5	
1,1,2-Trichloroethane	ND	0.5	
2-Hexanone	ND	10	
1,3-Dichloropropane	ND	0.5	
Tetrachloroethene	ND	0.5	0.1
Dibromochloromethane	ND	0.5	
1,2-Dibromoethane	ND	0.5	
Chlorobenzene	ND	0.5	
1,1,1,2-Tetrachloroethane	ND	0.5	
Ethylbenzene	ND	0.5	
m,p-Xylenes	ND	0.5	
o-Xylene	ND	0.5	
Styrene	ND	0.5	
Bromoform	ND	1.0	
Isopropylbenzene	ND	0.5	
1,1,2,2-Tetrachloroethane	ND	0.5	
1,2,3-Trichloropropane	ND	0.5	
Propylbenzene	ND	0.5	
Bromobenzene	ND	0.5	
1,3,5-Trimethylbenzene	ND	0.5	

b= See narrative
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	287072	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC877491	Batch#:	245669
Matrix:	Water	Analyzed:	03/19/17
Units:	ug/L		

Analyte	Result	RL	MDL
2-Chlorotoluene	ND	0.5	
4-Chlorotoluene	ND	0.5	
tert-Butylbenzene	ND	0.5	
1,2,4-Trimethylbenzene	ND	0.5	
sec-Butylbenzene	ND	0.5	
para-Isopropyl Toluene	ND	0.5	
1,3-Dichlorobenzene	ND	0.5	
1,4-Dichlorobenzene	ND	0.5	
n-Butylbenzene	ND	0.5	
1,2-Dichlorobenzene	ND	0.5	
1,2-Dibromo-3-Chloropropane	ND	2.0	
1,2,4-Trichlorobenzene	ND	0.5	
Hexachlorobutadiene	ND	2.0	
Naphthalene	ND	2.0	
1,2,3-Trichlorobenzene	0.7 b	0.5	

Surrogate	%REC	Limits
Dibromofluoromethane	95	80-120
1,2-Dichloroethane-d4	88	73-136
Toluene-d8	97	80-120
Bromofluorobenzene	98	80-120

b= See narrative
ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	287072	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Type:	BLANK	Dil'n Fac:	1.000
Lab ID:	QC877891	Batch#:	245769
Matrix:	Water	Analyzed:	03/22/17
Units:	ug/L		

Analyte	Result	RL	MDL
Freon 12	ND	1.0	
Chloromethane	ND	1.0	
Vinyl Chloride	ND	0.5	
Bromomethane	ND	1.0	
Chloroethane	ND	1.0	
Trichlorofluoromethane	ND	1.0	
Acetone	ND	10	
Freon 113	ND	2.0	
1,1-Dichloroethene	ND	0.5	
Methylene Chloride	ND	10	
Carbon Disulfide	ND	0.5	
MTBE	ND	0.5	
trans-1,2-Dichloroethene	ND	0.5	
Vinyl Acetate	ND	10	
1,1-Dichloroethane	ND	0.5	
2-Butanone	ND	10	
cis-1,2-Dichloroethene	ND	0.5	
2,2-Dichloropropane	ND	0.5	
Chloroform	ND	0.5	
Bromochloromethane	ND	0.5	
1,1,1-Trichloroethane	ND	0.5	
1,1-Dichloropropene	ND	0.5	
Carbon Tetrachloride	ND	0.5	
1,2-Dichloroethane	ND	0.5	
Benzene	ND	0.5	
Trichloroethene	ND	0.5	
1,2-Dichloropropane	ND	0.5	
Bromodichloromethane	ND	0.5	
Dibromomethane	ND	0.5	
4-Methyl-2-Pentanone	ND	10	
cis-1,3-Dichloropropene	ND	0.5	
Toluene	ND	0.5	
trans-1,3-Dichloropropene	ND	0.5	
1,1,2-Trichloroethane	ND	0.5	
2-Hexanone	ND	10	
1,3-Dichloropropane	ND	0.5	
Tetrachloroethene	ND	0.5	0.1
Dibromochloromethane	ND	0.5	
1,2-Dibromoethane	ND	0.5	
Chlorobenzene	ND	0.5	
1,1,1,2-Tetrachloroethane	ND	0.5	
Ethylbenzene	ND	0.5	
m,p-Xylenes	ND	0.5	
o-Xylene	ND	0.5	
Styrene	ND	0.5	
Bromoform	ND	1.0	
Isopropylbenzene	ND	0.5	
1,1,2,2-Tetrachloroethane	ND	0.5	
1,2,3-Trichloropropane	ND	0.5	
Propylbenzene	ND	0.5	
Bromobenzene	ND	0.5	
1,3,5-Trimethylbenzene	ND	0.5	
2-Chlorotoluene	ND	0.5	

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	287072	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC877891	Batch#:	245769
Matrix:	Water	Analyzed:	03/22/17
Units:	ug/L		

Analyte	Result	RL	MDL
4-Chlorotoluene	ND	0.5	
tert-Butylbenzene	ND	0.5	
1,2,4-Trimethylbenzene	ND	0.5	
sec-Butylbenzene	ND	0.5	
para-Isopropyl Toluene	ND	0.5	
1,3-Dichlorobenzene	ND	0.5	
1,4-Dichlorobenzene	ND	0.5	
n-Butylbenzene	ND	0.5	
1,2-Dichlorobenzene	ND	0.5	
1,2-Dibromo-3-Chloropropane	ND	2.0	
1,2,4-Trichlorobenzene	ND	0.5	
Hexachlorobutadiene	ND	2.0	
Naphthalene	ND	2.0	
1,2,3-Trichlorobenzene	ND	0.5	

Surrogate	%REC	Limits
Dibromofluoromethane	91	80-120
1,2-Dichloroethane-d4	81	73-136
Toluene-d8	95	80-120
Bromofluorobenzene	96	80-120

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	287072	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	1233 BOCKMAN	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	245769
Units:	ug/L	Analyzed:	03/22/17
Diln Fac:	1.000		

Type: BS Lab ID: QC877892

Analyte	Spiked	Result	%REC	Limits
1,1-Dichloroethene	12.50	12.87	103	66-127
Benzene	12.50	12.76	102	78-123
Trichloroethene	12.50	12.57	101	75-120
Toluene	12.50	12.67	101	80-120
Chlorobenzene	12.50	12.79	102	80-120

Surrogate	%REC	Limits
Dibromofluoromethane	90	80-120
1,2-Dichloroethane-d4	81	73-136
Toluene-d8	94	80-120
Bromofluorobenzene	91	80-120

Type: BSD Lab ID: QC877893

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
1,1-Dichloroethene	12.50	11.65	93	66-127	10	20
Benzene	12.50	11.59	93	78-123	10	20
Trichloroethene	12.50	11.48	92	75-120	9	20
Toluene	12.50	11.62	93	80-120	9	20
Chlorobenzene	12.50	12.01	96	80-120	6	20

Surrogate	%REC	Limits
Dibromofluoromethane	92	80-120
1,2-Dichloroethane-d4	79	73-136
Toluene-d8	95	80-120
Bromofluorobenzene	94	80-120

RPD= Relative Percent Difference


Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 287534
ANALYTICAL REPORT

Pangea Environmental	Project : 1233 BOCKMAN
1710 Franklin Street	Location : 1233 Bockman
Oakland, CA 94612	Level : II

Sample ID	Lab ID
SV-63-2.5	287534-001
SV-64-2.5	287534-002
SV-65-2.5	287534-003

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: _____ Date: 04/06/2017

Will Rice
Project Manager
will.rice@ctberk.com
(510) 204-2221 Ext 13102

CA ELAP# 2896, NELAP# 4044-001

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**287534**
Client:	**Pangea Environmental**
Project:	**1233 BOCKMAN**
Location:	**1233 Bockman**
Request Date:	**03/30/17**
Samples Received:	**03/30/17**

This data package contains sample and QC results for three soil samples, requested for the above referenced project on 03/30/17. The samples were received cold and intact.

TPH-Purgeables and/or BTXE by GC (EPA 8015B):

Matrix spikes QC879602,QC879603 (batch 246168) were not reported because there was insufficient sample amount. No other analytical problems were encountered.

TPH-Extractables by GC (EPA 8015B):

Matrix spikes QC879566,QC879567 (batch 246180) were not reported because the parent sample required a dilution that would have diluted out the spikes. SV-64-2.5 (lab # 287534-002) and SV-65-2.5 (lab # 287534-003) were diluted due to the dark and viscous nature of the sample extracts. No other analytical problems were encountered.

CHAIN OF CUSTODY

Curtis & Tompkins Laboratories
ENVIRONMENTAL ANALYTICAL TESTING LABORATORY
In Business Since 1878

2323 Fifth Street
Berkeley, CA 94710

Phone (510) 486-0900
Fax (510) 486-0532

Chain of Custody #

C&T LOGIN # 287534

Project No:

Project Name: 1233 Buckman

Project P. O. No:

EDD Format: Report Level ☐ II ☐ III ☐ IV

Turnaround Time: ☐ RUSH ☒ Standard

Sampler: B. Lervaag

Report To: Ron Scheele

Company: Pangea Env. Srs.

Telephone: 510-836-3700

Email: rscheele@pangeaenv.com

Lab No.	Sample ID.	SAMPLING		MATRIX				# of Containers	CHEMICAL PRESERVATIVE					ANALYTICAL REQUEST	
		Date Collected	Time Collected	Water	Solid				HCl	H2SO4	HNO3	NaOH	None	TPH-D by 8015	TPH-P by 8015
	SV-63-2.5	3.30.17	1115		X			4				X	X	X	X
	SV-64-2.5	3.30.17	1133		X			4				X	X	X	X
	SV-65-2.5	3.30.17	1150		X			4				X	X	X	X

Notes:

SAMPLE RECEIPT
☐ Intact
☐ Cold
☐ On Ice
☐ Ambient

RELINQUISHED BY:
3.30.17 DATE: 1600 TIME:
DATE: TIME:
DATE: TIME:

RECEIVED BY:
3/30/17 DATE: 1600 TIME:
DATE: TIME:
DATE: TIME:

COOLER RECEIPT CHECKLIST

Curtis & Tompkins, Ltd.

Login # 287534 Date Received 3-30-17 Number of coolers _____
Client Paige Env Svs Project 1233 Backman

Date Opened 3-30-17 By (print) DC (sign)
Date Logged in ↓ By (print) DC (sign)
Date Labeled _____ By (print) DC (sign)

1. Did cooler come with a shipping slip (airbill, etc) _____ YES NO
   Shipping info _____
2A. Were custody seals present? .... ☐ YES (circle) on cooler on samples ~~NO~~
   How many _____ Name _____ Date _____
2B. Were custody seals intact upon arrival? _____ YES NO N/A
3. Were custody papers dry and intact when received? _____ YES NO
4. Were custody papers filled out properly (ink, signed, etc)? _____ YES NO
5. Is the project identifiable from custody papers? (If so fill out top of form) ___ YES NO
6. Indicate the packing in cooler: (if other, describe) _____

☐ ~~Bubble Wrap~~ ☐ ~~Foam blocks~~ ☐ ~~Bags~~ ☐ ~~None~~
☐ Cloth material ☐ Cardboard ☐ Styrofoam ☐ Paper towels

7. Temperature documentation: * Notify PM if temperature exceeds 6°C

   Type of ice used: ☐ Wet ☐ Blue/Gel ☐ None Temp(°C) _____

   ☐ Temperature blank(s) included? ☐ Thermometer# _____ ☐ IR Gun# _____

   ☐ Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present? _____ YES NO
   If YES, what time were they transferred to freezer? 1707 3-30-17
9. Did all bottles arrive unbroken/unopened? _____ YES NO
10. Are there any missing / extra samples? _____ YES NO
11. Are samples in the appropriate containers for indicated tests? _____ YES NO
12. Are sample labels present, in good condition and complete? _____ YES NO
13. Do the sample labels agree with custody papers? _____ YES NO
14. Was sufficient amount of sample sent for tests requested? _____ YES NO
15. Are the samples appropriately preserved? _____ YES NO N/A
16. Did you check preservatives for all bottles for each sample? _____ YES NO N/A
17. Did you document your preservative check? (pH strip lot# _____) YES NO N/A
18. Did you change the hold time in LIMS for unpreserved VOAs? _____ YES NO N/A
19. Did you change the hold time in LIMS for preserved terracores? _____ YES NO N/A
20. Are bubbles > 6mm absent in VOA samples? _____ YES NO N/A
21. Was the client contacted concerning this sample delivery? _____ YES NO
   If YES, Who was called? _____ By _____ Date: _____

COMMENTS

_____

_____

_____

_____

_____

_____

Curtis & Tompkins, Ltd.

Detections Summary for 287534

Results for any subcontracted analyses are not included in this summary.

Client : Pangea Environmental
Project : 1233 BOCKMAN
Location : 1233 Bockman

Client Sample ID : SV-63-2.5 Laboratory Sample ID : 287534-001

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Diesel C10-C24	2.8	Y	1.0	mg/Kg	As Recd	1.000	EPA 8015B	EPA 3550B

Client Sample ID : SV-64-2.5 Laboratory Sample ID : 287534-002

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Diesel C10-C24	15	Y	3.0	mg/Kg	As Recd	3.000	EPA 8015B	EPA 3550B

Client Sample ID : SV-65-2.5 Laboratory Sample ID : 287534-003

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Diesel C10-C24	5.6	Y	2.0	mg/Kg	As Recd	2.000	EPA 8015B	EPA 3550B

Y = Sample exhibits chromatographic pattern which does not resemble standard

Curtis & Tompkins, Ltd.

Gasoline by GC/FID (5035 Prep)

Lab #:	287534	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5035
Project#:	1233 BOCKMAN	Analysis:	EPA 8015B
Matrix:	Soil	Batch#:	246168
Units:	mg/Kg	Sampled:	03/30/17
Basis:	as received	Received:	03/30/17
Diln Fac:	1.000	Analyzed:	03/31/17

Field ID: SV-63-2.5 Lab ID: 287534-001
Type: SAMPLE

Analyte	Result	RL
Gasoline C7-C12	ND	0.14

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	89	70-138

Field ID: SV-64-2.5 Lab ID: 287534-002
Type: SAMPLE

Analyte	Result	RL
Gasoline C7-C12	ND	0.15

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	90	70-138

Field ID: SV-65-2.5 Lab ID: 287534-003
Type: SAMPLE

Analyte	Result	RL
Gasoline C7-C12	ND	0.14

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	87	70-138

Type: BLANK Lab ID: QC879522

Analyte	Result	RL
Gasoline C7-C12	ND	0.20

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	99	70-138

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Gasoline by GC/FID (5035 Prep)

Lab #:	287534	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5035
Project#:	1233 BOCKMAN	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC879510	Batch#:	246168
Matrix:	Soil	Analyzed:	03/31/17
Units:	mg/Kg		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1.000	1.020	102	80-120

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	100	70-138

Curtis & Tompkins, Ltd.

Batch QC Report

Gasoline by GC/FID (5035 Prep)

Lab #:	287534	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	1233 BOCKMAN	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Diln Fac:	1.000
MSS Lab ID:	287562-001	Batch#:	246168
Matrix:	Soil	Sampled:	03/31/17
Units:	mg/Kg	Received:	03/31/17
Basis:	as received	Analyzed:	04/01/17

Type: MS Lab ID: QC879602

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	0.07806	9.709	7.940	81	49-120

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	102	70-138

Type: MSD Lab ID: QC879603

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	9.615	7.993	82	49-120	2	32

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	103	70-138

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Total Extractable Hydrocarbons

Lab #:	287534	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	1233 BOCKMAN	Analysis:	EPA 8015B
Matrix:	Soil	Sampled:	03/30/17
Units:	mg/Kg	Received:	03/30/17
Basis:	as received	Prepared:	03/31/17
Batch#:	246180		

Field ID: SV-63-2.5 Diln Fac: 1.000
Type: SAMPLE Analyzed: 04/01/17
Lab ID: 287534-001

Analyte	Result	RL
Diesel C10-C24	2.8 Y	1.0

Surrogate	%REC	Limits
o-Terphenyl	114	58-136

Field ID: SV-64-2.5 Diln Fac: 3.000
Type: SAMPLE Analyzed: 04/01/17
Lab ID: 287534-002

Analyte	Result	RL
Diesel C10-C24	15 Y	3.0

Surrogate	%REC	Limits
o-Terphenyl	110	58-136

Field ID: SV-65-2.5 Diln Fac: 2.000
Type: SAMPLE Analyzed: 04/01/17
Lab ID: 287534-003

Analyte	Result	RL
Diesel C10-C24	5.6 Y	2.0

Surrogate	%REC	Limits
o-Terphenyl	99	58-136

Type: BLANK Diln Fac: 1.000
Lab ID: QC879564 Analyzed: 03/31/17

Analyte	Result	RL
Diesel C10-C24	ND	0.99

Surrogate	%REC	Limits
o-Terphenyl	109	58-136

Y= Sample exhibits chromatographic pattern which does not resemble standard
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

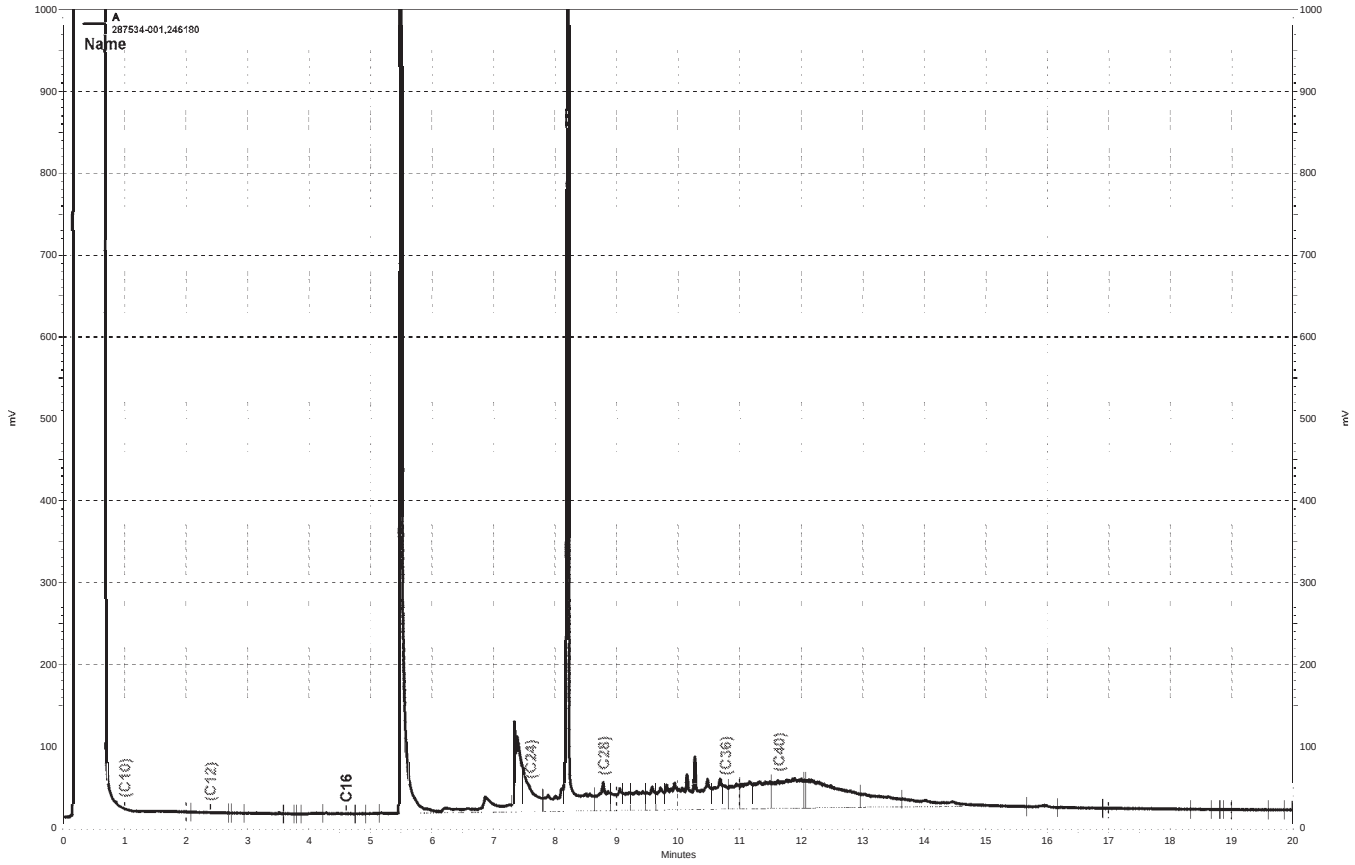
Batch QC Report

Total Extractable Hydrocarbons

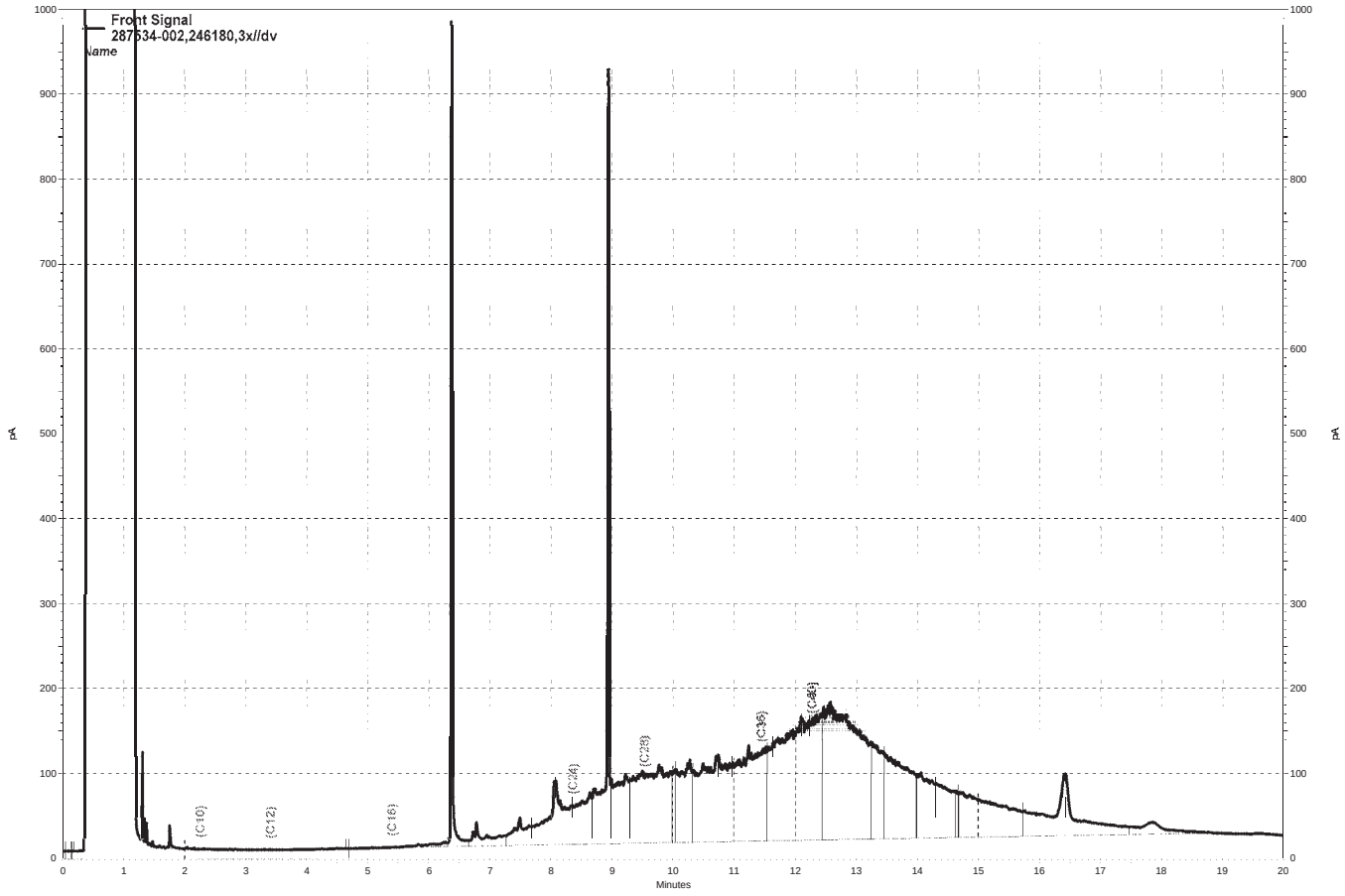
Lab #:	287534	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	1233 BOCKMAN	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC879565	Batch#:	246180
Matrix:	Soil	Prepared:	03/31/17
Units:	mg/Kg	Analyzed:	03/31/17

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	50.38	54.68	109	56-135

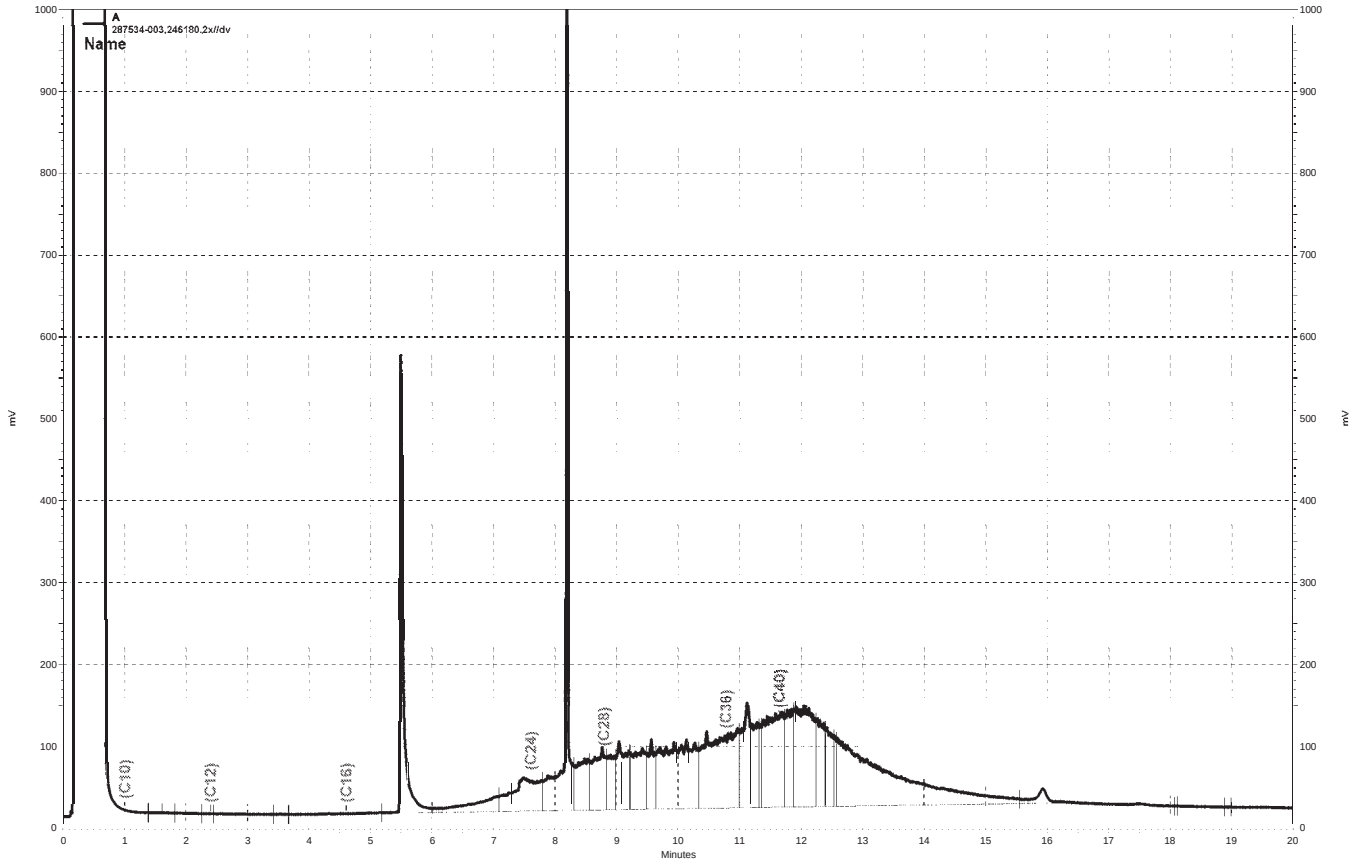
Surrogate	%REC	Limits
o-Terphenyl	116	58-136



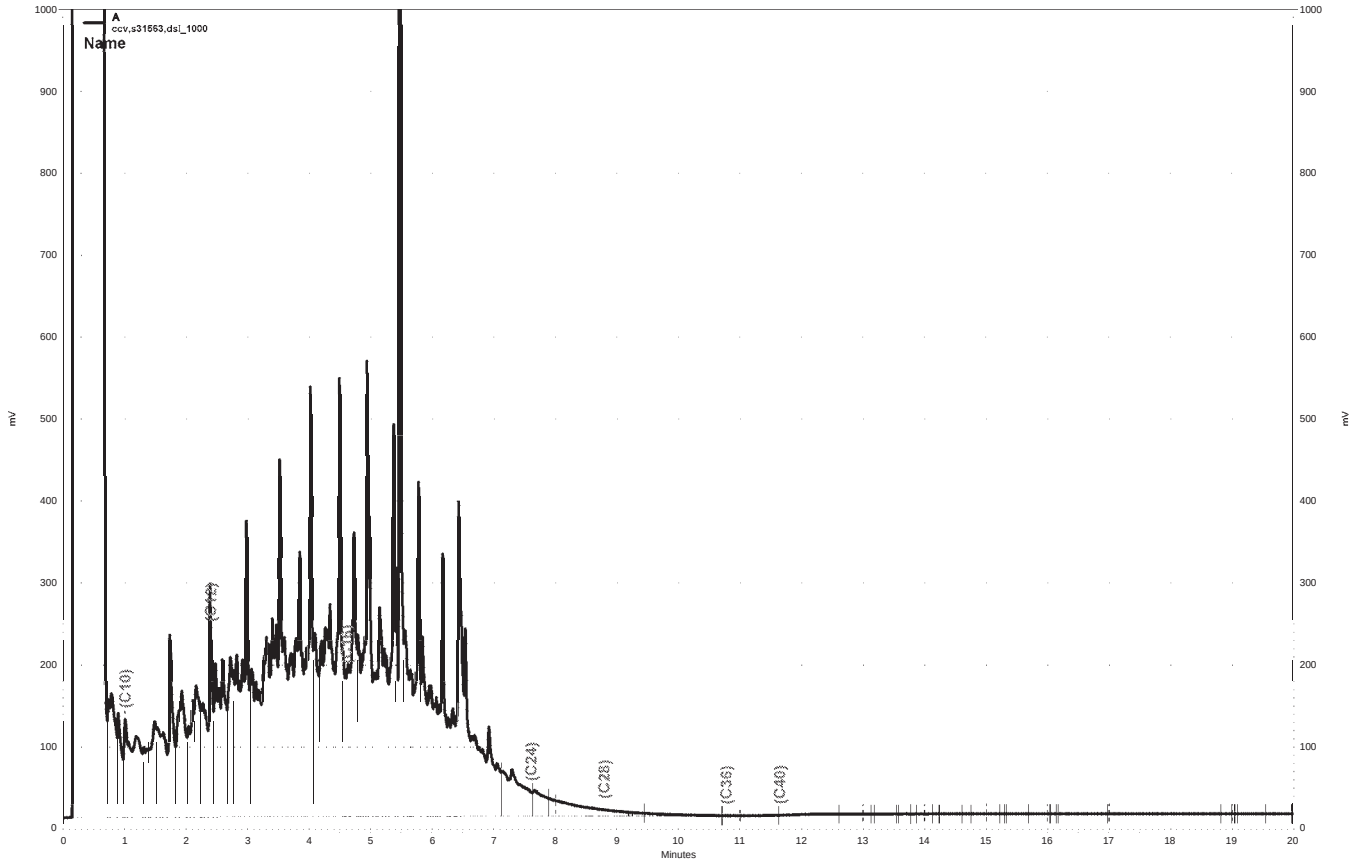
\\kraken\gdrive\ezchrom\Projects\GC17a\Data\090a036, A



\\kraken\gdrive\ezchrom\Projects\GC27\Data\090a054.dat, Front Signal



\\kraken\gdrive\ezchrom\Projects\GC17a\Data\090a038, A



\\kraken\gdrive\ezchrom\Projects\GC17a\Data\090a025, A


Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 287540
ANALYTICAL REPORT

Pangea Environmental	Project : 1233 BOCKMAN
1710 Franklin Street	Location : 1233 Bockman
Oakland, CA 94612	Level : II

Sample ID	Lab ID
B-17-2.5	287540-001
B-18-2.5	287540-002
B-19-2.5	287540-003
B-20-2.5	287540-004
B-21-2.5	287540-005

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: Will Rice Date: 04/06/2017

Will Rice
Project Manager
will.rice@ctberk.com
(510) 204-2221 Ext 13102

CA ELAP# 2896, NELAP# 4044-001

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**287540**
Client:	**Pangea Environmental**
Project:	**1233 BOCKMAN**
Location:	**1233 Bockman**
Request Date:	**03/30/17**
Samples Received:	**03/30/17**

This data package contains sample and QC results for five soil samples, requested for the above referenced project on 03/30/17. The samples were received cold and intact.

TPH-Purgeables and/or BTXE by GC (EPA 8015B):
Matrix spikes QC879602,QC879603 (batch 246168) were not reported because there was insufficient sample amount. No other analytical problems were encountered.

TPH-Extractables by GC (EPA 8015B):
Matrix spikes QC879566,QC879567 (batch 246180) were not reported because the parent sample required a dilution that would have diluted out the spikes. No other analytical problems were encountered.

CHAIN OF CUSTODY

Curtis & Tompkins Laboratories
ENVIRONMENTAL ANALYTICAL TESTING LABORATORY
In Business Since 1878

2323 Fifth Street
Berkeley, CA 94710

Phone (510) 486-0900
Fax (510) 486-0532

C&T LOGIN # 28750

Chain of Custody # _____

Project No: _____

Project Name: 1233 Beckman

Project P. O. No: _____

EDD Format: Report Level ☐ II ☐ III ☐ IV

Turnaround Time: ☐ RUSH _____ ☒ Standard

Sampler: E. Lervaag

Report To: Ron Scheele

Company: Pangea Env. Svs.

Telephone: 510-836-3700

Email: rscheele@pangeaenv.com

Lab No.	Sample ID.	SAMPLING		MATRIX				# of Containers	CHEMICAL PRESERVATIVE					ANALYTICAL REQUEST	
		Date Collected	Time Collected	Water	Solid				HCl	H2SO4	HNO3	NaOH	None	TPH by 8015	TPH by 8015
1	B-17-2.5	3.30.17	0845		X			4						X	X
2	B-18-2.5		0915		X			4						X	X
3	B-19-2.5		0947		X			4						X	X
4	B-20-2.5		1021		X			4						X	X
5	B-21-2.5	3.30.17	1055		X			4						X	X

Notes:

SAMPLE RECEIPT
☐ Intact
☐ Cold
☐ On Ice
☐ Ambient

RELINQUISHED BY:
3.30.17 DATE: 1600 TIME:
DATE: TIME:
DATE: TIME:

RECEIVED BY:
3/30/17 DATE: 1600 TIME:
DATE: TIME:
DATE: TIME:

COOLER RECEIPT CHECKLIST

Curtis & Tompkins, Ltd.

Login # 287340 Date Received 3-30-17 Number of coolers Ø
Client Pangea Env Project 1733 Bakman

Date Opened 3-30-17 By (print) EMS (sign)
Date Logged in ↓ By (print) EMS (sign)
Date Labeled ↓ By (print) EMS (sign)

1. Did cooler come with a shipping slip (airbill, etc) YES (NO)
   Shipping info
2A. Were custody seals present? .... ☐ YES (circle) on cooler on samples ☒ NO
   How many Name Date
2B. Were custody seals intact upon arrival? YES NO N/A
3. Were custody papers dry and intact when received? YES NO
4. Were custody papers filled out properly (ink, signed, etc)? YES NO
5. Is the project identifiable from custody papers? (If so fill out top of form) YES NO
6. Indicate the packing in cooler: (if other, describe)

~~☐ Bubble Wrap~~ ~~☐ Foam blocks~~ ~~☐ Bags~~ ~~☒ None~~
☐ Cloth material ☐ Cardboard ☐ Styrofoam ☐ Paper towels

7. Temperature documentation: * Notify PM if temperature exceeds 6°C

   Type of ice used: ☐ Wet ☐ Blue/Gel ~~☒ None~~ Temp(°C)

   ☐ Temperature blank(s) included? ☐ Thermometer# ☐ IR Gun#

   ☐ Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present? (YES) NO
   If YES, what time were they transferred to freezer? @ 1759
9. Did all bottles arrive unbroken/unopened? YES NO
10. Are there any missing / extra samples? YES (NO)
11. Are samples in the appropriate containers for indicated tests? (YES) NO
12. Are sample labels present, in good condition and complete? YES NO
13. Do the sample labels agree with custody papers? YES NO
14. Was sufficient amount of sample sent for tests requested? YES NO
15. Are the samples appropriately preserved? YES NO (N/A)
16. Did you check preservatives for all bottles for each sample? YES NO N/A
17. Did you document your preservative check? (pH strip lot#) YES NO N/A
18. Did you change the hold time in LIMS for unpreserved VOAs? YES NO N/A
19. Did you change the hold time in LIMS for preserved terracores? YES NO N/A
20. Are bubbles > 6mm absent in VOA samples? YES NO N/A
21. Was the client contacted concerning this sample delivery? YES (NO)
   If YES, Who was called? By Date:

COMMENTS

Curtis & Tompkins, Ltd.

Detections Summary for 287540

Results for any subcontracted analyses are not included in this summary.

Client : Pangea Environmental
Project : 1233 BOCKMAN
Location : 1233 Bockman

Client Sample ID : B-17-2.5 Laboratory Sample ID : 287540-001

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Diesel C10-C24	3.1	Y	1.0	mg/Kg	As Recd	1.000	EPA 8015B	EPA 3550B

Client Sample ID : B-18-2.5 Laboratory Sample ID : 287540-002

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Diesel C10-C24	1.3	Y	1.0	mg/Kg	As Recd	1.000	EPA 8015B	EPA 3550B

Client Sample ID : B-19-2.5 Laboratory Sample ID : 287540-003

No Detections

Client Sample ID : B-20-2.5 Laboratory Sample ID : 287540-004

No Detections

Client Sample ID : B-21-2.5 Laboratory Sample ID : 287540-005

No Detections

Y = Sample exhibits chromatographic pattern which does not resemble standard

Curtis & Tompkins, Ltd.

Gasoline by GC/FID (5035 Prep)

Lab #:	287540	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5035
Project#:	1233 BOCKMAN	Analysis:	EPA 8015B
Matrix:	Soil	Batch#:	246168
Units:	mg/Kg	Sampled:	03/30/17
Basis:	as received	Received:	03/30/17
Diln Fac:	1.000	Analyzed:	03/31/17

Field ID: B-17-2.5 Lab ID: 287540-001
Type: SAMPLE

Analyte	Result	RL
Gasoline C7-C12	ND	0.15

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	93	70-138

Field ID: B-18-2.5 Lab ID: 287540-002
Type: SAMPLE

Analyte	Result	RL
Gasoline C7-C12	ND	0.15

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	101	70-138

Field ID: B-19-2.5 Lab ID: 287540-003
Type: SAMPLE

Analyte	Result	RL
Gasoline C7-C12	ND	0.15

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	100	70-138

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Gasoline by GC/FID (5035 Prep)

Lab #:	287540	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5035
Project#:	1233 BOCKMAN	Analysis:	EPA 8015B
Matrix:	Soil	Batch#:	246168
Units:	mg/Kg	Sampled:	03/30/17
Basis:	as received	Received:	03/30/17
Diln Fac:	1.000	Analyzed:	03/31/17

Field ID: B-20-2.5 Lab ID: 287540-004
Type: SAMPLE

Analyte	Result	RL
Gasoline C7-C12	ND	0.15

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	102	70-138

Field ID: B-21-2.5 Lab ID: 287540-005
Type: SAMPLE

Analyte	Result	RL
Gasoline C7-C12	ND	0.14

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	101	70-138

Type: BLANK Lab ID: QC879522

Analyte	Result	RL
Gasoline C7-C12	ND	0.20

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	99	70-138

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Gasoline by GC/FID (5035 Prep)

Lab #:	287540	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5035
Project#:	1233 BOCKMAN	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC879510	Batch#:	246168
Matrix:	Soil	Analyzed:	03/31/17
Units:	mg/Kg		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1.000	1.020	102	80-120

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	100	70-138

Curtis & Tompkins, Ltd.

Batch QC Report

Gasoline by GC/FID (5035 Prep)

Lab #:	287540	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	1233 BOCKMAN	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Diln Fac:	1.000
MSS Lab ID:	287562-001	Batch#:	246168
Matrix:	Soil	Sampled:	03/31/17
Units:	mg/Kg	Received:	03/31/17
Basis:	as received	Analyzed:	04/01/17

Type: MS Lab ID: QC879602

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	0.07806	9.709	7.940	81	49-120

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	102	70-138

Type: MSD Lab ID: QC879603

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	9.615	7.993	82	49-120	2	32

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	103	70-138

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Total Extractable Hydrocarbons

Lab #:	287540	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	1233 BOCKMAN	Analysis:	EPA 8015B
Matrix:	Soil	Batch#:	246180
Units:	mg/Kg	Sampled:	03/30/17
Basis:	as received	Received:	03/30/17
Diln Fac:	1.000	Prepared:	03/31/17

Field ID: B-17-2.5 Lab ID: 287540-001
Type: SAMPLE Analyzed: 04/01/17

Analyte	Result	RL
Diesel C10-C24	3.1 Y	1.0

Surrogate	%REC	Limits
o-Terphenyl	125	58-136

Field ID: B-18-2.5 Lab ID: 287540-002
Type: SAMPLE Analyzed: 04/01/17

Analyte	Result	RL
Diesel C10-C24	1.3 Y	1.0

Surrogate	%REC	Limits
o-Terphenyl	115	58-136

Field ID: B-19-2.5 Lab ID: 287540-003
Type: SAMPLE Analyzed: 04/01/17

Analyte	Result	RL
Diesel C10-C24	ND	1.0

Surrogate	%REC	Limits
o-Terphenyl	123	58-136

Y= Sample exhibits chromatographic pattern which does not resemble standard
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Total Extractable Hydrocarbons

Lab #:	287540	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	1233 BOCKMAN	Analysis:	EPA 8015B
Matrix:	Soil	Batch#:	246180
Units:	mg/Kg	Sampled:	03/30/17
Basis:	as received	Received:	03/30/17
Diln Fac:	1.000	Prepared:	03/31/17

Field ID: B-20-2.5 Lab ID: 287540-004
Type: SAMPLE Analyzed: 04/01/17

Analyte	Result	RL
Diesel C10-C24	ND	1.0

Surrogate	%REC	Limits
o-Terphenyl	120	58-136

Field ID: B-21-2.5 Lab ID: 287540-005
Type: SAMPLE Analyzed: 04/01/17

Analyte	Result	RL
Diesel C10-C24	ND	1.0

Surrogate	%REC	Limits
o-Terphenyl	118	58-136

Type: BLANK Analyzed: 03/31/17
Lab ID: QC879564

Analyte	Result	RL
Diesel C10-C24	ND	0.99

Surrogate	%REC	Limits
o-Terphenyl	109	58-136

Y= Sample exhibits chromatographic pattern which does not resemble standard
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

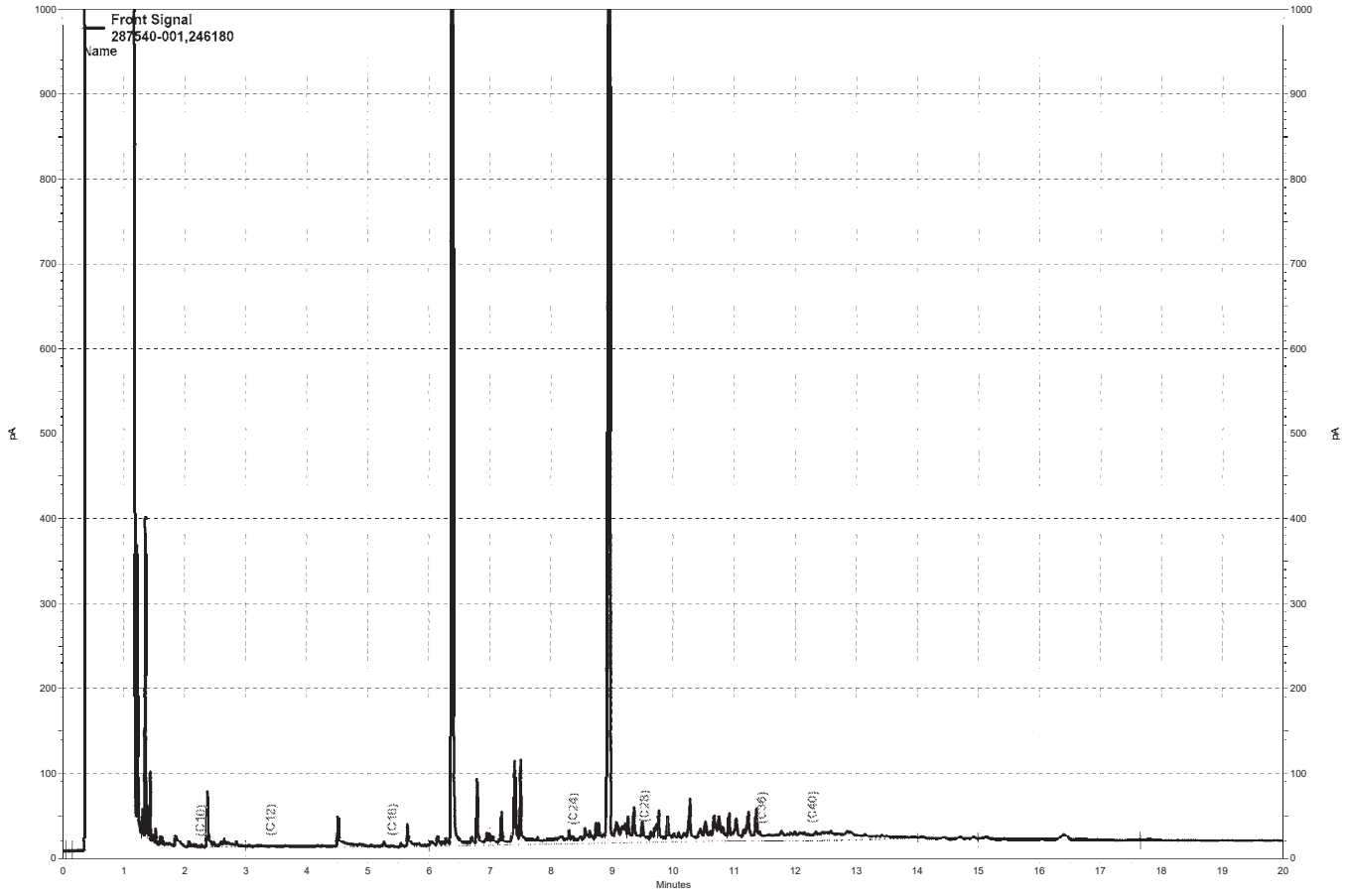
Batch QC Report

Total Extractable Hydrocarbons

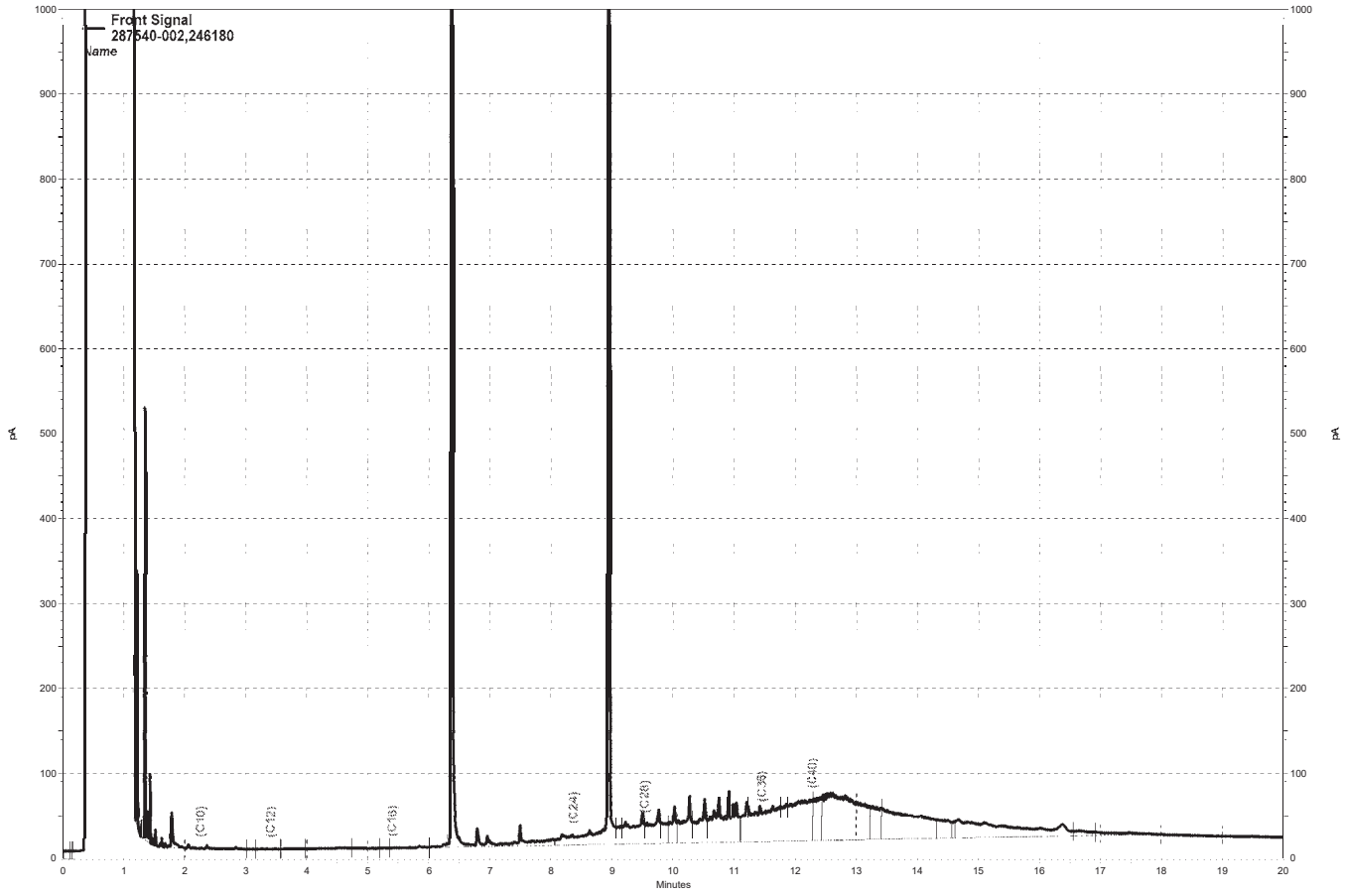
Lab #:	287540	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	1233 BOCKMAN	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC879565	Batch#:	246180
Matrix:	Soil	Prepared:	03/31/17
Units:	mg/Kg	Analyzed:	03/31/17

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	50.38	54.68	109	56-135

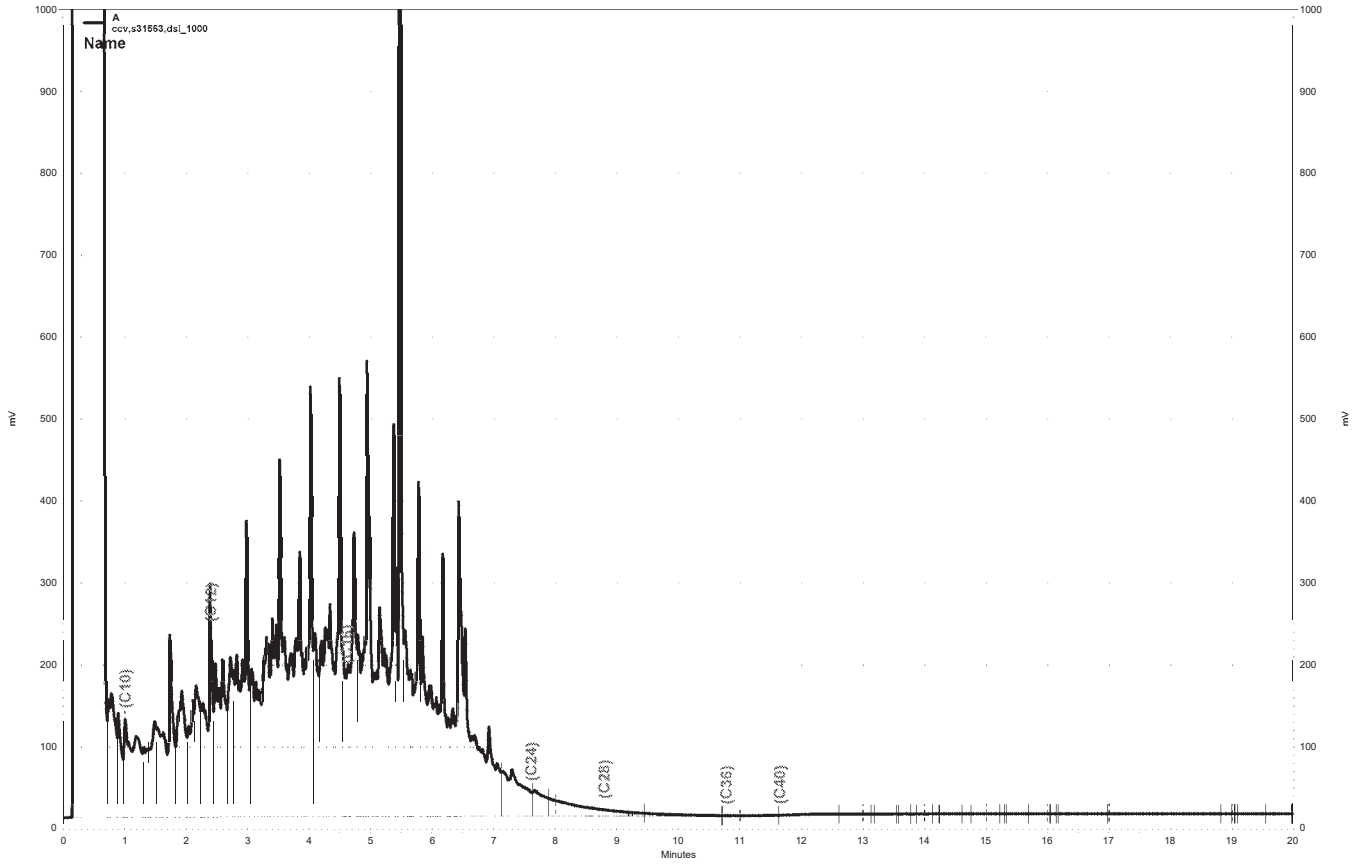
Surrogate	%REC	Limits
o-Terphenyl	116	58-136



\\kraken\gdrive\ezchrom\Projects\GC27\Data\090a049.dat, Front Signal



\\kraken\gdrive\ezchrom\Projects\GC27\Data\090a050.dat, Front Signal



\\kraken\gdrive\ezchrom\Projects\GC17a\Data\090a025, A


Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 287709
ANALYTICAL REPORT

Pangea Environmental	Project : STANDARD
1710 Franklin Street	Location : 1233 Bockman
Oakland, CA 94612	Level : II

Sample ID	Lab ID
SV-18	287709-001
SV-19	287709-002
SV-24	287709-003
SV-33	287709-004
SV-3	287709-005
SV-55	287709-006
SV-56	287709-007
SV-63	287709-008
SV-64	287709-009
SV-65	287709-010
SV-37	287709-011
SHROUD	287709-012
SV-27	287709-013

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: _____ Date: 05/01/2017

Will Rice
Project Manager
will.rice@ctberk.com
(510) 204-2221 Ext 13102

CA ELAP# 2896, NELAP# 4044-001

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**287709**
Client:	**Pangea Environmental**
Location:	**1233 Bockman**
Request Date:	**04/05/17**
Samples Received:	**04/05/17**

This data package contains sample and QC results for twelve air samples, requested for the above referenced project on 04/05/17. The samples were received cold and intact.

Volatile Organics in Air by MS (EPA TO-15):

High response was observed for vinyl acetate in the ICV analyzed 03/11/17 11:05; affected data was qualified with "b". High responses were observed for a number of analytes in the CCV analyzed 04/05/17 07:41; affected data was qualified with "b". High response was observed for vinyl acetate in the CCV analyzed 04/06/17 06:53; affected data was qualified with "b". High responses were observed for 2-hexanone and vinyl acetate in the CCV analyzed 04/10/17 07:40; affected data was qualified with "b". High response was observed for vinyl acetate in the CCV analyzed 04/07/17 06:49; affected data was qualified with "b". High recoveries were observed for a number of analytes in the BS/BSD for batch 246311; the associated RPDs were within limits, and these analytes were not detected at or above the RL in the associated samples. High recoveries were observed for vinyl acetate in the BS/BSD for batch 246351; the associated RPD was within limits, and this analyte was not detected at or above the RL in the associated samples. High recoveries were observed for vinyl acetate in the BS/BSD for batch 246397; the associated RPD was within limits, and these high recoveries were not associated with any reported results. High recoveries were observed for 2-hexanone and vinyl acetate in the BS/BSD for batch 246456; the associated RPDs were within limits, and these analytes were not detected at or above the RL in the associated sample. No other analytical problems were encountered.

Volatile Organics in Air GC (ASTM D1946-90):

No analytical problems were encountered.

Curtis & Tompkins, Ltd.
Analytical Laboratory Since 1878
2323 Fifth Street
Berkeley, CA 94710
(510)486-0900 Phone
(510)486-0532 Fax

AIR TESTING CHAIN OF CUSTODY
& PURCHASE ORDER

Page 1 of 1

Chain of Custody # :

C&T LOGIN #: 287709

Project No:
Project Name: 1233 Beckman
EDD Format: _____ Rpt Level: II III IV
Turnaround Time: ☐ RUSH _____ ☐ Standard

Sampler: E. Lervaag
Report To: Ron Scheele
Company: Pangea
Telephone: 510-836-3700
Email: rscheele@pangeaenv.com

Lab No.	Sample ID.	Sampling Information: Date Collected	Time Collected	Canister ID (Bar Code #)	Flow Controller ID	Sample Volume (Gauge Reading)	TESTING REQUESTED: TO-15	IPA - Leak check	Hold		
1	SV-18	4.3.17	1127	267	189	4	X	X			
2	SV-19	4.3.17	1215	342	235	5	X	X			
3	SV-24	4.3.17	1444	131	222	10	X	X			
4	SV-33	4.3.17	1554	121	272	5	X	X			
5	SV-3	4.3.17	1606	289	274	15	X	X			
6	SV-55	4.3.17	1633	276	241	4	X	X			
7	SV-56	4.3.17	1621	071	297	4	X	X			
8	SV-63	4.4.17	~~1533~~	~~267~~	169	3.5	X	X			
9	SV-64	4.4.17	0950	126	163		X	X			
10	SV-65	4.4.17	1013	99	299	5	X	X			
11	SV-37	4.4.17	1613	72	214	4			X		
12	SHROUD	4.4.17	1614	379	~~379~~ 287	4		X			
13	SV-27	4.4.17	1102	302		27			X		

Notes:

RELINQUISHED BY:		RECEIVED BY:	
[signature]	4.5.17 1030 DATE/TIME	[signature]	4/5/17 10:38 DATE/TIME
	DATE/TIME		DATE/TIME
	DATE/TIME		DATE/TIME

COOLER RECEIPT CHECKLIST

Curtis & Tompkins, Ltd.

Login # 287909 Date Received 4/5/17 Number of coolers 6
Client PANGEA Project 1233 Bockman

Date Opened 4/5/17 By (print) EWA (sign) Edlay
Date Logged in ↓ By (print) ↓ (sign) ↓
Date Labeled ↓ By (print) ↓ (sign) ↓

1. Did cooler come with a shipping slip (airbill, etc) YES (NO)
Shipping info

2A. Were custody seals present? .... ☐YES (circle) on cooler on samples ☑NO
How many Name Date
2B. Were custody seals intact upon arrival? YES NO N/A
3. Were custody papers dry and intact when received? (YES) NO
4. Were custody papers filled out properly (ink, signed, etc)? (YES) NO
5. Is the project identifiable from custody papers? (If so fill out top of form) (YES) NO
6. Indicate the packing in cooler: (if other, describe)

☐Bubble Wrap ☐Foam blocks ☐Bags ☑None
☐Cloth material ☐Cardboard ☐Styrofoam ☐Paper towels

7. Temperature documentation: * Notify PM if temperature exceeds 6°C

Type of ice used: ☐ Wet ☐Blue/Gel ☑None Temp(°C)

☐ Temperature blank(s) included? ☐ Thermometer# ☐ IR Gun#

☐ Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present? YES (NO)
If YES, what time were they transferred to freezer?
9. Did all bottles arrive unbroken/unopened? (YES) NO
10. Are there any missing / extra samples? YES (NO)
11. Are samples in the appropriate containers for indicated tests? (YES) NO
12. Are sample labels present, in good condition and complete? (YES) NO
13. Do the sample labels agree with custody papers? (YES) NO
14. Was sufficient amount of sample sent for tests requested? (YES) NO
15. Are the samples appropriately preserved? YES NO (N/A)
16. Did you check preservatives for all bottles for each sample? YES NO (N/A)
17. Did you document your preservative check? (pH strip lot#) YES NO (N/A)
18. Did you change the hold time in LIMS for unpreserved VOAs? YES NO (N/A)
19. Did you change the hold time in LIMS for preserved terracores? YES NO (N/A)
20. Are bubbles > 6mm absent in VOA samples? YES NO (N/A)
21. Was the client contacted concerning this sample delivery? YES (NO)
If YES, Who was called? By Date:

COMMENTS
Canister label for can ID 131 was not filled out, but according to the COC it should be Sample ID: SV-24

train 000202 did not return with rest of order # 1884

Curtis & Tompkins, Ltd.

Detections Summary for 287709

Results for any subcontracted analyses are not included in this summary.

Client : Pangea Environmental
Project : STANDARD
Location : 1233 Bockman

Client Sample ID : SV-18 Laboratory Sample ID : 287709-001

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Acetone	15		4.3	ppbv	As Recd	2.170	EPA TO-15	METHOD
Isopropanol	260		8.7	ppbv	As Recd	4.340	EPA TO-15	METHOD

Client Sample ID : SV-19 Laboratory Sample ID : 287709-002

No Detections

Client Sample ID : SV-24 Laboratory Sample ID : 287709-003

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Chloromethane	3.6		2.5	ppbv	As Recd	5.020	EPA TO-15	METHOD
Acetone	130		10	ppbv	As Recd	5.020	EPA TO-15	METHOD
Isopropanol	880		30	ppbv	As Recd	15.06	EPA TO-15	METHOD
Carbon Dioxide	5,300		2,500	ppmv	As Recd	2.510	ASTM D1946-90	METHOD
Oxygen	150,000		2,500	ppmv	As Recd	2.510	ASTM D1946-90	METHOD

Client Sample ID : SV-33 Laboratory Sample ID : 287709-004

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Isopropanol	22		4.4	ppbv	As Recd	2.190	EPA TO-15	METHOD

Client Sample ID : SV-3 Laboratory Sample ID : 287709-005

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Acetone	100		16	ppbv	As Recd	7.900	EPA TO-15	METHOD
Isopropanol	990		47	ppbv	As Recd	23.70	EPA TO-15	METHOD
cis-1,2-Dichloroethene	40		4.0	ppbv	As Recd	7.900	EPA TO-15	METHOD
Tetrachloroethene	65		4.0	ppbv	As Recd	7.900	EPA TO-15	METHOD

Client Sample ID : SV-55 Laboratory Sample ID : 287709-006

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Acetone	5.4		4.3	ppbv	As Recd	2.170	EPA TO-15	METHOD

Client Sample ID : SV-56 Laboratory Sample ID : 287709-007

No Detections

Client Sample ID : SV-63 Laboratory Sample ID : 287709-008

No Detections

Client Sample ID : SV-64 Laboratory Sample ID : 287709-009

No Detections

Client Sample ID : SV-65 Laboratory Sample ID : 287709-010

No Detections

Client Sample ID : SHROUD Laboratory Sample ID : 287709-012

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Isopropanol	67,000		5,300	ppbv	As Recd	2640	EPA TO-15	METHOD

Client Sample ID : SV-27 Laboratory Sample ID : 287709-013

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Acetone	88		26	ppbv	As Recd	12.80	EPA TO-15	METHOD
Isopropanol	220		26	ppbv	As Recd	12.80	EPA TO-15	METHOD

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Field ID:	SV-18	Units (M):	ug/m3
Lab ID:	287709-001	Sampled:	04/03/17
Matrix:	Air	Received:	04/05/17
Units (V):	ppbv		

Analyte	Result (V)	RL	Result (M)	RL	Diln Fac	Batch#	Analyzed
Freon 12	ND	1.1	ND	5.4	2.170	246311	04/05/17
Freon 114	ND	1.1	ND	7.6	2.170	246311	04/05/17
Chloromethane	ND	1.1	ND	2.2	2.170	246311	04/05/17
Vinyl Chloride	ND	1.1	ND	2.8	2.170	246311	04/05/17
1,3-Butadiene	ND	1.1	ND	2.4	2.170	246311	04/05/17
Bromomethane	ND	1.1	ND	4.2	2.170	246311	04/05/17
Chloroethane	ND	1.1	ND	2.9	2.170	246311	04/05/17
Trichlorofluoromethane	ND	1.1	ND	6.1	2.170	246311	04/05/17
Acrolein	ND	4.3	ND	10	2.170	246311	04/05/17
1,1-Dichloroethene	ND	1.1	ND	4.3	2.170	246311	04/05/17
Freon 113	ND	1.1	ND	8.3	2.170	246311	04/05/17
Acetone	15	4.3	35	10	2.170	246311	04/05/17
Carbon Disulfide	ND	1.1	ND	3.4	2.170	246311	04/05/17
Isopropanol	260	8.7	630	21	4.340	246351	04/06/17
Methylene Chloride	ND	1.1	ND	3.8	2.170	246311	04/05/17
trans-1,2-Dichloroethene	ND	1.1	ND	4.3	2.170	246311	04/05/17
MTBE	ND	1.1	ND	3.9	2.170	246311	04/05/17
n-Hexane	ND	1.1	ND	3.8	2.170	246311	04/05/17
1,1-Dichloroethane	ND	1.1	ND	4.4	2.170	246311	04/05/17
Vinyl Acetate	ND	1.1	ND	3.8	2.170	246311	04/05/17
cis-1,2-Dichloroethene	ND	1.1	ND	4.3	2.170	246311	04/05/17
2-Butanone	ND	3.6	ND	11	2.170	246311	04/05/17
Ethyl Acetate	ND	1.1	ND	3.9	2.170	246311	04/05/17
Tetrahydrofuran	ND	1.1	ND	3.2	2.170	246311	04/05/17
Chloroform	ND	1.1	ND	5.3	2.170	246311	04/05/17
1,1,1-Trichloroethane	ND	1.1	ND	5.9	2.170	246311	04/05/17
Cyclohexane	ND	1.1	ND	3.7	2.170	246311	04/05/17
Carbon Tetrachloride	ND	1.1	ND	6.8	2.170	246311	04/05/17
Benzene	ND	1.1	ND	3.5	2.170	246311	04/05/17
1,2-Dichloroethane	ND	1.1	ND	4.4	2.170	246311	04/05/17
n-Heptane	ND	1.1	ND	4.4	2.170	246311	04/05/17
Trichloroethene	ND	1.1	ND	5.8	2.170	246311	04/05/17
1,2-Dichloropropane	ND	1.1	ND	5.0	2.170	246311	04/05/17
Bromodichloromethane	ND	1.1	ND	7.3	2.170	246311	04/05/17
cis-1,3-Dichloropropene	ND	1.1	ND	4.9	2.170	246311	04/05/17
4-Methyl-2-Pentanone	ND	1.1	ND	4.4	2.170	246311	04/05/17

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Field ID:	SV-18	Units (M):	ug/m3
Lab ID:	287709-001	Sampled:	04/03/17
Matrix:	Air	Received:	04/05/17
Units (V):	ppbv		

Analyte	Result (V)	RL	Result (M)	RL	Diln Fac	Batch#	Analyzed
Toluene	ND	1.1	ND	4.1	2.170	246311	04/05/17
trans-1,3-Dichloropropene	ND	1.1	ND	4.9	2.170	246311	04/05/17
1,1,2-Trichloroethane	ND	1.1	ND	5.9	2.170	246311	04/05/17
Tetrachloroethene	ND	1.1	ND	7.4	2.170	246311	04/05/17
2-Hexanone	ND	1.1	ND	4.4	2.170	246311	04/05/17
Dibromochloromethane	ND	1.1	ND	9.2	2.170	246311	04/05/17
1,2-Dibromoethane	ND	1.1	ND	8.3	2.170	246311	04/05/17
Chlorobenzene	ND	1.1	ND	5.0	2.170	246311	04/05/17
Ethylbenzene	ND	1.1	ND	4.7	2.170	246311	04/05/17
m,p-Xylenes	ND	1.1	ND	4.7	2.170	246311	04/05/17
o-Xylene	ND	1.1	ND	4.7	2.170	246311	04/05/17
Styrene	ND	1.1	ND	4.6	2.170	246311	04/05/17
Bromoform	ND	1.1	ND	11	2.170	246311	04/05/17
1,1,2,2-Tetrachloroethane	ND	1.1	ND	7.4	2.170	246311	04/05/17
4-Ethyltoluene	ND	1.1	ND	5.3	2.170	246311	04/05/17
1,3,5-Trimethylbenzene	ND	1.1	ND	5.3	2.170	246311	04/05/17
1,2,4-Trimethylbenzene	ND	1.1	ND	5.3	2.170	246311	04/05/17
1,3-Dichlorobenzene	ND	1.1	ND	6.5	2.170	246311	04/05/17
1,4-Dichlorobenzene	ND	1.1	ND	6.5	2.170	246311	04/05/17
Benzyl chloride	ND	1.1	ND	5.6	2.170	246311	04/05/17
1,2-Dichlorobenzene	ND	1.1	ND	6.5	2.170	246311	04/05/17
1,2,4-Trichlorobenzene	ND	1.1	ND	8.1	2.170	246311	04/05/17
Hexachlorobutadiene	ND	1.1	ND	12	2.170	246311	04/05/17
Naphthalene	ND	4.3	ND	23	2.170	246311	04/05/17

Surrogate	%REC	Limits	Diln Fac	Batch#	Analyzed
Bromofluorobenzene	101	80-120	2.170	246311	04/05/17

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Field ID:	SV-19	Units (M):	ug/m3
Lab ID:	287709-002	Diln Fac:	2.310
Matrix:	Air	Sampled:	04/03/17
Units (V):	ppbv	Received:	04/05/17

Analyte	Result (V)	RL	Result (M)	RL	Batch#	Analyzed
Freon 12	ND	1.2	ND	5.7	246311	04/05/17
Freon 114	ND	1.2	ND	8.1	246311	04/05/17
Chloromethane	ND	1.2	ND	2.4	246311	04/05/17
Vinyl Chloride	ND	1.2	ND	3.0	246311	04/05/17
1,3-Butadiene	ND	1.2	ND	2.6	246311	04/05/17
Bromomethane	ND	1.2	ND	4.5	246311	04/05/17
Chloroethane	ND	1.2	ND	3.0	246311	04/05/17
Trichlorofluoromethane	ND	1.2	ND	6.5	246311	04/05/17
Acrolein	ND	4.6	ND	11	246311	04/05/17
1,1-Dichloroethene	ND	1.2	ND	4.6	246311	04/05/17
Freon 113	ND	1.2	ND	8.9	246311	04/05/17
Acetone	ND	4.6	ND	11	246311	04/05/17
Carbon Disulfide	ND	1.2	ND	3.6	246311	04/05/17
Isopropanol	ND	4.6	ND	11	246397	04/07/17
Methylene Chloride	ND	1.2	ND	4.0	246311	04/05/17
trans-1,2-Dichloroethene	ND	1.2	ND	4.6	246311	04/05/17
MTBE	ND	1.2	ND	4.2	246311	04/05/17
n-Hexane	ND	1.2	ND	4.1	246311	04/05/17
1,1-Dichloroethane	ND	1.2	ND	4.7	246311	04/05/17
Vinyl Acetate	ND	1.2	ND	4.1	246311	04/05/17
cis-1,2-Dichloroethene	ND	1.2	ND	4.6	246311	04/05/17
2-Butanone	ND	3.9	ND	11	246311	04/05/17
Ethyl Acetate	ND	1.2	ND	4.2	246311	04/05/17
Tetrahydrofuran	ND	1.2	ND	3.4	246311	04/05/17
Chloroform	ND	1.2	ND	5.6	246311	04/05/17
1,1,1-Trichloroethane	ND	1.2	ND	6.3	246311	04/05/17
Cyclohexane	ND	1.2	ND	4.0	246311	04/05/17
Carbon Tetrachloride	ND	1.2	ND	7.3	246311	04/05/17
Benzene	ND	1.2	ND	3.7	246311	04/05/17
1,2-Dichloroethane	ND	1.2	ND	4.7	246311	04/05/17
n-Heptane	ND	1.2	ND	4.7	246311	04/05/17
Trichloroethene	ND	1.2	ND	6.2	246311	04/05/17
1,2-Dichloropropane	ND	1.2	ND	5.3	246311	04/05/17
Bromodichloromethane	ND	1.2	ND	7.7	246311	04/05/17
cis-1,3-Dichloropropene	ND	1.2	ND	5.2	246311	04/05/17
4-Methyl-2-Pentanone	ND	1.2	ND	4.7	246311	04/05/17

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Field ID:	SV-19	Units (M):	ug/m3
Lab ID:	287709-002	Diln Fac:	2.310
Matrix:	Air	Sampled:	04/03/17
Units (V):	ppbv	Received:	04/05/17

Analyte	Result (V)	RL	Result (M)	RL	Batch#	Analyzed
Toluene	ND	1.2	ND	4.4	246311	04/05/17
trans-1,3-Dichloropropene	ND	1.2	ND	5.2	246311	04/05/17
1,1,2-Trichloroethane	ND	1.2	ND	6.3	246311	04/05/17
Tetrachloroethene	ND	1.2	ND	7.8	246311	04/05/17
2-Hexanone	ND	1.2	ND	4.7	246311	04/05/17
Dibromochloromethane	ND	1.2	ND	9.8	246311	04/05/17
1,2-Dibromoethane	ND	1.2	ND	8.9	246311	04/05/17
Chlorobenzene	ND	1.2	ND	5.3	246311	04/05/17
Ethylbenzene	ND	1.2	ND	5.0	246311	04/05/17
m,p-Xylenes	ND	1.2	ND	5.0	246311	04/05/17
o-Xylene	ND	1.2	ND	5.0	246311	04/05/17
Styrene	ND	1.2	ND	4.9	246311	04/05/17
Bromoform	ND	1.2	ND	12	246311	04/05/17
1,1,2,2-Tetrachloroethane	ND	1.2	ND	7.9	246311	04/05/17
4-Ethyltoluene	ND	1.2	ND	5.7	246311	04/05/17
1,3,5-Trimethylbenzene	ND	1.2	ND	5.7	246311	04/05/17
1,2,4-Trimethylbenzene	ND	1.2	ND	5.7	246311	04/05/17
1,3-Dichlorobenzene	ND	1.2	ND	6.9	246311	04/05/17
1,4-Dichlorobenzene	ND	1.2	ND	6.9	246311	04/05/17
Benzyl chloride	ND	1.2	ND	6.0	246311	04/05/17
1,2-Dichlorobenzene	ND	1.2	ND	6.9	246311	04/05/17
1,2,4-Trichlorobenzene	ND	1.2	ND	8.6	246311	04/05/17
Hexachlorobutadiene	ND	1.2	ND	12	246311	04/05/17
Naphthalene	ND	4.6	ND	24	246311	04/05/17

Surrogate	%REC	Limits	Batch#	Analyzed
Bromofluorobenzene	99	80-120	246311	04/05/17

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Field ID:	SV-24	Units (M):	ug/m3
Lab ID:	287709-003	Sampled:	04/03/17
Matrix:	Air	Received:	04/05/17
Units (V):	ppbv	Analyzed:	04/06/17

Analyte	Result (V)	RL	Result (M)	RL	Diln Fac	Batch#
Freon 12	ND	2.5	ND	12	5.020	246311
Freon 114	ND	2.5	ND	18	5.020	246311
Chloromethane	3.6	2.5	7.4	5.2	5.020	246311
Vinyl Chloride	ND	2.5	ND	6.4	5.020	246311
1,3-Butadiene	ND	2.5	ND	5.6	5.020	246311
Bromomethane	ND	2.5	ND	9.7	5.020	246311
Chloroethane	ND	2.5	ND	6.6	5.020	246311
Trichlorofluoromethane	ND	2.5	ND	14	5.020	246311
Acrolein	ND	10	ND	23	5.020	246311
1,1-Dichloroethene	ND	2.5	ND	10	5.020	246311
Freon 113	ND	2.5	ND	19	5.020	246311
Acetone	130	10	300	24	5.020	246311
Carbon Disulfide	ND	2.5	ND	7.8	5.020	246311
Isopropanol	880	30	2,200	74	15.06	246351
Methylene Chloride	ND	2.5	ND	8.7	5.020	246311
trans-1,2-Dichloroethene	ND	2.5	ND	10	5.020	246311
MTBE	ND	2.5	ND	9.0	5.020	246311
n-Hexane	ND	2.5	ND	8.8	5.020	246311
1,1-Dichloroethane	ND	2.5	ND	10	5.020	246311
Vinyl Acetate	ND	2.5	ND	8.8	5.020	246311
cis-1,2-Dichloroethene	ND	2.5	ND	10	5.020	246311
2-Butanone	ND	8.4	ND	25	5.020	246311
Ethyl Acetate	ND	2.5	ND	9.0	5.020	246311
Tetrahydrofuran	ND	2.5	ND	7.4	5.020	246311
Chloroform	ND	2.5	ND	12	5.020	246311
1,1,1-Trichloroethane	ND	2.5	ND	14	5.020	246311
Cyclohexane	ND	2.5	ND	8.6	5.020	246311
Carbon Tetrachloride	ND	2.5	ND	16	5.020	246311
Benzene	ND	2.5	ND	8.0	5.020	246311
1,2-Dichloroethane	ND	2.5	ND	10	5.020	246311
n-Heptane	ND	2.5	ND	10	5.020	246311
Trichloroethene	ND	2.5	ND	13	5.020	246311
1,2-Dichloropropane	ND	2.5	ND	12	5.020	246311
Bromodichloromethane	ND	2.5	ND	17	5.020	246311
cis-1,3-Dichloropropene	ND	2.5	ND	11	5.020	246311
4-Methyl-2-Pentanone	ND	2.5	ND	10	5.020	246311

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Field ID:	SV-24	Units (M):	ug/m3
Lab ID:	287709-003	Sampled:	04/03/17
Matrix:	Air	Received:	04/05/17
Units (V):	ppbv	Analyzed:	04/06/17

Analyte	Result (V)	RL	Result (M)	RL	Diln Fac	Batch#
Toluene	ND	2.5	ND	9.5	5.020	246311
trans-1,3-Dichloropropene	ND	2.5	ND	11	5.020	246311
1,1,2-Trichloroethane	ND	2.5	ND	14	5.020	246311
Tetrachloroethene	ND	2.5	ND	17	5.020	246311
2-Hexanone	ND	2.5	ND	10	5.020	246311
Dibromochloromethane	ND	2.5	ND	21	5.020	246311
1,2-Dibromoethane	ND	2.5	ND	19	5.020	246311
Chlorobenzene	ND	2.5	ND	12	5.020	246311
Ethylbenzene	ND	2.5	ND	11	5.020	246311
m,p-Xylenes	ND	2.5	ND	11	5.020	246311
o-Xylene	ND	2.5	ND	11	5.020	246311
Styrene	ND	2.5	ND	11	5.020	246311
Bromoform	ND	2.5	ND	26	5.020	246311
1,1,2,2-Tetrachloroethane	ND	2.5	ND	17	5.020	246311
4-Ethyltoluene	ND	2.5	ND	12	5.020	246311
1,3,5-Trimethylbenzene	ND	2.5	ND	12	5.020	246311
1,2,4-Trimethylbenzene	ND	2.5	ND	12	5.020	246311
1,3-Dichlorobenzene	ND	2.5	ND	15	5.020	246311
1,4-Dichlorobenzene	ND	2.5	ND	15	5.020	246311
Benzyl chloride	ND	2.5	ND	13	5.020	246311
1,2-Dichlorobenzene	ND	2.5	ND	15	5.020	246311
1,2,4-Trichlorobenzene	ND	2.5	ND	19	5.020	246311
Hexachlorobutadiene	ND	2.5	ND	27	5.020	246311
Naphthalene	ND	10	ND	53	5.020	246311

Surrogate	%REC	Limits	Diln Fac	Batch#
Bromofluorobenzene	103	80-120	5.020	246311

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Field ID:	SV-33	Diln Fac:	2.190
Lab ID:	287709-004	Batch#:	246311
Matrix:	Air	Sampled:	04/03/17
Units (V):	ppbv	Received:	04/05/17
Units (M):	ug/m3	Analyzed:	04/05/17

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	1.1	ND	5.4
Freon 114	ND	1.1	ND	7.7
Chloromethane	ND	1.1	ND	2.3
Vinyl Chloride	ND	1.1	ND	2.8
1,3-Butadiene	ND	1.1	ND	2.4
Bromomethane	ND	1.1	ND	4.3
Chloroethane	ND	1.1	ND	2.9
Trichlorofluoromethane	ND	1.1	ND	6.2
Acrolein	ND	4.4	ND	10
1,1-Dichloroethene	ND	1.1	ND	4.3
Freon 113	ND	1.1	ND	8.4
Acetone	ND	4.4	ND	10
Carbon Disulfide	ND	1.1	ND	3.4
Isopropanol	22	4.4	53	11
Methylene Chloride	ND	1.1	ND	3.8
trans-1,2-Dichloroethene	ND	1.1	ND	4.3
MTBE	ND	1.1	ND	3.9
n-Hexane	ND	1.1	ND	3.9
1,1-Dichloroethane	ND	1.1	ND	4.4
Vinyl Acetate	ND	1.1	ND	3.9
cis-1,2-Dichloroethene	ND	1.1	ND	4.3
2-Butanone	ND	3.7	ND	11
Ethyl Acetate	ND	1.1	ND	3.9
Tetrahydrofuran	ND	1.1	ND	3.2
Chloroform	ND	1.1	ND	5.3
1,1,1-Trichloroethane	ND	1.1	ND	6.0
Cyclohexane	ND	1.1	ND	3.8
Carbon Tetrachloride	ND	1.1	ND	6.9
Benzene	ND	1.1	ND	3.5
1,2-Dichloroethane	ND	1.1	ND	4.4
n-Heptane	ND	1.1	ND	4.5
Trichloroethene	ND	1.1	ND	5.9
1,2-Dichloropropane	ND	1.1	ND	5.1
Bromodichloromethane	ND	1.1	ND	7.3
cis-1,3-Dichloropropene	ND	1.1	ND	5.0

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Field ID:	SV-33	Diln Fac:	2.190
Lab ID:	287709-004	Batch#:	246311
Matrix:	Air	Sampled:	04/03/17
Units (V):	ppbv	Received:	04/05/17
Units (M):	ug/m3	Analyzed:	04/05/17

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	1.1	ND	4.5
Toluene	ND	1.1	ND	4.1
trans-1,3-Dichloropropene	ND	1.1	ND	5.0
1,1,2-Trichloroethane	ND	1.1	ND	6.0
Tetrachloroethene	ND	1.1	ND	7.4
2-Hexanone	ND	1.1	ND	4.5
Dibromochloromethane	ND	1.1	ND	9.3
1,2-Dibromoethane	ND	1.1	ND	8.4
Chlorobenzene	ND	1.1	ND	5.0
Ethylbenzene	ND	1.1	ND	4.8
m,p-Xylenes	ND	1.1	ND	4.8
o-Xylene	ND	1.1	ND	4.8
Styrene	ND	1.1	ND	4.7
Bromoform	ND	1.1	ND	11
1,1,2,2-Tetrachloroethane	ND	1.1	ND	7.5
4-Ethyltoluene	ND	1.1	ND	5.4
1,3,5-Trimethylbenzene	ND	1.1	ND	5.4
1,2,4-Trimethylbenzene	ND	1.1	ND	5.4
1,3-Dichlorobenzene	ND	1.1	ND	6.6
1,4-Dichlorobenzene	ND	1.1	ND	6.6
Benzyl chloride	ND	1.1	ND	5.7
1,2-Dichlorobenzene	ND	1.1	ND	6.6
1,2,4-Trichlorobenzene	ND	1.1	ND	8.1
Hexachlorobutadiene	ND	1.1	ND	12
Naphthalene	ND	4.4	ND	23

Surrogate	%REC	Limits
Bromofluorobenzene	97	80-120

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Field ID:	SV-3	Units (M):	ug/m3
Lab ID:	287709-005	Sampled:	04/03/17
Matrix:	Air	Received:	04/05/17
Units (V):	ppbv	Analyzed:	04/06/17

Analyte	Result (V)	RL	Result (M)	RL	Diln Fac	Batch#
Freon 12	ND	4.0	ND	20	7.900	246311
Freon 114	ND	4.0	ND	28	7.900	246311
Chloromethane	ND	4.0	ND	8.2	7.900	246311
Vinyl Chloride	ND	4.0	ND	10	7.900	246311
1,3-Butadiene	ND	4.0	ND	8.7	7.900	246311
Bromomethane	ND	4.0	ND	15	7.900	246311
Chloroethane	ND	4.0	ND	10	7.900	246311
Trichlorofluoromethane	ND	4.0	ND	22	7.900	246311
Acrolein	ND	16	ND	36	7.900	246311
1,1-Dichloroethene	ND	4.0	ND	16	7.900	246311
Freon 113	ND	4.0	ND	30	7.900	246311
Acetone	100	16	240	38	7.900	246311
Carbon Disulfide	ND	4.0	ND	12	7.900	246311
Isopropanol	990	47	2,400	120	23.70	246351
Methylene Chloride	ND	4.0	ND	14	7.900	246311
trans-1,2-Dichloroethene	ND	4.0	ND	16	7.900	246311
MTBE	ND	4.0	ND	14	7.900	246311
n-Hexane	ND	4.0	ND	14	7.900	246311
1,1-Dichloroethane	ND	4.0	ND	16	7.900	246311
Vinyl Acetate	ND	4.0	ND	14	7.900	246311
cis-1,2-Dichloroethene	40	4.0	160	16	7.900	246311
2-Butanone	ND	13	ND	39	7.900	246311
Ethyl Acetate	ND	4.0	ND	14	7.900	246311
Tetrahydrofuran	ND	4.0	ND	12	7.900	246311
Chloroform	ND	4.0	ND	19	7.900	246311
1,1,1-Trichloroethane	ND	4.0	ND	22	7.900	246311
Cyclohexane	ND	4.0	ND	14	7.900	246311
Carbon Tetrachloride	ND	4.0	ND	25	7.900	246311
Benzene	ND	4.0	ND	13	7.900	246311
1,2-Dichloroethane	ND	4.0	ND	16	7.900	246311
n-Heptane	ND	4.0	ND	16	7.900	246311
Trichloroethene	ND	4.0	ND	21	7.900	246311
1,2-Dichloropropane	ND	4.0	ND	18	7.900	246311
Bromodichloromethane	ND	4.0	ND	26	7.900	246311
cis-1,3-Dichloropropene	ND	4.0	ND	18	7.900	246311
4-Methyl-2-Pentanone	ND	4.0	ND	16	7.900	246311

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Field ID:	SV-3	Units (M):	ug/m3
Lab ID:	287709-005	Sampled:	04/03/17
Matrix:	Air	Received:	04/05/17
Units (V):	ppbv	Analyzed:	04/06/17

Analyte	Result (V)	RL	Result (M)	RL	Diln Fac	Batch#
Toluene	ND	4.0	ND	15	7.900	246311
trans-1,3-Dichloropropene	ND	4.0	ND	18	7.900	246311
1,1,2-Trichloroethane	ND	4.0	ND	22	7.900	246311
Tetrachloroethene	65	4.0	440	27	7.900	246311
2-Hexanone	ND	4.0	ND	16	7.900	246311
Dibromochloromethane	ND	4.0	ND	34	7.900	246311
1,2-Dibromoethane	ND	4.0	ND	30	7.900	246311
Chlorobenzene	ND	4.0	ND	18	7.900	246311
Ethylbenzene	ND	4.0	ND	17	7.900	246311
m,p-Xylenes	ND	4.0	ND	17	7.900	246311
o-Xylene	ND	4.0	ND	17	7.900	246311
Styrene	ND	4.0	ND	17	7.900	246311
Bromoform	ND	4.0	ND	41	7.900	246311
1,1,2,2-Tetrachloroethane	ND	4.0	ND	27	7.900	246311
4-Ethyltoluene	ND	4.0	ND	19	7.900	246311
1,3,5-Trimethylbenzene	ND	4.0	ND	19	7.900	246311
1,2,4-Trimethylbenzene	ND	4.0	ND	19	7.900	246311
1,3-Dichlorobenzene	ND	4.0	ND	24	7.900	246311
1,4-Dichlorobenzene	ND	4.0	ND	24	7.900	246311
Benzyl chloride	ND	4.0	ND	20	7.900	246311
1,2-Dichlorobenzene	ND	4.0	ND	24	7.900	246311
1,2,4-Trichlorobenzene	ND	4.0	ND	29	7.900	246311
Hexachlorobutadiene	ND	4.0	ND	42	7.900	246311
Naphthalene	ND	16	ND	83	7.900	246311

Surrogate	%REC	Limits	Diln Fac	Batch#
Bromofluorobenzene	98	80-120	7.900	246311

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Field ID:	SV-55	Diln Fac:	2.170
Lab ID:	287709-006	Batch#:	246311
Matrix:	Air	Sampled:	04/03/17
Units (V):	ppbv	Received:	04/05/17
Units (M):	ug/m3	Analyzed:	04/05/17

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	1.1	ND	5.4
Freon 114	ND	1.1	ND	7.6
Chloromethane	ND	1.1	ND	2.2
Vinyl Chloride	ND	1.1	ND	2.8
1,3-Butadiene	ND	1.1	ND	2.4
Bromomethane	ND	1.1	ND	4.2
Chloroethane	ND	1.1	ND	2.9
Trichlorofluoromethane	ND	1.1	ND	6.1
Acrolein	ND	4.3	ND	10
1,1-Dichloroethene	ND	1.1	ND	4.3
Freon 113	ND	1.1	ND	8.3
Acetone	5.4	4.3	13	10
Carbon Disulfide	ND	1.1	ND	3.4
Isopropanol	ND	4.3	ND	11
Methylene Chloride	ND	1.1	ND	3.8
trans-1,2-Dichloroethene	ND	1.1	ND	4.3
MTBE	ND	1.1	ND	3.9
n-Hexane	ND	1.1	ND	3.8
1,1-Dichloroethane	ND	1.1	ND	4.4
Vinyl Acetate	ND	1.1	ND	3.8
cis-1,2-Dichloroethene	ND	1.1	ND	4.3
2-Butanone	ND	3.6	ND	11
Ethyl Acetate	ND	1.1	ND	3.9
Tetrahydrofuran	ND	1.1	ND	3.2
Chloroform	ND	1.1	ND	5.3
1,1,1-Trichloroethane	ND	1.1	ND	5.9
Cyclohexane	ND	1.1	ND	3.7
Carbon Tetrachloride	ND	1.1	ND	6.8
Benzene	ND	1.1	ND	3.5
1,2-Dichloroethane	ND	1.1	ND	4.4
n-Heptane	ND	1.1	ND	4.4
Trichloroethene	ND	1.1	ND	5.8
1,2-Dichloropropane	ND	1.1	ND	5.0
Bromodichloromethane	ND	1.1	ND	7.3
cis-1,3-Dichloropropene	ND	1.1	ND	4.9

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Field ID:	SV-55	Diln Fac:	2.170
Lab ID:	287709-006	Batch#:	246311
Matrix:	Air	Sampled:	04/03/17
Units (V):	ppbv	Received:	04/05/17
Units (M):	ug/m3	Analyzed:	04/05/17

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	1.1	ND	4.4
Toluene	ND	1.1	ND	4.1
trans-1,3-Dichloropropene	ND	1.1	ND	4.9
1,1,2-Trichloroethane	ND	1.1	ND	5.9
Tetrachloroethene	ND	1.1	ND	7.4
2-Hexanone	ND	1.1	ND	4.4
Dibromochloromethane	ND	1.1	ND	9.2
1,2-Dibromoethane	ND	1.1	ND	8.3
Chlorobenzene	ND	1.1	ND	5.0
Ethylbenzene	ND	1.1	ND	4.7
m,p-Xylenes	ND	1.1	ND	4.7
o-Xylene	ND	1.1	ND	4.7
Styrene	ND	1.1	ND	4.6
Bromoform	ND	1.1	ND	11
1,1,2,2-Tetrachloroethane	ND	1.1	ND	7.4
4-Ethyltoluene	ND	1.1	ND	5.3
1,3,5-Trimethylbenzene	ND	1.1	ND	5.3
1,2,4-Trimethylbenzene	ND	1.1	ND	5.3
1,3-Dichlorobenzene	ND	1.1	ND	6.5
1,4-Dichlorobenzene	ND	1.1	ND	6.5
Benzyl chloride	ND	1.1	ND	5.6
1,2-Dichlorobenzene	ND	1.1	ND	6.5
1,2,4-Trichlorobenzene	ND	1.1	ND	8.1
Hexachlorobutadiene	ND	1.1	ND	12
Naphthalene	ND	4.3	ND	23

Surrogate	%REC	Limits
Bromofluorobenzene	96	80-120

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Field ID:	SV-56	Diln Fac:	2.130
Lab ID:	287709-007	Batch#:	246311
Matrix:	Air	Sampled:	04/03/17
Units (V):	ppbv	Received:	04/05/17
Units (M):	ug/m3	Analyzed:	04/05/17

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	1.1	ND	5.3
Freon 114	ND	1.1	ND	7.4
Chloromethane	ND	1.1	ND	2.2
Vinyl Chloride	ND	1.1	ND	2.7
1,3-Butadiene	ND	1.1	ND	2.4
Bromomethane	ND	1.1	ND	4.1
Chloroethane	ND	1.1	ND	2.8
Trichlorofluoromethane	ND	1.1	ND	6.0
Acrolein	ND	4.3	ND	9.8
1,1-Dichloroethene	ND	1.1	ND	4.2
Freon 113	ND	1.1	ND	8.2
Acetone	ND	4.3	ND	10
Carbon Disulfide	ND	1.1	ND	3.3
Isopropanol	ND	4.3	ND	10
Methylene Chloride	ND	1.1	ND	3.7
trans-1,2-Dichloroethene	ND	1.1	ND	4.2
MTBE	ND	1.1	ND	3.8
n-Hexane	ND	1.1	ND	3.8
1,1-Dichloroethane	ND	1.1	ND	4.3
Vinyl Acetate	ND	1.1	ND	3.7
cis-1,2-Dichloroethene	ND	1.1	ND	4.2
2-Butanone	ND	3.6	ND	10
Ethyl Acetate	ND	1.1	ND	3.8
Tetrahydrofuran	ND	1.1	ND	3.1
Chloroform	ND	1.1	ND	5.2
1,1,1-Trichloroethane	ND	1.1	ND	5.8
Cyclohexane	ND	1.1	ND	3.7
Carbon Tetrachloride	ND	1.1	ND	6.7
Benzene	ND	1.1	ND	3.4
1,2-Dichloroethane	ND	1.1	ND	4.3
n-Heptane	ND	1.1	ND	4.4
Trichloroethene	ND	1.1	ND	5.7
1,2-Dichloropropane	ND	1.1	ND	4.9
Bromodichloromethane	ND	1.1	ND	7.1
cis-1,3-Dichloropropene	ND	1.1	ND	4.8

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Field ID:	SV-56	Diln Fac:	2.130
Lab ID:	287709-007	Batch#:	246311
Matrix:	Air	Sampled:	04/03/17
Units (V):	ppbv	Received:	04/05/17
Units (M):	ug/m3	Analyzed:	04/05/17

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	1.1	ND	4.4
Toluene	ND	1.1	ND	4.0
trans-1,3-Dichloropropene	ND	1.1	ND	4.8
1,1,2-Trichloroethane	ND	1.1	ND	5.8
Tetrachloroethene	ND	1.1	ND	7.2
2-Hexanone	ND	1.1	ND	4.4
Dibromochloromethane	ND	1.1	ND	9.1
1,2-Dibromoethane	ND	1.1	ND	8.2
Chlorobenzene	ND	1.1	ND	4.9
Ethylbenzene	ND	1.1	ND	4.6
m,p-Xylenes	ND	1.1	ND	4.6
o-Xylene	ND	1.1	ND	4.6
Styrene	ND	1.1	ND	4.5
Bromoform	ND	1.1	ND	11
1,1,2,2-Tetrachloroethane	ND	1.1	ND	7.3
4-Ethyltoluene	ND	1.1	ND	5.2
1,3,5-Trimethylbenzene	ND	1.1	ND	5.2
1,2,4-Trimethylbenzene	ND	1.1	ND	5.2
1,3-Dichlorobenzene	ND	1.1	ND	6.4
1,4-Dichlorobenzene	ND	1.1	ND	6.4
Benzyl chloride	ND	1.1	ND	5.5
1,2-Dichlorobenzene	ND	1.1	ND	6.4
1,2,4-Trichlorobenzene	ND	1.1	ND	7.9
Hexachlorobutadiene	ND	1.1	ND	11
Naphthalene	ND	4.3	ND	22

Surrogate	%REC	Limits
Bromofluorobenzene	96	80-120

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Field ID:	SV-63	Diln Fac:	2.060
Lab ID:	287709-008	Batch#:	246311
Matrix:	Air	Sampled:	04/04/17
Units (V):	ppbv	Received:	04/05/17
Units (M):	ug/m3	Analyzed:	04/06/17

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	1.0	ND	5.1
Freon 114	ND	1.0	ND	7.2
Chloromethane	ND	1.0	ND	2.1
Vinyl Chloride	ND	1.0	ND	2.6
1,3-Butadiene	ND	1.0	ND	2.3
Bromomethane	ND	1.0	ND	4.0
Chloroethane	ND	1.0	ND	2.7
Trichlorofluoromethane	ND	1.0	ND	5.8
Acrolein	ND	4.1	ND	9.4
1,1-Dichloroethene	ND	1.0	ND	4.1
Freon 113	ND	1.0	ND	7.9
Acetone	ND	4.1	ND	9.8
Carbon Disulfide	ND	1.0	ND	3.2
Isopropanol	ND	4.1	ND	10
Methylene Chloride	ND	1.0	ND	3.6
trans-1,2-Dichloroethene	ND	1.0	ND	4.1
MTBE	ND	1.0	ND	3.7
n-Hexane	ND	1.0	ND	3.6
1,1-Dichloroethane	ND	1.0	ND	4.2
Vinyl Acetate	ND	1.0	ND	3.6
cis-1,2-Dichloroethene	ND	1.0	ND	4.1
2-Butanone	ND	3.4	ND	10
Ethyl Acetate	ND	1.0	ND	3.7
Tetrahydrofuran	ND	1.0	ND	3.0
Chloroform	ND	1.0	ND	5.0
1,1,1-Trichloroethane	ND	1.0	ND	5.6
Cyclohexane	ND	1.0	ND	3.5
Carbon Tetrachloride	ND	1.0	ND	6.5
Benzene	ND	1.0	ND	3.3
1,2-Dichloroethane	ND	1.0	ND	4.2
n-Heptane	ND	1.0	ND	4.2
Trichloroethene	ND	1.0	ND	5.5
1,2-Dichloropropane	ND	1.0	ND	4.8
Bromodichloromethane	ND	1.0	ND	6.9
cis-1,3-Dichloropropene	ND	1.0	ND	4.7

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Field ID:	SV-63	Diln Fac:	2.060
Lab ID:	287709-008	Batch#:	246311
Matrix:	Air	Sampled:	04/04/17
Units (V):	ppbv	Received:	04/05/17
Units (M):	ug/m3	Analyzed:	04/06/17

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	1.0	ND	4.2
Toluene	ND	1.0	ND	3.9
trans-1,3-Dichloropropene	ND	1.0	ND	4.7
1,1,2-Trichloroethane	ND	1.0	ND	5.6
Tetrachloroethene	ND	1.0	ND	7.0
2-Hexanone	ND	1.0	ND	4.2
Dibromochloromethane	ND	1.0	ND	8.8
1,2-Dibromoethane	ND	1.0	ND	7.9
Chlorobenzene	ND	1.0	ND	4.7
Ethylbenzene	ND	1.0	ND	4.5
m,p-Xylenes	ND	1.0	ND	4.5
o-Xylene	ND	1.0	ND	4.5
Styrene	ND	1.0	ND	4.4
Bromoform	ND	1.0	ND	11
1,1,2,2-Tetrachloroethane	ND	1.0	ND	7.1
4-Ethyltoluene	ND	1.0	ND	5.1
1,3,5-Trimethylbenzene	ND	1.0	ND	5.1
1,2,4-Trimethylbenzene	ND	1.0	ND	5.1
1,3-Dichlorobenzene	ND	1.0	ND	6.2
1,4-Dichlorobenzene	ND	1.0	ND	6.2
Benzyl chloride	ND	1.0	ND	5.3
1,2-Dichlorobenzene	ND	1.0	ND	6.2
1,2,4-Trichlorobenzene	ND	1.0	ND	7.6
Hexachlorobutadiene	ND	1.0	ND	11
Naphthalene	ND	4.1	ND	22

Surrogate	%REC	Limits
Bromofluorobenzene	93	80-120

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Field ID:	SV-64	Diln Fac:	2.200
Lab ID:	287709-009	Batch#:	246311
Matrix:	Air	Sampled:	04/04/17
Units (V):	ppbv	Received:	04/05/17
Units (M):	ug/m3	Analyzed:	04/06/17

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	1.1	ND	5.4
Freon 114	ND	1.1	ND	7.7
Chloromethane	ND	1.1	ND	2.3
Vinyl Chloride	ND	1.1	ND	2.8
1,3-Butadiene	ND	1.1	ND	2.4
Bromomethane	ND	1.1	ND	4.3
Chloroethane	ND	1.1	ND	2.9
Trichlorofluoromethane	ND	1.1	ND	6.2
Acrolein	ND	4.4	ND	10
1,1-Dichloroethene	ND	1.1	ND	4.4
Freon 113	ND	1.1	ND	8.4
Acetone	ND	4.4	ND	10
Carbon Disulfide	ND	1.1	ND	3.4
Isopropanol	ND	4.4	ND	11
Methylene Chloride	ND	1.1	ND	3.8
trans-1,2-Dichloroethene	ND	1.1	ND	4.4
MTBE	ND	1.1	ND	4.0
n-Hexane	ND	1.1	ND	3.9
1,1-Dichloroethane	ND	1.1	ND	4.5
Vinyl Acetate	ND	1.1	ND	3.9
cis-1,2-Dichloroethene	ND	1.1	ND	4.4
2-Butanone	ND	3.7	ND	11
Ethyl Acetate	ND	1.1	ND	4.0
Tetrahydrofuran	ND	1.1	ND	3.2
Chloroform	ND	1.1	ND	5.4
1,1,1-Trichloroethane	ND	1.1	ND	6.0
Cyclohexane	ND	1.1	ND	3.8
Carbon Tetrachloride	ND	1.1	ND	6.9
Benzene	ND	1.1	ND	3.5
1,2-Dichloroethane	ND	1.1	ND	4.5
n-Heptane	ND	1.1	ND	4.5
Trichloroethene	ND	1.1	ND	5.9
1,2-Dichloropropane	ND	1.1	ND	5.1
Bromodichloromethane	ND	1.1	ND	7.4
cis-1,3-Dichloropropene	ND	1.1	ND	5.0

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Field ID:	SV-64	Diln Fac:	2.200
Lab ID:	287709-009	Batch#:	246311
Matrix:	Air	Sampled:	04/04/17
Units (V):	ppbv	Received:	04/05/17
Units (M):	ug/m3	Analyzed:	04/06/17

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	1.1	ND	4.5
Toluene	ND	1.1	ND	4.1
trans-1,3-Dichloropropene	ND	1.1	ND	5.0
1,1,2-Trichloroethane	ND	1.1	ND	6.0
Tetrachloroethene	ND	1.1	ND	7.5
2-Hexanone	ND	1.1	ND	4.5
Dibromochloromethane	ND	1.1	ND	9.4
1,2-Dibromoethane	ND	1.1	ND	8.5
Chlorobenzene	ND	1.1	ND	5.1
Ethylbenzene	ND	1.1	ND	4.8
m,p-Xylenes	ND	1.1	ND	4.8
o-Xylene	ND	1.1	ND	4.8
Styrene	ND	1.1	ND	4.7
Bromoform	ND	1.1	ND	11
1,1,2,2-Tetrachloroethane	ND	1.1	ND	7.6
4-Ethyltoluene	ND	1.1	ND	5.4
1,3,5-Trimethylbenzene	ND	1.1	ND	5.4
1,2,4-Trimethylbenzene	ND	1.1	ND	5.4
1,3-Dichlorobenzene	ND	1.1	ND	6.6
1,4-Dichlorobenzene	ND	1.1	ND	6.6
Benzyl chloride	ND	1.1	ND	5.7
1,2-Dichlorobenzene	ND	1.1	ND	6.6
1,2,4-Trichlorobenzene	ND	1.1	ND	8.2
Hexachlorobutadiene	ND	1.1	ND	12
Naphthalene	ND	4.4	ND	23

Surrogate	%REC	Limits
Bromofluorobenzene	100	80-120

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Field ID:	SV-65	Diln Fac:	2.150
Lab ID:	287709-010	Batch#:	246351
Matrix:	Air	Sampled:	04/04/17
Units (V):	ppbv	Received:	04/05/17
Units (M):	ug/m3	Analyzed:	04/06/17

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	1.1	ND	5.3
Freon 114	ND	1.1	ND	7.5
Chloromethane	ND	1.1	ND	2.2
Vinyl Chloride	ND	1.1	ND	2.7
1,3-Butadiene	ND	1.1	ND	2.4
Bromomethane	ND	1.1	ND	4.2
Chloroethane	ND	1.1	ND	2.8
Trichlorofluoromethane	ND	1.1	ND	6.0
Acrolein	ND	4.3	ND	9.9
1,1-Dichloroethene	ND	1.1	ND	4.3
Freon 113	ND	1.1	ND	8.2
Acetone	ND	4.3	ND	10
Carbon Disulfide	ND	1.1	ND	3.3
Isopropanol	ND	4.3	ND	11
Methylene Chloride	ND	1.1	ND	3.7
trans-1,2-Dichloroethene	ND	1.1	ND	4.3
MTBE	ND	1.1	ND	3.9
n-Hexane	ND	1.1	ND	3.8
1,1-Dichloroethane	ND	1.1	ND	4.4
Vinyl Acetate	ND	1.1	ND	3.8
cis-1,2-Dichloroethene	ND	1.1	ND	4.3
2-Butanone	ND	3.6	ND	11
Ethyl Acetate	ND	1.1	ND	3.9
Tetrahydrofuran	ND	1.1	ND	3.2
Chloroform	ND	1.1	ND	5.2
1,1,1-Trichloroethane	ND	1.1	ND	5.9
Cyclohexane	ND	1.1	ND	3.7
Carbon Tetrachloride	ND	1.1	ND	6.8
Benzene	ND	1.1	ND	3.4
1,2-Dichloroethane	ND	1.1	ND	4.4
n-Heptane	ND	1.1	ND	4.4
Trichloroethene	ND	1.1	ND	5.8
1,2-Dichloropropane	ND	1.1	ND	5.0
Bromodichloromethane	ND	1.1	ND	7.2
cis-1,3-Dichloropropene	ND	1.1	ND	4.9

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Field ID:	SV-65	Diln Fac:	2.150
Lab ID:	287709-010	Batch#:	246351
Matrix:	Air	Sampled:	04/04/17
Units (V):	ppbv	Received:	04/05/17
Units (M):	ug/m3	Analyzed:	04/06/17

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	1.1	ND	4.4
Toluene	ND	1.1	ND	4.1
trans-1,3-Dichloropropene	ND	1.1	ND	4.9
1,1,2-Trichloroethane	ND	1.1	ND	5.9
Tetrachloroethene	ND	1.1	ND	7.3
2-Hexanone	ND	1.1	ND	4.4
Dibromochloromethane	ND	1.1	ND	9.2
1,2-Dibromoethane	ND	1.1	ND	8.3
Chlorobenzene	ND	1.1	ND	4.9
Ethylbenzene	ND	1.1	ND	4.7
m,p-Xylenes	ND	1.1	ND	4.7
o-Xylene	ND	1.1	ND	4.7
Styrene	ND	1.1	ND	4.6
Bromoform	ND	1.1	ND	11
1,1,2,2-Tetrachloroethane	ND	1.1	ND	7.4
4-Ethyltoluene	ND	1.1	ND	5.3
1,3,5-Trimethylbenzene	ND	1.1	ND	5.3
1,2,4-Trimethylbenzene	ND	1.1	ND	5.3
1,3-Dichlorobenzene	ND	1.1	ND	6.5
1,4-Dichlorobenzene	ND	1.1	ND	6.5
Benzyl chloride	ND	1.1	ND	5.6
1,2-Dichlorobenzene	ND	1.1	ND	6.5
1,2,4-Trichlorobenzene	ND	1.1	ND	8.0
Hexachlorobutadiene	ND	1.1	ND	11
Naphthalene	ND	4.3	ND	23

Surrogate	%REC	Limits
Bromofluorobenzene	96	80-120

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Field ID:	SHROUD	Units (M):	ug/m3
Lab ID:	287709-012	Sampled:	04/04/17
Matrix:	Air	Received:	04/05/17
Units (V):	ppbv		

Analyte	Result (V)	RL	Result (M)	RL	Diln Fac	Batch#	Analyzed
Freon 12	ND	260	ND	1,300	528.0	246351	04/06/17
Freon 114	ND	260	ND	1,800	528.0	246351	04/06/17
Chloromethane	ND	260	ND	550	528.0	246351	04/06/17
Vinyl Chloride	ND	260	ND	670	528.0	246351	04/06/17
1,3-Butadiene	ND	260	ND	580	528.0	246351	04/06/17
Bromomethane	ND	260	ND	1,000	528.0	246351	04/06/17
Chloroethane	ND	260	ND	700	528.0	246351	04/06/17
Trichlorofluoromethane	ND	260	ND	1,500	528.0	246351	04/06/17
Acrolein	ND	1,100	ND	2,400	528.0	246351	04/06/17
1,1-Dichloroethene	ND	260	ND	1,000	528.0	246351	04/06/17
Freon 113	ND	260	ND	2,000	528.0	246351	04/06/17
Acetone	ND	1,100	ND	2,500	528.0	246351	04/06/17
Carbon Disulfide	ND	260	ND	820	528.0	246351	04/06/17
Isopropanol	67,000	5,300	170,000	13,000	2,640	246397	04/07/17
Methylene Chloride	ND	260	ND	920	528.0	246351	04/06/17
trans-1,2-Dichloroethene	ND	260	ND	1,000	528.0	246351	04/06/17
MTBE	ND	260	ND	950	528.0	246351	04/06/17
n-Hexane	ND	260	ND	930	528.0	246351	04/06/17
1,1-Dichloroethane	ND	260	ND	1,100	528.0	246351	04/06/17
Vinyl Acetate	ND	260	ND	930	528.0	246351	04/06/17
cis-1,2-Dichloroethene	ND	260	ND	1,000	528.0	246351	04/06/17
2-Butanone	ND	880	ND	2,600	528.0	246351	04/06/17
Ethyl Acetate	ND	260	ND	950	528.0	246351	04/06/17
Tetrahydrofuran	ND	260	ND	780	528.0	246351	04/06/17
Chloroform	ND	260	ND	1,300	528.0	246351	04/06/17
1,1,1-Trichloroethane	ND	260	ND	1,400	528.0	246351	04/06/17
Cyclohexane	ND	260	ND	910	528.0	246351	04/06/17
Carbon Tetrachloride	ND	260	ND	1,700	528.0	246351	04/06/17
Benzene	ND	260	ND	840	528.0	246351	04/06/17
1,2-Dichloroethane	ND	260	ND	1,100	528.0	246351	04/06/17
n-Heptane	ND	260	ND	1,100	528.0	246351	04/06/17
Trichloroethene	ND	260	ND	1,400	528.0	246351	04/06/17
1,2-Dichloropropane	ND	260	ND	1,200	528.0	246351	04/06/17
Bromodichloromethane	ND	260	ND	1,800	528.0	246351	04/06/17
cis-1,3-Dichloropropene	ND	260	ND	1,200	528.0	246351	04/06/17
4-Methyl-2-Pentanone	ND	260	ND	1,100	528.0	246351	04/06/17

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Field ID:	SHROUD	Units (M):	ug/m3
Lab ID:	287709-012	Sampled:	04/04/17
Matrix:	Air	Received:	04/05/17
Units (V):	ppbv		

Analyte	Result (V)	RL	Result (M)	RL	Diln Fac	Batch#	Analyzed
Toluene	ND	260	ND	990	528.0	246351	04/06/17
trans-1,3-Dichloropropene	ND	260	ND	1,200	528.0	246351	04/06/17
1,1,2-Trichloroethane	ND	260	ND	1,400	528.0	246351	04/06/17
Tetrachloroethene	ND	260	ND	1,800	528.0	246351	04/06/17
2-Hexanone	ND	260	ND	1,100	528.0	246351	04/06/17
Dibromochloromethane	ND	260	ND	2,200	528.0	246351	04/06/17
1,2-Dibromoethane	ND	260	ND	2,000	528.0	246351	04/06/17
Chlorobenzene	ND	260	ND	1,200	528.0	246351	04/06/17
Ethylbenzene	ND	260	ND	1,100	528.0	246351	04/06/17
m,p-Xylenes	ND	260	ND	1,100	528.0	246351	04/06/17
o-Xylene	ND	260	ND	1,100	528.0	246351	04/06/17
Styrene	ND	260	ND	1,100	528.0	246351	04/06/17
Bromoform	ND	260	ND	2,700	528.0	246351	04/06/17
1,1,2,2-Tetrachloroethane	ND	260	ND	1,800	528.0	246351	04/06/17
4-Ethyltoluene	ND	260	ND	1,300	528.0	246351	04/06/17
1,3,5-Trimethylbenzene	ND	260	ND	1,300	528.0	246351	04/06/17
1,2,4-Trimethylbenzene	ND	260	ND	1,300	528.0	246351	04/06/17
1,3-Dichlorobenzene	ND	260	ND	1,600	528.0	246351	04/06/17
1,4-Dichlorobenzene	ND	260	ND	1,600	528.0	246351	04/06/17
Benzyl chloride	ND	260	ND	1,400	528.0	246351	04/06/17
1,2-Dichlorobenzene	ND	260	ND	1,600	528.0	246351	04/06/17
1,2,4-Trichlorobenzene	ND	260	ND	2,000	528.0	246351	04/06/17
Hexachlorobutadiene	ND	260	ND	2,800	528.0	246351	04/06/17
Naphthalene	ND	1,100	ND	5,500	528.0	246351	04/06/17

Surrogate	%REC	Limits	Diln Fac	Batch#	Analyzed
Bromofluorobenzene	96	80-120	528.0	246351	04/06/17

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Field ID:	SV-27	Diln Fac:	12.80
Lab ID:	287709-013	Batch#:	246456
Matrix:	Air	Sampled:	04/03/17
Units (V):	ppbv	Received:	04/05/17
Units (M):	ug/m3	Analyzed:	04/10/17

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	6.4	ND	32
Freon 114	ND	6.4	ND	45
Chloromethane	ND	6.4	ND	13
Vinyl Chloride	ND	6.4	ND	16
1,3-Butadiene	ND	6.4	ND	14
Bromomethane	ND	6.4	ND	25
Chloroethane	ND	6.4	ND	17
Trichlorofluoromethane	ND	6.4	ND	36
Acrolein	ND	26	ND	59
1,1-Dichloroethene	ND	6.4	ND	25
Freon 113	ND	6.4	ND	49
Acetone	88	26	210	61
Carbon Disulfide	ND	6.4	ND	20
Isopropanol	220	26	530	63
Methylene Chloride	ND	6.4	ND	22
trans-1,2-Dichloroethene	ND	6.4	ND	25
MTBE	ND	6.4	ND	23
n-Hexane	ND	6.4	ND	23
1,1-Dichloroethane	ND	6.4	ND	26
Vinyl Acetate	ND	6.4	ND	23
cis-1,2-Dichloroethene	ND	6.4	ND	25
2-Butanone	ND	21	ND	63
Ethyl Acetate	ND	6.4	ND	23
Tetrahydrofuran	ND	6.4	ND	19
Chloroform	ND	6.4	ND	31
1,1,1-Trichloroethane	ND	6.4	ND	35
Cyclohexane	ND	6.4	ND	22
Carbon Tetrachloride	ND	6.4	ND	40
Benzene	ND	6.4	ND	20
1,2-Dichloroethane	ND	6.4	ND	26
n-Heptane	ND	6.4	ND	26
Trichloroethene	ND	6.4	ND	34
1,2-Dichloropropane	ND	6.4	ND	30
Bromodichloromethane	ND	6.4	ND	43
cis-1,3-Dichloropropene	ND	6.4	ND	29

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Field ID:	SV-27	Diln Fac:	12.80
Lab ID:	287709-013	Batch#:	246456
Matrix:	Air	Sampled:	04/03/17
Units (V):	ppbv	Received:	04/05/17
Units (M):	ug/m3	Analyzed:	04/10/17

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	6.4	ND	26
Toluene	ND	6.4	ND	24
trans-1,3-Dichloropropene	ND	6.4	ND	29
1,1,2-Trichloroethane	ND	6.4	ND	35
Tetrachloroethene	ND	6.4	ND	43
2-Hexanone	ND	6.4	ND	26
Dibromochloromethane	ND	6.4	ND	55
1,2-Dibromoethane	ND	6.4	ND	49
Chlorobenzene	ND	6.4	ND	29
Ethylbenzene	ND	6.4	ND	28
m,p-Xylenes	ND	6.4	ND	28
o-Xylene	ND	6.4	ND	28
Styrene	ND	6.4	ND	27
Bromoform	ND	6.4	ND	66
1,1,2,2-Tetrachloroethane	ND	6.4	ND	44
4-Ethyltoluene	ND	6.4	ND	31
1,3,5-Trimethylbenzene	ND	6.4	ND	31
1,2,4-Trimethylbenzene	ND	6.4	ND	31
1,3-Dichlorobenzene	ND	6.4	ND	38
1,4-Dichlorobenzene	ND	6.4	ND	38
Benzyl chloride	ND	6.4	ND	33
1,2-Dichlorobenzene	ND	6.4	ND	38
1,2,4-Trichlorobenzene	ND	6.4	ND	47
Hexachlorobutadiene	ND	6.4	ND	68
Naphthalene	ND	26	ND	130

Surrogate	%REC	Limits
Bromofluorobenzene	91	80-120

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	246311
Units (V):	ppbv	Analyzed:	04/05/17
Diln Fac:	1.000		

Type: BS Lab ID: QC880107

Analyte	Spiked	Result (V)	%REC	Limits
Freon 12	10.00	8.515	85	70-130
Freon 114	10.00	9.240	92	70-130
Chloromethane	10.00	7.250	73	70-130
Vinyl Chloride	10.00	8.477	85	70-130
1,3-Butadiene	10.00	8.520	85	70-130
Bromomethane	10.00	6.978	70	70-130
Chloroethane	10.00	8.102	81	70-130
Trichlorofluoromethane	10.00	9.787	98	70-130
Acrolein	10.00	11.87	119	70-130
1,1-Dichloroethene	10.00	12.86	129	70-130
Freon 113	10.00	10.51	105	70-130
Acetone	10.00	8.895	89	70-130
Carbon Disulfide	10.00	10.14	101	70-130
Isopropanol	10.00	8.928	89	70-130
Methylene Chloride	10.00	9.601	96	70-130
trans-1,2-Dichloroethene	10.00	11.27	113	70-130
MTBE	10.00	10.26	103	70-130
n-Hexane	10.00	10.67	107	70-130
1,1-Dichloroethane	10.00	11.10	111	70-130
Vinyl Acetate	10.00	15.33 b	153 *	70-130
cis-1,2-Dichloroethene	10.00	10.36	104	70-130
2-Butanone	10.00	8.613	86	70-130
Ethyl Acetate	10.00	7.731	77	70-130
Tetrahydrofuran	10.00	12.04	120	70-130
Chloroform	10.00	10.43	104	70-130
1,1,1-Trichloroethane	10.00	11.30	113	70-130
Cyclohexane	10.00	11.19	112	70-130
Carbon Tetrachloride	10.00	9.218	92	70-130
Benzene	10.00	10.61	106	70-130
1,2-Dichloroethane	10.00	11.06	111	70-130
n-Heptane	10.00	12.16	122	70-130
Trichloroethene	10.00	10.82	108	70-130

*= Value outside of QC limits; see narrative
b= See narrative
RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	246311
Units (V):	ppbv	Analyzed:	04/05/17
Diln Fac:	1.000		

Analyte	Spiked	Result (V)	%REC	Limits
1,2-Dichloropropane	10.00	11.48	115	70-130
Bromodichloromethane	10.00	11.13	111	70-130
cis-1,3-Dichloropropene	10.00	10.91	109	70-130
4-Methyl-2-Pentanone	10.00	12.31	123	70-130
Toluene	10.00	12.09	121	70-130
trans-1,3-Dichloropropene	10.00	11.74	117	70-130
1,1,2-Trichloroethane	10.00	12.58	126	70-130
Tetrachloroethene	10.00	12.27	123	70-130
2-Hexanone	10.00	13.27 b	133 *	70-130
Dibromochloromethane	10.00	10.75	107	70-130
1,2-Dibromoethane	10.00	11.79	118	70-130
Chlorobenzene	10.00	12.31	123	70-130
Ethylbenzene	10.00	12.07	121	70-130
m,p-Xylenes	20.00	24.48	122	70-130
o-Xylene	10.00	12.13	121	70-130
Styrene	10.00	11.80	118	70-130
Bromoform	10.00	10.13	101	70-130
1,1,2,2-Tetrachloroethane	10.00	11.69	117	70-130
4-Ethyltoluene	10.00	12.08	121	70-130
1,3,5-Trimethylbenzene	10.00	12.37	124	70-130
1,2,4-Trimethylbenzene	10.00	12.88	129	70-130
1,3-Dichlorobenzene	10.00	11.53	115	70-130
1,4-Dichlorobenzene	10.00	11.91	119	70-130
Benzyl chloride	10.00	12.14	121	70-130
1,2-Dichlorobenzene	10.00	11.97	120	70-130
1,2,4-Trichlorobenzene	10.00	12.86	129	70-130
Hexachlorobutadiene	10.00	13.33 b	133 *	70-130
Naphthalene	10.00	13.40 b	134 *	70-130

Surrogate	%REC	Limits
Bromofluorobenzene	104	70-130

*= Value outside of QC limits; see narrative
b= See narrative
RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	246311
Units (V):	ppbv	Analyzed:	04/05/17
Diln Fac:	1.000		

Type: BSD Lab ID: QC880108

Analyte	Spiked	Result (V)	%REC	Limits	RPD	Lim
Freon 12	10.00	8.917	89	70-130	5	25
Freon 114	10.00	9.545	95	70-130	3	25
Chloromethane	10.00	7.667	77	70-130	6	25
Vinyl Chloride	10.00	8.734	87	70-130	3	25
1,3-Butadiene	10.00	9.270	93	70-130	8	25
Bromomethane	10.00	7.342	73	70-130	5	25
Chloroethane	10.00	8.475	85	70-130	5	25
Trichlorofluoromethane	10.00	10.07	101	70-130	3	25
Acrolein	10.00	11.46	115	70-130	4	25
1,1-Dichloroethene	10.00	13.12	131 *	70-130	2	25
Freon 113	10.00	10.87	109	70-130	3	25
Acetone	10.00	9.321	93	70-130	5	25
Carbon Disulfide	10.00	10.19	102	70-130	1	25
Isopropanol	10.00	9.060	91	70-130	1	25
Methylene Chloride	10.00	9.888	99	70-130	3	25
trans-1,2-Dichloroethene	10.00	11.74	117	70-130	4	25
MTBE	10.00	10.53	105	70-130	3	25
n-Hexane	10.00	10.83	108	70-130	1	25
1,1-Dichloroethane	10.00	11.33	113	70-130	2	25
Vinyl Acetate	10.00	16.12 b	161 *	70-130	5	25
cis-1,2-Dichloroethene	10.00	10.80	108	70-130	4	25
2-Butanone	10.00	9.090	91	70-130	5	25
Ethyl Acetate	10.00	7.930	79	70-130	3	25
Tetrahydrofuran	10.00	12.19	122	70-130	1	25
Chloroform	10.00	10.77	108	70-130	3	25
1,1,1-Trichloroethane	10.00	11.18	112	70-130	1	25
Cyclohexane	10.00	11.08	111	70-130	1	25
Carbon Tetrachloride	10.00	9.070	91	70-130	2	25
Benzene	10.00	10.41	104	70-130	2	25
1,2-Dichloroethane	10.00	11.01	110	70-130	0	25
n-Heptane	10.00	12.17	122	70-130	0	25
Trichloroethene	10.00	10.55	106	70-130	3	25

*= Value outside of QC limits; see narrative
b= See narrative
RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	246311
Units (V):	ppbv	Analyzed:	04/05/17
Diln Fac:	1.000		

Analyte	Spiked	Result (V)	%REC	Limits	RPD	Lim
1,2-Dichloropropane	10.00	11.34	113	70-130	1	25
Bromodichloromethane	10.00	11.14	111	70-130	0	25
cis-1,3-Dichloropropene	10.00	10.60	106	70-130	3	25
4-Methyl-2-Pentanone	10.00	12.01	120	70-130	2	25
Toluene	10.00	11.92	119	70-130	1	25
trans-1,3-Dichloropropene	10.00	11.40	114	70-130	3	25
1,1,2-Trichloroethane	10.00	12.48	125	70-130	1	25
Tetrachloroethene	10.00	12.16	122	70-130	1	25
2-Hexanone	10.00	13.21 b	132 *	70-130	0	25
Dibromochloromethane	10.00	10.63	106	70-130	1	25
1,2-Dibromoethane	10.00	11.73	117	70-130	0	25
Chlorobenzene	10.00	12.14	121	70-130	1	25
Ethylbenzene	10.00	12.03	120	70-130	0	25
m,p-Xylenes	20.00	23.84	119	70-130	3	25
o-Xylene	10.00	12.06	121	70-130	1	25
Styrene	10.00	11.50	115	70-130	3	25
Bromoform	10.00	10.09	101	70-130	0	25
1,1,2,2-Tetrachloroethane	10.00	11.62	116	70-130	1	25
4-Ethyltoluene	10.00	12.32	123	70-130	2	25
1,3,5-Trimethylbenzene	10.00	12.12	121	70-130	2	25
1,2,4-Trimethylbenzene	10.00	12.55	126	70-130	3	25
1,3-Dichlorobenzene	10.00	11.52	115	70-130	0	25
1,4-Dichlorobenzene	10.00	11.35	113	70-130	5	25
Benzyl chloride	10.00	11.78	118	70-130	3	25
1,2-Dichlorobenzene	10.00	11.45	115	70-130	4	25
1,2,4-Trichlorobenzene	10.00	12.40	124	70-130	4	25
Hexachlorobutadiene	10.00	12.94 b	129	70-130	3	25
Naphthalene	10.00	13.13 b	131 *	70-130	2	25

Surrogate	%REC	Limits
Bromofluorobenzene	100	70-130

*= Value outside of QC limits; see narrative
b= See narrative
RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Type:	BLANK	Units (M):	ug/m3
Lab ID:	QC880109	Diln Fac:	1.000
Matrix:	Air	Batch#:	246311
Units (V):	ppbv	Analyzed:	04/05/17

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	0.50	ND	2.5
Freon 114	ND	0.50	ND	3.5
Chloromethane	ND	0.50	ND	1.0
Vinyl Chloride	ND	0.50	ND	1.3
1,3-Butadiene	ND	0.50	ND	1.1
Bromomethane	ND	0.50	ND	1.9
Chloroethane	ND	0.50	ND	1.3
Trichlorofluoromethane	ND	0.50	ND	2.8
Acrolein	ND	2.0	ND	4.6
1,1-Dichloroethene	ND	0.50	ND	2.0
Freon 113	ND	0.50	ND	3.8
Acetone	ND	2.0	ND	4.8
Carbon Disulfide	ND	0.50	ND	1.6
Isopropanol	ND	2.0	ND	4.9
Methylene Chloride	ND	0.50	ND	1.7
trans-1,2-Dichloroethene	ND	0.50	ND	2.0
MTBE	ND	0.50	ND	1.8
n-Hexane	ND	0.50	ND	1.8
1,1-Dichloroethane	ND	0.50	ND	2.0
Vinyl Acetate	ND	0.50	ND	1.8
cis-1,2-Dichloroethene	ND	0.50	ND	2.0
2-Butanone	ND	1.7	ND	4.9
Ethyl Acetate	ND	0.50	ND	1.8
Tetrahydrofuran	ND	0.50	ND	1.5
Chloroform	ND	0.50	ND	2.4
1,1,1-Trichloroethane	ND	0.50	ND	2.7
Cyclohexane	ND	0.50	ND	1.7
Carbon Tetrachloride	ND	0.50	ND	3.1
Benzene	ND	0.50	ND	1.6
1,2-Dichloroethane	ND	0.50	ND	2.0
n-Heptane	ND	0.50	ND	2.0
Trichloroethene	ND	0.50	ND	2.7
1,2-Dichloropropane	ND	0.50	ND	2.3
Bromodichloromethane	ND	0.50	ND	3.4
cis-1,3-Dichloropropene	ND	0.50	ND	2.3

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Type:	BLANK	Units (M):	ug/m3
Lab ID:	QC880109	Diln Fac:	1.000
Matrix:	Air	Batch#:	246311
Units (V):	ppbv	Analyzed:	04/05/17

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	0.50	ND	2.0
Toluene	ND	0.50	ND	1.9
trans-1,3-Dichloropropene	ND	0.50	ND	2.3
1,1,2-Trichloroethane	ND	0.50	ND	2.7
Tetrachloroethene	ND	0.50	ND	3.4
2-Hexanone	ND	0.50	ND	2.0
Dibromochloromethane	ND	0.50	ND	4.3
1,2-Dibromoethane	ND	0.50	ND	3.8
Chlorobenzene	ND	0.50	ND	2.3
Ethylbenzene	ND	0.50	ND	2.2
m,p-Xylenes	ND	0.50	ND	2.2
o-Xylene	ND	0.50	ND	2.2
Styrene	ND	0.50	ND	2.1
Bromoform	ND	0.50	ND	5.2
1,1,2,2-Tetrachloroethane	ND	0.50	ND	3.4
4-Ethyltoluene	ND	0.50	ND	2.5
1,3,5-Trimethylbenzene	ND	0.50	ND	2.5
1,2,4-Trimethylbenzene	ND	0.50	ND	2.5
1,3-Dichlorobenzene	ND	0.50	ND	3.0
1,4-Dichlorobenzene	ND	0.50	ND	3.0
Benzyl chloride	ND	0.50	ND	2.6
1,2-Dichlorobenzene	ND	0.50	ND	3.0
1,2,4-Trichlorobenzene	ND	0.50	ND	3.7
Hexachlorobutadiene	ND	0.50	ND	5.3
Naphthalene	ND	2.0	ND	10

Surrogate	%REC	Limits
Bromofluorobenzene	98	70-130

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	246351
Units (V):	ppbv	Analyzed:	04/06/17
Diln Fac:	1.000		

Type: BS Lab ID: QC880274

Analyte	Spiked	Result (V)	%REC	Limits
Freon 12	10.00	8.691	87	70-130
Freon 114	10.00	9.036	90	70-130
Chloromethane	10.00	8.864	89	70-130
Vinyl Chloride	10.00	9.797	98	70-130
1,3-Butadiene	10.00	8.920	89	70-130
Bromomethane	10.00	8.150	82	70-130
Chloroethane	10.00	8.146	81	70-130
Trichlorofluoromethane	10.00	9.599	96	70-130
Acrolein	10.00	12.28	123	70-130
1,1-Dichloroethene	10.00	12.34	123	70-130
Freon 113	10.00	10.11	101	70-130
Acetone	10.00	8.510	85	70-130
Carbon Disulfide	10.00	10.01	100	70-130
Isopropanol	10.00	8.508	85	70-130
Methylene Chloride	10.00	9.525	95	70-130
trans-1,2-Dichloroethene	10.00	10.91	109	70-130
MTBE	10.00	9.877	99	70-130
n-Hexane	10.00	10.19	102	70-130
1,1-Dichloroethane	10.00	10.68	107	70-130
Vinyl Acetate	10.00	17.26 b	173 *	70-130
cis-1,2-Dichloroethene	10.00	10.23	102	70-130
2-Butanone	10.00	8.504	85	70-130
Ethyl Acetate	10.00	7.122	71	70-130
Tetrahydrofuran	10.00	11.74	117	70-130
Chloroform	10.00	9.891	99	70-130
1,1,1-Trichloroethane	10.00	10.46	105	70-130
Cyclohexane	10.00	10.22	102	70-130
Carbon Tetrachloride	10.00	9.647	96	70-130
Benzene	10.00	10.19	102	70-130
1,2-Dichloroethane	10.00	10.69	107	70-130
n-Heptane	10.00	11.70	117	70-130
Trichloroethene	10.00	10.23	102	70-130

*= Value outside of QC limits; see narrative
b= See narrative
RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	246351
Units (V):	ppbv	Analyzed:	04/06/17
Diln Fac:	1.000		

Analyte	Spiked	Result (V)	%REC	Limits
1,2-Dichloropropane	10.00	10.85	109	70-130
Bromodichloromethane	10.00	10.42	104	70-130
cis-1,3-Dichloropropene	10.00	10.57	106	70-130
4-Methyl-2-Pentanone	10.00	11.93	119	70-130
Toluene	10.00	10.78	108	70-130
trans-1,3-Dichloropropene	10.00	11.24	112	70-130
1,1,2-Trichloroethane	10.00	11.10	111	70-130
Tetrachloroethene	10.00	10.92	109	70-130
2-Hexanone	10.00	11.80	118	70-130
Dibromochloromethane	10.00	10.00	100	70-130
1,2-Dibromoethane	10.00	10.70	107	70-130
Chlorobenzene	10.00	11.05	110	70-130
Ethylbenzene	10.00	10.88	109	70-130
m,p-Xylenes	20.00	21.42	107	70-130
o-Xylene	10.00	10.80	108	70-130
Styrene	10.00	10.96	110	70-130
Bromoform	10.00	9.974	100	70-130
1,1,2,2-Tetrachloroethane	10.00	10.59	106	70-130
4-Ethyltoluene	10.00	10.87	109	70-130
1,3,5-Trimethylbenzene	10.00	11.22	112	70-130
1,2,4-Trimethylbenzene	10.00	11.29	113	70-130
1,3-Dichlorobenzene	10.00	10.19	102	70-130
1,4-Dichlorobenzene	10.00	10.07	101	70-130
Benzyl chloride	10.00	10.69	107	70-130
1,2-Dichlorobenzene	10.00	10.60	106	70-130
1,2,4-Trichlorobenzene	10.00	10.49	105	70-130
Hexachlorobutadiene	10.00	10.53	105	70-130
Naphthalene	10.00	11.03	110	70-130

Surrogate	%REC	Limits
Bromofluorobenzene	98	70-130

*= Value outside of QC limits; see narrative
b= See narrative
RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	246351
Units (V):	ppbv	Analyzed:	04/06/17
Diln Fac:	1.000		

Type: BSD Lab ID: QC880275

Analyte	Spiked	Result (V)	%REC	Limits	RPD	Lim
Freon 12	10.00	8.825	88	70-130	2	25
Freon 114	10.00	9.044	90	70-130	0	25
Chloromethane	10.00	8.897	89	70-130	0	25
Vinyl Chloride	10.00	9.782	98	70-130	0	25
1,3-Butadiene	10.00	8.861	89	70-130	1	25
Bromomethane	10.00	8.597	86	70-130	5	25
Chloroethane	10.00	8.901	89	70-130	9	25
Trichlorofluoromethane	10.00	9.637	96	70-130	0	25
Acrolein	10.00	12.87	129	70-130	5	25
1,1-Dichloroethene	10.00	12.45	125	70-130	1	25
Freon 113	10.00	10.31	103	70-130	2	25
Acetone	10.00	8.646	86	70-130	2	25
Carbon Disulfide	10.00	9.350	94	70-130	7	25
Isopropanol	10.00	8.308	83	70-130	2	25
Methylene Chloride	10.00	9.711	97	70-130	2	25
trans-1,2-Dichloroethene	10.00	11.03	110	70-130	1	25
MTBE	10.00	10.09	101	70-130	2	25
n-Hexane	10.00	10.28	103	70-130	1	25
1,1-Dichloroethane	10.00	10.92	109	70-130	2	25
Vinyl Acetate	10.00	17.68 b	177 *	70-130	2	25
cis-1,2-Dichloroethene	10.00	10.14	101	70-130	1	25
2-Butanone	10.00	8.709	87	70-130	2	25
Ethyl Acetate	10.00	7.337	73	70-130	3	25
Tetrahydrofuran	10.00	11.91	119	70-130	1	25
Chloroform	10.00	10.05	101	70-130	2	25
1,1,1-Trichloroethane	10.00	10.52	105	70-130	1	25
Cyclohexane	10.00	10.29	103	70-130	1	25
Carbon Tetrachloride	10.00	10.02	100	70-130	4	25
Benzene	10.00	10.14	101	70-130	0	25
1,2-Dichloroethane	10.00	11.23	112	70-130	5	25
n-Heptane	10.00	11.78	118	70-130	1	25
Trichloroethene	10.00	10.53	105	70-130	3	25

*= Value outside of QC limits; see narrative
b= See narrative
RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	246351
Units (V):	ppbv	Analyzed:	04/06/17
Diln Fac:	1.000		

Analyte	Spiked	Result (V)	%REC	Limits	RPD	Lim
1,2-Dichloropropane	10.00	11.09	111	70-130	2	25
Bromodichloromethane	10.00	10.73	107	70-130	3	25
cis-1,3-Dichloropropene	10.00	10.47	105	70-130	1	25
4-Methyl-2-Pentanone	10.00	11.84	118	70-130	1	25
Toluene	10.00	11.38	114	70-130	5	25
trans-1,3-Dichloropropene	10.00	11.28	113	70-130	0	25
1,1,2-Trichloroethane	10.00	11.79	118	70-130	6	25
Tetrachloroethene	10.00	11.42	114	70-130	5	25
2-Hexanone	10.00	12.88	129	70-130	9	25
Dibromochloromethane	10.00	10.29	103	70-130	3	25
1,2-Dibromoethane	10.00	11.38	114	70-130	6	25
Chlorobenzene	10.00	11.50	115	70-130	4	25
Ethylbenzene	10.00	11.43	114	70-130	5	25
m,p-Xylenes	20.00	22.96	115	70-130	7	25
o-Xylene	10.00	11.47	115	70-130	6	25
Styrene	10.00	11.22	112	70-130	2	25
Bromoform	10.00	10.43	104	70-130	4	25
1,1,2,2-Tetrachloroethane	10.00	11.07	111	70-130	4	25
4-Ethyltoluene	10.00	11.38	114	70-130	5	25
1,3,5-Trimethylbenzene	10.00	11.38	114	70-130	1	25
1,2,4-Trimethylbenzene	10.00	11.68	117	70-130	3	25
1,3-Dichlorobenzene	10.00	10.61	106	70-130	4	25
1,4-Dichlorobenzene	10.00	10.52	105	70-130	4	25
Benzyl chloride	10.00	11.17	112	70-130	4	25
1,2-Dichlorobenzene	10.00	10.93	109	70-130	3	25
1,2,4-Trichlorobenzene	10.00	10.94	109	70-130	4	25
Hexachlorobutadiene	10.00	10.90	109	70-130	3	25
Naphthalene	10.00	11.45	115	70-130	4	25

Surrogate	%REC	Limits
Bromofluorobenzene	101	70-130

*= Value outside of QC limits; see narrative
b= See narrative
RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Type:	BLANK	Units (M):	ug/m3
Lab ID:	QC880276	Diln Fac:	1.000
Matrix:	Air	Batch#:	246351
Units (V):	ppbv	Analyzed:	04/06/17

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	0.50	ND	2.5
Freon 114	ND	0.50	ND	3.5
Chloromethane	ND	0.50	ND	1.0
Vinyl Chloride	ND	0.50	ND	1.3
1,3-Butadiene	ND	0.50	ND	1.1
Bromomethane	ND	0.50	ND	1.9
Chloroethane	ND	0.50	ND	1.3
Trichlorofluoromethane	ND	0.50	ND	2.8
Acrolein	ND	2.0	ND	4.6
1,1-Dichloroethene	ND	0.50	ND	2.0
Freon 113	ND	0.50	ND	3.8
Acetone	ND	2.0	ND	4.8
Carbon Disulfide	ND	0.50	ND	1.6
Isopropanol	ND	2.0	ND	4.9
Methylene Chloride	ND	0.50	ND	1.7
trans-1,2-Dichloroethene	ND	0.50	ND	2.0
MTBE	ND	0.50	ND	1.8
n-Hexane	ND	0.50	ND	1.8
1,1-Dichloroethane	ND	0.50	ND	2.0
Vinyl Acetate	ND	0.50	ND	1.8
cis-1,2-Dichloroethene	ND	0.50	ND	2.0
2-Butanone	ND	1.7	ND	4.9
Ethyl Acetate	ND	0.50	ND	1.8
Tetrahydrofuran	ND	0.50	ND	1.5
Chloroform	ND	0.50	ND	2.4
1,1,1-Trichloroethane	ND	0.50	ND	2.7
Cyclohexane	ND	0.50	ND	1.7
Carbon Tetrachloride	ND	0.50	ND	3.1
Benzene	ND	0.50	ND	1.6
1,2-Dichloroethane	ND	0.50	ND	2.0
n-Heptane	ND	0.50	ND	2.0
Trichloroethene	ND	0.50	ND	2.7
1,2-Dichloropropane	ND	0.50	ND	2.3
Bromodichloromethane	ND	0.50	ND	3.4
cis-1,3-Dichloropropene	ND	0.50	ND	2.3

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Type:	BLANK	Units (M):	ug/m3
Lab ID:	QC880276	Diln Fac:	1.000
Matrix:	Air	Batch#:	246351
Units (V):	ppbv	Analyzed:	04/06/17

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	0.50	ND	2.0
Toluene	ND	0.50	ND	1.9
trans-1,3-Dichloropropene	ND	0.50	ND	2.3
1,1,2-Trichloroethane	ND	0.50	ND	2.7
Tetrachloroethene	ND	0.50	ND	3.4
2-Hexanone	ND	0.50	ND	2.0
Dibromochloromethane	ND	0.50	ND	4.3
1,2-Dibromoethane	ND	0.50	ND	3.8
Chlorobenzene	ND	0.50	ND	2.3
Ethylbenzene	ND	0.50	ND	2.2
m,p-Xylenes	ND	0.50	ND	2.2
o-Xylene	ND	0.50	ND	2.2
Styrene	ND	0.50	ND	2.1
Bromoform	ND	0.50	ND	5.2
1,1,2,2-Tetrachloroethane	ND	0.50	ND	3.4
4-Ethyltoluene	ND	0.50	ND	2.5
1,3,5-Trimethylbenzene	ND	0.50	ND	2.5
1,2,4-Trimethylbenzene	ND	0.50	ND	2.5
1,3-Dichlorobenzene	ND	0.50	ND	3.0
1,4-Dichlorobenzene	ND	0.50	ND	3.0
Benzyl chloride	ND	0.50	ND	2.6
1,2-Dichlorobenzene	ND	0.50	ND	3.0
1,2,4-Trichlorobenzene	ND	0.50	ND	3.7
Hexachlorobutadiene	ND	0.50	ND	5.3
Naphthalene	ND	2.0	ND	10

Surrogate	%REC	Limits
Bromofluorobenzene	94	70-130

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	246397
Units (V):	ppbv	Analyzed:	04/07/17
Diln Fac:	1.000		

Type: BS Lab ID: QC880457

Analyte	Spiked	Result (V)	%REC	Limits
Freon 12	10.00	8.693	87	70-130
Freon 114	10.00	9.250	93	70-130
Chloromethane	10.00	7.346	73	70-130
Vinyl Chloride	10.00	8.854	89	70-130
1,3-Butadiene	10.00	9.012	90	70-130
Bromomethane	10.00	7.358	74	70-130
Chloroethane	10.00	8.546	85	70-130
Trichlorofluoromethane	10.00	10.04	100	70-130
Acrolein	10.00	12.73	127	70-130
1,1-Dichloroethene	10.00	12.86	129	70-130
Freon 113	10.00	10.42	104	70-130
Acetone	10.00	9.408	94	70-130
Carbon Disulfide	10.00	9.803	98	70-130
Isopropanol	10.00	8.920	89	70-130
Methylene Chloride	10.00	9.619	96	70-130
trans-1,2-Dichloroethene	10.00	11.23	112	70-130
MTBE	10.00	10.20	102	70-130
n-Hexane	10.00	10.34	103	70-130
1,1-Dichloroethane	10.00	11.10	111	70-130
Vinyl Acetate	10.00	18.20 b	182 *	70-130
cis-1,2-Dichloroethene	10.00	10.47	105	70-130
2-Butanone	10.00	9.367	94	70-130
Ethyl Acetate	10.00	7.373	74	70-130
Tetrahydrofuran	10.00	12.35	123	70-130
Chloroform	10.00	10.32	103	70-130
1,1,1-Trichloroethane	10.00	10.78	108	70-130
Cyclohexane	10.00	10.85	108	70-130
Carbon Tetrachloride	10.00	10.05	100	70-130
Benzene	10.00	10.18	102	70-130
1,2-Dichloroethane	10.00	11.17	112	70-130
n-Heptane	10.00	12.10	121	70-130
Trichloroethene	10.00	10.70	107	70-130

*= Value outside of QC limits; see narrative
b= See narrative
RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	246397
Units (V):	ppbv	Analyzed:	04/07/17
Diln Fac:	1.000		

Analyte	Spiked	Result (V)	%REC	Limits
1,2-Dichloropropane	10.00	11.15	112	70-130
Bromodichloromethane	10.00	10.89	109	70-130
cis-1,3-Dichloropropene	10.00	10.83	108	70-130
4-Methyl-2-Pentanone	10.00	12.43	124	70-130
Toluene	10.00	11.06	111	70-130
trans-1,3-Dichloropropene	10.00	11.11	111	70-130
1,1,2-Trichloroethane	10.00	11.27	113	70-130
Tetrachloroethene	10.00	11.24	112	70-130
2-Hexanone	10.00	12.67	127	70-130
Dibromochloromethane	10.00	10.16	102	70-130
1,2-Dibromoethane	10.00	11.02	110	70-130
Chlorobenzene	10.00	11.20	112	70-130
Ethylbenzene	10.00	11.28	113	70-130
m,p-Xylenes	20.00	22.49	112	70-130
o-Xylene	10.00	11.03	110	70-130
Styrene	10.00	10.91	109	70-130
Bromoform	10.00	10.16	102	70-130
1,1,2,2-Tetrachloroethane	10.00	11.02	110	70-130
4-Ethyltoluene	10.00	11.10	111	70-130
1,3,5-Trimethylbenzene	10.00	11.16	112	70-130
1,2,4-Trimethylbenzene	10.00	11.32	113	70-130
1,3-Dichlorobenzene	10.00	10.64	106	70-130
1,4-Dichlorobenzene	10.00	10.64	106	70-130
Benzyl chloride	10.00	10.99	110	70-130
1,2-Dichlorobenzene	10.00	10.55	106	70-130
1,2,4-Trichlorobenzene	10.00	10.62	106	70-130
Hexachlorobutadiene	10.00	11.02	110	70-130
Naphthalene	10.00	11.23	112	70-130

Surrogate	%REC	Limits
Bromofluorobenzene	95	70-130

*= Value outside of QC limits; see narrative
b= See narrative
RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	246397
Units (V):	ppbv	Analyzed:	04/07/17
Diln Fac:	1.000		

Type: BSD Lab ID: QC880458

Analyte	Spiked	Result (V)	%REC	Limits	RPD	Lim
Freon 12	10.00	9.125	91	70-130	5	25
Freon 114	10.00	9.563	96	70-130	3	25
Chloromethane	10.00	9.000	90	70-130	20	25
Vinyl Chloride	10.00	10.25	103	70-130	15	25
1,3-Butadiene	10.00	9.744	97	70-130	8	25
Bromomethane	10.00	8.720	87	70-130	17	25
Chloroethane	10.00	8.459	85	70-130	1	25
Trichlorofluoromethane	10.00	9.905	99	70-130	1	25
Acrolein	10.00	11.53	115	70-130	10	25
1,1-Dichloroethene	10.00	12.83	128	70-130	0	25
Freon 113	10.00	10.60	106	70-130	2	25
Acetone	10.00	8.566	86	70-130	9	25
Carbon Disulfide	10.00	9.307	93	70-130	5	25
Isopropanol	10.00	8.039	80	70-130	10	25
Methylene Chloride	10.00	9.502	95	70-130	1	25
trans-1,2-Dichloroethene	10.00	10.89	109	70-130	3	25
MTBE	10.00	9.393	94	70-130	8	25
n-Hexane	10.00	9.927	99	70-130	4	25
1,1-Dichloroethane	10.00	11.02	110	70-130	1	25
Vinyl Acetate	10.00	17.38 b	174 *	70-130	5	25
cis-1,2-Dichloroethene	10.00	10.12	101	70-130	3	25
2-Butanone	10.00	8.532	85	70-130	9	25
Ethyl Acetate	10.00	6.950	70	70-130	6	25
Tetrahydrofuran	10.00	12.29	123	70-130	0	25
Chloroform	10.00	9.773	98	70-130	5	25
1,1,1-Trichloroethane	10.00	11.36	114	70-130	5	25
Cyclohexane	10.00	11.28	113	70-130	4	25
Carbon Tetrachloride	10.00	10.63	106	70-130	6	25
Benzene	10.00	10.58	106	70-130	4	25
1,2-Dichloroethane	10.00	11.75	118	70-130	5	25
n-Heptane	10.00	12.15	122	70-130	0	25
Trichloroethene	10.00	10.84	108	70-130	1	25

*= Value outside of QC limits; see narrative
b= See narrative
RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	246397
Units (V):	ppbv	Analyzed:	04/07/17
Diln Fac:	1.000		

Analyte	Spiked	Result (V)	%REC	Limits	RPD	Lim
1,2-Dichloropropane	10.00	11.27	113	70-130	1	25
Bromodichloromethane	10.00	10.80	108	70-130	1	25
cis-1,3-Dichloropropene	10.00	10.77	108	70-130	1	25
4-Methyl-2-Pentanone	10.00	12.14	121	70-130	2	25
Toluene	10.00	11.31	113	70-130	2	25
trans-1,3-Dichloropropene	10.00	11.31	113	70-130	2	25
1,1,2-Trichloroethane	10.00	11.90	119	70-130	5	25
Tetrachloroethene	10.00	11.22	112	70-130	0	25
2-Hexanone	10.00	12.81	128	70-130	1	25
Dibromochloromethane	10.00	10.43	104	70-130	3	25
1,2-Dibromoethane	10.00	11.10	111	70-130	1	25
Chlorobenzene	10.00	11.72	117	70-130	5	25
Ethylbenzene	10.00	11.52	115	70-130	2	25
m,p-Xylenes	20.00	23.08	115	70-130	3	25
o-Xylene	10.00	11.50	115	70-130	4	25
Styrene	10.00	11.32	113	70-130	4	25
Bromoform	10.00	10.51	105	70-130	3	25
1,1,2,2-Tetrachloroethane	10.00	11.18	112	70-130	1	25
4-Ethyltoluene	10.00	11.28	113	70-130	2	25
1,3,5-Trimethylbenzene	10.00	11.65	117	70-130	4	25
1,2,4-Trimethylbenzene	10.00	11.46	115	70-130	1	25
1,3-Dichlorobenzene	10.00	10.53	105	70-130	1	25
1,4-Dichlorobenzene	10.00	10.60	106	70-130	0	25
Benzyl chloride	10.00	11.25	112	70-130	2	25
1,2-Dichlorobenzene	10.00	10.94	109	70-130	4	25
1,2,4-Trichlorobenzene	10.00	10.93	109	70-130	3	25
Hexachlorobutadiene	10.00	11.13	111	70-130	1	25
Naphthalene	10.00	11.69	117	70-130	4	25

Surrogate	%REC	Limits
Bromofluorobenzene	98	70-130

*= Value outside of QC limits; see narrative
b= See narrative
RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Type:	BLANK	Units (M):	ug/m3
Lab ID:	QC880459	Diln Fac:	1.000
Matrix:	Air	Batch#:	246397
Units (V):	ppbv	Analyzed:	04/07/17

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	0.50	ND	2.5
Freon 114	ND	0.50	ND	3.5
Chloromethane	ND	0.50	ND	1.0
Vinyl Chloride	ND	0.50	ND	1.3
1,3-Butadiene	ND	0.50	ND	1.1
Bromomethane	ND	0.50	ND	1.9
Chloroethane	ND	0.50	ND	1.3
Trichlorofluoromethane	ND	0.50	ND	2.8
Acrolein	ND	2.0	ND	4.6
1,1-Dichloroethene	ND	0.50	ND	2.0
Freon 113	ND	0.50	ND	3.8
Acetone	ND	2.0	ND	4.8
Carbon Disulfide	ND	0.50	ND	1.6
Isopropanol	ND	2.0	ND	4.9
Methylene Chloride	ND	0.50	ND	1.7
trans-1,2-Dichloroethene	ND	0.50	ND	2.0
MTBE	ND	0.50	ND	1.8
n-Hexane	ND	0.50	ND	1.8
1,1-Dichloroethane	ND	0.50	ND	2.0
Vinyl Acetate	ND	0.50	ND	1.8
cis-1,2-Dichloroethene	ND	0.50	ND	2.0
2-Butanone	ND	1.7	ND	4.9
Ethyl Acetate	ND	0.50	ND	1.8
Tetrahydrofuran	ND	0.50	ND	1.5
Chloroform	ND	0.50	ND	2.4
1,1,1-Trichloroethane	ND	0.50	ND	2.7
Cyclohexane	ND	0.50	ND	1.7
Carbon Tetrachloride	ND	0.50	ND	3.1
Benzene	ND	0.50	ND	1.6
1,2-Dichloroethane	ND	0.50	ND	2.0
n-Heptane	ND	0.50	ND	2.0
Trichloroethene	ND	0.50	ND	2.7
1,2-Dichloropropane	ND	0.50	ND	2.3
Bromodichloromethane	ND	0.50	ND	3.4
cis-1,3-Dichloropropene	ND	0.50	ND	2.3

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Batch QC Report

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Type:	BLANK	Units (M):	ug/m3
Lab ID:	QC880459	Diln Fac:	1.000
Matrix:	Air	Batch#:	246397
Units (V):	ppbv	Analyzed:	04/07/17

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	0.50	ND	2.0
Toluene	ND	0.50	ND	1.9
trans-1,3-Dichloropropene	ND	0.50	ND	2.3
1,1,2-Trichloroethane	ND	0.50	ND	2.7
Tetrachloroethene	ND	0.50	ND	3.4
2-Hexanone	ND	0.50	ND	2.0
Dibromochloromethane	ND	0.50	ND	4.3
1,2-Dibromoethane	ND	0.50	ND	3.8
Chlorobenzene	ND	0.50	ND	2.3
Ethylbenzene	ND	0.50	ND	2.2
m,p-Xylenes	ND	0.50	ND	2.2
o-Xylene	ND	0.50	ND	2.2
Styrene	ND	0.50	ND	2.1
Bromoform	ND	0.50	ND	5.2
1,1,2,2-Tetrachloroethane	ND	0.50	ND	3.4
4-Ethyltoluene	ND	0.50	ND	2.5
1,3,5-Trimethylbenzene	ND	0.50	ND	2.5
1,2,4-Trimethylbenzene	ND	0.50	ND	2.5
1,3-Dichlorobenzene	ND	0.50	ND	3.0
1,4-Dichlorobenzene	ND	0.50	ND	3.0
Benzyl chloride	ND	0.50	ND	2.6
1,2-Dichlorobenzene	ND	0.50	ND	3.0
1,2,4-Trichlorobenzene	ND	0.50	ND	3.7
Hexachlorobutadiene	ND	0.50	ND	5.3
Naphthalene	ND	2.0	ND	10

Surrogate	%REC	Limits
Bromofluorobenzene	97	70-130

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	246456
Units (V):	ppbv	Analyzed:	04/10/17
Diln Fac:	1.000		

Type: BS Lab ID: QC880663

Analyte	Spiked	Result (V)	%REC	Limits
Freon 12	10.00	8.735	87	70-130
Freon 114	10.00	9.221	92	70-130
Chloromethane	10.00	8.939	89	70-130
Vinyl Chloride	10.00	10.16	102	70-130
1,3-Butadiene	10.00	9.756	98	70-130
Bromomethane	10.00	8.220	82	70-130
Chloroethane	10.00	8.315	83	70-130
Trichlorofluoromethane	10.00	9.571	96	70-130
Acrolein	10.00	12.26	123	70-130
1,1-Dichloroethene	10.00	12.79	128	70-130
Freon 113	10.00	10.35	103	70-130
Acetone	10.00	9.508	95	70-130
Carbon Disulfide	10.00	9.942	99	70-130
Isopropanol	10.00	8.722	87	70-130
Methylene Chloride	10.00	9.705	97	70-130
trans-1,2-Dichloroethene	10.00	11.43	114	70-130
MTBE	10.00	10.49	105	70-130
n-Hexane	10.00	10.14	101	70-130
1,1-Dichloroethane	10.00	11.21	112	70-130
Vinyl Acetate	10.00	18.63 b	186 *	70-130
cis-1,2-Dichloroethene	10.00	10.55	105	70-130
2-Butanone	10.00	9.353	94	70-130
Ethyl Acetate	10.00	7.610	76	70-130
Tetrahydrofuran	10.00	12.41	124	70-130
Chloroform	10.00	10.19	102	70-130
1,1,1-Trichloroethane	10.00	10.67	107	70-130
Cyclohexane	10.00	11.09	111	70-130
Carbon Tetrachloride	10.00	9.667	97	70-130
Benzene	10.00	10.04	100	70-130
1,2-Dichloroethane	10.00	11.23	112	70-130
n-Heptane	10.00	11.95	120	70-130
Trichloroethene	10.00	10.90	109	70-130

*= Value outside of QC limits; see narrative
b= See narrative
RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	246456
Units (V):	ppbv	Analyzed:	04/10/17
Diln Fac:	1.000		

Analyte	Spiked	Result (V)	%REC	Limits
1,2-Dichloropropane	10.00	11.39	114	70-130
Bromodichloromethane	10.00	11.04	110	70-130
cis-1,3-Dichloropropene	10.00	10.73	107	70-130
4-Methyl-2-Pentanone	10.00	12.46	125	70-130
Toluene	10.00	11.42	114	70-130
trans-1,3-Dichloropropene	10.00	11.16	112	70-130
1,1,2-Trichloroethane	10.00	11.90	119	70-130
Tetrachloroethene	10.00	11.99	120	70-130
2-Hexanone	10.00	13.19 b	132 *	70-130
Dibromochloromethane	10.00	10.90	109	70-130
1,2-Dibromoethane	10.00	11.29	113	70-130
Chlorobenzene	10.00	11.82	118	70-130
Ethylbenzene	10.00	11.58	116	70-130
m,p-Xylenes	20.00	23.16	116	70-130
o-Xylene	10.00	11.56	116	70-130
Styrene	10.00	11.55	115	70-130
Bromoform	10.00	10.23	102	70-130
1,1,2,2-Tetrachloroethane	10.00	11.24	112	70-130
4-Ethyltoluene	10.00	11.36	114	70-130
1,3,5-Trimethylbenzene	10.00	11.62	116	70-130
1,2,4-Trimethylbenzene	10.00	11.71	117	70-130
1,3-Dichlorobenzene	10.00	11.18	112	70-130
1,4-Dichlorobenzene	10.00	11.10	111	70-130
Benzyl chloride	10.00	11.13	111	70-130
1,2-Dichlorobenzene	10.00	11.17	112	70-130
1,2,4-Trichlorobenzene	10.00	11.68	117	70-130
Hexachlorobutadiene	10.00	11.42	114	70-130
Naphthalene	10.00	12.13	121	70-130

Surrogate	%REC	Limits
Bromofluorobenzene	99	70-130

*= Value outside of QC limits; see narrative
b= See narrative
RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	246456
Units (V):	ppbv	Analyzed:	04/10/17
Diln Fac:	1.000		

Type: BSD Lab ID: QC880664

Analyte	Spiked	Result (V)	%REC	Limits	RPD	Lim
Freon 12	10.00	8.563	86	70-130	2	25
Freon 114	10.00	9.273	93	70-130	1	25
Chloromethane	10.00	7.759	78	70-130	14	25
Vinyl Chloride	10.00	9.191	92	70-130	10	25
1,3-Butadiene	10.00	9.170	92	70-130	6	25
Bromomethane	10.00	7.506	75	70-130	9	25
Chloroethane	10.00	8.163	82	70-130	2	25
Trichlorofluoromethane	10.00	9.463	95	70-130	1	25
Acrolein	10.00	12.18	122	70-130	1	25
1,1-Dichloroethene	10.00	12.63	126	70-130	1	25
Freon 113	10.00	10.15	101	70-130	2	25
Acetone	10.00	9.375	94	70-130	1	25
Carbon Disulfide	10.00	9.529	95	70-130	4	25
Isopropanol	10.00	8.784	88	70-130	1	25
Methylene Chloride	10.00	9.536	95	70-130	2	25
trans-1,2-Dichloroethene	10.00	11.36	114	70-130	1	25
MTBE	10.00	10.56	106	70-130	1	25
n-Hexane	10.00	10.26	103	70-130	1	25
1,1-Dichloroethane	10.00	11.06	111	70-130	1	25
Vinyl Acetate	10.00	18.21 b	182 *	70-130	2	25
cis-1,2-Dichloroethene	10.00	10.43	104	70-130	1	25
2-Butanone	10.00	9.340	93	70-130	0	25
Ethyl Acetate	10.00	7.715	77	70-130	1	25
Tetrahydrofuran	10.00	12.41	124	70-130	0	25
Chloroform	10.00	10.02	100	70-130	2	25
1,1,1-Trichloroethane	10.00	10.63	106	70-130	0	25
Cyclohexane	10.00	10.84	108	70-130	2	25
Carbon Tetrachloride	10.00	9.545	95	70-130	1	25
Benzene	10.00	10.07	101	70-130	0	25
1,2-Dichloroethane	10.00	11.27	113	70-130	0	25
n-Heptane	10.00	12.22	122	70-130	2	25
Trichloroethene	10.00	10.74	107	70-130	2	25

*= Value outside of QC limits; see narrative
b= See narrative
RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	246456
Units (V):	ppbv	Analyzed:	04/10/17
Diln Fac:	1.000		

Analyte	Spiked	Result (V)	%REC	Limits	RPD	Lim
1,2-Dichloropropane	10.00	11.04	110	70-130	3	25
Bromodichloromethane	10.00	10.94	109	70-130	1	25
cis-1,3-Dichloropropene	10.00	10.62	106	70-130	1	25
4-Methyl-2-Pentanone	10.00	12.40	124	70-130	0	25
Toluene	10.00	11.85	118	70-130	4	25
trans-1,3-Dichloropropene	10.00	11.20	112	70-130	0	25
1,1,2-Trichloroethane	10.00	12.12	121	70-130	2	25
Tetrachloroethene	10.00	12.02	120	70-130	0	25
2-Hexanone	10.00	13.57 b	136 *	70-130	3	25
Dibromochloromethane	10.00	11.11	111	70-130	2	25
1,2-Dibromoethane	10.00	11.58	116	70-130	3	25
Chlorobenzene	10.00	11.93	119	70-130	1	25
Ethylbenzene	10.00	11.64	116	70-130	1	25
m,p-Xylenes	20.00	23.87	119	70-130	3	25
o-Xylene	10.00	11.70	117	70-130	1	25
Styrene	10.00	11.57	116	70-130	0	25
Bromoform	10.00	10.57	106	70-130	3	25
1,1,2,2-Tetrachloroethane	10.00	11.49	115	70-130	2	25
4-Ethyltoluene	10.00	11.60	116	70-130	2	25
1,3,5-Trimethylbenzene	10.00	11.61	116	70-130	0	25
1,2,4-Trimethylbenzene	10.00	11.73	117	70-130	0	25
1,3-Dichlorobenzene	10.00	11.15	112	70-130	0	25
1,4-Dichlorobenzene	10.00	11.15	111	70-130	0	25
Benzyl chloride	10.00	11.51	115	70-130	3	25
1,2-Dichlorobenzene	10.00	11.70	117	70-130	5	25
1,2,4-Trichlorobenzene	10.00	11.63	116	70-130	0	25
Hexachlorobutadiene	10.00	11.90	119	70-130	4	25
Naphthalene	10.00	12.17	122	70-130	0	25

Surrogate	%REC	Limits
Bromofluorobenzene	97	70-130

*= Value outside of QC limits; see narrative
b= See narrative
RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Type:	BLANK	Units (M):	ug/m3
Lab ID:	QC880665	Diln Fac:	1.000
Matrix:	Air	Batch#:	246456
Units (V):	ppbv	Analyzed:	04/10/17

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	0.50	ND	2.5
Freon 114	ND	0.50	ND	3.5
Chloromethane	ND	0.50	ND	1.0
Vinyl Chloride	ND	0.50	ND	1.3
1,3-Butadiene	ND	0.50	ND	1.1
Bromomethane	ND	0.50	ND	1.9
Chloroethane	ND	0.50	ND	1.3
Trichlorofluoromethane	ND	0.50	ND	2.8
Acrolein	ND	2.0	ND	4.6
1,1-Dichloroethene	ND	0.50	ND	2.0
Freon 113	ND	0.50	ND	3.8
Acetone	ND	2.0	ND	4.8
Carbon Disulfide	ND	0.50	ND	1.6
Isopropanol	ND	2.0	ND	4.9
Methylene Chloride	ND	0.50	ND	1.7
trans-1,2-Dichloroethene	ND	0.50	ND	2.0
MTBE	ND	0.50	ND	1.8
n-Hexane	ND	0.50	ND	1.8
1,1-Dichloroethane	ND	0.50	ND	2.0
Vinyl Acetate	ND	0.50	ND	1.8
cis-1,2-Dichloroethene	ND	0.50	ND	2.0
2-Butanone	ND	1.7	ND	4.9
Ethyl Acetate	ND	0.50	ND	1.8
Tetrahydrofuran	ND	0.50	ND	1.5
Chloroform	ND	0.50	ND	2.4
1,1,1-Trichloroethane	ND	0.50	ND	2.7
Cyclohexane	ND	0.50	ND	1.7
Carbon Tetrachloride	ND	0.50	ND	3.1
Benzene	ND	0.50	ND	1.6
1,2-Dichloroethane	ND	0.50	ND	2.0
n-Heptane	ND	0.50	ND	2.0
Trichloroethene	ND	0.50	ND	2.7
1,2-Dichloropropane	ND	0.50	ND	2.3
Bromodichloromethane	ND	0.50	ND	3.4
cis-1,3-Dichloropropene	ND	0.50	ND	2.3

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	EPA TO-15
Type:	BLANK	Units (M):	ug/m3
Lab ID:	QC880665	Diln Fac:	1.000
Matrix:	Air	Batch#:	246456
Units (V):	ppbv	Analyzed:	04/10/17

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	0.50	ND	2.0
Toluene	ND	0.50	ND	1.9
trans-1,3-Dichloropropene	ND	0.50	ND	2.3
1,1,2-Trichloroethane	ND	0.50	ND	2.7
Tetrachloroethene	ND	0.50	ND	3.4
2-Hexanone	ND	0.50	ND	2.0
Dibromochloromethane	ND	0.50	ND	4.3
1,2-Dibromoethane	ND	0.50	ND	3.8
Chlorobenzene	ND	0.50	ND	2.3
Ethylbenzene	ND	0.50	ND	2.2
m,p-Xylenes	ND	0.50	ND	2.2
o-Xylene	ND	0.50	ND	2.2
Styrene	ND	0.50	ND	2.1
Bromoform	ND	0.50	ND	5.2
1,1,2,2-Tetrachloroethane	ND	0.50	ND	3.4
4-Ethyltoluene	ND	0.50	ND	2.5
1,3,5-Trimethylbenzene	ND	0.50	ND	2.5
1,2,4-Trimethylbenzene	ND	0.50	ND	2.5
1,3-Dichlorobenzene	ND	0.50	ND	3.0
1,4-Dichlorobenzene	ND	0.50	ND	3.0
Benzyl chloride	ND	0.50	ND	2.6
1,2-Dichlorobenzene	ND	0.50	ND	3.0
1,2,4-Trichlorobenzene	ND	0.50	ND	3.7
Hexachlorobutadiene	ND	0.50	ND	5.3
Naphthalene	ND	2.0	ND	10

Surrogate	%REC	Limits
Bromofluorobenzene	93	70-130

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Fixed Gas Analysis

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	ASTM D1946-90
Field ID:	SV-24	Batch#:	246426
Matrix:	Air	Sampled:	04/03/17
Units:	ppmv	Received:	04/05/17
Units (Mol %):	MOL %	Analyzed:	04/07/17

Type: SAMPLE Diln Fac: 2.510
Lab ID: 287709-003

Analyte	Result	RL	Result (Mol %)	RL
Carbon Dioxide	5,300	2,500	0.53	0.25
Oxygen	150,000	2,500	15	0.25
Methane	ND	2,500	ND	0.25

Type: BLANK Diln Fac: 1.000
Lab ID: QC880577

Analyte	Result	RL	Result (Mol %)	RL
Carbon Dioxide	ND	1,000	ND	0.10
Oxygen	ND	1,000	ND	0.10
Methane	ND	1,000	ND	0.10

ND= Not Detected
RL= Reporting Limit
Result Mol %= Result in Mole Percent

Curtis & Tompkins, Ltd.

Batch QC Report

Fixed Gas Analysis

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	ASTM D1946-90
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC880576	Batch#:	246426
Matrix:	Air	Analyzed:	04/07/17
Units:	ppmv		

Analyte	Spiked	Result	%REC	Limits
Carbon Dioxide	2,000	1,816	91	70-130
Oxygen	2,000	1,736	87	70-130
Methane	2,000	1,834	92	70-130

Curtis & Tompkins, Ltd.

Batch QC Report

Fixed Gas Analysis

Lab #:	287709	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	STANDARD	Analysis:	ASTM D1946-90
Field ID:	SV-24	Units (Mol %):	MOL %
Type:	SDUP	Diln Fac:	2.510
MSS Lab ID:	287709-003	Batch#:	246426
Lab ID:	QC880578	Sampled:	04/03/17
Matrix:	Air	Received:	04/05/17
Units:	ppmv	Analyzed:	04/07/17

Analyte	MSS Result	Result	RL	Result (Mol %)	RL	RPD	Lim
Carbon Dioxide	5,348	5,337	2,510	0.5337	0.2510	0	30
Oxygen	146,500	146,500	2,510	14.65	0.2510	0	30
Methane	<2,510	ND	2,510	ND	0.2510	NC	30

NC= Not Calculated
ND= Not Detected
RL= Reporting Limit
RPD= Relative Percent Difference
Result Mol %= Result in Mole Percent


Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 287858
ANALYTICAL REPORT

Pangea Environmental	Project : 1233 BOCKMAN
1710 Franklin Street	Location : 1233 Bockman
Oakland, CA 94612	Level : II

Sample ID	Lab ID
SB-22	287858-001

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: _____ Date: 04/18/2017

Will Rice
Project Manager
will.rice@ctberk.com
(510) 204-2221 Ext 13102

CA ELAP# 2896, NELAP# 4044-001

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**287858**
Client:	**Pangea Environmental**
Project:	**1233 BOCKMAN**
Location:	**1233 Bockman**
Request Date:	**04/10/17**
Samples Received:	**04/10/17**

This data package contains sample and QC results for one soil sample, requested for the above referenced project on 04/10/17. The sample was received cold and intact.

TPH-Purgeables and/or BTXE by GC (EPA 8015B):
No analytical problems were encountered.

TPH-Extractables by GC (EPA 8015B):
No analytical problems were encountered.

CHAIN OF CUSTODY

Curtis & Tompkins Laboratories
ENVIRONMENTAL ANALYTICAL TESTING LABORATORY
In Business Since 1878

2323 Fifth Street
Berkeley, CA 94710

Phone (510) 486-0900
Fax (510) 486-0532

Chain of Custody # _____

C&T LOGIN # 287858

Project No:

Project Name: 1233 Beckman

Project P. O. No:

EDD Format: Report Level ☐ II ☐ III ☐ IV

Turnaround Time: ☐ RUSH _____ ☒ Standard

Sampler: E. Lervaag

Report To: Ron Scheele

Company: Pangea Env. Svs

Telephone: 510-836-3700

Email: rscheele@pangeaenv.com

Lab No.	Sample ID.	SAMPLING		MATRIX				# of Containers	CHEMICAL PRESERVATIVE					ANALYTICAL REQUEST	
		Date Collected	Time Collected	Water	Solid				HCl	H2SO4	HNO3	NaOH	None	TPHg 5ppb	TPHd 50ppb
	SB-22	4.10.17	1400		X			4				X	X	X	X

Notes:

SAMPLE RECEIPT
☒ Intact
☐ Cold
☐ On Ice
☐ Ambient

RELINQUISHED BY:
DATE: 4.10.17 TIME: 1455
DATE: TIME:
DATE: TIME:

RECEIVED BY:
DATE: 4/10/17 TIME: 1455
DATE: TIME:
DATE: TIME:

COOLER RECEIPT CHECKLIST

Curtis & Tompkins, Ltd.

Login # 287858 Date Received 4/10/17 Number of coolers 0
Client PANGEA Project 1233 BUCKMAN

Date Opened 4/10/17 By (print) KPS (sign) KSebus
Date Logged in ↓ By (print) KPS (sign) KSebus
Date Labeled ↓ By (print) ↓ (sign) ↓

1. Did cooler come with a shipping slip (airbill, etc) YES (NO)
   Shipping info
2A. Were custody seals present? .... ☐ YES (circle) on cooler on samples ☒ NO
   How many Name Date
2B. Were custody seals intact upon arrival? YES NO (N/A)
3. Were custody papers dry and intact when received? (YES) NO
4. Were custody papers filled out properly (ink, signed, etc)? (YES) NO
5. Is the project identifiable from custody papers? (If so fill out top of form) (YES) NO
6. Indicate the packing in cooler: (if other, describe)

☐ Bubble Wrap ☐ Foam blocks ☒ Bags ☐ None
☐ Cloth material ☐ Cardboard ☒ Styrofoam ☐ Paper towels

7. Temperature documentation: * Notify PM if temperature exceeds 6°C

Type of ice used: ☐ Wet ☐ Blue/Gel ☒ None Temp(°C)

☐ Temperature blank(s) included? ☐ Thermometer# ☐ IR Gun#

☐ Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present? (YES) NO
   If YES, what time were they transferred to freezer? @ 16:50
9. Did all bottles arrive unbroken/unopened? (YES) NO
10. Are there any missing / extra samples? YES (NO)
11. Are samples in the appropriate containers for indicated tests? (YES) NO
12. Are sample labels present, in good condition and complete? (YES) NO
13. Do the sample labels agree with custody papers? (YES) NO
14. Was sufficient amount of sample sent for tests requested? (YES) NO
15. Are the samples appropriately preserved? (YES) NO N/A
16. Did you check preservatives for all bottles for each sample? YES NO (N/A)
17. Did you document your preservative check? (pH strip lot#) YES NO (N/A)
18. Did you change the hold time in LIMS for unpreserved VOAs? YES NO (N/A)
19. Did you change the hold time in LIMS for preserved terracores? (YES) NO N/A
20. Are bubbles > 6mm absent in VOA samples? YES NO (N/A)
21. Was the client contacted concerning this sample delivery? YES (NO)
   If YES, Who was called? By Date:

KPS 4/10/17

COMMENTS

Curtis & Tompkins, Ltd.

Detections Summary for 287858

Results for any subcontracted analyses are not included in this summary.

Client : Pangea Environmental
Project : 1233 BOCKMAN
Location : 1233 Bockman

Client Sample ID : SB-22 Laboratory Sample ID : 287858-001

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Diesel C10-C24	1.8	Y	1.0	mg/Kg	As Recd	1.000	EPA 8015B	EPA 3550B

Y = Sample exhibits chromatographic pattern which does not resemble standard

Curtis & Tompkins, Ltd.

Gasoline by GC/FID (5035 Prep)

Lab #:	287858	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5035
Project#:	1233 BOCKMAN	Analysis:	EPA 8015B
Field ID:	SB-22	Diln Fac:	1.000
Matrix:	Soil	Batch#:	246646
Units:	mg/Kg	Sampled:	04/10/17
Basis:	as received	Received:	04/10/17

Type: SAMPLE Analyzed: 04/14/17
Lab ID: 287858-001

Analyte	Result	RL
Gasoline C7-C12	ND	0.16

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	88	70-138

Type: BLANK Analyzed: 04/13/17
Lab ID: QC881415

Analyte	Result	RL
Gasoline C7-C12	ND	0.20

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	78	70-138

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Gasoline by GC/FID (5035 Prep)

Lab #:	287858	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	1233 BOCKMAN	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Diln Fac:	1.000
MSS Lab ID:	287893-001	Batch#:	246646
Matrix:	Soil	Sampled:	04/10/17
Units:	mg/Kg	Received:	04/11/17
Basis:	as received	Analyzed:	04/13/17

Type: MS Lab ID: QC881413

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	<0.07115	10.42	8.982	86	49-120

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	101	70-138

Type: MSD Lab ID: QC881414

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	9.524	8.186	86	49-120	0	32

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	99	70-138

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Gasoline by GC/FID (5035 Prep)

Lab #:	287858	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5035
Project#:	1233 BOCKMAN	Analysis:	EPA 8015B
Matrix:	Soil	Batch#:	246646
Units:	mg/Kg	Analyzed:	04/13/17
Diln Fac:	1.000		

Type: BS Lab ID: QC881416

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1.000	0.9869	99	80-120

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	96	70-138

Type: BSD Lab ID: QC881417

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	1.000	0.9574	96	80-120	3	20

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	95	70-138

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Total Extractable Hydrocarbons

Lab #:	287858	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	1233 BOCKMAN	Analysis:	EPA 8015B
Field ID:	SB-22	Batch#:	246531
Matrix:	Soil	Sampled:	04/10/17
Units:	mg/Kg	Received:	04/10/17
Basis:	as received	Prepared:	04/11/17
Diln Fac:	1.000		

Type: SAMPLE Analyzed: 04/12/17
Lab ID: 287858-001

Analyte	Result	RL
Diesel C10-C24	1.8 Y	1.0

Surrogate	%REC	Limits
o-Terphenyl	115	58-136

Type: BLANK Analyzed: 04/11/17
Lab ID: QC880971

Analyte	Result	RL
Diesel C10-C24	ND	1.0

Surrogate	%REC	Limits
o-Terphenyl	120	58-136

Y= Sample exhibits chromatographic pattern which does not resemble standard
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Total Extractable Hydrocarbons

Lab #:	287858	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	1233 BOCKMAN	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC880972	Batch#:	246531
Matrix:	Soil	Prepared:	04/11/17
Units:	mg/Kg	Analyzed:	04/11/17

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	49.57	56.83	115	56-135

Surrogate	%REC	Limits
o-Terphenyl	120	58-136

Curtis & Tompkins, Ltd.

Batch QC Report

Total Extractable Hydrocarbons

Lab #:	287858	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	1233 BOCKMAN	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	246531
MSS Lab ID:	287853-001	Sampled:	04/10/17
Matrix:	Soil	Received:	04/10/17
Units:	mg/Kg	Prepared:	04/11/17
Basis:	as received	Analyzed:	04/11/17
Diln Fac:	1.000		

Type: MS Lab ID: QC880973

Analyte	MSS Result	Spiked	Result	%REC	Limits
Diesel C10-C24	0.3644	49.93	56.06	112	35-143

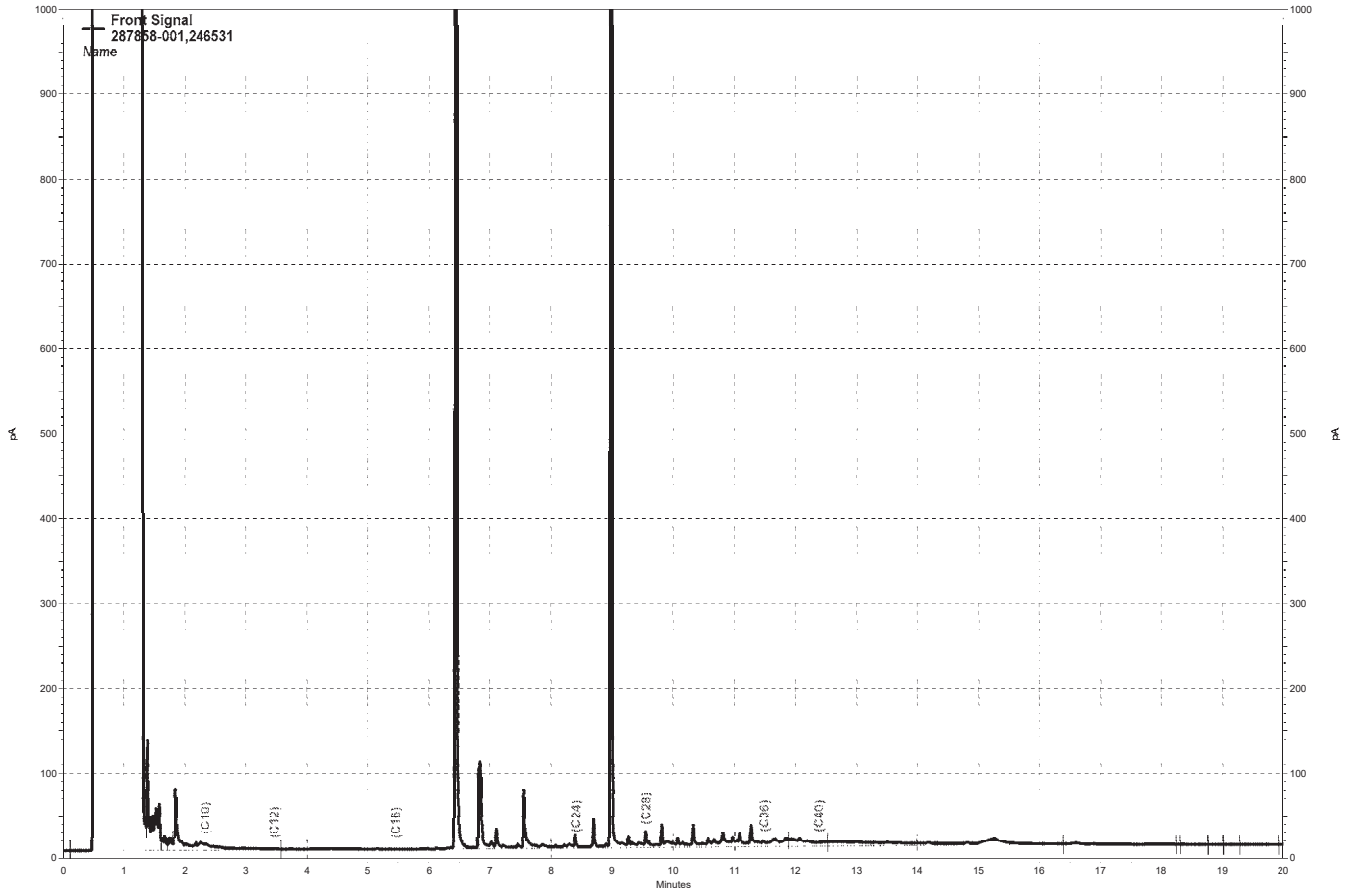
Surrogate	%REC	Limits
o-Terphenyl	119	58-136

Type: MSD Lab ID: QC880974

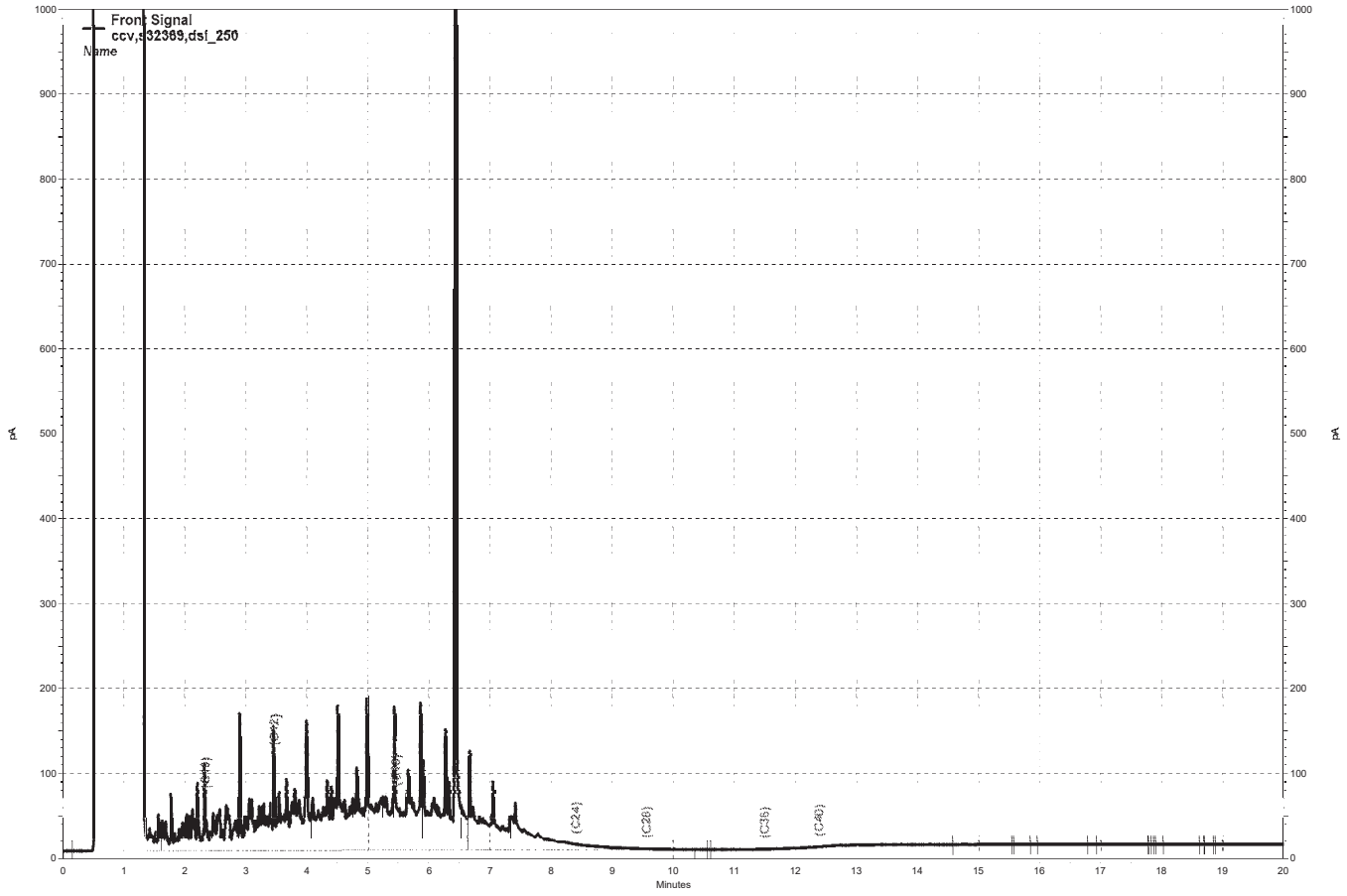
Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	50.02	56.27	112	35-143	0	59

Surrogate	%REC	Limits
o-Terphenyl	118	58-136

RPD= Relative Percent Difference



\\kraken\gdrive\ezchrom\Projects\GC27\Data\102a018.dat, Front Signal



\\kraken\gdrive\ezchrom\Projects\GC27\Data\101a017.dat, Front Signal

APPENDIX F

Standard Operating Procedures

STANDARD FIELD PROCEDURES FOR SOIL BORINGS

This document describes Pangea Environmental Services' standard field methods for drilling and sampling soil borings. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

Objectives

Soil samples are collected to characterize subsurface lithology, assess whether the soils exhibit obvious hydrocarbon or other compound vapor odor or staining, estimate ground water depth and quality, and to submit samples for chemical analysis.

Soil Classification/Logging

All soil samples are classified according to the Unified Soil Classification System by a trained geologist, scientist or engineer working under the supervision of a California Registered Engineer, California Registered Geologist (RG) or a Certified Engineering Geologist (CEG). The following soil properties are noted for each soil sample:

- Principal and secondary grain size category (i.e. sand, silt, clay or gravel)
- Approximate percentage of each grain size category,
- Color,
- Approximate water or product saturation percentage,
- Observed odor and/or discoloration,
- Other significant observations (i.e. cementation, presence of marker horizons, mineralogy), and
- Estimated permeability.

Soil Boring and Sampling

Soil borings are typically drilled using hollow-stem augers or hydraulic-push technologies. At least one and one half ft of the soil column is collected for every five ft of drilled depth. Additional soil samples are collected near the water table and at lithologic changes. With hollow-stem drilling, samples are collected using lined split-barrel or equivalent samplers driven into undisturbed sediments beyond the bottom of the borehole. With hydraulic-push drilling, samples are typically collected using acetate liners. The vertical location of each soil sample is determined by measuring the distance from the middle of the soil sample tube to the end of the drive rod used to advance the split barrel sampler or the acetate tube. All sample depths use the ground surface immediately adjacent to the boring as a datum. The horizontal location of each boring is measured in the field from an onsite permanent reference using a measuring wheel or tape measure.

Drilling and sampling equipment is steam-cleaned prior to drilling and between borings to prevent cross-contamination. Sampling equipment is washed between samples with trisodium phosphate or an equivalent EPA-approved detergent.

Sample Storage, Handling and Transport

Sampling tubes or cut acetate liners chosen for analysis are trimmed of excess soil and capped with Teflon tape and plastic end caps. Soil samples are labeled and stored at or below 4°C on either crushed or dry ice, depending upon local regulations. Samples are transported under chain-of-custody to a State-certified analytic laboratory.

Field Screening

Soil samples collected during drilling will be analyzed in the field for ionizable organic compounds using a photo-ionization detector (PID) with a 10.2 eV lamp. The screening procedure will involve placing an undisturbed soil sample in a sealed container (either a zip-lock bag, glass jar, or a capped soil tube). The container will be set aside, preferably in the sun or warm location. After approximately fifteen minutes, the head space within the container will be tested for total organic vapor, measured in parts per million on a volume to volume basis (ppmv) by the PID. The PID instrument will be calibrated prior to boring using hexane or isobutylene. PID measurements are used along with the field observations, odors, stratigraphy and ground water depth to select soil samples for analysis.

Water Sampling

Water samples collected from borings are either collected from the open borehole, from within screened PVC inserted into the borehole, or from a driven Hydropunch-type sampler. Groundwater is typically extracted using a bailer, check valve and/or a peristaltic pump. The ground water samples are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4°C, and transported under chain-of-custody to the laboratory.

Pangea often performs electrical conductivity (EC) logging and/or continuous coring to identify potential water-bearing zones. Hydropunch-type sampling is then performed to provide discrete-depth grab groundwater sampling within potential water-bearing zones for vertical contaminant delineation. Hydropunch-type sampling typically involves driving a cylindrical sheath of hardened steel with an expendable drive point to the desired depth within undisturbed soil. The sheath is retracted to expose a stainless steel or PVC screen that is sealed inside the sheath with Neoprene O-rings to prevent infiltration of formation fluids until the desired depth is attained. The groundwater is extracted using tubing inserted down the center of the rods into the screened sampler.

Duplicates and Blanks

Blind duplicate water samples are collected usually collected only for monitoring well sampling programs, at a rate of one blind sample for every 10 wells sampled. Laboratory-supplied trip blanks accompany samples collected for all sampling programs to check for cross-contamination caused by sample handling and transport. These trip blanks are analyzed if the internal laboratory QA/QC blanks contain the suspected field contaminants. An equipment blank may also be analyzed if non-dedicated sampling equipment is used.

Grouting

If the borings are not completed as wells, the borings are filled to the ground surface with cement grout poured or pumped through a tremie pipe.

Waste Handling and Disposal

Soil cuttings from drilling activities are usually stockpiled onsite on top of and covered by plastic sheeting. At least four individual soil samples are collected from the stockpiles for later compositing at the analytic laboratory. The composite sample is analyzed for the same constituents analyzed in the borehole samples. Soil cuttings are transported by licensed waste haulers and disposed in secure, licensed facilities based on the composite analytic results.

Ground water removed during sampling and/or rinsate generated during decontamination procedures are stored onsite in sealed 55 gallon drums. Each drum is labeled with the drum number, date of generation, suspected contents, generator identification and consultant contact. Disposal of the water is based on the analytic results for the well samples. The water is either pumped out using a vacuum truck for transport to a licensed waste treatment/disposal facility or the individual drums are picked up and transported to the waste facility where the drum contents are removed and appropriately disposed.

PANGEA

AIR AND DUST MONITORING LOG

Site:

Station ID:

Recorded By:

Date:

Dust Monitor Model:

Dust Monitor Serial Number:

PID Meter Model:

PID Meter Serial Number:

Time	Wind Direction	Wind Speed (mph)	PM10 Concentration (ug/m3)	PID Reading (ppmv)	Notes